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The relationship between income inequality and savings: evidence from household-level panel data in Vietnam

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ABSTRACT

The purpose of this paper is to address whether province-level income inequality is associated with household savings, as well as investigate how this relationship varies across different subgroups. The paper uses a unique balanced panel survey on access to resources of 2181 rural households between 2008 and 2014 in twelve provinces of Vietnam. An instrumental variablegeneralized method of moments approach aimed to tackle the issue of the endogeneity is applied to estimate relationships between relevant variables. Consistent with the prediction of the social status hypothesis, we find that income inequality positively impacts on households savings. Further analysis also shows that the effect of inequality on savings is somewhat stronger in those including poorer, richer, younger, and married-headed households than in the others. Our results are robust to alternative inequality measures and subsamples.

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KEYWORDS
Income inequality; household consumption and savings; social status hypothesis; rural Vietnam

1. Introduction

It has been widely accepted that the accumulation of physical capital is one of the major drivers of economic and social development, especially in developing countries like Vietnam. To accumulate additional capital, countries need to generate savings and investments partly from the private sector. From the micro perspective, savings is an important factor of household welfare, understanding the social-economic determinants that prompt households to save is therefore a worthwhile topic of academics and policymakers. Some empirical studies attempt to identify the key influences driving the saving behavior of households in Vietnam, including demographics (Nguyen, Nguyen, Trinh, Phung, & Le, 2013), social capital (Newman, Tarp, & Van Den Broeck, 2014), and social networks and insurance (Gries & Van Dung, 2014). Recently, the growing literature on social status and economic growth has provided several explanations for how and why income inequality can impact on households' savings.

There are various mechanisms in which the need for social status as a hidden motive helps explain the inequality-saving link.[1] In a theoretical analysis of Pham (2005), assuming that people care about both consumption and social status, it is predicted that households with

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[1]Weiss and Fershtman (1998) define that social status is the rank of an individual or a group of individuals in a given society; the rank relies on a commonly agreed-upon standard such as income, wealth, education, origin and occupation. In our paper, income distribution is considered as a social ranking.

low-status have stronger incentives for saving, since it is important to obtain more satisfaction from a marginal increase in wealth accumulation so as to improve social status, as compared to consumption. This, in turn, may urge those belong to the high-status groups to hold enough savings in order to maintain their social status. Consequently, income inequality on the rise within the reference group leads households to greater savings for future consumption. This result is in contrast to a recent study of Frank, Levine, and Dijk (2014), who find that each individual's current consumption is not only proportional to his/her permanent income but determined by current consumption of others with higher income. The latter demonstrates that if myopic consumers are induced to spend more today to avoid falling behind in the social race because of higher current spending of peers above them on income rank, aggregate savings thus reduces in response to growing income inequality.

In parallel with this literature, our paper aims to test if there is a significant relationship between province-level income inequality and savings among rural Vietnamese households. Besides, we also aim to examine whether the influence of inequality differs across socio-economic groups (by income, age, gender, etc.) because they can assign various importance to saving behavior. It is remarkable in this paper that the reference group of a household is presented as all households living in the same province. To the best of our knowledge, no previous research empirically assesses such a relationship in a developing country like Vietnam. We employ a unique balanced panel data from the Vietnam Access to Resources Household Survey (VARHS) between 2008 and 2014 in 12 provinces conducted by the United Nations University World Institute for Development Economics Research in collaboration with Vietnamese partners.[2] Due to the presence of endogeneity, serial correlation in error term and heteroskedasticity in our data, we apply an instrumental variable-generalized method of moments (IV-GMM) technique to control these problems.

Noteworthy findings consist of: (i) an increase in provincial income inequality, as represented by the GINI coefficient, leads to an increase in savings of rural households in Vietnam, meaning that as living in the province with higher inequality, those households will be likely to have more savings, after controlling for income, demographic characteristics, income sources, diversifications, and shocks; (ii) the impact of income inequality on savings is moderately stronger among poorer, richer, younger, and married-headed households perhaps due to the process of status-seeking; (iii) other measures of economic inequality, including Theil (L) and Palma ratio, are used to check the robustness of our regression results, and we find a similar impact of provincial inequality on household savings.

The contribution of this paper is both empirical and methodological. Firstly, identifying the causal effect of income inequality on savings in field data studies is highly complicated. For instance, some households with a status-seeking motive may be more extroverted, risk-loving, or vulnerable to the location where they chose to live than their counterparts. These factors which are difficult to observe may lead them to self-select into a province with high inequality. In this context, using the balanced panel data obtained from the VARHS is highly attractive, because it helps to control for such unobservable household characteristics, which impact on both their savings and self-selection. Secondly, there may exist two-way causality between income and savings as it could be argued that income is an endogenous variable. It could be either that savings turns out to be influenced by income or that the causal effect could derive

[2]Survey data of growth, structural transformation, and rural change in Viet Nam book, the United Nations University World Institute for Development Economics Research, available at: https://www.wider.unu.edu

from savings. Similarly, another important issue in the estimation is the endogeneity of the variable income inequality. Because household savings adversely affects income inequality, the coefficient for inequality to savings may be biased. As income inequality is the extent to which income is distributed unevenly within a province, this variable should also be treated as endogenous.[3]

To solve fully these problems and to get unbiased and consistent estimates, instrumental variables estimation with panel data is used in the present paper. This is a novelty with respect to most of the previous empirical studies, which have considered income and inequality as exogenous when analyzing relationships among variables of interest at the household level. With this approach, we are instead able to give useful and consistent insights on the relationship between income inequality and savings, taking it into consideration the potential endogeneity.

The paper is structured as follows. Section 2 describes the literature review and develops our hypotheses. Section 3 presents the econometric model, data and measures of household savings, income, and inequality. Section 4 shows results of research and discussion, robustness tests, and subsample analyses. In the final section, we give conclusions.

2. Literature review and hypotheses

Theoretical and empirical discussions have shown ambiguous results on the income inequality-saving link as documented by Schmidt-Hebbel and Servén (2000). In their seminal works, both Friedman (1957) and Modigliani (1970) predict that poor or rich households seek to smooth consumption throughout their lifetimes; thereby savings rate is relatively stable over time and independent of their relative position in the income distribution. A political-economy study of Alesina and Rodrik (1996) suggests that rising inequality causes social tension and political instability, greater demand for taxation and redistributive policies, and therefore a decrease in aggregate savings; whereas there is evidence on the bequest motive driving a positive relationship between income inequality and savings. For instance, Dynan, Skinner, and Zeldes (2004) show higher saving rates among wealthier households when their bequests are much larger and effectively exempt from a more regressive consumption tax compared to an income tax. Some of the other studies consider subsistence consumption as a mechanism through which income inequality positively influences savings. It could be that rich households save a high proportion of their income, whereas other groups in the economy save less after buying the necessities (Ben-David, 1998; Lewis, 1954). While these studies assume that individuals derive utility from absolute levels of consumption, it is well understood that they also care about the social aspects of consumption and savings.

In the recent economic growth literature, social status as a motive of individual behavior has appeared to corroborate the positive link between inequality and savings. In the wealth-is-status case, Cole, Mailath, and Postlewaite (1992) find that individual utility depends not only on absolute wealth but also on relative position in the distribution of income and that increased inequality over time gives a strong incentive to accumulate that stems from increased future consumption. By incorporating status-seeking into the model of Glomm and Ravikumar (1994), Pham (2005) shows that greater income inequality accelerates greater

[3]Charles et al. (2009) and Roychowdhury (2017) discuss that inequality of the reference group is not exogenously due to individuals' self-selection behavior to locate in one place versus another with particular motives.

savings of highly motivated individuals. When the income gap between the low-and high-status groups widens, members of low-status groups could be more preferred to use savings strategies which would help them move into the high-status groups. According to a much different approach of Corneo and Jeann (1997) and Veblen (1992), instead of spending on productive goods and savings, individuals try to display social status through conspicuous consumption, for instance, collecting rare cars, artworks, and other positional items. A more equal society acquires less entry consumption level for the high-status groups, thereby the poor spend more on conspicuous goods to overtake others in the status competition (Hopkins & Kornienko, 2004, 2009). It also implies to the extent that economic inequality increases positively with savings.

In contrast to these findings, several other studies argue that income inequality has a negative relationship with savings when social status is taken into account. Van Long and Shimomura (2004) state that if wealth accumulation is relatively more attractive than consumption, the poor who have a stronger desire to save will catch up with those who are initially richer, meaning that a substantial rise in savings responds to decreasing inequality over time. The possibility of catching up is that the poor' additional benefit from increasing their future income would encourage them to spend on education (Kawamoto, 2009). Another analysis of Corneo and Jeanne (2001) shows that greater income inequality diminishes the motivation of the poor, making them more difficult to save money while it weakens that of the rich to assert their social status. Moreover, Frank et al. (2014) find that individuals look locally to higher-income earners for their consumption, which means that greater current expenditure of those forces them to spend more to keep up, respectively. This suggests that greater inequality is associated with more conspicuous consumption of all groups and may even cause a decline in total savings.

Following the theoretical discussion, the empirical research has also established mixed findings. On the one hand, some studies suggest a negative relationship. Using aggregate quarterly US data for the years 1980 to 2003, Christen and Morgan (2005) show that income inequality has a positive influence on conspicuous consumption, and, instead of saving, poor families increase borrowing to keep consumption level relative to rich ones. Similarly, Jaikumar and Sarin (2015) analyze that as a result of growing inequality, poor rural households in India spend significantly on conspicuous items, because of less access to alternatives to indicate social status, such as educational qualifications and savings. Drawing upon the theoretical work of Frank et al. (2014), Darku (2014) explains that income inequality negatively impacts on personal savings at both the provincial and national level since people in Canada seek to signal their social status with current consumption.

On the other hand, other studies have reached different results. First of all, Harbaugh (2004) argues that rising inequality induces more savings if consumers in China are not too impatient and tilt their consumption towards the future. It could be for the case where the future income is uncertain, they are even more afraid of falling behind in the status contest, which thus leads to an increase in precautionary savings. In addition, Jin, Li, and Wu (2011), employing Chinese household survey data, find that income inequality at the provincial level is positively related to status-seeking savings of households, especially poorer and younger ones; and increased inequality discourages expenditure on conspicuous goods. A recent analysis of Roychowdhury (2017) proposes and tests the status competition hypothesis pointed out by Hopkins and Kornienko (2009) using Indian data and finds that province-level inequality is negatively associated with conspicuous consumption and may have

a positive link with savings in consonance with the hypothesis. In their seminal study, Charles, Hurst, and Roussanov (2009) reveal that average income and inequality of the reference group could explain the differences in conspicuous expenditure between races in the United States, although the coefficient of income inequality is not statistically significant.

In short, based on the existing theoretical and empirical literature on saving and consumption decisions, this paper will investigate behavioral patterns of Vietnamese rural household savings by two key hypotheses:

H1: *Household savings is positively affected by income inequality*

This hypothesis is an application to the social status hypothesis (Cole et al., 1992; Hopkins & Kornienko, 2009; Pham, 2005). It could be hypothesized in our paper whether savings of Vietnamese rural households rises in response to greater provincial income inequality. We aim to empirically test this nexus grounded on the initial observations that according to the World Bank database, the Gini index increased from 35.4 to 39.3 while gross savings as a percentage of gross national income raised by almost 10% from 1998 to 2010, and then both followed a downtrend in the next four years.[4]

H2: *Effect of income inequality varies across different subgroups*

Household characteristics classified by income group, age, gender, marital status, etc. may matter in the case that they assign various importance to saving behavior of the household. The social status hypothesis also predicts that the effect of income inequality is stronger in those who lie at the bottom status groups (poorer, younger, female-headed household, etc.) because of more satisfaction from status upgrading, whereas it, in turn, strengthens the incentives of households belong to the top groups (richer, older, male-headed household, etc.) to keep their social status.

3. Empirical strategy

3.1. Econometric model

To detect whether provincial income inequality is associated with household savings in rural Vietnam. Firstly, we estimate a baseline regression model:

$$\ln(S_{ht}) = \alpha + \beta \ln(\text{income}_{ht}) + \gamma \text{inequality}_{ht} + \delta X_{ht} + \varepsilon_{ht}$$

Where S_{ht} is the annual average saving for household h in time t; income is monthly real per capita income; X_h is a vector of household-specific variables, including demographic characteristics, the presence of income sources and diversified economic activities, and the incidence of natural and economics income shocks; inequality is represented by three different measures of income inequality (namely, Gini index, Theil index, and Palma ratio); and ε_{ht} is a statistical noise term.

Notice that γ is expected to be positive as predicted by the social status hypothesis: income inequality within the reference group is positively associated with household savings. It can be seen that γ also shows the effect of inequality on the average propensity

[4]World Bank Open Data, available at: https://data.worldbank.org

to save or savings rate, since log(savings rate) equals log(savings) minus log(income). Besides, β is the income elasticity of savings and expected to be positive; and if this estimated coefficient is more than 1.0, the average propensity to save or savings rate increases with income.

Some tests are conducted to check for possible violations of the underlying estimation assumption in order to choose the most appropriate estimation method. Table 1 presents the results of these tests, with statistically significant p-values shown in italic. It can be shown that the result of the White test indicates the presence of heteroscedasticity, and the test for the first-order autocorrelation in the panel data (significant even at the 1% level) indicates the existence of first-order serial correlation, while the Durbin-Wu-Hausman test indicates the existence of endogeneity among the variables income and income inequality.

To deal with these econometric problems, we apply two approaches: (i) the feasible generalized least-squares method (GLS) which allows estimation in the presence of first-order serial autocorrelation and heteroskedasticity with panel data (Greene, 2002) and (ii) the instrument variable-generalized method of moments (IV-GMM) clustering standard errors at the household level (Baum, Schaffer, & Stillman, 2010). Since the IV-GMM requires the availability and validity of exogenous instruments, our paper use land area, food consumption, and durable consumption as instrumental variables for the income variable. Following an instrumental variables strategy widely used in the macro literature (Brueckner & Lederman, 2015), we generate an inequality variable adjusted for the effect of savings on inequality as an instrumental variable for inequality. This relationship is expressed and estimated in the regression using the IV-GMM estimator: $\text{Inequality}_{ht} = \sigma + \rho \ln(S_{ht}) + u_{ht}$. Instrumental variables for household savings are demographic variables, consisting of age, age squared, and household size. This adjusted inequality variable is given by: $\text{Inequality}_{ht} - \rho \ln(S_{ht})$, hence this instrument is uncorrelated with the natural log of annual average savings. Table A1 of the Appendix A shows that household savings has a significant negative impact on income inequality, hence the ordinary least squares may underestimate the coefficient for inequality to savings.

3.2. Data

A unique balanced panel of rural households between 2008 and 2014 used for the study is obtained from the Vietnam Access to Resources Household Survey (VARHS) implemented by the United Nations University World Institute for Development Economics Research in collaboration with Vietnamese partners. The VARHS covers the rural areas of twelve

Table 1. Testing for possible violations of the underlying estimation assumptions.

White test for the presence of heteroskedasticity	Chi-sq(357) = 1086.03 *p = 0.000*
Test for serial correlation	F (1, 1287) = 83.426 *p = 0.000*
Durbin-Wu-Hausman test	Chi-sq(2) = 6935.2 *p = 0.000*

Source: Authors' calculations based on VARHS 2008–2014 survey data.

provinces across the country (Dak Lak, Dak Nong, Dien Bien, Ha Tay, Khanh Hoa, Lai Chau, Lam Dong, Lao Cai, Long An, Nghe An, Phu Tho, and Quang Nam). To establish the balanced panel of 2,181 households, the same households interviewed every two years are included. However, in our paper, the number of households may be smaller due to missing data.

Since the VARHS did not record total expenditure data, a standard measure of savings that equals income minus expenditure is unavailable. Another reliable measure of savings is the amount of self-reported savings: Families are asked about their saving stock at the interview date, twelve months ago, and how much they saved during the past 12 months, which are used to check misreporting of financial information. Notice that the measure of savings is expressed on an annual household basis, while data on per capita income from different sources (agriculture, wage, non-farm non-wage, transfers, etc.) is annually collected and then is transferred to monthly figures. Subsequently, the data on income and savings are adjusted for price differences over time from 2008 to 2014 and between the different provinces in Vietnam. Furthermore, we use the Gini coefficient, one of the most commonly used indicators to measure income inequality. Other measures of inequality are also employed to check the robustness of our regression results, consisting of the Theil index and Palma ratio – the ratio of the income share of the richest 10% divided by the income share of the poorest 40%.

Tables A2 and A3 of the Appendix A shows the correlation coefficients of independent variables. Table A4 of the Appendix A describes all the variables that we use for the empirical analysis: savings, inequality measures, income, household and shocks control variables, instrumental variables (land ownership, food consumption, and durable consumption) for the income variable, and instrumental variable (adjusted measure of inequality) for the inequality variable. The variables including savings, income, average province income, land area, food consumption, and durable consumption are under log transformation to reduce the impact of outliers and for convenience in interpreting parameter estimates.

4. Estimation and discussion of results

4.1. Baseline regression results

This section aims to test the hypothesis H1 on the impact of provincial income inequality on household savings in rural Vietnam. Table 2 reports the baseline panel data regression results for the key variables of interest, using both the GLS method and IV-GMM method.

Overall, the results from the IV-GMM estimator are more significant than those from the GLS estimator. Because of the existence of endogeneity, serial correlation in error term and heteroskedasticity in our data, the IV-GMM estimator provides more unbiased and efficient estimations. More reasonable, our focus is on the results by adopting the IV-GMM, using the Gini coefficient as the main measure of income inequality and controlling for income, household characteristics, income sources, diversified activities, shocks, and province and time dummies.

Several diagnostic tests are conducted to assess the reliability and efficiency of this approach. Firstly, Hansen's over-identification test is performed to confirm the validity of the instruments. The join null hypothesis of this test is that instruments are uncorrelated with the error term and that the excluded instruments are correctly excluded from the estimated equation, thus, the instruments are valid. Secondly, based on the under-

Table 2. Regressions estimating the effect of income inequality on household savings.

Dependent variable: Log (household savings)			
	GLS (1)	IV-GMM (2)	IV-GMM (3)
GINI	2.474[a]	4.993[a]	5.496[a]
	(0.302)	(0.605)	(0.610)
Income (log)	0.975[a]	1.760[a]	1.757[a]
	(0.014)	(0.049)	(0.049)
Average province income (log)			−0.909[a]
			(0.182)
Control variables	YES	YES	YES
Province Time dummies	YES	YES	YES
Constant	−0.126	−7.633[a]	0.177
	(0.190)	(0.496)	(1.590)
F stat	13,428.3[a]	133.52[a]	129.41[a]
Under-identification test		663.772[a]	665.306[a]
Weak-identification test		465.405[a]	471.374[a]
Inequality (GINI)		320000[a]	240000[a]
Income (log)		621.31[a]	629.33[a]
Hansen J statistic		0.621	0.463
Number of observations	7,151	6,936	6,936

Each model includes province and time fixed effects. Robust standard errors clustered at the household level. [a] denotes significance at the 1% level, [b] denotes significance at the 5% level, and [c] denotes significance at the 10% level. Controlling for income, average province income, demographic characteristics, income sources, diversifications and shocks. The variables include land area, food consumption and durable consumption are instrumental variables for income, while adjusted income inequality is an instrumental variable for inequality.

Source: Authors' calculations based on VARHS 2008–2014 survey data.

identification test, the estimated Kleibergen and Paap rk LM statistic permits us to clearly reject the null hypothesis that the instruments are uncorrelated with the endogenous regressors and that the model is not identified. Thirdly, both the Sanderson-Windmeijer first-stage F statistics reported for each endogenous regressor separately and the estimated Kleibergen and Paap Wald rk F statistic for the weak-identification test allow us to readily reject the null hypothesis of weak instruments.

The results in Table 2 show that the effect of provincial income inequality on household savings is positive and statistically significant, as hypothesized and expected (Cole et al., 1992; Pham, 2005; Hopkins & Kornienko, 2009). The magnitude of the coefficient of inequality is around 5 at the 1% significance level in the second column, and this coefficient is economically meaningful as well. Holding other things constant, when the Gini coefficient rises by 0.1, household savings or the average propensity to save rises by roughly 50%. It is noticeable in the third column that after we control for average province income which has a significant negative association with savings, the estimated effect of income inequality becomes slightly stronger. However, the issue of multicollinearity arises and is caused by the inclusion of the average province income variable which is computed from the income variable in our data and an almost identical variable to the inequality variable.[5] Hence, it seems appropriate to exclude this variable from further considerations.[6]

This confirms the findings of Harbaugh (2004) and Jin et al. (2011), which demonstrate that income inequality appears to raise savings of Chinese households. A possible

[5]A useful tool to detect multicollinearity is to calculate the variance inflation factor (VIF). In our case here, the VIF of average province income is large (> 10).

[6]The variables average province income and inequality are jointly empirical measures of the wealth distribution of the reference group in the study of Charles et al. (2009).

explanation for this is that if people place a high value on relative consumption in the future, they will be more patient and able to save more so as not to fall behind in the race rather than increasing expenditure in the present, which may well reflect precautionary behavior of households caring more about the uncertainty of future income (Harbaugh, 2004). Furthermore, it is more worth receiving tangible and intangible benefits from wealth accumulation by increasing saving, in comparison with consumption (Pham, 2005); and it could be due to the fact that households' savings increases in response to the higher wealth level required for the high-status groups (Cole et al., 1992; Jin et al., 2011). There could be an additional explanation under assuming that the similar distributions of consumption and income. As a result of income inequality, the entry consumption level will make it very difficult for households to spend a little bit more and get ahead of others in a status competition (Hopkins & Kornienko, 2009; Roychowdhury, 2017). This mechanism, therefore, would also explain why rising income inequality leads to lower consumption and hence higher savings among rural households in Vietnam.

However, they are not consistent with the results of Christen and Morgan (2005); Darku (2014); Jaikumar and Sarin (2015). These studies show that households facing increased income inequality would rather spend money on conspicuous consumption, rather than on savings. It is discussed by Frank et al. (2014) that people are present-biased, but may still be rational to the extent that their experience can be more painful if left behind in the contest of social status today while pecuniary and non-pecuniary rewards they will receive in the future can be really doubtful.

In general, our empirical findings lead support to the prediction of the social status hypothesis. There exist multiple potential explanations for the results obtained in this paper. This could be because people care about not only their rank in the wealth distribution but also conspicuous consumption. Jin et al. (2011) propose and test these related hypotheses to pin down the plausible mechanism. These authors find that both total consumption and conspicuous consumption are negatively affected by income inequality, and these confirm that people have a stronger status motive to increase their savings when rising inequality. We notice that even though income inequality has a positive effect on savings as expected in our paper, this does not necessarily mean the tendency to reduce conspicuous expenditure in rural Vietnamese households. Regrettably, the VARHS does not contain the specific types of conspicuous consumption that would enable us to measure and test this consumption-inequality link.

The results are also remarkable with the income variable. Not surprisingly, we find that income per capita per family that strengthens income inequality has a positive and significant link with household savings. More specifically, other things kept equal, a 1% increase in the per capita income of each household is associated with a 1.76% increase in savings, which means that the average propensity to save rises by appropriately 0.76%. In our comparison paper, Jin et al. (2011) show that when income increases by 1%, consumption (net of education expenditures) rises by 0.75%, which suggests that the average propensity to save tends to rise by 1.25%, correspondingly. These results are consistent with the social status hypothesis (see more Pham, 2005), which clarifies that if income growth is largely contributed by highly motivated individuals, then it will enlarge income inequality, thereby inducing savings rates to increase. In short, the estimate

indicates that province-level inequality can explain a large portion of savings as a percentage of income.

Table 3 presents the regressions estimating the effect of provincial income inequality, according to its other measures that are used to check robustness for our baseline results. On the whole sample, we also find a similar positive relationship between income inequality and household savings. It can be seen that when the Theil index increases by 0.1, household savings rises by around 33.25%, holding other things equal. Likewise, the estimate using the Palma ratio as an inequality indicator reported in the third column of Table 3 gives the same result.

4.2. Subsample analysis

The aim of this section is to test the hypothesis H2 on whether the influence of income inequality on household savings differs between subgroups in rural Vietnam. The results for the key variables of interest are presented in Tables 4–6, namely by three measures of provincial inequality.

Overall, consistent with results above that suggest a positive association in reference group income inequality with savings, we also find that household savings across all subsamples rises in response to greater provincial income inequality. However, the magnitude of this effect is precisely comparable in terms of income level, age, and marital status.

Firstly, while income inequality has significant positive coefficients at the 1% level, the magnitudes of these coefficients vary across all income groups. More particularly, the impact of income inequality on poor and rich households is reasonably stronger than on middle ones, for all three measures of inequality. There are some possible interpretations about why income groups may matter in this case.[7] On the one side, as a consequence of rising income inequality, it is not easy for poor households to engage in conspicuous consumption than the others, perhaps because of the fact that some consumption expenditure could be largely driven only after a certain income threshold level has been reached. In other words, the chances of getting to the top groups are not given to them unless they try to increase income. On the other side, it could be explained that the status-seeking motive is relatively stronger among poorer households since they feel satisfied with accumulating wealth by increasing savings, while the rich would be able to hold enough savings in order to keep their social status, and the middle group may place a greater value on additional current expenditure and less sensitive to increased inequality in their reference group.

These findings are in line with the results of a study by Jin et al. (2011), which find that poor households in urban China may be able to save enough to enter the higher status groups, except that the influence on saving behavior of the rich is insignificantly positive. They, however, are in contrast to some previous studies (Christen & Morgan, 2005; Corneo & Jeanne, 2001; Jaikumar & Sarin, 2015), which show that poor households are urged to involve more in conspicuous consumption than productive activities like savings. It could be suggested that a key policy challenge for the poor is to expand the share of savings for

[7]Three income groups are measured by per capita income per household in 2008. The poor, middle, and rich are the bottom, middle, and top one-third of the income distribution, correspondingly.

Table 3. Regressions estimating the effect of income inequality: different measures of income inequality.

Dependent variable: Log (household savings)		
	IV-GMM	
Theil	3.325[a]	
	(0.361)	
Palma		0.437[a]
		(0.048)
Income (log)	1.762[a]	1.758[a]
	(0.049)	(0.049)
Control variables	YES	YES
Province Time dummies	YES	YES
Constant	−6.624[a]	−6.440[a]
	(0.434)	(0.430)
F stat	133.92[a]	133.86[a]
Under-identification test	664.151[a]	664.252[a]
Weak-identification test	466.024[a]	465.649[a]
Inequality	180000[a]	240000[a]
Income (log)	622.0[a]	621.73[a]
Hansen J statistic	0.594	0.610
Number of observations	6,936	6,936

Each model includes province and time fixed effects. Robust standard errors clustered at the household level. [a] denotes significance at the 1% level, [b] denotes significance at the 5% level, and [c] denotes significance at the 10% level. Controlling for income, demographic characteristics, income sources, diversifications and shocks. The variables include land area, food consumption and durable consumption are instrumental variables for income, while adjusted income inequality is an instrumental variable for inequality.

Source: Authors' calculations based on VARHS 2008–2014 survey data.

investment and production purposes (for example, material and machinery purchase and education expenditure for their children), and instead of, for conspicuous consumption.

Secondly, the significant effect of income inequality is somewhat stronger for households headed by younger individuals. It could be understood that the reason why younger households facing rising inequality have more savings may be partially consistent with the life-cycle consumption pattern. One other reason is that as province-level inequality is set to rise, those who are younger are more likely to be concerned about accumulating wealth needed to meet the requirement for their entry into the high-status groups. They tend to restrict conspicuous consumption and increase savings to compete with their peers in the reference group whose membership is determined by the level of wealth (Jin et al., 2011).

Next, we find that the higher is provincial income inequality, the higher is savings among married-headed households who may be a bit more strongly motivated than unmarried-headed ones. This, nevertheless, is inconsistent with the finding of Roychowdhury (2017), which demonstrates that unmarried people seem to be more responsive to others' assessment of their social status as they search for spouses and to peer pressure to raise social status. Finally, the magnitude of the effect seems not to vary across gender and types of economic activities, although this effect of income inequality is statistically significant. This could be that both men and women might make the same response to status competition, and households taking part in diversification activities and agricultural production only might have a similar level of benefits produced by accumulating wealth.[8]

[8]Our data includes households with no economic activities that do not earn an income from any of the economic activities; their main income source was from public and private transfers.

Table 4. Regressions estimating the effect of income inequality (GINI) on household savings: subsample analysis.

	Dependent variable: Log (household savings)										
	Income			Age		Gender		Marriage Status		Diversified activity	
	Poor	Middle	Rich	≤ 39.5	>39.5	Female	Male	Married	Not married	Divers.	Agri. activity
GINI	5.915[a]	4.287[a]	5.971[a]	5.605[a]	4.486[a]	5.410[a]	5.362[a]	4.979[a]	4.393[a]	5.240[a]	5.321[a]
	(1.201)	(1.075)	(1.048)	(0.770)	(0.954)	(1.377)	(0.681)	(0.660)	(1.515)	(0.690)	(1.325)
Income (log)	2.073[a]	2.323[a]	1.978[a]	1.716[a]	1.864[a]	1.772[a]	1.764[a]	1.762[a]	1.786[a]	1.824[a]	1.606[a]
	(0.135)	(0.159)	(0.118)	(0.070)	(0.075)	(0.118)	(0.056)	(0.055)	(0.120)	(0.058)	(0.105)
Constant	−9.541[a]	−12.203[a]	−11.137[a]	−6.982[a]	−8.313[a]	−6.757 [c]	2.038	−7.800[a]	−6.981 [a]	−8.429[a]	−6.326[a]
	(1.263)	(1.453)	(1.092)	(0.699)	(0.763)	(3.711)	(1.754)	(0.555)	(1.180)	(0.582)	(0.984)
F stat	26.22[a]	32.95[a]	29.70[a]	80.96[a]	58.07[a]	23.85[a]	119.09[a]	122.02[a]	20.31[a]	106.46[a]	45.35[a]
Under-identification test	135.056[a]	144.781[a]	216.605[a]	376.942[a]	332.637[a]	134.106[a]	550.670[a]	565.137[a]	124.370[a]	551.931[a]	145.985[a]
Weak-identification test	57.585[a]	69.966[a]	110.036[a]	233.098[a]	214.605[a]	87.081[a]	369.659[a]	378.932[a]	86.023[a]	378.542[a]	77.375[a]
Inequality (GINI)	11,425.8[a]	24,440.2[a]	79,921.4[a]	88899[a]	67,907.3[a]	46662[a]	140000[a]	120000[a]	16,215.5[a]	240000[a]	61,275.5[a]
Income (log)	77.91[a]	93.38[a]	146.71[a]	310.95[a]	287.23[a]	116.34[a]	493.42[a]	505.79[a]	115.38[a]	507.92[a]	104.00[a]
Hansen J statistic	1.026	0.095	1.139	0.292	1.617	1.968	0.115	0.137	3.079	0.182	3.108
Number of observations	2,058	2,356	2,439	3,631	3,305	1,409	5,527	5,695	1,241	5,253	1,458

Each model includes province and time fixed effects. Robust standard errors clustered at the household level. [a] denotes significance at the 1% level, [b] denotes significance at the 5% level, and [c] denotes significance at the 10% level. Controlling for income, demographic characteristics, income sources, diversifications and shocks. The variables include land area, food consumption and durable consumption are instrumental variables for income, while adjusted income inequality is an instrumental variable for inequality.

Source: Authors' calculations based on VARHS 2008–2014 survey data.

Table 5. Regressions estimating the effect of income inequality (Theil) on household savings: subsample analysis.

	Dependent variable: Log (household savings)										
	Income			Age		Gender		Marriage Status		Diversified activity	
	Poor	Middle	Rich	≤ 39.5	>39.5	Female	Male	Married	Not married	Divers.	Agri. activity
Theil	3.707[a]	2.586[a]	4.218[a]	3.673[a]	3.047[a]	3.498[a]	3.519[a]	3.332[a]	2.967[a]	3.469[a]	3.503[a]
	(0.716)	(0.639)	(0.620)	(0.469)	(0.551)	(0.806)	(0.404)	(0.394)	(0.900)	(0.414)	(0.779)
Income (log)	2.078[a]	2.325[a]	1.979[a]	1.719[a]	1.865[a]	1.774[a]	1.766[a]	1.764[a]	1.788[a]	1.824[a]	1.613[a]
	(0.135)	(0.159)	(0.118)	(0.071)	(0.075)	(0.118)	(0.056)	(0.055)	(0.120)	(0.058)	(0.105)
Constant	−8.284[a]	−11.232[a]	−9.999[a]	−5.827[a]	−7.424[a]	−5.461	3.064 [c]	−6.801[a]	−6.111[a]	−7.346[a]	−5.274[a]
	(1.113)	(1.363)	(1.042)	(0.622)	(0.669)	(3.725)	(1.749)	(0.489)	(1.021)	(0.513)	(0.846)
F stat	26.19[a]	32.78[a]	30.47[a]	81.03[a]	58.40[a]	23.76[a]	119.42[a]	122.54[a]	20.19[a]	107.11[a]	45.54[a]
Under-identification test	135.561[a]	145.037[a]	216.716[a]	376.903[a]	332.704[a]	134.051[a]	551.120[a]	565.514[a]	124.354[a]	552.453[a]	146.187[a]
Weak-identification test	57.900[a]	70.159[a]	110.023[a]	233.449[a]	214.632[a]	87.090[a]	370.427[a]	379.676[a]	86.032[a]	379.260[a]	77.513[a]
Inequality (Theil)	15,102.5[a]	32,935.6[a]	53,156.4[a]	83,598.8[a]	48,684.5[a]	27,187.1[a]	120000[a]	150000[a]	13,797.3[a]	130000[a]	36,703.1[a]
Income (log)	78.09[a]	93.61[a]	146.71[a]	311.36[a]	287.19[a]	116.39[a]	494.28[a]	506.67[a]	115.32[a]	508.53[a]	104.41[a]
Hansen J statistic	0.999	0.097	1.126	0.321	1.590	1.972	0.095	0.121	3.135	0.188	3.145
Number of observations	2,058	2,356	2,439	3,631	3,305	1,409	5,527	5,695	1,241	5,253	1,458

Each model includes province and time fixed effects. Robust standard errors clustered at the household level. [a] denotes significance at the 1% level, [b] denotes significance at the 5% level, and [c] denotes significance at the 10% level. Controlling for income, demographic characteristics, income sources, diversifications and shocks. The variables include land area, food consumption and durable consumption are instrumental variables for income, while adjusted income inequality is an instrumental variable for inequality.

Source: Authors' calculations based on VARHS 2008–2014 survey data.

Table 6. Regressions estimating the effect of income inequality (Palma) on household savings: subsample analysis.

	Dependent variable: Log (household savings)										
	Income			Age		Gender		Marriage Status		Diversified activity	
	Poor	Middle	Rich	≤ 39.5	>39.5	Female	Male	Married	Not married	Divers.	Agri. activity
Palma	0.552[a]	0.415[a]	0.542[a]	0.535[a]	0.423[a]	0.430[a]	0.430[a]	0.446[a]	0.358[a]	0.444[a]	0.489[a]
	(0.103)	(0.087)	(0.080)	(0.063)	(0.074)	(0.106)	(0.054)	(0.052)	(0.118)	(0.054)	(0.105)
Income (log)	2.031[a]	2.321[a]	1.974[a]	1.710[a]	1.856[a]	1.771[a]	1.766[a]	1.759[a]	1.785[a]	1.821[a]	1.603[a]
	(0.131)	(0.159)	(0.118)	(0.070)	(0.075)	(0.118)	(0.056)	(0.055)	(0.120)	(0.058)	(0.105)
Constant	4.607	−0.682	−8.332[a]	1.606	2.000	−6.554[a]	−6.390[a]	−6.637[a]	−5.873[a]	−7.142[a]	−5.111[a]
	(2.999)	(2.677)	(3.081)	(2.179)	(2.402)	(0.995)	(0.499)	(0.484)	(1.006)	(0.508)	(0.839)
F stat	26.24[a]	31.94[a]	29.10[a]	79.07[a]	56.31[a]	24.50[a]	123.30[a]	122.44[a]	20.26[a]	107.07[a]	45.51[a]
Under-identification test	141.037[a]	145.069[a]	215.962[a]	378.267[a]	334.086[a]	133.614[a]	492.153[a]	565.636[a]	124.353[a]	552.540[a]	145.811[a]
Weak-identification test	61.697[a]	70.881[a]	109.786[a]	237.076[a]	217.398[a]	86.383[a]	363.446[a]	379.272[a]	86.143[a]	379.189[a]	77.294[a]
Inequality (Palma)	8231.3[a]	8975.5[a]	85,204.1[a]	41,700.2[a]	65,477.1[a]	25,934.4[a]	190000[a]	180000[a]	12537[a]	170000[a]	44,677.1[a]
Income (log)	83.71[a]	94.58[a]	146.40[a]	316.23[a]	291.18[a]	115.36[a]	485.22[a]	506.19[a]	115.96[a]	508.69[a]	103.89[a]
Hansen J statistic	1.261	0.109	1.217	0.360	1.352	2.010	0.168	0.135	3.065	0.181	3.128
Number of observations	2,058	2,356	2,439	3,631	3,305	1,409	5,527	5,695	1,241	5,253	1,458

Each model includes province and time fixed effects. Robust standard errors clustered at the household level. [a] denotes significance at the 1% level, [b] denotes significance at the 5% level, and [c] denotes significance at the 10% level. Controlling for income, demographic characteristics, income sources, diversifications and shocks. The variables include land area, food consumption and durable consumption are instrumental variables for income, while adjusted income inequality is an instrumental variable for inequality.

Source: Authors' calculations based on VARHS 2008–2014 survey data.

5. Conclusion

The social status hypothesis makes the prediction that income inequality is positively associated with savings in the reference group where social status is determined by a household's rank in the wealth distribution aside from consumption. To test this hypothesis, we first investigate if there is a consistent relationship between provincial income inequality and household savings in Vietnam, and then study how this relationship is different between subgroups. The IV-GMM approach is applied to the balanced panel of 2,181 rural Vietnamese households derived from the VARHS 2008–2014 in 12 provinces.

The key finding is that household savings increases positively with income inequality in the provincial reference group. It could be because rural households may choose to be more patient to restrain current consumption so that they have enough savings to enter the high-status groups. Wealth accumulation by increasing savings gives them more satisfaction through upgrading their social status, as compared to consumption. One alternative explanation is that because the higher is income inequality, the higher is entry consumption level for the high-status groups; it is more difficult for households to spend on conspicuous items which are generally expensive but not necessarily very useful in order to show their social position, whereas savings becomes more rewarding because of differences in the income distribution.

In addition, our paper finds that the impact of income inequality on household savings varies across some subgroups defined by income level, age, and marital status. More particularly, the effect of inequality is moderately stronger among poorer, richer, younger, and married-headed households, perhaps because they are likely to be more concerned about social comparison against other people. In general, these findings are consistent with the social status hypothesis and robust to three measures of income inequality, including the Gini coefficient, Theil index and Palma ratio, and subsamples.

It could be the case with our findings that income inequality has a positive and indirect impact on economic outcomes. From this viewpoint, policies to reduce inequality by taxing on the income of individuals with a high status motive should be stepped up to minimize the adverse effect on growth. We also notice that this paper brings out an indirect link from social status through the degree of income inequality so that its relationship with savings is empirically testable, as recommended by Cole et al. (1992). Moreover, in the presence of endogeneity of the variables income and inequality, caution should be warranted in interpreting these results as causal. Future work should emphasize on understanding the psychological and social aspects of income inequality through laboratory experiments which allow researchers to isolate relevant variables more effectively, moderate endogenous problems, and hence precisely explain the exact mechanism of the impact which inequality has on conspicuous consumption as well as savings. In addition, the findings in the present paper might be influenced by specific features of households in rural Vietnam where is at low stages of economic development and therefore not be applicable to the whole country as well as other developing countries.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix A

Table A1. Regressions estimating the effect of household savings on inequality.

Dependent variable: Income Inequality			
	GINI	Theil	Palma
Savings (log)	−0.002[a]	−0.004[a]	−0.027[a]
	(0.0009)	(0.0016)	(0.0123)
Province Time dummies	YES	YES	YES
Constant	0.465[a]	0.3977[a]	2.646[a]
	(0.008)	(0.014)	(0.108)
F stat	8119.18[a]	4369.71[a]	6079.64[a]
Under identification test	64.433[a]	64.433 [a]	64.433[a]
Weak-identification test	29.18[a]	29.18[a]	29.18[a]
Hansen J statistic	2.717	3.135	2.082
Number of observations	7301	7301	7301

Each model includes province and time fixed effects. Robust standard errors clustered at the household level. [a] denotes significance at the 1% level, [b] denotes significance at the 5% level, and [c] denotes significance at the 10% level. The variables consist of age, age squared, and household size are instrumental variables for savings.
Source: Authors' calculations based on VARHS 2008–2014 survey data.

Table A2. Correlation coefficients of independent variables.

	GINI	Theil	Palma	Income (log)	Age	Highed	Kids	Household size	Female head	Married head
GINI	1.000									
Theil		1.000								
Palma			1.000							
Income (log)	0.003	0.017	−0.004	1.000						
Age	0.068*	0.073*	0.055*	−0.266*	1.000					
Highed	0.061*	0.056*	0.049*	0.221*	−0.008	1.000				
Kids	−0.039*	−0.042*	−0.030*	0.071*	−0.285*	−0.040*	1.000			
Household size	−0.102*	−0.102*	−0.086*	0.290*	−0.506*	−0.039*	0.557*	1.000		
Female head	0.056*	0.055*	0.048*	−0.134*	0.187*	−0.098*	−0.087*	−0.248*	1.000	
Married head	−0.043*	−0.045*	−0.038*	0.209*	−0.222*	0.130*	0.083*	0.279*	−0.715*	1.000
Enterprise income	0.028*	0.014	0.021*	0.253*	−0.110*	0.081*	0.063*	0.091*	−0.065*	0.083*
Crop income	−0.041*	−0.045*	−0.041*	−0.071*	−0.205*	−0.090*	0.079*	0.190*	−0.120*	0.096*
Wage income	0.017	0.013	0.015	0.177*	−0.300*	0.028*	0.096*	0.207*	0.011	0.018
Divers	0.037*	0.027*	0.031*	0.307*	−0.350*	0.061*	0.124*	0.224*	−0.028*	0.055*
No activities	0.026*	0.029*	0.024*	−0.156*	0.414*	−0.022*	−0.161*	−0.263*	0.130*	−0.141*
Natural shock	−0.060*	−0.069*	−0.048*	−0.132*	−0.144*	−0.086*	0.077*	0.133*	−0.097*	0.079*
Economic shock	−0.036*	−0.033*	−0.044*	0.012	0.009	0.003	0.002	0.001	0.043*	−0.042*

* denotes significance at the 5% level.
Source: Authors' calculations based on VARHS 2008–2014 survey data.

Table A3. Correlation coefficients of independent variables.

	Enterprise income	Crop income	Wage income	Divers	No activities	Natural shock	Eco shock
GINI							
Theil							
Palma							
Income (log)							
Age							
Highed							
Kids							
Household size							
Female head							
Married head							
Enterprise income	1.000						
Crop income	−0.133*	1.000					
Wage income	−0.131*	0.073*	1.000				
Divers	0.353*	0.000	0.739*	1.000			
No activities	−0.119*	−0.477*	−0.249*	−0.338*	1.000		
Natural shock	−0.056*	0.256*	0.009	−0.026*	−0.115*	1.000	
Economic shock	−0.010	−0.001	0.017	0.008	0.013	0.088*	1.000

* denotes significance at the 5% level.
Source: Authors' calculations based on VARHS 2008–2014 survey data.

Table A4. Mean, standard deviations, and description of variables.

Indicators	Variables	Mean	Std. Dev	Measure	Expected sign
Inequality measures	GINI	0.432	0.0392	We use the Gini coefficient to measure income inequality, which is one of the most commonly used income inequality indicators. Other measures of inequality are used to check robustness of our regression results, consisting of the Theil (L) index and Palma ratio – the ratio of the income share of the richest 10% divided by the income share of the poorest 40%.	+
	Theil	0.343	0.0637		
	Palma	2.255	0.468		
Household income	Income (log)	8.479	0.878	Log of monthly real household income. The VARHSs used detailed questions about agricultural sales and input purchases, on members' engagement in wage work, on household non-wage non-farm activities, and on common property resources, as well as receipts of transfers.	+
Demographic variables	Age	0.187	0.39	Age of household head	?
	Highed	0.495	0.5	The dummy attains 1 if head has higher education (%)	?
	Kids	4.319	1.78	The dummy attains 1 If household has children	?
	Household size	0.22	0.415	Number of household members	-
	Female head	0.801	0.399	The dummy attains 1 If household is led by a female member	?
	Married head	0.187	0.39	The dummy attains 1 if head married	?
Income source variables	Enterprise income	0.265	0.441	The dummy attains 1 if earning income from non-farm enterprises	?
	Crop income	0.852	0.355	The dummy attains 1 if earning income from agriculture	?
	Wage income	0.612	0.487	The dummy attains 1 if earning income from wage	?
Diversification variables	Diversifications	0.743	0.437	The dummy attains 1 if having more than one economic activity	?
	Agricultural activity	0.219	0.414	The dummy attains 1 if engaging in agriculture production only	Excluded
	No economic activity	0.0380	0.191	The dummy attains 1 if not engaging in economic activity	-
Shocks	Natural shock	0.356	0.479	The dummy attains 1 if has economic shock	+

(*Continued*)

Table A4. (Continued).

Indicators	Variables	Mean	Std. Dev	Measure	Expected sign
	Economic shock	0.182	0.386	The dummy attains 1 if has natural shock	+
Instrumental variables for income	Land area (log)	8.087	1.348	Log of total land area owned by household	
	Food con. (log)	7.964	1.130	Log of real household consumption of main food commodities over the preceding four weeks (from purchases, own production, or other sources)	
	Durables (log)	5.714	0.753	Log of real household durables expenditure. Durable goods include TVs, radios, computers, mobile phones, household appliances, motor vehicles, and farm assets.	
Instrumental variable for inequality	Adjusted GINI	0.449	0.040	This variable is adjusted for the effect of savings on inequality, by three measures of inequality.	
	Adjusted Theil	0.382	0.066		
	Adjusted Palma	2.513	0.484		