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Understanding asset holdings of Vietnamese households

Vy Thao Nguyen[a]* and Maria Sagrario Floro[b]

[a]Investment Strategist, 1 North Wealth Services, LLC, Annapolis, MD, USA; [b]Department of Economics, American University, Washington, DC, USA

ABSTRACT

This paper examines household management in terms of saving and spending of financial and real (primarily gold and jewelry) asset holdings among Vietnamese households and the extent to which these are used when a major health shock or a family event-expenditure shock occurs. Using 2002–06 Vietnam Household Living Standard Surveys (VHLSS) pooled data, this study demonstrates that the range of assets households rely upon for precautionary saving is broader than those described in standard household saving portfolio literature. We find the enduring presence of non-conventional assets such as gold and other precious metals in many households, although this significantly declined during the reference period. We also found significant negative correlation between education level and household's decision to own gold. On the other hand, the positive and significant correlation between the sale of gold and the incidence of having a hospitalized family member or a funeral suggests that Vietnamese households tend to rely on these assets as precautionary saving. This illustrates their valuable function beyond the more commonly known cultural purpose i.e. inheritance bequests, dowries and offerings. The study provides important insights for savings mobilization such as financial literacy education and reducing expenditure shocks by improving health insurance system.

KEYWORDS

Gold; household resource management; liquid assets; Vietnam

1. Introduction

Understanding the composition and patterns of household asset holdings is crucial for policies that aim to mobilize savings, raise investment, and boost productivity. Although extensive in the industrialized countries, studies on household savings and asset holdings however but remain scant in developing and transition countries. Until now, the paucity of empirical studies on the subject has been due largely to the lack of household level data. A small but growing number of studies have been undertaken to fill this gap including those on Pakistan, China, Mexico, Indonesia, Thailand and transition economies (Antonopoulos and Floro 2005; Demirguc-Kunt et al. 2007; Cole, Sampson, and Zia 2009; Meng 2003; Dvorsky, Scheiber, and Stix 2009; Stix

CONTACT Maria Sagrario Floro mfloro@american.edu
*Present address: Department of Economics, American University, Washington, DC, USA.

2011).[1] With few exceptions, these studies fail to consider that households may hold a wide range of liquid (and near liquid) assets outside the formal financial sector.[2] The presence of assets such as informal savings and credit group deposits, gold, jewelry, and foreign currencies is ubiquitous in developing countries, even though their aggregate volumes are difficult to estimate. These informal financial and real assets are important not only for household transactions but also for precautionary purposes, (Nguyen 2002; Adam, Goujon, and Guillamont Jeanneney 2004; Tran and Starr 2007; Nguyen 2007; Newman et al. 2008; Vuong 2010). Given the recent financial crises and the growing economic insecurity faced by workers, an examination of their role as precautionary savings can yield insights on the importance of non-conventional liquid assets such as gold, jewelry, and informal savings such as rotating savings and credit association (ROSCAS) deposits and their enduring presence in many households.

This paper makes use of the 2002, 2004, and 2006 Vietnamese Household Living Standards Survey pooled data to empirically investigate how the flow/use of funds affect the balances of household liquid asset holdings by performing probit analyses. It aims to understand household resource management in terms of saving preferences and the use of their financial and real assets (gold, jewelry, etc.) over a given period in order to meet their transaction needs, by taking into account the macroeconomic conditions, cultural norms, and relative wealth position. Additionally, our paper aims to understand the role of these assets particularly gold and jewelry as precautionary savings, given the inadequacy of social protection schemes such as health insurance system. We perform probit analyses to examine the relationship between the incidence of a major shock such as hospitalization of a household member and the changes in asset holdings. As robustness test, we use the occurrence of household's having funeral as an alternative proxy for health shock.

The rest of the paper is organized as follows. The next section provides a brief background on Vietnam's economy, particularly the financial sector, and relevant policy reforms undertaken by the government in the last few decades to boost financial development. Section three discusses the reasons for the wide range of liquid assets held by households in Vietnam. It describes the historical and cultural importance and popularity of gold in Vietnamese society and its use as an alternative medium of exchange and store of wealth. Section four describes the data and pertinent characteristics of the households and the model use in the study. Section five analyzes the empirical results. The implications of our study findings and suggestions for future research conclude our paper.

2. Liquid asset holdings among Vietnamese households

Several studies on savings in developing countries acknowledge the fact that households save in a wide variety of forms.[3] In the case of Vietnam, the studies by Adam, Goujon, and Guillaumont Jeanneney (2004), Newman et al. (2008), Nguyen (2002), and Vuong (2010) show that informal financial assets such as informal savings and credit group deposits, and real assets including gold, jewelry, etc. are quite significant

in the savings portfolios of Vietnamese household, serving both transaction as well investment purposes.

There are a number of reasons as to why households in developing countries such as Vietnam hold assets in varied forms. First, the development of the formal financial sector has been uneven, more bank-based than capital market-based, tends to concentrate in urban areas particularly major cities, and caters to the needs of particular clientele such as medium and large firms and middle and upper class households (Spratt 2008). Many formal financial institutions including commercial banks and rural banks prefer to deal in large sums (deposits and loans), require loan collateral with legal documentation or proof of asset ownership and regular and steady stream of earnings, which are beyond the means of low-income households, microenterprises, and small firms. The cumbersome paperwork and processing not only requires a lot of time but also financial literacy that many do not have.

Not surprisingly, the use of formal financial sector services such as savings deposits and investment opportunities in bonds, securities and stocks by the population in developing countries remain very low compared to those in developed countries. Despite the significant expansion of the banking sector as well as capital markets over the last few decades, majority of the population including small farmers, agricultural and casual laborers, informal sector workers, small and micro-entrepreneurs have very limited or no contact with and access to the formal financial system.[4] For instance, while checking and saving accounts are prevalent in developed countries, they have yet to reach half of the population in developing countries. The average population with a deposit account is 25% in Mexico, 40% in Indonesia and about 29% in Vietnam in 2006[5] (Honohan 2008). Similar trends are found in South Africa (31.7%), Lesotho (17%) and Namibia (28.4%) (Spratt 2008).

Second, in contrast to the degree of participation in the formal financial system, there is evidence of extensive household participation in semi-formal and informal financial institutions and intermediaries such as credit cooperatives, local ROSCAs and other forms of informal savings groups in Asian countries including Vietnam (McCarty 2001).[6] They are easily accessible, generally with no asset collateral requirement involved, and utilize mechanisms that are more adapted to the conditions and the needs of the milieu in which they operate, whether self-employed workers, small farmers and entrepreneurs, as well as housewives.[7]

Third, cultural factors and the persistence of social norms such as the dowry system and practice of bride price help explain the prevalence of gold, jewelry and other precious metals. While gold has played a smaller role in household savings portfolio in industrialized countries, it serves a number of economic and social functions in many Middle East and Asian countries including Vietnam. Gold in its various forms, e.g. bullions and jewelry, has both social and cultural importance in Vietnamese life. As in other Asian societies, gold in Vietnam carries a high social significance beyond its monetary net worth. They can be important for prestige, status, and ceremonial purposes. The perception of gold as having a timeless, intrinsic value permeates throughout the centuries, providing basis to the well-known adage guarantee 'as good as gold'.[8]

The significance of gold in the daily economic life in Vietnam is highlighted in the studies of Vuong (2010) and Nguyen (2002). In fact, households may prefer to save

in gold, jewelry and other precious metals, which are used as adornments, gifts and offerings dowries, and inheritance bequests. Gifts of gold jewelry are customarily given during weddings and other special occasions and holidays. In addition, gold, gemstones and jewelry can serve as precautionary savings as these assets can be easily sold or pawned when households experience consumption and income shocks. Because of their economic and social significance, there are active gold and jewelry (including secondhand) markets that give liquidity to these assets. They also are used as medium of exchange and serves as store of wealth especially during periods of economic instability and downturns. In fact, real estate properties in Vietnam are often priced in gold tael (Boudreau, John, Nguyen, and Dieu Tu Uyen, 2019).

The study by Tran and Starr (2007) provides evidence of a steady, large demand for gold in several developing countries including Vietnam. Not surprisingly, they found that an upward, historical trend of domestic gold price in countries where gold performs many functions, one which is relatively more stable than that of the international gold price.[9] Other studies indicate that gold provides a safe haven during periods of high inflation and exchange rate volatilities and economic downturns. For instance, Capie, Mills, and Wood (2005) and Ozturk and Acikalin (2008) show that gold provides protection against the loss of purchasing power from the depreciation of the US dollar and the Turkish lira, respectively. A number of studies also confirm some portfolio diversification benefits associated with holding gold assets (Perasan and Timmerman 1995; Abanomey and Mathur 2001; Georgiev 2001; Nijman and Swinkels 2003; Vrugt et al. 2004; Chan and Young 2006). It has been shown to counter business cycles and perform better during sluggish financial market (Chow et al. 1999; Edwards and Caglayan 2001; Coudert and Raymond 2011).

The relative stability and counter-cyclicality of the gold market renders this asset to be an attractive form of insurance against inflation risk and a hedge against other financial assets' depreciation in value, thereby making it desirable as a means of storing wealth. The skyrocketed inflation at 23.8% in 2008 for example, further reinforced the Vietnamese' belief in the value of gold.

Aside from gold, Vietnamese households also have a practice of holding foreign currencies particularly the US dollar, a result of its historical, albeit tragic, link with the US. The widespread holding and use of US dollars first appeared during the Vietnam War in the early sixties (Adam, Goujon, and Guillaumont Jeanneney 2004, 1463). Foreign currency holding was prohibited however, following the reunification of Vietnam in 1975. Dollarization reappeared in the mid-1980s during the transition towards a more market-oriented economy. During this period, the holding of US dollars has become prevalent among the Vietnamese (Vuong 2010).[10] The economic instability that ensued in the nineties has made US dollar (USD) and other major foreign currencies particularly attractive saving instruments that Vietnamese households and enterprises can use to hedge against currency risks.

Similar to gold, foreign currencies function as store of value, medium of exchange, and unit of account in both international and domestic payments in Vietnam. The weakening of the trade balance in 1995–96 and the Asian crisis in 1997–98 led to a sharp depreciation of the Dong, which increased the demand for the US dollar despite foreign currency controls.

The above discussion shows the prevalence of gold, jewelry, other precious metals and foreign currencies in Vietnam as household liquid assets. They are ubiquitously present in social occasions, cultural practices, and in market transactions even though statistics on the total holding of gold and US dollars by Vietnamese households and enterprises remain unknown. In the following section, we empirically examine the incidence and composition of liquid asset holdings of Vietnamese households and the extent to which household asset holdings are affected when a major health shock occurs.

3. Data and methodology

3.1. Data

Our study relies on the pooled household level data of Vietnam Household Living Standard Surveys (VHLSS) 2002, 2004, and 2006 of 47,904 households, of which 5,652 households were followed for a panel dataset throughout the years of the survey. The 2002 VHLSS (Income and Expenditure module) has 30,000 household respondents while VHLSS 2004 and 2006 have 9189 and 9186 households, respectively. VHLSS use the fifty percent rotation rule for every next implementation of VHLS (every two years) by retaining enumeration areas (EA) in half of the primary sampling unit, which is commune and interview the same households in the last survey and adding new enumeration areas to the other half. Therefore, VHLSS can provide a panel sample of 3967 households interviewed in both 2002 and 2004, 4264 households in both 2004 and 2006, and 1,884 households interviewed in all three years.

Although the panel data can be useful in terms of studying household income mobility over time, it suffers from a sample selection bias due to the rotating panel rule. A large number of households were dropped and new households were added in the next survey year. The bias was tested significant using an OLS for the selection indicator according to the method in Wooldridge (2002).

Correcting for this bias is complicated, particularly for nonlinear models such as probit and two stage selection models. The full sample of each year survey, however, is nationally representative. Therefore, our study estimates here are based on full samples, being pooled across 3 years. Thus we performed a cross-sectional analysis and included the year dummies to capture any change in the aggregate conditions, such as expansion of the financial market, or other unobserved changes in household consumption behavior over time.

The surveys provide a wide range of information regarding the characteristics of household members such as education, details about their income and expenditures as well as information on incidence of serious health shock i.e. whether or not a household member has been hospitalized due to illness, childbirth and other reasons requiring major medical treatment. In the income and expenditure module, respondents are asked to report the amount of buying, earnings and selling of liquid (or near liquid) assets in the past 12 months.

For the purpose of our study and due to data limitations, we focus the analysis on the relatively liquid type of assets that are categorized into two groups namely: a) formal, semi-formal and informal financial assets, and b) gold, jewelry, other precious metals, and foreign currencies. Group 1 refers to financial assets whose net value (converted in constant US dollar equivalent) is based on the following transactions in the past 12 months:[11]

i. received from interest of savings, shares, bonds, and loans
ii. deposited in savings accounts
iii. contributed to revolving savings and credit groups or bought shares
iv. withdrew from savings, stocks, and revolving savings and credit groups.

Group 2 refers to precious metals including gold, silver, precious stones, jewelry and foreign currencies whose net value is based on the following transactions in the past 12 months:

i. sold gold, silver, precious stones, jewelry, and foreign currency
ii. purchased gold, gemstones, jewelry and foreign currency for savings.

Some data caveats need to be mentioned and acknowledged. First, the twelve-month recall period used in the World Bank Living Standards Measurement Surveys such as the VHLSS may have an impact on data accuracy. Second, the lumping of financial transactions in the questionnaire design does not allow for more detailed categorization of liquid asset holdings household holdings; this is true in the case of withdrawal of financial asset holdings as well as the combined transactions of precious metals such as gold, gemstones, jewelry and foreign currencies, which explain the above grouping of saving assets. Third, the study makes use of the amounts and the corresponding types of transaction that a household has engaged, which enables us to identify the net change in the asset holding (increase, decrease, and no change).

That said, the comprehensive list of assets identified in the survey dataset provides a unique opportunity to examine the extent to which households make use of non-financial assets such as gold as liquid assets to meet their transactions needs. The approach is described in detail in the following section.

3.2. Methodology

To use this data to examine the flow/use of household assets for transactions purposes, let K_{ijk} denotes the change in the value of transaction k listed from (i) to (vi) above of household i, in asset group j. K_{ijk} can be negative if the transaction involves withdrawal or sale than purchase or deposit; and positive if it involves purchase or deposit in a particular asset group j. Hence, the transactions (i), (ii), (iii) and (vi) yield positive values, while (iv) and (v) are negative. Households may choose to buy/accumulate more of a given asset type (positive value), sell/withdraw (negative value), or maintain the same asset holding position (zero value) over the past twelve months.

The net value of household i's holding of each asset group j is defined as:

$$V_{ij} = \sum_{1}^{k} K_{ijk} \tag{1}$$

where $V_{ij} < , \ = or > 0$.

A household i is said to own a particular asset j at some point in the past 12 months if it has conducted a transaction in that asset group – regardless of

whether it involves withdrawing or selling, depositing, purchasing or accumulating some time in the past 12 months, even though V_{ij} at the end of the year is zero. Put in another way, a household i is considered to be holding an asset belonging to group j if $\sum_1^j \sum_1^k |K_{ijk}| > 0$.

We then examine the determinants of asset holdings by Vietnamese households by estimate the following equation using a probit model:

$$s_{ij} = \beta_1{}' X_i + \omega_{ij} \tag{2}$$

where the asset-owner indicator variable $s_{ij} = 1$ if $\sum_1^j \sum_1^k |K_{ijk}| > 0$, and zero otherwise.

X is a vector of pertinent individual and household-level factors that may influence the dependent variable as well as control variables. We take into account the following as possible determinants of asset holdings: household wealth (proxied by household wealth index), social norm-related motives e.g. dowry and bride price (proxied by number of sons and daughters), age of household head, and financial skills and literacy (proxied by education of household head). We include also the following control variables namely: household size, sex of household head, ethnicity of household head, area fixed effects (urban, region, and banks per province variables) and year fixed effects. The ω_{ij} is the independent and normally distributed error term, $\omega_{ij} \sim N(0, 1)$.

The construction of the household wealth index merits some discussion. The literature on household saving typically considers permanent income to be an important determinant. This income however cannot be measured nor observed directly without aggregate household income information and longitudinal panel data. Instead, we make use of a household wealth index that is proxied by the predicted real per capita expenditure.[12] The household wealth index has typically been computed as a weighted average of a set of asset ownership variables and housing characteristics.[13] According to Filmer and Scott (2012), the weights can be calculated by regressing real per capita expenditure on the set of assets and housing variables described above. The estimated regression coefficients are then used to represent the weights for the assets.

The VHLSS collects data on household ownership of fixed assets, durable goods and housing information that allow for the construction of a wealth index. We adopt Filmer and Scott (2012) wealth index construction method as it offers several advantages. First, the linear combination of the assets to predict wealth is best aligned with household consumption expenditure. Secondly, the method eliminates the measurement errors, transitory shocks, and endogeneity effects of expenditure, leaving the permanent component of expenditure as wealth.

As mentioned earlier, we assume in our study that households that have conducted at least one transaction of financial assets, gold, jewelry, precious metals, or foreign currencies in the past 12 month to have holding for that type of asset during the time period. This proxy indicator however can underestimate the incidence of asset holding if the household does not have a reason nor need to undertake an asset transaction over the 12 months prior to the survey. As discussed in section 3 however, the assets considered in this study such as formal and informal financial accounts, gold,

jewelry and foreign currencies especially the US dollar are considered to be relatively liquid in Vietnam where they not only serve as store of wealth but also are often used in transactions. They also serve as precautionary savings to help cope with household shocks such as a serious health or medical issue involving large expense. Hence, it is reasonable to assume that the unobserved number of households that could have held these assets but have not undertaken any asset transaction in the past year is minimal.

4. Empirical results

4.1. Descriptive statistics

Tables 1–3 present several characteristics of the household sample. Over a third (36.8%) of Vietnamese households have any kind of liquid asset on average between 2002 and 2006 (Table 1); it is higher among those living in urban areas (41.7%) compared to those in rural areas (35.2%). This is quite low compared to developed economies. According to the Global Financial Inclusion Database (World Bank, 2011), 89.5% of individuals age 15 and above in high-income countries have an account at a formal financial institution in 2011. The low rate of households having liquid assets indicates a low penetration of the formal financial sector in Vietnam, confirming the findings of Newman et al. (2008) that Vietnam in the early 2000 is still a largely cash-economy. Local citizens have an enormous amount of capital, but many people keep cash (and other liquid assets) at home. This phenomenon is not unique to Vietnam; in fact, it is prevalent in many developing countries. According to the Global Financial Inclusion Database (2011), only 28.4% of people age 15 and above in lower middle-income countries have an account at a formal financial institution.

Table 2 shows that gold, jewelry, and foreign currencies are commonly held liquid assets among households. In 2002, 34.47% of asset-owning households accumulated or increased their holding of gold, jewelry, precious metals and foreign currencies. Although this rate is lower than those who accumulated financial assets (45%), it demonstrates the relative popularity of these forms of liquid or near-liquid assets, especially in the rural areas. This is possibly due to the smaller network of financial institutions and intermediaries operating in the rural areas compared to the urban areas as well as the inadequate communications and road infrastructure that make it difficult for rural women and men to reach these institutions.

It can also be noted in Table 2 that there is an increasing shift in the composition of liquid assets among rural and urban households in favor of financial assets from 2002 to 2006. Households are three times more likely to have accumulated financial assets compared to those that withdraw or reduced their holdings in 2002. This trend is further amplified in 2004 and 2006. Between 2002 and 2006, the proportion of households who accumulated financial assets increased from 45% to 59%. On the other hand, we see a reversed trend in the holdings of gold, jewelry, precious metals and foreign currencies, with the proportion of households declining from 34% in 2002 to 24% in 2006. The trends are similar in both urban and rural areas. This may be due to a variety of reasons including the moderate to high economic growth, rising household incomes experienced by Vietnam and government promotion of

Table 1. Percent of households with liquid assets, by urban/rural and year.

Year	2002	2004	2006	All years
Rural	31.60%	40.10%	34.00%	35.20%
Urban	38.30%	47.70%	38.80%	41.70%
All	33.20%	42.10%	35.20%	36.80%

Note: All statistics are weighted. Having assets is defined as households who have conducted at least one transaction (withdrawing, selling, purchasing or accumulating) related to financial assets, gold, jewelry, other precious metals or foreign currencies (especially US Dollar) in the past 12 months.

Table 2. Net asset flow over the past 12 months, by asset type, household location, and year (as percent of asset-owning households).

Year	2002	2004	2006	2002	2004	2006
	Financial Assets (%)			Gold, Other Precious Metal and Foreign Currencies (%)		
		All			All	
Decreasing	15.68	18.13	16.25	16.23	15.54	13.87
No Change	39.17	23.87	24.32	49.31	60.94	62.61
Accumulating	45.15	58	59.43	34.47	23.51	23.52
		Urban			Urban	
Decreasing	15.59	18.85	13.65	10.85	12.37	10.62
No Change	28.88	15.73	16.91	60.3	68.61	71.6
Accumulating	55.53	65.42	69.44	28.85	19.02	17.78
		Rural			Rural	
Withdrawing	15.71	17.84	17.2	18.31	16.81	15.05
No Change	43.15	27.13	27.01	45.05	57.88	59.34
Accumulating	41.13	55.04	55.79	36.64	25.31	25.61

Note: No change includes households that have bought and sold equal values of that asset in the past 12 months and households that did not undertake any transaction in the mentioned asset.

financial sector development during that time period, which has led to increased demand for financial services and broadened access to financial services.

Table 3 provides summary statistics for the explanatory variables, including pertinent individual (head) and household characteristics of the rural and urban household subsamples as well as the poorest and richest quintile subsamples. About 24 and 76 percent of households live in the urban and rural areas respectively. Over half or 58% of household heads in rural areas have only primary education or less, compared to 39% in the urban areas. Urban households also tend to be richer, with 50.1% belonging to the richest quintile compared to only 10.5% of rural households; on the other hand, about 47.7% of rural households are in the bottom 40% (lowest two quintiles) compared to 15.6% of urban households. Urban households are also more likely to have a female head, and to belong to the main ethnic group, Kinh-Hoa. Compared to the poorest quintile and rural households, the urban and richest quintile households are more likely to have higher education and live in more developed regions and in provinces with higher number of banks per capita. The majority of the top quintile households live in urban areas as well.

4.2. What explains the gold ownership of Vietnamese households?

Table 4 shows the probit estimation results for the determinants of household's ownership of gold, jewelry, precious metals and/or foreign currencies. In all regressions, we include year and regional fixed effects as well as urban/rural dummy to capture

Table 3. Descriptive statistics of explanatory variables.

	Rural (N = 36441) Mean	Urban (N = 11463) Mean	Poorest quintile (N = 9584)	Richest quintile (N = 9565)	All (N = 47,904) Mean
Wealth quintiles (% of population)					
1	24.30%	6.30%			20.00%
2	23.40%	9.30%			20.00%
3	22.10%	13.30%			20.00%
4	19.70%	21.10%			20.00%
5	10.50%	50.10%			20.00%
Age of household head(mean	48.65	50.46	49.2	49.52	49.09
& SD)	(14.21)	(13.27)	(17.14)	(12.51)	(14.01)
Education of Household head (% of total)					
a) Primary or less	57.60%	38.70%	76.00%	33.70%	53.00%
b) Secondary or Vocational	41.30%	50.30%	23.90%	55.50%	43.60%
c) University or higher	1.00%	11.00%	0.10%	10.80%	3.50%
Share of sons (of HHH) in the household	24%	23%	21.80%	23.50%	24%
Share of daughters (of HHH) in the household	20%	20%	19.20%	20.80%	20%
Proportion of hhs with female head	21%	38%	30.20%	30.30%	25%
Proportion whose ethnicity is Kinh or Hoa[a]	87%	97%	74.20%	98.00%	89%
Urban			6.80%	56.30%	25%
Average number of banks per province	72.4	235.3	65.73	343.389	111.4
Place of residence (% of total households)[b]					
a) Poorest region (NW, NE, NC.Coast & C.Highlands)	35%	25%	44.80%	19.30%	32%
b) Poor region (Mekong river & SC.Coast)	30%	25%	30.30%	26.20%	29%
c) Rich region (Red River Delta)	25%	21%	19.20%	24.50%	24%
d) Richest region (NE South)	10%	30%	5.70%	29.90%	15%

Note: Standard deviations in parentheses. a. Hereafter referred to as Kinh-Hoa, the ethnic majority in Vietnam. b. There are 8 regions in Vietnam namely: Northwest (NW), Northeast (NE), North Central Coast (NC. Coast), Central Highlands (C. Highlands), Mekong River Delta, South Central Coast (SC. Coast), Red River Delta and Northeast South (NE. South). These regions are classified from poorest to richest on the basis of average per capita expenditure.

Table 4. Explaining Vietnamese' gold ownership among savers.

Variables	(1) All	(2) Rural	(3) Urban	(4) Poorest	(5) Richest
Wealth index (log)	−0.119	0.233*	−0.813***	1.134	−0.691***
	(0.102)	(0.129)	(0.159)	(1.398)	(0.258)
Age	−0.000117	0.000295	−0.00139**	7.33e-05	−0.000785
	(0.000327)	(0.000389)	(0.000593)	(0.000907)	(0.000641)
Education: Secondary or Vocational	−0.0657***	−0.0668***	−0.0333*	−0.100***	−0.0641***
	(0.00990)	(0.0117)	(0.0184)	(0.0329)	(0.0183)
Education: University or higher	−0.143***	−0.184***	−0.0899***		−0.133***
	(0.0211)	(0.0370)	(0.0256)		(0.0247)
Household size	0.00805***	0.00521	0.0184***	0.00425	0.0139***
	(0.00269)	(0.00321)	(0.00483)	(0.00773)	(0.00495)
Female	−0.0258**	−0.0154	−0.0390**	−0.00610	−0.0480***
	(0.0104)	(0.0135)	(0.0155)	(0.0340)	(0.0167)
Kinh-Hoa	0.0611***	0.0490**	0.0537	0.0431	0.0652
	(0.0175)	(0.0200)	(0.0392)	(0.0427)	(0.0486)
Year 2004	−0.110***	−0.127***	−0.0720***	−0.117***	−0.0967***
	(0.0104)	(0.0127)	(0.0178)	(0.0446)	(0.0178)
Year 2006	−0.134***	−0.159***	−0.0805***	−0.189*	−0.108***
	(0.0117)	(0.0145)	(0.0196)	(0.105)	(0.0174)
Urban	−0.111***			−0.0612	−0.111***
	(0.0109)			(0.0524)	(0.0168)
Banks per province (log)	−0.0141***	−0.00822	−0.0175***	0.0161	−0.0111*
	(0.00385)	(0.00513)	(0.00577)	(0.0145)	(0.00615)
Poor regions (Mekong river & SC.Coast)	0.421***	0.442***	0.347***	0.444***	0.324***
	(0.00977)	(0.0111)	(0.0200)	(0.0286)	(0.0209)
Rich region (Red River)	−0.0217*	−0.0446***	0.0856***	−0.0729*	0.0356
	(0.0127)	(0.0145)	(0.0263)	(0.0398)	(0.0264)
Richest region (NE South)	0.312***	0.310***	0.308***	0.290***	0.266***
	(0.0128)	(0.0144)	(0.0251)	(0.0422)	(0.0251)
Observations	16,556	11,912	4,644	1,674	4,789
Pseudo R-squared	0.163	0.181	0.101	0.188	0.112
Chi-square	3272	2690	544.7	394.5	621.7
Chi-square p value	0	0	0	0	0

Robust standard errors in parentheses. Ommitted categorical variables are year 2002, rural, the poorest region (NW, NE, North Central Coast & Central Highlands).
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

the aggregate effects of prevailing macroeconomic conditions, changes in the world gold price, and changes in the market infrastructure and financial sector support.

The pseudo R-squares indicate that the explanatory variables explain 16.3% of the variation in gold ownership for the full sample. The pseudo R-squares range between 11 and 18% for the subsamples. Although the pseudo R-squared statistics are low, the Chi-square statistics with p-value of 0 indicate that the explanatory variables overall are significant, in the full and across all subsample regressions. One plausible explanation is that although the data is noisy and far from the fitted line, the observed household characteristics and macro factors still provide significant prediction of household's gold ownership.

The statistically significant results in Table 4 show that across the country, less educated, male-headed and Kinh Hoa households in rural areas are more likely to own gold. In particular, education has a strong, negative effect on the decision to own gold, and this consistent across the whole sample and subsamples. Households with heads having secondary or vocational education are 6.6% less likely to own gold than those with primary education. University or higher educated household heads are 14.3% less likely to own gold than the primary educated households. The effect is strongest in the rural areas and among the richest quintile.

Kinh-Hoa (the major ethnic group) households are 6.1% more likely to own gold than the non-Kinh Hoa ethnic groups. We conjecture that this may be due to the more business-oriented culture and the spirit of entrepreneurship among the Kinh-Hoa that has cultivated the habit of holding gold. Female-headed households are 2.6% less likely than the male-headed households to own gold. This is expected as female headed households tend to be more concerned about the security of keeping gold at home.

Household size has a significant but very small effect on the decision to own gold. Each additional member of the household is likely to associate with 0.8% higher probability of gold ownership among savers. The effect is mainly driven by those living in the urban areas and those belonging to the richest quintile, as the effect of household size is not significant for those in the rural areas and poorest quintile. Age and wealth do not have statistically significant effect on the decision to hold gold, which indicates the ubiquity and popularity of this asset across social classes and life-cycle stages.

Using the year dummies as proxies for macroeconomic conditions, we see a statistically significant decline of gold ownership among savers from 2002 to 2006, despite a rapid rise in the world gold price (U.S. inflation adjusted) from $310.08 in 2002, $409.53 in 2004, to $604.34 per ounce in 2006 (Macrotrends, 2019). The presence and density of banks in provinces and living in urban areas have statistically significant negative effect on gold holding Such trends maybe explained by the country's rapid development of infrastructure and the banking sector during this period of high growth rate (6.3–7% annually), fueled by government reforms that helped move the economy away from cash and gold asset holdings and toward financial assets. In 1999, it introduced a Deposit Insurance Agency in 1999 to boost depositors' confidence (World Bank 2002). In 2012, it banned the trading of gold, with exceptions for a few major banks and jewelry producers. The development of financial sector also occurred at a much faster rate in urban areas. With more options now available to keep their saving for 'those rainy days', households are less likely to risk storing gold at home.

4.3. Analysis of assets' role as precautionary savings

The second focus of our paper pertains to the role of these assets as precautionary saving. In particular, we investigate what happens to certain liquid assets held by households when a shock involving a major expense or outlay occurs. We use two types of events or shocks namely a) the incidence of a serious health shock in the form of a serious medical treatment or hospitalization, and b) economic shock that requires fund outlays to examine their role as precautionary savings.

During the study period, health insurance and affordable health care were woefully absent among the majority of the population in Vietnam. The promotion of market-oriented reforms since the 1980s has brought about the liberalization of the health care market and the introduction of user fees in public health facilities (Ekman et al. 2008). Between 1996 and 2005, the government share of overall health spending declined from 32% to 22%, with resulting increases in private spending (Ekman et al.

Table 5. Access to health services, incidence of a serious health shock and health expenditures, by urban/rural and poorest/richest quintile categories.

	Rural	Urban	Poorest quintile	Richest quintile	Total
% of households that generally use health services to treat medical emergency or illness	13%	15%	5%	22%	14%
% of those with health problems who said that they cannot afford or pay for treatment.	16%	10%	35%	6%	14%
% of households with at least 1 member being hospitalized	28%	27%	34%	24%	28%
% of households that incurred health expenses in the past 12 months amounting to:					
0–499 thousand dong	67%	57%	79%	51%	64%
500–999	19%	23%	14%	25%	20%
1000–1499	8%	11%	5%	12%	9%
1500–1999	4%	6%	1%	7%	4%
2000 and above	2%	4%	1%	4%	3%

Note: 1 USD = 23,208.50 Vietnam Dong (as of August 14th, 2019).

2008, 254).[14] As a result, many households paid high out-of-pocket amounts for health care. (Somanathan, Dao, and Tran 2013).

Not surprisingly, Vietnamese households save for such "rainy days". Their coping behavior include not just setting aside savings in the form of financial assets but also in gold, jewelry and gemstones that can be easily sold or pawned when a serious shock occurs.[15] Both precious metals and foreign currencies are highly liquid and widely traded. To date, however, there is little evidence that such assets can also play a role in dealing with household shocks.

Table 5 provides information regarding household access to health services, the ability of households to pay for medical treatment (of any kind), incidence of a serious health shock (hospitalization or serious medical treatment), and the associated medical expenses using VHLSS 2002–06 health and expenditure data. Only 5% of those in the poorest quintile are able to use health services in general, compared to 22% of the richest quintile. About 35% of households in the poorest quintile reported that they could not afford the required health fees, while that rate is only 6% for the richest quintile households; the proportion is slightly higher in the rural areas compared to the urban areas.

Table 5 also indicates that more than a quarter of all households had at least one member requiring serious medical treatment or being hospitalized; the incidence of this type of health shock is greater among households in the poorest quintile (34%) compared to those in the richest quintile (24%). Health expenditure is a heavier burden for the poor and residents in rural areas, although the rich and urban residents tend to spend more on health services in absolute terms. Hence, we expect that the poorest quintile households are more likely to withdraw their assets in order to deal with health shocks.

4.4. Do major family events/shocks influence the decision to hold gold?

It is often perceived that Vietnamese households tend to own gold simply because of the long-ingrained cultural habit of hoarding gold (Boudreau, John, Nguyen, and

Table 6. Marginal effects of major family event/shock on the sale of gold among savers (probit model).

Variables	(1) All	(2) Rural	(3) Urban	(4) Poorest	(5) Richest
Number of hh members being hospitalized	0.0394***	0.0408***	0.0352***	0.0580***	0.0263***
	(0.00524)	(0.00656)	(0.00823)	(0.0174)	(0.00844)
Have funeral or death anniversaries	0.0243***	0.0219***	0.0271**	0.0141	0.0351***
	(0.00669)	(0.00834)	(0.0107)	(0.0204)	(0.0121)
Have wedding	0.0124	0.0118	0.0132	0.0140	0.0152
	(0.00908)	(0.0115)	(0.0139)	(0.0354)	(0.0134)
Age	−0.00281*	−0.00265	−0.00374	−0.00567	−0.00421
	(0.00145)	(0.00178)	(0.00243)	(0.00388)	(0.00264)
Age squared	1.62e − 05	1.68e − 05	2.00e − 05	5.17e − 05	3.23e − 05
	(1.36e − 05)	(1.68e − 05)	(2.26e − 05)	(3.62e − 05)	(2.44e − 05)
Female	−0.00705	−0.0115	−0.00263	0.0183	−0.0176
	(0.00722)	(0.00944)	(0.0100)	(0.0237)	(0.0111)
Education: Secondary or Vocational	−0.0372***	−0.0346***	−0.0391***	−0.0402*	−0.0272**
	(0.00692)	(0.00859)	(0.0115)	(0.0236)	(0.0123)
Education: University or higher	−0.0962***	−0.103***	−0.0851***		−0.0865***
	(0.0110)	(0.0207)	(0.0108)		(0.0129)
Kinh − Hoa	0.0373***	0.0410***	0.0176	0.0682***	0.0356
	(0.0117)	(0.0138)	(0.0257)	(0.0261)	(0.0309)
Year 2004	−0.0188***	−0.0195**	−0.0169	−0.0254	−0.0310***
	(0.00709)	(0.00887)	(0.0112)	(0.0324)	(0.0118)
Year 2006	−0.0402***	−0.0457***	−0.0275**	−0.00846	−0.0325**
	(0.00872)	(0.0109)	(0.0139)	(0.0819)	(0.0138)
Urban	−0.0579***			−0.000101	−0.0633***
	(0.00672)			(0.0369)	(0.0113)
Poor regions (Mekong river & SC.Coast)	0.166***	0.189***	0.106***	0.145***	0.104***
	(0.00942)	(0.0115)	(0.0157)	(0.0276)	(0.0168)
Rich region (Red River)	−0.0311***	−0.0395***	0.000123	−0.0556**	−0.0361**
	(0.00910)	(0.0111)	(0.0162)	(0.0274)	(0.0157)
Richest region (NE South)	0.108***	0.123***	0.0757***	−0.00554	0.0731***
	(0.0130)	(0.0170)	(0.0180)	(0.0415)	(0.0185)
Observations	16,559	11,914	4,645	1,674	4,789
Pseudo R-squared	0.0744	0.0720	0.0527	0.0665	0.0663
Chi-square	1097	846.9	184.7	107	239.5
Chi-square p value	0	0	0	0	0

Robust standard errors in parentheses. Ommitted categorical variables are year 2002, rural, the poorest region (NW, NE, North Central Coast & Central Highlands).
***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

Dieu Tu Uyen, 2019). We argue that there are economic reasons for this saving behavior. While it is the case that gold holdings are used by some for speculative purposes, gold can also be used for precautionary purposes such as to deal with family shocks/events involving major financial outlay. In this section, we investigate whether households with assets are more likely to sell gold in the event of having an ill household member, having a funeral, or having a wedding using probit analysis.

Table 6 shows probit estimation results, after controlling for the household characteristics and macroeconomic conditions examined above. Separate estimations are conducted for rural and urban households as well as for the poorest quintile and richest quintile households. The pseudo R squared ranges from 6.6% to 7.4%, but the p-value of Chi square is 0, indicating the overall significance of these the predicting variables.

The results show strong and statically significant effect of health shocks and the probability of selling gold. For each additional member being hospitalized, saving-

Table 7. Sensitivity test: Marginal effects of major family event/shock on the purchase of gold among savers (probit model).

Variables	(1) All	(2) Rural	(3) Urban	(4) Poorest	(5) Richest
Number of hh members being hospitalized	−0.0387***	−0.0394***	−0.0363***	−0.0122	−0.0380***
	(0.00720)	(0.00867)	(0.0125)	(0.0246)	(0.0119)
Have funeral or death anniversaries	0.0180**	0.0205**	0.0146	0.00360	0.0220
	(0.00821)	(0.0101)	(0.0138)	(0.0253)	(0.0149)
Have wedding	0.0149	0.0378***	−0.0253	−0.0380	−0.0193
	(0.0110)	(0.0139)	(0.0172)	(0.0407)	(0.0162)
Age	0.00599***	0.00888***	−0.00298	0.00781	0.00384
	(0.00184)	(0.00222)	(0.00323)	(0.00498)	(0.00355)
Age squared	−5.20e − 05***	−7.85e − 05***	2.65e − 05	−7.63e − 05	−3.42e − 05
	(1.73e − 05)	(2.09e − 05)	(2.97e − 05)	(4.70e − 05)	(3.29e − 05)
Female	−0.0366***	−0.0182	−0.0643***	−0.0343	−0.0479***
	(0.00880)	(0.0115)	(0.0130)	(0.0281)	(0.0141)
Education: Secondary or Vocational	−0.0423***	−0.0431***	−0.0295*	−0.0607**	−0.0408***
	(0.00855)	(0.0104)	(0.0151)	(0.0299)	(0.0158)
Education: University or higher	−0.0689***	−0.0557*	−0.0697***		−0.0713***
	(0.0173)	(0.0330)	(0.0189)		(0.0203)
Kinh-Hoa	0.00624	0.00586	−0.00285	−0.0132	0.0247
	(0.0158)	(0.0180)	(0.0377)	(0.0387)	(0.0439)
Year 2004	−0.102***	−0.112***	−0.0815***	−0.116***	−0.0826***
	(0.00833)	(0.0102)	(0.0141)	(0.0353)	(0.0146)
Year 2006	−0.102***	−0.114***	−0.0752***	−0.181***	−0.0740***
	(0.0103)	(0.0126)	(0.0176)	(0.0644)	(0.0172)
Urban	−0.0736***			−0.0413	−0.0897***
	(0.00859)			(0.0423)	(0.0142)
Poor regions (Mekong river & SC.Coast)	0.318***	0.337***	0.259***	0.357***	0.258***
	(0.0104)	(0.0124)	(0.0193)	(0.0313)	(0.0208)
Rich region (Red River)	−0.0175	−0.0334**	0.0380*	−0.0344	0.0408*
	(0.0115)	(0.0136)	(0.0220)	(0.0376)	(0.0227)
Richest region (NE South)	0.265***	0.293***	0.208***	0.354***	0.199***
	(0.0141)	(0.0175)	(0.0225)	(0.0507)	(0.0236)
Observations	16,559	11,914	4,645	1,674	4,789
Pseudo R-squared	0.115	0.124	0.0789	0.137	0.0819
Chi-square	2099	1742	364.8	286.1	393.6
Chi-square p value	0	0	0	0	0

Robust standard errors in parentheses.
***p < 0.01; **p < 0.05; *p < 0.1.

households are 3.9% more likely to sell gold to cope with such shock. The impacts are most prominent among the poorest and rural population (coefficients in column 2 and 4 show 5.8% and 4.1% effects, respectively). Funeral event also has statistically significant impact, of 2.4% in the whole sample. Weddings, on the other hand, do not have statistically significant effect on the sale of gold. This may be explained by the significant presence of gold and jewelry in the dowry and bride price exchange during these events.

The wealth quintile regression results are not surprising since the poor tend to have less health coverage, lower access to health services and higher liquidity constraints so that they tend to dip into their assets particularly gold, to help meet unexpected expenses. Thia is corroborated by similar findings in other studies. Wagstaff's (2005) study on Vietnamese households' response to health shocks indicate that the poor rely on dissaving, along with borrowing, rather than reducing their food and other non-food consumption following an adverse health shock as better-off households do (17). This coping behavior, according to Wagstaff (2005), has to do "with

the existence of a threshold effect whereby poor households have levels of food and non-food consumption that are simply too low … to enable them to cut back" in the face of an adverse shock (ibid).

4.5. Sensitivity test

To test for the robustness of the above estimations, we conduct probit analyses on the effect of family events/economic shocks on whether or not households are likely to sell gold over the past 12 months. We expect that the resulting impact is opposite that of their effect on saver-households' purchase of gold. The results in Table 7 show that having an ill member requiring hospitalization effect on the sale of gold is negative and statistically significant, which is in contrast to the positive and statistically significant effect on the savers' purchase of gold. This result is consistently significant for the full sample and the subsamples. The effect of having a funeral, death anniversaries, or a wedding on the other hand, is significant only for rural household subsample. It also has an unexpected positive sign, which may be explained by the relative strength of social norms and cultural practices involving the use of gold and jewelry for these occasions in the rural areas that propel households to buy them.

5. Concluding remarks

Vietnam's economy has enjoyed one of the fastest growth rates in the world, with an average annual GDP growth rate of 7.1 percent between 1988 and 2000 and an average of 7.8 percent during 2001–2008 period (World Bank 2019). Poverty also was reduced by half (Glewwe 2004). Reforms in the financial sector accompanied the market-promoting policy reform during the nineties and early 2000s. These include the creation of joint-stock banks and commercial state-owned banks, a gradual liberalization of interest rates and the computerization of financial transactions that facilitated more speedy transmission of funds and more convenience and better safety of a payment for users (World Bank 2002).

Despite these improvements in the banking sector, non-financial liquid assets such as gold and foreign currencies for making payments and as precautionary savings remain a significant part of the household asset holdings. Although the government banned gold as a medium of exchange, a recent Bloomberg report still found that 95% of payments are being processed in cash and gold (Boudreau, John, Nguyen, and Dieu Tu Uyen, 2019). Outlawing a medium of exchange could open the opportunity for a black market, and therefore could prove ineffective under time of stress or economic crisis. We encourage financial development policies to focus on sustainable drivers in an effort of promoting asset diversification.

Understanding the composition of household savings and their determinants is crucial for effective savings mobilization. This study demonstrates that the range of assets households rely upon for precautionary saving in Vietnam is broader than those described in standard and conventional household saving portfolio literature. We find the enduring presence of non-conventional assets such as gold, jewelry, gemstones, other precious metals in many households in Vietnam. Our probit regression

results show the influence of financial literacy (proxied by level of education) and cultural norms (proxied by Kinh-Hoa dummy) on the ability of households to hold such assets. The significant correlation between the sale of gold in particular and the incidence of a major health shock, such as having hospitalized family member or funeral, suggests that Vietnamese households tend to rely on these assets as precautionary saving. This illustrates their valuable function beyond the more commonly known cultural purpose i.e. inheritance bequests, dowries and offerings. This is especially true among poor households and those living in the rural areas.

That said, our study indicates a declining trend in holding gold as part of household asset portfolio between 2002 and 2006, even before the 2012 ban of gold trading. This in part may be due to the growth in household incomes and infrastructure development as well as to financial sector development, which helped expand the options for savings and thus a shift in the composition of asset portfolios. Our results imply that improvement of the financial sector alongside stability of market conditions can help promote financial savings mobilization. Higher educational attainment, to the extent that it leads to financial literacy, is likely to discourage the use of gold by households as a store of wealth. Last but not least, improving the health insurance system would reduce the use of savings such as gold in meeting health shocks, enabling households to accumulate and invest in a diversified portfolio. While health expenditure is not the focus of this paper, it shows to be one of the significant drivers for precautionary saving in gold.

Notes

1. Studies on household savings in transition economies have noted the prevalence of holdings of foreign currencies.
2. In this study, we focus our analysis on liquid and near liquid asset holdings of households.
3. See Alderman (1996), Fafchamps, Udry, and Czukas (1998), Park (2006), Lee and Sawada (2010).
4. The development of partnerships between credit cooperatives and microfinance institutions and the commercial banks as well as the growth of mobile banking in some developing countries are likely to alter this trend though.
5. For a cross-country comparison of access to financial services, see Honohan (2008).
6. Household participation in revolving savings and credit groups is quite common in Vietnam especially in the rural areas.
7. For detailed description of the types of cooperatives, credit unions and informal savings clubs and rotating savings and credit associations, see Germidis, Kessler, and Meghir 1991.
8. The World Gold Council estimates that Vietnam's gold market grew by approximately 5.1% per annum during the period from 1995 to 2003, becoming the second largest gold market within South East Asia, behind only Indonesia (Vuong 2010).
9. The relation between gold prices and macroeconomic variables is well documented in the literature (Strongin and Petsch 1995; Gorton and Rouwenhorst 2006). Batten, Ciner, and Lucey (2010) for example find that monetary variables such as inflation and interest rate and growth rate in money supply were important indicators for the movement of gold prices (Batten, Ciner, and Lucey 2010).
10. For instance, the use of foreign currency for transactions purposes and as part of household savings is found to be prevalent in Russia, Croatia, Slovakia, Slovenia and

other Eastern European countries (Gregorio et al. 1999; Dvorsky, Scheiber, and Stix 2009; Stix 2011).

11. Adjusted for inflation.
12. Researchers have used as proxy for permanent income the average or trend income of a long panel household aggregate income (Bhalla 1980). Unfortunately, the data from VHLSS does not allow us to pursue this approach. Moreover, the non-trivial attritions in later years are likely to cause measurement errors and bias.
13. The fixed assets, durables and housing characteristics in the regression include household ownership of: cars; motorbikes; bicycles; motor boats; rowing boats; printers, photocopiers; phone; cell phones; video cassette players; tv; stereos; radios/cassette players; recorders/disc players; computers; cameras, fridges, freezers; washing machines & driers; electric fans; water heaters; gas cookers; electric cookers, rice cookers, w tables, chairs, sofas; vacuum cleaners, water filters; microwaves, baking stoves; houses with a private kitchen & bathroom/toilet; houses with a shared kitchen or bathroom; semi-permanent houses; flush toilet with septic tank/sewage pipes; toilet; double vault compost latrine; and access to electricity.
14. The government made substantial effort to provide health insurance for the poor through subsidy. In 2011, 97% were insured under Social Health Insurance scheme. However the subsidies are quite small.
15. Frankenberg, Smith, and Thomas (2003) study of the impact of the 1997 Asian crisis noted that rural Indonesian households tend to store their wealth in gold for consumption smoothing purposes.

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Notes on contributors

Vy Thao Nguyen received her PhD in Economics degree at American University with her field of specialization in International and Monetary Economics. She worked as economist at the Human Development Network of the World Bank for several years.

Maria S. Floro is Professor of Economics at American University in Washington DC and served as co-director of the Graduate Program on Gender Analysis in Economics (PGAE) between 2009-2018. Her publications include co-authored books on Informal Credit Markets and the New Institutional Economics, Women's Work in the World Economy, and Gender, Development, and Globalization: Economics as if All People Mattered and journal articles on time use, unpaid work and well-being, environmental degradation, care, vulnerability and informal employment, urban food security, household savings, credit and debt service burden.

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