



# Guanxi, Financial Literacy and Household Portfolio Efficiency

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**Abstract.** Guanxi is an unique concept of China, which loosely equals to “social relationship”. This passage investigates the relationship between guanxi and household portfolio efficiency. We use factor analysis to measure guanxi in a numerical approach. To solve the possible endogenous problem, we chose “whether parents are communist party member” as an instrumental variable. Via 2SLS model, we find that there is a significant positive influence that guanxi has on household portfolio efficiency. To verify a possible mechanism of this casual effect, we establish an mediation model in which individual financial literacy is the intermediary variable. The result proves that guanxi influences portfolio efficiency by affecting individuals’ financial literacy.

**Keywords:** Guanxi · Household Finance · Portfolio Efficiency

## 1 Introduction

Guanxi is a concept that is unique to Chinese society. A less appropriate translation is “interpersonal relationship”, but this translation only includes one aspect of guanxi. Guanxi can be understood as a collection of many relationships, which includes familial relationships, political relationships, etc. Winfield-Hayes once said, “If you want to understand what dominates China today, you have to understand the meaning of guanxi.” Because the foundation of Chinese society is guanxi, guanxi influences everything that is based on it. guanxi can be used to explain the problems of Chinese society, such as wealth inequality. In a financial perspective, a notable problem in Chinese society is the low participation in Chinese risky financial markets, the general tendency of people is saving; and the irrational investment behavior of the population. This paper attempts to explain the current state of financial markets in terms of the root causes-guanxi in Chinese society.

The first problem the study of guanxi faced with is how to measure it. Generally speaking, it is impossible to measure relationships a single indicator. If we use the number of communists in a household to measure individual relationships for instance, we are only measuring the political relationship of the person, which is only one component of guanxi. And guanxi is not a constant indicator; it involves a process of “building-maintaining”. A very interesting phenomenon in the Chinese stock market is that stocks from the wine industry tend to rise in price before Chinese holidays, when Chinese people

give a lot of gifts, including wines, to relatives, superiors, and acquainted government officials to maintain guanxi. So an appropriate metric of guanxi should not only include all aspects of guanxi, but also consider the process of maintaining guanxi. The biggest challenge in constructing such a indicator is how to obtain micro data and the method of indicator synthesis.

China Household Financial Survey (CHFS) is a survey conducted by Southwest University of Finance and Economics on the economic state of Chinese households. The data provided by this survey includes household demographic characteristics, the composition of household financial assets (which can be used to calculate the efficiency of household asset portfolios), and detailed expenditure information. This detailed micro-data addresses part of the questions of our study. We construct the explanatory variables of this paper according to the method of factor analysis which Du, Guo and Zhang first adopted to synthesize guanxi indicators based on the data collected by CHFS [1].

Since the “guanxi” as an indicator was constructed, a number of literatures in China have started to focus on the role of guanxi in household finance. Guanxi can significantly facilitate the participation of stock market, while there is no connection between guanxi and the return of stocks [5]. As declared by Sun in 2016, guanxi also has an positive impact on formal loans. Additionally, guanxi can also increase the possibility of purchasing commercial insurance [4]. However, we find that prior studies have focused merely on the impact of guanxi on participation in various financial assets, but not on the efficiency of the household’s overall asset portfolio, or, in other word, whether the household profits from that. So this paper tries to investigate the influence of guanxi on the household portfolio effectiveness, as a complement to the literature about guanxi.

The rest of the paper is organized in the following way. In the second part, we introduce the data and methodology of the paper. In the third part, we present the benchmark regression result of our study. In the forth part, we construct a mediation model to investigate the possible mechanism. In the end of the paper, we conclude and come up with several real-world implications of our work.

## **2 Data, Variable and Model**

### **2.1 Data**

The main data resources of this paper is China Household Finance Survey (CHFS) conducted by the China Household Finance Survey and Research Center of Southwest University of Finance and Economics in 2015 in 29 provinces, 367 counties (districts and county-level cities), and 1,481 communities across China. The CHFS mainly collected information on the micro level of Chinese household finance, including demographic characteristics, household finance and housing asset status. This survey is scientifically designed and highly representative, and is widely used in empirical studies.

We also use the data from Wind, which is a financial database that is widely used in China, to calculate the sharp ratio of portfolio in each family in the sample.

### **2.2 Variable**

We refer to the methodology of Du, Guo and Zhang to construt guanxi indicator in this paper. We first extract 23 variables related to guanxi from CHFS, and using factor

analysis and cluster analysis, we keep 8 variables, to construct guanxi indicator. Those 8 variables are, party membership, job position, work unit type, dining-out expenditure, entertainment expenditure, communication expenditure, transportation expenditure and gift expenditure. Using PCA (Principle Component Analysis)/FA (Principle Component Analysis), We synthesis those 8 variables into one variable guanxi. Based on the gravel diagram, we retained four principal factors. Based on the degree of contribution of the variables to each factor, we name each of the four factors as follow to represent different dimension of guanxi: author&power, static relationship, blood relationship and effort to maintain the relationship. We rotate the factor loading matrix and obtain the guanxi aggregate indicator by weighting according to the relative weights of 4 principal factors.

We use sharp ratio to measure household portfolio efficiency according to [1]. We divide household financial assets into three categories, deposit, stock and bond. Deposit includes fixed deposit. Stock includes stock, equity bond, derivatives, noble metal, foreign currency etc. Bond includes bond, bond fund, money funds, WMP. For commingled funds, which is not suitable to be classified in any three group above, we classify half of it (if hold) into stock and another into bond. We replace the return and standard deviation of the portfolio with those of the market index. In detail, we use annually return and standard deviation of CSI aggregate bond index to represent return and standard deviation of the category bond; turnover-weighted annually return and standard deviation of the SSE and SZSI indices. We chose the benchmark interest rate of one-year fixed deposit which is announced by PBOC as the return of deposit, while the risk is set to be 0. The sharp ratio is calculated as follow:

$$sharp\_ratio = \frac{E(r) - r_f}{\sigma} \quad (1)$$

$$E(r) = \sum_{i=1}^3 w_i r_i \quad (2)$$

$$\sigma = \sqrt{\sum_{i=1}^3 \sum_{k=1}^3 w_i w_k \sigma(r_k, r_i)} \quad (3)$$

$r_f$  is the risk-free interest rate,  $E(r)$  is the expected return the portfolio,  $\sigma$  is the standard deviation of the portfolio.  $w_i (i = 1, 2, 3)$  is the weight of each category (deposit, bond and stock) in the total financial asset of a family.  $\sigma(r_k, r_i)$  is the covariance of the returns of two categories. In these three formulas, we use the returns, standard deviations and covariances of market indices to replace  $r$ ,  $\sigma$  and  $\sigma(r_k, r_i)$ .

We use instrumental variables to address the endogeneity of causal inference. A very simple intuitive scenario can explain the endogeneity problem faced in this paper—People with higher guanxi index tend to have higher ability, which cannot be measured. This ability, however, is also correlated with portfolio efficiency. Therefore, we introduce whether the parents are members of the Communist Party (parent\_cpc, which is the largest political party in China) as an instrumental variable. This variable is a valid instrumental variable for the following reasons: 1) Chinese society emphasizes the inheritance of guanxi, which means the guanxi of the parents will influence the guanxi of the

offsprings to a greater or lesser extent. For many Chinese families, it is common for offsprings to attend the social events of their parents. 2) Our sample consists of adults with established families, who are financially independent and able to make their own investment decisions, so parents' guanxi is uncorrelated with their portfolio efficiency.

We chose following variables as control variables: whether individual has bank deposits (deposit), whether individual can use the Internet to get information (internet), whether individual engages in self-employed business (bussiness), whether individual works in the field of finance (fin\_job), whether individual has own house (own\_house), family size (fam\_size, which is measured by the number of family members), square of family size (fam\_size2), household net asset in logarithmic form (ln\_net\_asset), individual risk preference (contorlled by three variables, risk\_avoid, risk\_neutral, risk\_love, no multicollinearity because "don't know" option is given in the questionnaire of CHFS), gender (gender), health condition (health), years of education (edu), marriage (married), age (age), square of age (age2). We also control the provincial fixed effect by adding dummies of  $n-1$  province.

### 2.3 Model

The model we use to identify the causality between the portfolio efficiency (measured in sharp ratio) and individual guanxi is constructed as follow:

$$sharp\_ratio = \beta_0 + \beta_1 guanxi_i + \beta_2 control\_variable_i + \varepsilon_i \quad (4)$$

We use two stage least square (2SLS) to estimate coefficients, in which the instrumental variable is parent\_cpc (whether the parents are members of the Communist Party). Additionally, reffering to the method presented by Wen adn Ye, we construct a mediation model to figure out the mechanism [2]. We hypothesize that guanxi influences portfolio efficiency by improving individual financial literacy. This is possible because individuals with higher guanxi are more likely to be exposed to finance-related information and thus will have higher levels of financial literacy, and the level of financial literacy is directly related to portfolio efficiency. Some papers also has proven that social interaction can improve one's financial literacy. To construct an indicator of financial literacy, we follow Yin et al., using three questiones in CHFS measuring individual's ability to calculate interest and understand inflation and investment risk to synthesize one comprehensive indicator by FA [3].

The model is constructed as follow:

$$sharp\_ratio = c_0 + c_1 guanxi + c_2 control\_variable_i + e_1 \quad (5)$$

$$financial\_literacy = a_0 + a_1 guanxi + a_2 control\_variable_i + e_2 \quad (6)$$

$$sharp\_ratio = b_0 + b_1 guanxi + b_2 financial\_literacy + b_3 control\_variable_i + e_3 \quad (7)$$

We use casual steps approach to identify the mediate effect. First, we estimate  $c_1$  in function 5, which is the same as benchmark regression function 4. Then, we estimate  $a_1$  in function 6, which regresses guanxi on financial literacy, the intermediate variable. Third, in the function 7, we put guanxi and financial literacy in one funtion. If  $c_1$ ,  $a_1$  and  $b_1$  are all significant, the mediate effect is significant.

**Table 1.** Benchmark Regression Result.

	(1)	(2)	(3)	(4)	(5)
	Sharp ratio	Sharp ratio	Sharp ratio	Sharp ratio	Sharp ratio
aggregate	0.209**				
	(0.097)				
author&power		0.081**			
		(0.036)			
static relationship			1.249		
			(2.713)		
blood relationship				0.444	
				(0.419)	
maintain					0.355
					(0.287)
Observation	7387	7387	7387	7387	7387

Note (the following tables are as same):

- 1) Standard errors in parentheses \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$
- 2) control variables are not shown in the table
- 3) province fixed effect is controlled

**Table 2.** Age.

	(1)	(2)	(3)
aggregate	0.121	0.332*	0.093
	(0.133)	(0.190)	(0.405)
Observation	2622	4016	749

### 3 Regression Result

Table 1 displays the result of benchmark regression of our paper.

As column (1) in Table 1 shows that guanxi has significant positive influence on portfolio effectiveness. An unit increment in gunxin would casue 0.209 increment in household portfolio effectiveness (significant at 5% level). Column (2)–(5) display the result of 4 sub-indicators. In column (2), we find that sub-indicator which represents author&power has a possitive influence on portofolio effectiveness, an unit increment in this sub-indicator causes 0.081 increment in sharp ratio. There is no evidence to prove that other 3 sub-indicators have relationship with household portfolio effectiveness.

We also do the following heterogeneity analysis: age (Table 2), rural area (Table 3), region (Table 4). In Table 2, we divide individuals in the sample into three groups by their age, young people, middle-aged people and elderly people. We find that the effect of guanxi on sharp ratio is only significant in middle-aged group. In Table 3, we divide

**Table 3.** Rural&Urban.

	(1)	(2)
aggregate	0.219*	0.166
	(0.115)	(0.160)
Observation	3874	3513

**Table 4.** Region.

	(1)	(2)
aggregate	0.047	0.199*
	(0.113)	(0.116)
Observation	1701	5686

individuals in the sample by whether they live in rural area or not. Column (1) displays the result of sample form rural area, in which we find that the effect is only significant in rural area, which still is dominated by traditional custom. In Table 4, we divide total sample into two groups based on the region-eastern provinces, central and western provinces. Currently, provinces form eastern part of China (like Shanghai and Jiangsu) are much more developed than their counterparts. We also find that effect is significant in less developed area.

## 4 Mediation Model

We postulate that guanxi influences portfolio efficiency by affecting individuals' financial literacy. As mentioned above, the hypothesis is possible because individuals with higher guanxi are more likely to be exposed to finance-related information and thus will have higher levels of financial literacy, and the level of financial literacy is directly related to portfolio efficiency. To construct an indicator of financial literacy, we follow Yin et. al., using three questions in CHFS measuring individual's ability to calculate interest and understand inflation and investment risk to synthesize one comprehensive indicator by FA [3].

The results in Table 5 prove the intermediary relationship, guanxi increase sharp ratio by increasing the financial literacy. Guanxi has a positive impact on sharp ratio (portfolio efficiency), which is significant at 5% level. This is consistent with our benchmark regression. And we find that guanxi and financial literacy are also positively correlated (significant at 1% level). At last, we run a regression on sharp ratio to guanxi and financial literacy, the coefficients of both independent variables are significant. According to the model section of this paper, this mediation effect holds and is significant.

**Table 5.** Mediation model result.

	(1)	(2)	(3)
	Sharp ratio	Financial literacy	Sharp ratio
aggregate	0.209**	0.047***	0.023***
	(0.097)	(0.017)	(0.004)
Financial Literacy			0.031***
			(0.003)
Observation	7387	7387	7387

## 5 Conclusion

Guanxi is an unique Chinese concept. In this paper, we investigate the relationship between guanxi on portfolio effectiveness. We find that relationships significantly enhance portfolio effectiveness. This effect is more significant in backward regions (e.g. rural areas, central and western provinces of China) and significant among middle-aged people. Through mediation effect model, we find that relationships can improve portfolio effectiveness by enhancing financial literacy.

The findings of this article have strong practical significance. The current low level of financial literacy of Chinese residents makes it difficult for them to make rational investments, and their investment portfolios are characterized by monotonicity, as a direct result of which the efficiency of their portfolios is low. This phenomenon is clearly detrimental to individual investors and increases macroeconomic systemic risk. Our research suggests that in finding an antidote to this problem, it is important to consider not only modern factors, such as the Internet, but also factors that are rooted in Chinese culture. For the government, although guanxi is a variable they cannot influence, our findings are still somewhat relevant. Interpreting the paper's findings from the government's perspective, guanxi is an important channel for the transmission of information (including financial literacy). Clearly, placing information in groups with high aggregation has a greater effect on information dissemination, but guanxi implies more policy recommendations than that. For example, the generally low level of financial literacy in rural China is a major problem for Chinese government' advocating for financial inclusion. And since rural clans' size tend to be larger than urban ones, the government can provide financial literacy education to individuals with higher prestige in the clan, who can then disseminate it to other individuals, which can save local financial expenses and increase efficiency. Such an approach could equally be used to address the gender, racial imbalance in financial literacy and to make finance more accessible to more people.

Subsequent researches can also build on this paper and continue to expand on the influence of traditional Chinese factors on modern finance by looking at the underlying logic of Chinese society to find explanations for modern financial phenomena. For example, whether the ancient Chinese educational tradition can explain the inequality

of regional financial development. The advantage of such a study is that more solutions can be found that are applicable to Chinese society.

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