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The Illusion of Knowing: Households' Misplaced Confidence and Stock Market Participation

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Abstract

This paper exploits CHFS2017's household data to study misplaced confidence when perception deviates from objective financial knowledge. Observing the relationship between "misplaced confidence" and stock market participation and net worth, I explain the mystery of limited stock market participation: misplaced confidence leads to sub-optimal choices. The study also finds that the positive correlation between objective financial knowledge and stock market participation is affected by threshold effects.

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"One of the painful things about our time is that those who feel certainty are stupid, and those with any imagination and understanding are filled with doubt and indecision."

— *Bertrand Russell*

Ⅰ. Introduction

In real life, perception of one's abilities deviates from actuality due

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to information seeking, cognitive ability, personality traits, *etc*. Some deviations can be corrected by additional information, but in many cases, they are difficult to detect, and whether they are correctly perceived or not, these biases can affect decision-making and economic outcomes. Dunning and Kruger (1999) divide human cognitive states into self-awareness and the illusion of knowledge.

In the series of stock market participation research, self-awareness indicates when perceived and objective financial knowledge is positively correlated. When they are negatively correlated, it is called an illusion of knowing. An illusion of knowing, or the deviation of one's perceived financial knowledge from objective one, leads to misplaced confidence (i.e., over/under-confidence bias). In summary, there are two consequences of misplaced confidence in financial knowledge. Firstly, people with insufficient financial knowledge but overconfident in their abilities, blindly choose to participate in the stock market and invest more in risky assets. Secondly, people with high financial knowledge but underconfidence in their ability hesitate to participate in the stock market and waste the chance, if any, to earn gains. Since objective financial knowledge is the cornerstone of wise decision-making, appropriate financial decision-making requires a perception matching such objective knowledge. Therefore, "misplaced confidence" inevitably leads to suboptimal decisions in finance and all aspects of life, affecting net worth. This paper first observes the relationship between misplaced confidence and stock market participation choices and then identifies the relationship between misplaced confidence and net worth.

Under the rationality hypothesis, objective financial knowledge plays a vital role in predicting financial decisions and helping investors make effective and safe investment decisions (Campbell et al., 2011). In recent years, the Internet has accelerated the speed of information dissemination, providing opportunities for improving

objective financial knowledge. However, the gap between objective and perceived financial knowledge remains large. The mystery of limited participation in the stock market is a classic example of the failure of objective financial knowledge to guide the participation of the stock market in decision-making.

Earlier research on the limited participation problem in the stock market focused on factors such as risk aversion (Gomes and Michealides, 2005), background risk (Heaton and Lucase, 2000), market friction (Paiella, 2001), and information processing skills (Grinblatt et al., 2011). Subsequently, some scholars turned their attention to perceived financial knowledge. Scholars have acknowledged that objective financial knowledge is a prerequisite for ensuring safe and effective financial choices and further point out that perceived financial knowledge is the decisive factor in choice (Robb and Woodyard, 2011; Gautam and Jain, 2019). Lind et al. (2020) also argue that both objective and perceived financial knowledge can increase participation in financial markets and prove that perceived financial knowledge is a better predictor of financial behaviors than objective financial knowledge.

Investors may be over-or under-confident in objective financial knowledge (Huberman, 2001; Angrisani and Casanova, 2021). Misplaced confidence affects the financial decision, especially when there is a significant bias. By focusing on the deviation of perceived financial knowledge from objective financial knowledge, I explain the problem of limited stock market participation from a novel perspective. Balasubramnian and Sargent (2020) concentrate on the relationship between upward-biased perceived overconfidence and financial choices.[1] Based on this paper, the non-participation

1) Balasubramnian and Sargent (2020) use individual data to study 19 types of financial behavioral decisions (e.g., mortgage payments, receiving dunning calls, etc.). They controlled the perceived financial knowledge, focusing on overconfidence caused by objective knowledge gaps.

behavior is caused by insufficient confidence in downward-biased financial perceived knowledge.

Notably, the term "perceived financial literacy" used in this paper does not mean the cognition of financial information processing skills. Rather, it is closer to the concept of financial self-awareness that is proposed by Bazley et al. (2021). Allgood and Walstad (2016) also used "perceived financial literacy" to differentiate it from financial cognition and questioned the fit between perceived and objective financial knowledge (Agnew and Szykman, 2005).[2)]

This paper uses China Household Finance Survey 2017 (CHFS2017) household financial data to observe the relationship between misplaced confidence and stock participation and net assets. To measure misplaced confidence, we divide the households into four groups using the normalized objective (*Act-Fin.Know*) and subjective (*Per-Fin.Know*) financial knowledge: those who are aware that they are knowledgeable in finance (*Awa-Hi: Act-Hi, Per-Hi*); those who are aware that they lack knowledge in finance (*Awa-Lo: Act-Lo, Per-Lo*); those who wrongly believe that they are knowledgeable in finance (so-called "Blindspot group": *Act-Lo, Per-Hi*); and finally, those who wrongly believe that they have little knowledge in finance (so-called "Tentative group": *Act-Hi, Per-Lo*). The Awa-Hi and Awa-Lo groups are unbiased self-awareness groups (*Awa* group) and are the baseline groups for the study, while *Blindspot* and *Tentative* groups are the misplaced confidence groups that suffer from the illusion of knowing, the control group for the study.

I find that perceived and subjective financial knowledge positively correlates with household participation in the stock market; however, perceived financial knowledge is more predictive than objective

2) Agnew and Szkman (2005) also pointed out that the correlation between objective and perceived financial knowledge varies significantly according to individual characteristics.

financial knowledge. In addition, while controlling for the objective financial knowledge, the under-confidence group *Tentative* in the high financial knowledge group shows a significant negative correlation with stock market participation. In comparison, the over-confident *Blindspot* group in the low financial knowledge group correlates significantly positively with stock market participation. Finally, I also find a "threshold effect" of financial knowledge in the low financial knowledge group, where the positive correlation between objective financial knowledge and stock market participation fails in groups with a severe lack of financial knowledge.[3)]

Balasubramnian and Sargent's (2020) paper clearly states that an over-confidence in the *Blindspot* group would be a costly behavioral decision, while for a well-calibrated *Tentative* group, it would not produce adverse outcomes.[4)] Conversely, Angrisani and Casanova's (2021) research on retirement readiness argues that overconfidence does not reduce retirement readiness, while under-confidence shows poor results, albeit an eagerness to learn. The adaptation of financial knowledge is a leveraged solution for behavioral decision-making. Therefore, I hypothesize that the illusion of knowing triggers a sub-optimal solution for stock market participation in decision-making. An opportunity cost of under-confidence leads to less participation in the stock market, reducing family welfare (Cocco et al., 2005; Xia et al., 2014), while over-confidence in households with insufficient financial knowledge brings risk costs (Statman and Vorkink, 2006).

This paper finds that objective and perceived financial knowledge significantly correlates to households' net worth when participating

3) The "threshold effect" refers to the phenomenon that the increase of objective financial knowledge in the low financial knowledge group cannot significantly affect the stock market participation rate. Knowledge has a "threshold" limit, and it is only valid if it reaches a certain standard.

4) They are ignoring the tentative hidden opportunity cost.

in the stock market. On the other hand, objective financial knowledge demonstrates a significantly positive correlation with net worth when households are not participating in the stock market.

By studying the cost of "misplaced confidence" and avoiding "participantbias,"[5] this article sheds light on the under-confidence that cannot be corrected by stock participation. The results show that in the lack of confidence group *Tentative*, the stock market participation variable confirms the existence of opportunity cost when there is a downward perception bias among the households with high financial knowledge. When these households participate in the stock market, there is a negative correlation between *Tentative* and net worth, which is statistically insignificant but economically significant.

The *Blindspot* group with insufficient financial knowledge (but overconfidence) is positively correlated with net worth regardless of participation in the stock market (more significantly when not participating). But this does not mean that the *Blindspot* group has no risk cost. The risk of stock market participation comes from a lack of financial knowledge rather than over-confidence. The relational setting of observed misplaced confidence and net worth under controlling for objective financial knowledge sets our paper apart from the results from Balasubramnian and Sargent (2020). Therefore, I suggest that the optimal choice is based on trust in financial knowledge: the higher level of trust (even overconfidence), the more willing they are to increase their efforts, which can affect the family's net worth (Lemoine, 2021).

This paper has three contributions: First, only a handful number of articles study the gap between perceived and objective financial

5) Participant bias refers to the fact that participants in the stock market generally have confidence in their financial knowledge. A bulk of research focuses only on overconfidence and the stock market participants while ignoring groups who do not participate in the stock market.

knowledge, and most of them focus on individuals (Angrisani and Casanova, 2021; Balasubramnian and Sargent, 2020). Warmath et al. (2019) argue that household decision-making is more conservative than individuals. In this light, I exploit CHFS2017 household data to study the impact of misplaced confidence on the households' stock market participation caused by the "illusion of knowing" and fill the gap in the literature. Second, to the best of my knowledge, this paper controls for objective financial knowledge for the first time by using the gap between perceived financial knowledge to explore the influence of "misplaced confidence" on decision-making. Balasubramnian and Sargent (2020) also examined gaps but controlled for perceived financial knowledge and observed how *individual knowledge gaps create Blindspots* and how the "illusion of knowing" influences behavior. Actual financial knowledge is objective, so controlling for objective financial knowledge is more aligned to reality. It supports the result that *Blindspot is purer after excluding the influence of objective knowledge*. Finally, this paper is one of the few studies focusing on the opportunity cost arising from under-confidence. Most of the studies only focus on over-confidence, as they believe that the study of under-confidence would not damage assets. However, this paper identifies the opportunity cost under the same financial knowledge from the wealth difference caused by a lack of self-confidence.

The rest of the paper is organized as follows. Section 2 presents the data and measurement regarding variables of use. Section 3 reports the resultsofmisplacedconfidenceand the relationship between stock market participation and net worth. Finally, Section 4 concludes the study.

Ⅱ. Data and Measurement

This section introduces the data and main variables.[6] Since 2011, the Southwestern University of Finance and Economics has collected data from the China Household Finance Survey data every two years in field surveys. This article only used the data in the year 2017, because the 2017 survey added more detailed financial knowledge and self-perception questions. The survey of financial knowledge data covers 1,255 households in 14 provinces in China: The data collected 35.94% of households in rural and 34.5% in urban from the total population. The distribution of characteristics is the same as that of China's whole population.

2.1. Objective Financial Knowledge

For the measurement of objective financial knowledge, I sum the scores of eight questions comprised of two basic and six investment financial knowledge questions. One point is awarded for each correct answer and zero points otherwise. Hence, the minimum value for objective financial knowledge is zero (defined as financial illiteracy for each basic and investment financial knowledge), whereas the maximum value is eight.

1)The proportion of households with basic financial illiteracy is 62.87%. About 27.41% of households correctly answered only one question. Questions about basic financial knowledge focus on households' understanding of interest rates and inflation. For example, one question asks, "Assuming the annual bank interest rate is 4%, if you deposit 100 yuan for one year, what is the principal and interest earned after one year?".

2)The investment financial illiteracy rate of households turns out to be 17.45%. A series of questionnaires assessed the households' cognition of

6) See Table A.1 in the appendix.

investment risks and financial products. For example, to test the risk diversification, the households were asked: "Investing in various financial assets is less risky than investing in one financial asset. Do you think it is right?" Another example is to test the risks recognized by financial products: "Which do you think is riskier in general, stocks or funds?".

Unlike Van Rooij et al. (2011), the basic financial knowledge of Chinese households is weaker than investment finance knowledge, possibly because the Internet has promoted the spread of investment financial knowledge. It may also be that the arithmetic skills required for basic financial knowledge need "deliberate training." Table 1.1 shows that the Chinese overall objective financial knowledge illiteracy rate is 15.7%, with only 19.84% of households providing correct answers to four questions.

〈Table 1〉 Financial Knowledge

1.1 Objective Financial Knowledge							1.2 Perceived Financial Knowledge		
Variable	Value	Freq	Percent	Objective Financial Knowledge			Value	Freq	Percent
Basic Financial Knowledge	0	789	62.87				0	9	0.72
	1	344	27.41	Value	Freq.	Percent	1	904	72.03
	2	122	9.72	0	197	15.70	2	189	15.06
	Total	1255	100	1	263	20.96	3	116	9.24
Investment Financial Knowledge	0	219	17.45	2	334	26.61	4	32	2.55
	1	283	22.55	3	212	16.89	5	5	0.40
	2	310	24.7	4	111	8.84	Total	1255	100
	3	163	12.99	5	44	3.51	1.3 Standardized Variable		
	4	148	11.79	6	40	3.19	Variable	Min	Max
	5	84	6.69	7	31	2.47	Act-Fin. Know	-1.24	3.11
	6	48	3.82	8	23	1.83	Per-Fin. Know	-0.7	2.3
	Total	1255	100	Total	1255	100	Not: Obs.=1255, Mean = 0, Std. Dev. = 1		

2.2. Perceived Financial Knowledge

Using the 5-point Likert scale to measure perceived financial knowledge, CHFS2017 surveys a question that asks: "How much do you know about stocks, bonds, and funds as a whole?". The scale is from 1 (Not at all) to 5 (Very well). I assign the value of zero for nine households (0.72%) that answered "I do not know" since the answer illustrates no understanding of the question. Table 1.2 shows that households' illiteracy rate of perceived financial knowledge is 72.75% (the value is less than or equal to one), which is much higher than objective financial knowledge (15.7%). Considering that the question focuses on the financial knowledge of investment, this result intuitively confirms that the household tends to be more conservative in self-perceptions.[7)]

2.3. Misplaced Confidence and Stock Market Participation

Moore and Healy (2008) argue that confidence has three faces: i) overestimation (i.e., the absolute advantage of actual performance), ii) over-placement (i.e., "better-than-average effect."), and iii) excess precision (i.e., underestimated variance). I employ a "better-than-average effect" criterion and use the standardized variables of *Act-Fin.Know* and *Per-Fin.Know* (with zero as the cut-off point) to measure misplaced confidence. The *Act-Fin.Know* divides households into *Act-Hi* and *Act-Lo*, and the *Per-Fin.Know* divides households into *Per-Hi* and *Per-Lo*. When *Act-Fin.Know* and *Per-Fin.Know* are both

7) There is a concern of sequential effect, which leaves possibility that households with high illiteracy rates in basic financial literacy would modify perceived financial knowledge depending on the ordering of questionnaire as in our case (i.e., basic - perceived – investment). However, Bradburn and Mason's (1964) states that answers to self-report and self-evaluation questions are relatively unaffected by order of presentation.

greater than 0 or less than 0 simultaneously, the family can correctly perceive their actual financial knowledge and is assigned to the *Awa* group. The case of divergence is called "misplaced confidence". With *Per-Hi* but *Act-Lo*, households' confidence in their actual financial knowledge is biased upward, and these overconfident households are called the *Blindspot* group. In the case of *Act-Hi* but *Per-Lo*, households' confidence in their actual financial knowledge is biased downward, and those who underestimate the self-ability of households are called *Tentative* groups. *Tentative* and *Blindspot* are broadly categorized into "illusion of knowing" groups.

Table 2.1 shows that about 23.35% of households in China have the "illusion of knowing" problem. Around 70.31% of households tend to underestimate their actual financial knowledge. The average stock market participation rate in China is 8.21%. The *Awa-Hi* Group (29.94%) has the highest market participation rate, followed by the *Blindspot* group (17.24%), both belonging to the *Per-Hi* group. In addition, households with low perceived financial knowledge would reduce stock market participation rates, which is in line with the study conducted by Bazley et al. (2021). However, households in the *Tentative* group (2.91%) with high financial knowledge mistakenly believe in their insufficient knowledge, which can make them reduce stock market participation. The hypotheses regarding stock market participation are as follows:

Hypothesis 1: The Tentative group with high financial knowledge but lacking confidence islesslikelytoparticipateinthestockmarket.
Hypothesis 2: The Blindspot group with low financial knowledge but overconfidence is likelier to participate in the stock market.

〈Table 2〉 Group of Household

2.1: Stock Market Participation Rate (8.21%)					
	High Knowledge (*Act-Hi*)			Low Knowledge (*Act-Lo*)	
Value	Awa-Hi	Tentative		Awa-Lo	Blindspot
0	180	200		700	72
1	75	6		7	15
	29.94%	2.91%		0.99%	17.24%

2.2: Average Household Wealth						
	High Knowledge (*Act-Hi*)			Low Knowledge (*Act-Lo*)		
Variable	Awa-Hi	Tentative	Dif	Awa-Lo	Blindspot	Dif
Net worth	256.11	142.40	113.71***	60.07	205.78	145.7***
St Err	(402.01)	(315.05)	(34.26)	(115.38)	(358.30)	(18.25)
Income	18.73	12.97	5.76*	6.72	8.57	1.85
St Err	(35.95)	(37.08)	(3.42)	(20.42)	(15.19)	(2.26)
Consump	10.06	7.33	2.73***	4.49	8.17	3.67***
St Err	(10.93)	(8.88)	(0.94)	(4.83)	(6.92)	(0.58)
Obs.	255	206	461	707	87	794

2.4. Cost of Misplaced Confidence

Assuming that matching objective and perceived financial knowledge is the optimal solution for a household's wealth accumulation (Lemoine, 2021),[8] the illusion of knowing the problem incurs two costs. Firstly, the group of households with insufficient objective financial knowledge, compared to the *Awa-Lo* group, the *Blindspot* group is likely to blindly participate in the stock market due to the dual lack of correct self-perception and financial knowledge which incurs risk costs. Secondly, the high objective financial knowledge group of households, compared with the *Awa-Hi* group, *Tentative* group's lack of confidence would make them hesitant to participate in the stock market, in which occurs an opportunity cost.

Taking the households into account who can correctly perceive

8) Lemoine (2021) states a belief that trust in an individual's abilities can trigger best effort choices. Even if the evaluation is too low, it does not produce adverse results but can lead to the opportunity cost of suboptimal selection.

objective financial knowledge as the baseline group, another line of hypotheses is as follows:

Hypothesis 3: When Hypothesis 1 holds, the choice of the *Tentative* group not to participate in the stock market is negatively correlated with net worth, and there is an opportunity cost of not participating in the stock market among the *Tentative* group with high objective financial knowledge but with lack of confidence.

Hypothesis 4: When Hypothesis 2 holds, the stock market participation choice of the overconfident *Blindspot* group with the low objective financial knowledge is negatively correlated with net worth and bears risk costs for participating in the stock market.

In Table 2.2, objective financial knowledge plays a vital role in determining income compared to perceived financial knowledge. The *Act-Hi* (*Awa-Hi and Tentative*) group has a higher average income than the *Act-Lo* (*Awa-Low and Blindspot*) group. Assets and consumption are more affected by confidence. The *Per-Hi* group (*Awa-Hi and Blindspot*) is greater in number than the *Per-Lo* (*Awa-Low and Tentative*) group. In addition, regardless of other factors, the under-confidence group *Tentative* has a significantly lower net worth than the *Awa-Hi* group and more cautious consumption. However, note that high financial knowledge can mitigate the negative effects of low confidence on income. Moreover, the *Blindspot* group with a lack of financial knowledge and proper awareness knowledge has significantly more net worth and bolder consumption than the *Awa-Lo* group. But due to a lack of financial knowledge, income at the absolute level is not high.

Cocco et al. (2005) argue that households who do not participate in the stock market would lose around 4% of their wealth. From Table 2.2, the difference between the *Awa-Hi* and *Tentative* in the *Act-Hi*

group confirms that a lack of confidence has an opportunity cost. However, over-confidence incurs risk costs, whether from net worth or income. In the *Act-Lo* group, although the stock participation rate of the *Blindspot* group is higher than that of the *Awa-Lo* group, the phenomenon of lower worth effect is caused by the high stock market participation rate when financial knowledge is insufficient or not found. In this case, behavioral costs might offset the result with self-confidence leading to more efforts and attempts (Lemoine, 2021).

2.5. Control Variables

Socio-demographic factors, asset status, and innate characteristics are the three significant factors that affect households' participation in stock market decision-making. Variables, such as education, age, gender, and the total number of household members, are controlled to reduce the socio-demographic noise in the effect of misplaced confidence on stock market participation. This paper uses the highest educated member's feature for each household since the most educated person in a household is more influential than the other members while making investment decisions. In addition, controlling for household assets, debt, income, consumption, and the number of houses under possession mitigates the impact of differences in wealth on stock market participation behavior. I also include a regional variable ("Area"), which further reduces the remaining wealth noise between rich and poor. Finally, the study also controls for risk aversion, loss aversion, attention to the stock market, and trust and happiness index to account for differences in household investment styles.

Ⅲ. Results

3.1. Stock Market Participation

The dependent variable of interest is households' choice regarding stock market participation, which is an indicator variable that takes the value of one when the households participate in the stock market and zero otherwise. Firstly, I demonstrate the relationship between stock market participation choice and the *Act-Fin.Know* (or *Per-Fin.Know*) group. Secondly, I report the relationship between stock market participation choice and misplaced confidence in the Act-Hi and Act-Lo groups, respectively.

Table 3 reports the marginal effects of the explanatory variables on the households' stock market participation choice. It shows that without considering the perceived financial knowledge, their objective financial knowledge has a positive correlation with stock market participation at the 1 percent statistical significance level (column 1). However, the additional control for the *Per-Fin.Know* group in column (2) weakens the significance of the positive correlation between *Act-Fin.Know* and stock market participation, while itself showing a strong positive correlation with stock market participation. Under the same objective (or perceived) financial knowledge, the positive correlation between stock market participation and perceived financial knowledge is stronger than that between stock market participation and objective financial knowledge. Therefore, when the illusion of knowing triggers misplaced confidence, perceived financial knowledge is a key to the prediction of decision-making in stock market participation, becoming a more effective factor.

Columns (3) and (4) focus on the *Act-Hi* and *Act-Lo* groups, investigating the relationship between the stock market participation choices and the misplaced confidence with the correct awareness of

their objective financial knowledge. Balasubramnian and Sargent's (2020) paper uses "perceived" as a benchmark to observe knowledge gaps. However, the setting of this paper is more akin to perceived bias. Column (3) in the *Act-Hi* group shows that the unconfident *Tentative* group is less likely to participate in the stock market (13.4% less than the *Awa-Hi* group), which is significant at 1 percent. Regarding insufficient financial knowledge, in column (4), the *Blindspot* group is positively correlated with stock market participation (5.1% higher than the *Awa-Low* group) at a 1 percent significance level. According to their perceived financial knowledge, households choose financial actions that they think are suitable given their actual financial knowledge. This choice, however, is likely to be suboptimal because perceived financial knowledge deviates from actual financial knowledge. The downward biased confidence explains why households with high financial knowledge do not participate in the stock market.

〈Table 3〉 Stock Market Participation

	(1)	(2)	(3)	(4)
Act-Fin.Know	0.0288***	0.0106*	0.0475***	0.0032
Per-Fin.Know		0.0393***		
Tentative			-0.1337***	
Blindspot				0.0506***
man	-0.0246*	-0.0280**	-0.0145	-0.0294***
Edu	0.0136***	0.0111**	0.0222**	0.0048
Age	0.0003	0.0002	0.0008	0.0000
Family_n	-0.0115**	-0.0099**	-0.0258**	-0.001
Area	-0.0164***	-0.0123***	-0.0254***	-0.0073***
Asset	0.0000**	0.0000**	0.0001*	0.0000
Debt	0.0000	0.0000	0.0001	-0.0008**
Income	-0.0002	-0.0001	-0.0004	-0.0002
Consump	0.0012*	0.0008	0.0029**	-0.0001
House_n	0.0022	0.0016	0.01	0.004
Riskaversion	-0.0128**	-0.0084*	-0.0148	-0.0072*
Lossaversion	0.0056	0.0055	0.0105	0.0048
Attention	0.0268***	0.0122**	0.0477***	0.0047
N	1254	1254	460	794
pseudo R^2	0.379	0.443	0.355	0.36

Notably, the significance of the positive correlation between objective financial knowledge and stock market participation disappears in the low-financial knowledge households. This means that knowledge is significantly positively correlated with stock market participation only when objective financial knowledge reaches a certain threshold level. Although households with less sufficient objective financial knowledge are more likely to participate in the stock market due to their over-confidence blindly, there is a chance that this risk may be mitigated by the threshold effect of insufficient financial knowledge. In conclusion, we found that Hypothesis 1 and Hypothesis 2 hold.

3.2. Household's Net Worth

As shown in the previous section, stock market participation decisions depend on perceived financial knowledge rather than objective financial knowledge, consistent with the findings of Gautam and Jain (2019). However, Gautam and Jain (2019) further argue that financial decisions based on subjective financial knowledge may harm household wealth in the long run. In order to test this result, I take a household's net worth (defined as the difference between household assets and debts) as the dependent variable and use a linear regression model to observe its relation to misplaced confidence. In the data, since the number of households participating in the stock market is relatively small, I use total net value rather than financial net value, to consider the selection bias (see Table A.1).

In column (1) of Table 4, objective and perceived financial knowledge growth significantly correlates with a household's net worth at the 5 percent significance level. After controlling for the stock market participation variable in column (2), the significant positive correlation between perceived financial knowledge and net

worth is replaced (or diluted) by stock market participation.[9] Next, according to stock market participation variables, households are divided into stock market participation groups (column 3) and non-participation groups (column 4). Column (3) of the stock market participation group shows that perceived financial knowledge positively correlates with a household's net worth at a significant level of 5 percent, under the same objective financial knowledge. In contrast, objective financial knowledge is not significantly correlated with net worth. The positively correlated marginal effect between net assets and objective financial knowledge is less than that with perceived financial knowledge. Combining the results in column (2), I identify that perceived financial knowledge is positively correlated

〈Table 4〉 Net Worth

	(1)	(2)	(3)	(4)
Act-Fin.Know	26.11**	23.56**	11.37	25.10**
Per-Fin.Know	28.41**	17.61	77.05**	1.60
stock		98.43***		
man	-8.33	-5.31	-73.12	1.61
Edu	8.55**	8.00**	38.29	9.24***
Age	2.03***	1.97***	1.61	1.77***
Family_n	5.57	6.36	26.00	5.50
Area	-12.40***	-11.85***	-37.08	-13.70***
Income	0.24	0.26	0.11	0.62
Consump	11.12***	10.80***	15.14**	7.53**
House_n	132.04***	129.71***	134.37**	116.72***
Riskaversion	4.82	5.13	-8.06	5.53
Lossaversion	-0.9	-1.91	15.18	-4.71
Attention	8.62	7.13	5.71	7.12
constant	-229.93***	-227.47***	-453.53	-180.40***
N	1254	1254	103	1151
R^2	0.37	0.38	0.42	0.30

9) Regarding any collinearity concern between the variables of stock market participation and standardized perceived (objective) financial knowledge, the scores of VIF are 1.498 (2.09).

with households' net worth through their decision-making process in stock market participation. In the households that do not participate in the stock market in column (4), objective financial knowledge under the same perceived financial knowledge is positively correlated with the households' net worth (significant at the 5 percent level). However, when controlling for objective financial knowledge, perceived financial knowledge is not statistically significantly correlated with net worth.

3.3. Cost of Misplaced Confidence

The cost hypothesis of misplaced confidence is further tested, by dividing households into high and low objective financial knowledge groups. In this section, I first investigate whether the *Tentative* group in Hypothesis 3 is negatively correlated with household net wealth in the high objective financial knowledge group (columns 1-3) and find out if there is any opportunity cost of not participating in the stock market. Next, I test Hypothesis 4 in the low objective financial knowledge group (columns 4-6) and explore whether the *Blindspot* group is negatively correlated with net worth due to overconfidence that incurs risk cost for blindly participating in the stock market. This article still uses household net worth as the dependent variable for this body of exercises. Using *Tentative, Blindspot*, and stock market participation as the independent variables makes it possible to study whether choosing misplaced confidence brings opportunity and risk costs.

In Table 5, the cost is associated with the choice of stock market participation and the relationship with net assets after choosing to participate. Opportunity cost is observed in the high financial knowledge group in columns (1) through (3). From Table 3, it is shown that Tentative is negatively correlated with the stock market

participation. Then, with the high financial knowledge, the *Tentative* group further has an opportunity cost when not choosing to participate in the stock market. Secondly, when households choose to participate in the stock market, compared with those households who correctly perceive their actual financial knowledge as in the baseline group, they observe whether there is a negative correlation between the *Tentative* group and net worth. Therefore, to investigate any heterogeneous effect, I subdivide high financial knowledge into the stock market participation group (column 3) and the non-participation stock market group (column 4).

Using a similar approach, I find that households with low financial knowledge in columns (4)-(6) incur risk costs due to overconfidence in the *Blindspot* group. To explain, column (4) shows whether there is any risk arising from stock market participation and how the relationship between *Blindspot* and net worth affects the choice of households with low financial knowledge whether to participate in the stock market. In column (5), I examine whether households lose their net worth due to their overconfidence, leading them to participate in the stock market. Column (6) illustrates the relationship between the *Blindspot* and net worth when households choose not to participate in the stock market.

In the total households of the high financial literacy group in column (1), the stock market and net assets are significantly positively correlated. Combined with Hypothesis 1, the *Tentative* group reduces stock market participation, which intuitively makes sense considering the opportunity cost of not participating in the stock market. In addition, in columns (2) and (3), I find that the Tentative group negatively correlates with net worth when they join the stock market. However, when they do not participate in the stock market, there is a weak positive correlation with net worth because of their more cautious behavior. Although neither variable is statistically significant,

the economic significance in column (2) is worth noting. The opportunity cost of the *Tentative* group's underconfidence is intuitively captured by the turnout of stock market participation choice and the negative net worth relationship conditional on the stock market participation. In this case, Hypothesis 3 holds.

〈Table 5〉 Illusion of Knowing

	High Financial Knowledge			Low Financial Knowledge		
	(1)	(2)	(3)	(4)	(5)	(6)
	net worth	net worth	net worth	net worth	net worth	net worth
Act-Fin.Know	27.75	49.77	14.44	22.80**	-170.10	22.11**
Stock	105.46**			64.55		
Tentative	20.78	-201.85	23.31			
Blindspot				66.15**	115.36	62.28**
Man	-12.46	-81.55	-0.63	2.00	480.20	2.11
Edu	10.72	37.18	12.03	7.99***	59.62	7.65**
Age	2.59***	2.15	2.55***	1.24**	-1.30	1.21**
Family_n	17.66*	30.25	15.87	-0.94	32.74	-0.81
Area	-23.01***	-38.29	-26.77***	-7.34***	-191.41*	-7.51***
Income	0.79	0.79	1.20	-0.66	-2.90	-0.38
Consump	10.32**	14.68*	5.76	10.92***	1.87	9.84***
House_n	167.55***	152.53**	154.94***	87.71***	232.08	87.21***
Riskaversion	7.61	-0.40	11.51	4.15	-120.49	4.00
Lossaversion	1.42	22.97	-2.63	-4.36	57.32	-4.72
Attention	20.00	47.58	10.42	0.79	-148.06	2.62
constant	-382.81***	-638.86	-294.60***	-120.76**	397.87	-116.24*
N	460	81	379	794	22	772
R^2	0.39	0.39	0.33	0.30	0.73	0.27

Column (4) shows that under the same level of financial knowledge, the overconfidence of the *Blindspot* group positively correlated with a net worth at the 5 percent significance level. The contribution of *Blindspot* mainly comes from households that do not participate in the stock market (column 6), and both objective financial knowledge and *Blindspot* in column (6) are significantly positively related to

household net worth. This may be because confident households are willing to try harder, and the cost of trial and error is relatively small even compared to the case where households with poor financial knowledge do not participate in the stock market. In column (5), *Blindspot* with overconfidence but poor knowledge is still positively correlated with net worth, given that the group participates in the stock market. Although the statistics are insignificant, the economic significance cannot be ignored. This does not mean that financially illiterate households have no risk costs after participating in the stock market. Generally, households have an exploration period when initially choosing to participate in the stock market that they do not understand. During this period, timely feedback on the stock market can promptly help households with insufficient financial knowledge adjust their investment behavior (Deaves et al., 2010).

Finally, Hypothesis 2 predicts that the lack of financial knowledge and overconfidence of households is exposed to the risk of stock market participation. However, the stock market participation variable in column (4) does not confirm this prediction. It is also important to note that the relationship between objective financial knowledge and net worth is heterogeneous. In column (5), objective financial knowledge negatively correlated with the net wealth of households who choose to participate in the stock market despite their insufficient financial knowledge.

In conclusion, I argue that *Blindspot* has no risk cost even after controlling for objective financial knowledge. Rather, the *Blindspot* group may increase personal efforts due to upward self-perception, which contradicts the prediction of Hypothesis 4. The risk cost of participating in the stock market comes primarily from a lack of objective financial knowledge, not confidence.[10)]

10) In Section 3, the endogeneity issue is a problem. However, unfortunately,

Ⅳ. Concluding Remarks

Perceived financial knowledge dramatically affects how households use objective financial knowledge in their decision-making regarding stock market participation. Accurate self-awareness can help households make appropriate decisions given their objective financial knowledge (Ramalho and Forte, 2019; Bazley et al., 2021). However, "misplaced confidence" leads to sub-optimal choices, especially when the self-perceived ability is too low.

Based on the findings, households with insufficient financial knowledge have high risks when participating in the stock market, while the "threshold effect" which hinders stock market participation helps households diversify some risks. Thus, even in some cases, the growth of financial knowledge is negatively affected. However, improving financial knowledge is desirable first, then reducing the opportunity cost of low self-confidence.

This paper has some limitations since it only provides intuition (not causal inference) regarding misplaced confidence cost when objective and perceived financial knowledge do not match each other. However, this paper offers a series of policy implications. For example, the government may subdivide effective financial knowledge policies to improve households' confidence to the same level as their financial knowledge. Indeed, both perceived and objective financial knowledge must be taken seriously to reduce income inequality.

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there is no suitable instrumental variable to address the endogeneity issue. Taking this concern seriously, I have modified the interpretations and toned down the claims to point out the mere statistical associations of the key variables. I will try to address the endogeneity problem in future studies.

◈ *References* ◈

Agnew, J. R., and L. R. Szykman (2005), "Asset Allocation and Information Overload: The Influence of Information Display, Asset Choice, and Investor Experience," *The Journal of Behavioral Finance*, 6(2), 57-70.

Allgood, S., and W. B. Walstad (2016), "The Effects of Perceived and Actual Financial Literacy on Financial Behaviors," *Economic inquiry*, 54(1), 675-697.

Angrisani, M., and M. Casanova (2021), "What You Think You Know can Hurt You: Under/over Confidence in Financial Knowledge and Preparedness for Retirement," *Journal of Pension Economics and Finance*, 20(4), 516-531.

Balasubramnian, B., and C. S. Sargent (2020), "Impact of Inflated Perceptions of Financial Literacy on Financial Decision Making," *Journal of Economic Psychology*, 80, 102306.

Bazley, W. J., Y. Bonaparte, and G. M. Korniotis (2021), "Financial Self-awareness: Who Knows What They Don't Know?" *Finance Research Letters*, 38, 101445.

Bradburn, N. M., and W. M. Mason (1964), "The Effect of Question Order on Responses," *Journal of Marketing Research*, 1(4), 57-61.

Campbell, J. Y., J. D. Hilscher, and J. Szilagyi (2011), "Predicting Financial Distress and the Performance of Distressed Stocks," *Journal of Investment Management*.

Cocco, J. F., F. J. Gomes, and P. J. Maenhout (2005), "Consumption and Portfolio Choice Over the Life Cycle," *The Review of Financial Studies*, 18(2), 491-533.

Deaves, R., E. Lüders, and M. Schröder (2010), "The Dynamics of Overconfidence: Evidence from Stock Market Forecasters," *Journal of Economic Behavior and Organization*, 75(3), 402-412.

Kruger, J., and D. Dunning (1999), "Unskilled and Unaware of it: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-assessments," *Journal of Personality and Social Psychology*,

77(6), 1121.

Gan, L., Z. Yin, and J. Tan (2016), "Report on the Development of Household Finance in Rural China (2014)," Springer Singapore.

Gautam, S., and K. Jain (2019), "Dynamics of Objective and Subjective Financial Knowledge on Financial Behaviour," *Abhigyan*, 37(1), 11-21.

Gomes, F., and A. Michaelides (2005), "Optimal Life Cycle Asset Allocation: Understanding the Empirical Evidence," *The Journal of Finance*, 60(2), 869-904.

Grinblatt, M., M. Keloharju, and J. Linnainmaa (2011), "IQ and Stock Market Participation," *The Journal of Finance*, 66(6), 2121-2164.

Hawthorne, J., and J. Stanley (2008), "Knowledge and Action," *The Journal of Philosophy*, 105(10), 571-590.

Heaton, J., and D. Lucas (2000), "Portfolio Choice and Asset Prices: The Importance of Entrepreneurial Risk," *The Journal of Finance*, 55(3), 1163-1198.

Huberman, G. (2001), "Familiarity Breeds Investment," *The Review of Financial Studies*, 14(3), 659-680.

Lemoine, D. (2021), "Rationally Misplaced Confidence," Working Paper.

Lind, T., A. Ahmed, K. Skagerlund, C. Strömbäck, D. Västfjäll, and G. Tinghög (2020), "Competence, Confidence, and Gender: The Role of Objective and Subjective Financial Knowledge in Household Finance," *Journal of Family and Economic Issues*, 41(4), 626-638.

Moore, D. A., and P. J. Healy (2008), "The Trouble with Overconfidence," *Psychological Review*, 115(2), 502.

Paiella, M. (2001), "Limited Financial Market Participation: A Transaction Cost-based Explantation," Retrieved from.

Ramalho, T. B., and D. Forte (2019), "Financial Literacy in Brazil-do Knowledge and Self-confidence Relate with Behavior?" *RAUSP Management Journal*, 54, 77-95.

Robb, C. A., and A. Woodyard (2011), "Financial Knowledge and Best Practice Behavior," *Journal of Financial Counseling and Planning*, 22(1).

Statman, M., S. Thorley, and K. Vorkink (2006), "Investor Overconfidence and Trading Volume," *The Review of Financial Studies*, 19(4), 1531-1565.

Van Rooij, M., A. Lusardi, and R. Alessie (2011), "Financial Literacy and Stock Market Participation," *Journal of Financial Economics*, 101(2), 449-472.

Van Rooij, M. C., A. Lusardi, and R. J. Alessie (2012), "Financial Literacy, Retirement Planning and Household Wealth," *The Economic Journal*, 122(560), 449-478.

Warmath, D., D. Piehlmaier, and C. Robb (2019), "The Impact of Shared Financial Decision Making on Overconfidence for Married Adults," *Financial Planning Review*, 2(1), e1032.

Xia, T., Z. Wang, and K. Li (2014), "Financial Literacy Overconfidence and Stock Market Participation," *Social Indicators Research*, 119(3), 1233-1245.

Appendix

〈Table A1〉 Coding Variables

Measures	Description of variable	How Coded	CHFS2017
Primary variables			
Objective Financial Knowledge	The sum of correct answers on objective financial knowledge.	8 objective questions, correct = 1 (maximum score = 8, minximum = 0)	h3105 (interest), h3106(inflation rate), h3103 (risk and return), h3115 (diversification), h3111 (stockandfunds), h3112 (stock), h3113 (funds), h3114(bonds)
Act-Fin.Know	Standardized variables of objective financial knowledge	Mean=0, std.=1	
Perceived Financial Knowledge	Self-perceived financial knowledge	Likert scale 0-5; Very not at all = 0, Very well = 5	h3110 (How well do you know about stocks, bonds, and funds?)
Per-Fin.Know	Standardized variables of perceived financial knowledge	Mean=0, std.=1	
Awa-Hi	If act-Fin.Know〉0 and per-Fin.Know〉0	Yes=1	
Awa-Low	If act-Fin.Know〈0 and per-Fin.Know〈0	Yes=1	
Blindspot	If act-Fin.Know〈0 and per-Fin.Know〉0	Yes=1	
Tentative	If act-Fin.Know〉0 and per-Fin.Know〈0	Yes=1	

Dependent variables				
	Stock	Does your house own any stock account currently?	Yes=1	d3101
	Net worth	The difference between assets and debts	Unit: 10,000 RMB	asset and debt
Covariates				
Socio-demographic Factors	Edu	The highest education in the Household	9 levels; No schooling at all = 1, Doctorate degree = 9	a2012
	Age	Age of highest educated		a2005
	Man	Gender of highest educated	man=1	a2003
	Famaily_n	How many family members are there in your household?	family_n = a2000a + a2000b +1	a2000a, a2000b
Household Wealth	Asset	Total household assets include non-financial assets and financial assets.	Unit: 10,000 RMB	asset
	Debt	Total household debts include agricultural debt, business debt, real estate debt, vehicle debt, non-financial assets debt, stock debt, other financial assets debt, education debt, medical debt, and other debts.	Unit: 10,000 RMB	debt
	Income	Household income includes wage income, agricultural operating income, industrial and commercial operating income, transfer income, and investment income.	Unit: 10,000 RMB	total_income

	Consume	Total household consumption expenditures.	Unit: 10,000 RMB	total_consump
	House_n	How many houses does your Household own with rental houses excluded?		c2002
	Area	Where is the respondent's house located?	6 levels: Downtown in the city = 1, Village = 6	j1001
	Risk avasion	If you have a fund for investment, which investment project would you most like to choose?	6 levels	h3104
	Loss aversion	If you have a 50% chance of losing 100 and a 50% chance of getting Y yuan, how much do you want Y to be at least to participate in this game?	6 levels	h3109
Innate Characteristic	Attention	How concerned are you with economic and financial information?	6 levels: More than never concerned = 1, Very concerned = 6	h3101
	Trust	Do you trust people you don't know?	6 levels: I don't trust them very much = 1, I trust them very much = 6	h3380
	Happiness	In general, do you feel happy now?	6 levels: Very very unhappy = 1, Very happy = 6	h3514

Appendix Table A2: Financial Knowledge

〈Table A2〉 Financial Knowledge

Objective Financial Knowledge	Perceived Financial Knowledge						
	0	1	2	3	4	5	Total
0	6	185	3	3	0	0	197
1	3	244	10	6	0	0	263
2	0	269	39	22	4	0	334
3	0	132	55	21	4	0	212
4	0	50	37	20	2	2	111
5	0	15	22	5	1	1	44
6	0	6	16	13	4	1	40
7	0	3	2	16	10	0	31
8	0	0	5	10	7	1	23
Total	9	904	189	116	32	5	1255

Appendix Table A3: Variance Inflation Factor

〈Table A3〉 Variance Inflation Factor

	VIF	1/VIF
Act-Fin.Know	2.09	0.48
Per-Fin.Know	1.90	0.53
Consump	1.67	0.60
Age	1.66	0.60
Edu	1.65	0.61
Family n	1.52	0.66
Attention	1.47	0.68
stock	1.45	0.69
Income	1.44	0.69
Area	1.40	0.71
Riskaversion	1.39	0.72
Lostaversion	1.19	0.84
House n	1.09	0.92
man	1.04	0.96
Mean VIF	1.50	.

안다는 착각: 잘못된 자신감과 가계의 주식시장 참여

Karen Meng Li*

논문초록

이 논문은 CHFS2017의 가계 데이터를 사용하여 본인의 금융지식에 대한 주관적 평가가 객관적인 금융지식 수준과 다를 때 나타나는 잘못된 자신감을 연구한다. 더 구체적으로 잘못된 자신감과 주식시장 참여 및 순자산 간의 관계를 분석해서 중국인들의 주식시장 참여가 제한적인 이유를 밝혀냈다. 또한 객관적 금융지식과 주식시장 참여 사이의 양의 상관관계에서 '임계치 효과'가 나타난다는 것도 발견했다.

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