Identifying Factors of a Financial Literacy Scale Used among Vulnerable Populations

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Financial literacy scales are often used as a diagnostic tool to assess financial knowledge levels among various populations, although few of them have undergone empirical testing. This study utilized exploratory factor analysis (EFA) with a sample of Chinese rural migrant workers to identify the underlying structure of a financial literacy scale and its psychometric properties. EFA reduced the 23 items to 5 factors that explain for 69.08% of the variance in financial literacy. Five factors are identified that are daily money management, math skills, saving and borrowing, inflation, and long-term investment. Findings suggest that practitioners who work with migrant workers or groups with lower income, lower educational levels can use this instrument to assess financial literacy levels and explore interventions that improve specific areas of financial knowledge.

Keywords: chinese rural migrant workers, exploratory factor analysis, financial literacy scale, measurement

In today's society, individuals make financial decisions daily. These financial decisions can be as small as grocery shopping and as big as selecting health plans and purchasing property and assets. With numerous financial products and services available on financial markets and forever-changing financial market, it can be difficult to distinguish and select appropriate financial products and services that work best for their interests. It can be particularly challenging for social and economically disadvantaged groups (Daniels et al., 2021), such as Chinese rural migrant workers, a group who migrated from rural areas to cities for job opportunities. Migrant workers often are employed in low-wage jobs with no fringe benefit and little labor protection. Their low socioeconomic status as well as the institutional barriers created by the national household registration system makes migrant workers as one of the most financial vulnerable groups in China (Chen & Lemieux, 2016). Financial literacy, defined as the knowledge and skills to make informed financial decisions (Lusardi & Mitchell, 2011), can be crucial to migrant workers' ability of navigating financial lives and achieving financial capability and economic wellbeing (Chu et al., 2017; Xiao & Huang, 2021).

There are numerous studies indicating that financial literacy is related to beneficial financial behaviors (e.g., budgeting, record keeping, saving behaviors) and economic outcomes (e.g., amount of savings, wealth accumulation) (Lyons et al., 2006; Lusardi & Mitchell, 2007). Recognizing the importance of financial literacy, governments and non-profit organizations have initiated a series of financial education programs that aim to help individuals improve financial knowledge and decision-making skills. Often, these latter programs adopt various financial literacy scales to assess financial knowledge levels and identify knowledge gaps (Perotti et al., 2013). However, there is a growing concern about whether existing financial literacy instruments are measuring what they purport to measure, as very few existing measures have undergone empirical testing (Kindle, 2010). A review of existing financial literacy measurement by the World Bank indicates that there are at least 15 instruments that are used at a large-scale worldwide to assess levels of financial literacy and few of them have been empirically validated (Kempson et al., 2013).

A comprehensive and psychometrically sound measure of financial literacy can assist researchers to assess financial literacy with accuracy and consistency. Nevertheless, few financial literacy measures have demonstrated acceptable reliability and validity. This is partly because current literature lacks an agreed-upon conceptual framework of the construct, financial literacy, and researchers still debate on what constitutes financial literacy (Chiang, 2021; Hung et al., 2009; Huston, 2010; Liao et al., 2017; Remund,

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2010). What remains little understood is the core components of financial literacy and the relationship between core components (Białowolski et al., 2021; Birkenmaier et al., 2020).

More importantly, the field is lacking financial literacy measures that are designed for assessment among specific population such as low-income groups. It is widely recognized that household financial lives are complex and highly contextualized, which calls for a context-based conceptualization of financial literacy. Nevertheless, financial literacy measures used in Chinese context such as those in large datasets including the *Chinese Household Finance Study* and the *Chinese Survey of Consumer Finance* were adopted from questions developed in the American setting (Lusardi & Mitchell, 2005). Given that the financial environment in China is distinctively different from the U.S. (see a detailed discussion in Jin & Yuan, 2019), the use of imported financial literacy questions likely leads to poor portrait and inaccurate interpretation of Chinese populations' financial literacy.

To remedy the lack of culturally competent financial literacy scale, the current study introduces and assesses the Basic Financial Literacy Survey (BFLS), a survey instrument that was developed to measure financial literacy among Chinese rural migrant workers. The development of BFLS has taken a great consideration of migrant workers' socioeconomic circumstances and financial environment they work and live in; financial literacy questions were designed to be contextually relevant and culturally appropriate. A detailed account of survey development can be found in Chen and Lemieux (2016). This study examines factor structure of the BFLS and identifies the psychometric properties using exploratory factor analysis.

Literature Review
Conceptualizing Financial Literacy
There are considerable variations in defining financial literacy in the literature, and scholars have long disagreed on how to best define financial literacy. Hung et al., (2009) reviewed 71 existing studies and concluded that most existing definitions often included a focus or a combination of foci on (1) a specific form of knowledge, (2) the ability or skills to apply that knowledge, (3) perceived knowledge or confidence in managing money issues, (4) financially informed behavior, and (5) financial experience. For

example, in a frequently cited paper by Cutler and Devlin (1996), financial literacy was defined as knowledge and confidence for dealing with personal financial affairs, while the Office of Organization for Economic Co-operation and Development (OECD) (2005) defined financial literacy more broadly as the ability to understand financial products, concepts, and financial risks, as well as the ability to take advantage of opportunities to make informed financial decisions and choices. Lusardi and Tufano (2009) emphasized the decision-making aspect of financial literacy in terms of debt literacy, while Moore (2003) included practical experience as the basis for knowledge and other aspects of financial literacy. In many studies however, financial literacy is not clearly conceptualized, and readers must infer what the researcher meant from how financial literacy was measured (Hung et al., 2009; Remund, 2010, Xiao & Huang, 2021).

Nevertheless, a common factor across various definitions of financial literacy is knowledge or understanding of basic financial concepts. Based on the literature and the population of interest in this study, the current study defines financial literacy as the knowledge and skills regarding basic money management. While emphasizing basic knowledge, it focuses on skills, which is the application of the knowledge. Understanding financial concepts is important, and perhaps more critical for low-income families to have the ability to apply knowledge. Research has indicated that knowledge and skills on basic money management tasks are relevant to low-income individuals and families (Chen, 2018; Morduch & Siwiki, 2017), as their financial lives involve constant budgeting, spending, saving, and borrowing activities.

Existing Financial Literacy Measures
The lack of an agreed upon conceptualization of the financial literacy construct has led to a variety of ways that researchers have chosen to operationalize financial literacy and evaluate financial education interventions (Huston, 2010). Existing financial literacy measurement instruments vary in many aspects such as content domains, format of questions, number of items, and scoring procedures (Huston, 2010). Perhaps the most variations can be found in content domains, as some instruments include questions assessing numeracy skills and financial concepts (e.g., Borden et al., 2008; Lusardi & Mitchell, 2007), while others examining knowledge on saving interest and borrowing risks (e.g., Perry & Morris, 2005). There are also instruments that

include questions that assess behaviors, attitude, and confidence relevant to money management. Despite that financial literacy is a multi-dimensional concept, measures that cover a broad range of content are scarce. Huston (2010) reviewed financial literacy measures used in 71 studies and found over half (60%) of the 52 measures have included only one or two dimensions.

Another issue of current financial literacy instruments is that few have been subjected to tests of validity. After reviewing more than 20 financial literacy survey instruments used on various American populations, found only 2 instruments had some kind of validity testing. One is *Survey of Personal Financial Literacy* (SPFL), which was used by Chen & Volpe (1998) among a convenience sample of 924 college students. The SPFL is composed of 36 multiple-choice questions and showed good internal consistency (Cronbach alpha coefficient = .85). The other is Danes & Hira's (1987) 51-item multiple-choice financial literacy survey, which was used among a random sample of 323 college students from one university and showed good internal consistency (Cronbach alpha coefficient = .76). However, neither of these two instruments were validated with different populations. Overall, the majority financial literacy measures have not undergone empirical testing, and few studies reported their validity and reliability.

Measuring Financial Knowledge within Chinese Populations

Compared to research conducted in developed countries and some developing countries, research on financial literacy of Chinese populations remains limited (Xu & Zia, 2013). A search yielded three exploratory studies that assessed levels of financial literacy with researcher-developed tools. For example, Song (2011) used a single survey item to assess financial literacy within a sample of 1,104 rural household members in China, while Xia et al. (2014) examined financial knowledge about the stock market (i.e., investment risk, stocks and bonds, foreign exchange rate) with a 7-item survey among 3,122 Chinese adults. Besides, Yu et al., (2015) used a 3-item questionnaire to examine gender differences in financial knowledge among 1,005 Hong Kong workers. Similar to the research undertaken in other countries (e.g., OECD, 2005), these three exploratory studies focused on specific financial knowledge areas using brief, subjective, self-report measures. Large-scale

datasets that include financial literacy measures mostly used three questions from Lusardi & Mitchell (2005). While using similar questions allows for cross-country comparison (Zhu et al., 2017), few efforts were made to examine how relevant and culturally appropriate these imported questions are in Chinese setting (Dew & Xiao, 2011). Until today, there remains little discussion on cross-cultural adaptation of financial literacy measures (Chiang, 2021; Liao et al., 2017), no studies have questioned the widely used three questions' cross-cultural relevance to Chinese population.

The current study introduces and assesses the *Basic Financial Literacy Survey* (BFLS), a scale developed to assess financial knowledge among financially vulnerable populations. The BFLS focuses on basic financial knowledge and skills that are relevant to low-income groups' financial lives. Questions included in BFLS are a combination of adapted questions from previous studies and newly designed questions on financial matters closely relevant to Chinese rural migrant workers. With consideration of their life circumstances and financial environment, the BFLS aims to be culturally valid for measuring financial literacy among a subgroup of migrant workers. This study is the first step to assess whether BFLS is accurate and reliable in testing the actual levels of financial knowledge. It analyzes the underlying structure of this financial knowledge scale and examines how different types of tested financial knowledge relate to each other. The following research questions framed the current study:

1. What is the factor structure of BFLS?
2. What are the relationships between factors emerged from factor analysis?

Method

Design and Sampling

The current study analyzed cross-sectional data from self-report surveys. Permission to conduct the study was granted by the Institutional Review Board at a university where the researcher was employed at the time when this study was launched. The sampling frame consisted of Chinese migrant workers working on campus of Bejing Normal University in Beijing, China. Using a convenience sampling method, the researcher collected data from 329 on-campus migrant workers through face-to-face interviews in July of 2010. All participants gave their consent for participating in the

original study. A detailed account of data collection procedures can be found in an earlier study by Chen & Lemieux (2016). Studies using factor analysis approach often need to meet two minimum criteria: One is 100 minimum subjects, the other is subjects-to-items ratio (STV) no lower than 10:1 (Thompson, 2004). The sample size ($N = 329$) and the STV (14:1) in the current study meet the criteria.

Measures

The Basic Financial Literacy Survey (BFLS) is a researcher-developed survey instrument that collected data about respondents' socio-demographic information, financial literacy, and other relevant information. The focus in this study is BFLS's 23-item financial knowledge scale, which is composed of 3 subscales to assess participants' knowledge about numeracy (5 items), saving and borrowing (11 items), and risk and investment (7 items), respectively. All 23 questions were adapted from questions used by Lusardi & Mitchell (2005), Chen & Volpe (2002), Moore (2003), Vitt et al., (2000), and Worthington (2006), and then translated to Chinese with culturally appropriate contextual modifications. The detailed information regarding instrument development can be found in Chen & Lemieux's (2016) study. The following paragraphs describe the three subscales in detail.

Numeracy

There are 5 items measuring basic arithmetic skills including addition, subtraction, multiplication, and division. All questions are in fill-in-blank format, and each correct response was coded 1, otherwise coded 0. For example, subtraction and multiplication skills were measured by a question, *The price of a brand-new television is $250. Shop A takes $30 off the price, while shop B takes 10% off the price. Which shop offers lower price of this television?* (The response, *Shop A*, is the correct answers and was coded 1, otherwise coded 0).

Saving and Borrowing

Seven multi-optional questions were asked to assess respondents' knowledge about saving interest, inflation, borrowing interest and related responsibilities, and ATM use. For example, knowledge about inflation was assessed by a question, *Suppose the interest rate on your saving account was 1% per year and inflation rate was 2% per year. After one year, how much would you be able to buy with the money in this account*? The four options included *(i) more than today,*

(ii) exactly the same, (iii) less than today, (iv) DK. (Answer *iii* was correct and coded as 1, the others were coded 0.)

Risk and Investment

Respondents were asked 7 questions related to risk and investment. Two questions involved knowledge about investment and the remaining five focused on risk involved in investing different types of financial product. For example, respondents were asked to compare the degree of risk associated with several investment types with a question worded as follows: *Which investment is the riskiest one?* Options included *(i) stocks, (ii) bonds, (iii) housing fund, (iv) the same, (iv) DK.* (Answer *i* was correct and coded 1, other responses were coded 0).

Analytic Approach

Factor analysis is widely used in social science research for various goals including developing an instrument and identifying the needed social services (Costello & Osborne, 2015). There are two major factor analysis approaches. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Costello & Osborne, 2015). Rationale of using EFA for this study lies in its theoretical assumptions. While CFA focuses on testing of specific hypothesis about the data, EFA has no theoretical assumption and depends on data to establish a theory (Thompson, 2004). In the current study, there were no predetermined expectations regarding the underlying factors of financial knowledge (Huston, 2010); therefore, EFA was used to discover the latent variables that constitute financial knowledge.

EFA requires high-quality data, and variables should be carefully selected and have well-established psychometric properties (Fabrigar et al., 1999). Therefore, internal consistency of the financial knowledge scale was examined through computing Cronbach's alpha coefficient. The result ($\alpha = .76$) suggests that the financial knowledge scale has a good internal consistency and is acceptable for employing EFA. In addition, methodologists typically recommend using intervalley scaled variables for conducting EFA, however, it is appropriate to factor analyze dichotomous variables when the overarching goal of study is to uncover clustering patterns among variables (Kim & Mueller, 1978; Thompson, 2004).

EFA was accomplished in four steps using a variety of statistical methods in StataSE13. In the first step, the adequacy of

the input data and the statistical assumptions were assessed through frequencies and normality test using skewness and kurtosis. The second step involves performing two initial tests for the data adequacy for the factor analysis. The Kaiser-Meyer-Olkin (KMO) statistic and Bartlett's test of sphericity were computed to test the sampling adequacy and to ensure the appropriateness of correlations for the factor analysis. In the third step, EFA was conducted to identify the main component of financial knowledge scale. The principal factor extracting methods, with oblique rotation was used. The number of retained factors in the final model was determined by the Kaiser's rule, a scree plot examination, and parallel analysis results. The last step involves examining factor loadings in the final model, interpreting retained factors and correlations based on loadings, and naming retained factors.

A linear sequence of decisions was made during the EFA process. The following provides justifications for selecting the particular statistical techniques during the EFA process. First, tetrachoric correlations were chosen to compute correlation matrix because they are appropriate for using dichotomous data, which is the data under study (Fabrigar et al., 1999; Kim & Mueller, 1978). Second, principal factor analysis is commonly recommended for conducting EFA when the objective is to understand the relations among a set of measured variables as well as underlying latent variables (Thompson, 2004). Given the aim of this study was to identify the underlying patterns among the latent variables, principal factor solution was an appropriate approach for this study. In terms of rotation technique, orthogonal rotation assumes factors to be rotated are uncorrelated, whereas in oblique rotation factors can be correlated (Kim & Mueller, 1978; Thompson, 2004). Previous studies on financial literacy have shown that factors that constitute financial knowledge are likely correlated (e.g., OECD, 2005), oblique technique was selected to rotate factors in order to achieve a simple and interpretable factor structure.

Results

Characteristics of the Sample

The sample of this study was primarily composed of single (61.7%), young migrant workers (mean age is 26-year-old, SD = 8.0). More than half of respondents were male (57.5%) and did not have high school education (56.34%). The average monthly wage was $243 ($SD$

TABLE 1. Sample Characteristics (N = 329)

	N	percent
Gender		
Male	189	57.45%
Female	140	42.55%
Marital Status		
Single	203	61.7%
Married	126	38.3%
Children		
Yes	120	36.59%
No	128	63.41%
Education		
Primary school	14	4.26%
Middle school	171	51.98%
High school	97	29.48%
Vocational school	42	12.77%
College	5	1.52%
	Mean	**SD**
Age	26	8
Monthly Income	$243	$104
	(¥1652)	(¥705)
Years of Employment	7.5	5.8

= 104; US$1 = 6.78 Chinese yuan, as of July 2010). See Table 1 for a summary of socio-demographic information of the sample.

Results from Factor Analysis

Initially, all 23 variables were entered into the factor analysis with oblique rotation. The Kasier-Meyer-Olkin Measure of Sampling Adequacy (KMO) was .782 and Bartlett's test of sphericity was significant (p <.000), indicating that the sample was adequate for EFA. In the initial EFA, 7 factors were extracted with eigenvalues greater than 1.0. Communalities ranged from .13 to .91. Factor loading that exceeds .30 are generally considered to be significant on practical grounds (Thompson, 2004). All items were examined and one item with low communality level (lower than .30) was dropped. The omitted item was knowledge related to inflation and purchase power. This results in a 22-item financial knowledge scale, which still demonstrated a good internal consistency (Cronbach alpha coefficient = .69).

A second iteration with 22 items was performed. Seven factors had eigenvalues greater than 1, explaining 67.22% of

the variance, with communalities ranging from .59 to .91. To obtain an interpretable and theoretically plausible pattern of results, methodologists recommend using multiple criteria to determine the optimal number of factors to be included in the model (Fabrigar et al., 1999; Floyd & Widman, 1995; Thompson, 2004). Following this suggestion, scree plot and parallel analysis were performed to provide insights on factors that should be retained (see Figure 1). According to Cattell (1996), factor extraction should be stopped at the point where there is leveling of the plot. As seen in Figure 1, a line of eigenvalue 1.0 goes through the eighth factor, and eigenvalues begin to level off forming a relative straight line at fifth factor, eighth factor, and tenth factor.

Finally, in the parallel analysis, the raw data eigenvalue from the actual data was greater than eigenvalues of the 95th percentile of the distribution of random data for five factors, in disagreement with the Kaiser's rule and scree plot. Fabrigar et al. (1999) consider that both over factoring (viz., too many factors) and under factoring (viz., too few factors) can be problematic, as the former unnecessarily complicates theories and the latter causes errors in factor loading. Considering this suggestion well as the results of scree plot, a 5-factor model was computed to compare with earlier 7-factor model.

Results of the 5-factor (22 items) model showed that the model accounted for 69.08% of the variance (see Table 2). Factor 1 through 5 summed factor loadings of 4.03, 3.71, 3.50, 2.39, and 1.88. These latter 5 factors accounted for 18.35%, 16.87%, 15.89%, 10.86%, and 8.56% of the variance, respectively. As seen in the Table 2, individual

Figure 1. Scree plot and parallel analysis.

item factor loading ranged from 0.36 to 0.87. Compared to 7-factor model, 5 factor model was more parsimonious and plausible, and produces less bipolar variables (0 versus 3). Bipolar variables are variables that are equally loaded on two or more factors and are difficult to interpret (Thompson, 2004). As a result of balancing the need for parsimony against the need for plausibility, a primary 5-factor model was chosen for its interpretability and parsimony.

Table 3 shows descriptive statistics on the scale and subscales. On average, 11 out of 22 questions were answered correctly. Across five subscales, math skills subscale had the highest percentage of correct answers (Mean =3.22, 62.8%), followed by daily money management subscale (Mean = 3.14, 62.7%). The lowest percentage of correct answer falls on the subscale of long-term investment (Mean =1.08, 36%). The correlation among the 5 factors was estimated using the command "estat common". Results showed that correlations between factors range from 0.05 to 0.27. The five factors were named as following: Daily money management (5 items), math skills (4 items), saving and borrowing (6 items), inflation (4 items), long-term investment (3 items). The 5-factor BFLS shows a good internal reliability (Cronbach alpha coefficient = .69), with all five subscales demonstrating good internal consistency (Cronbach alpha coefficient ranges from 0.57 to 0.69, see Table 4 for details).

Discussions, Limitations, and Implications

The current study aims to identify the underlying structure of a financial knowledge scale and examine the relationships between factors constituting the construct, financial knowledge. Results from exploratory factor analysis indicated that a five-factor structure within the financial knowledge scale was the best solution. The five subscales including daily money management, basic math skills, saving and borrowing knowledge, inflation, and long-term investment demonstrated a good reliability overall, and explained a fair portion of the construct, financial literacy. The findings illuminate that financial literacy is a multidimensional concept that covers a wide range of knowledge domains. A review of current financial knowledge research showed that most studies examined only one or two knowledge domains (Huston, 2010). The lack of comprehensive financial knowledge measures can subject studies to measurement bias and incomprehensive assessment as a result. Not only an incomplete assessment, but these flawed financial literacy measures can also lead to inaccurate reporting
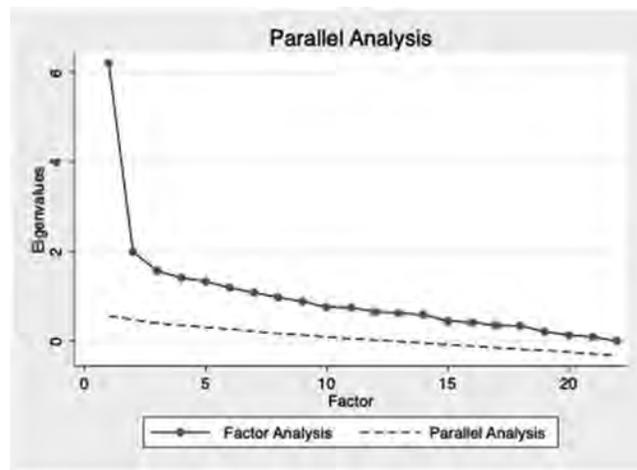
TABLE 2. 5-Factor Model with Factor Loading (*N* = 329)

Factor	1	2	3	4	5
1. Daily Money Management					
Shopping	0.57				
Living cost	0.63				
Saving	0.70				
Simple Interest	0.55				
ATM use	0.75				
2. Math Skills					
Lottery gains		0.79			
Lunch expense		0.87			
Rent cost		0.56			
Financial Return		0.66			
3. Saving and Borrowing					
Comparison of Savings			0.50		
Diversifying Investment			0.51		
Loan Payment Comparison			0.67		
Risk and Return			0.43		
Interest and Inflation			0.49		
10-year saving plan			0.79		
4. Inflation					
Inflation and Purchase				0.36	
Purchase power				0.40	
Loan Repayment				0.51	
Lender Credibility				0.77	
5. Long-term Investment					
Saving Interests					0.65
Lending Risk					0.51
Investment Risk					0.62

TABLE 3. BFLS and Subscales Descriptive Statistics (*N* = 329)

	M	*SD*	Range
BFLS	11.32	4.19	0–21
Daily Money Management	3.14	1.55	0–5
Math Skills	3.22	0.95	0–4
Saving and Borrowing	2.36	1.61	0–6
Inflation	1.53	1.16	0–4
Long-term Investment	1.08	0.81	0–3

regarding relationships between financial literacy and behaviors. Using untested financial knowledge measures, past research has shown correlations between financial literacy and behaviors, suggesting adopting financial education as an intervention to improve financial behavior and outcomes. More importantly, very few financial literacy measures have undergone cross-culture adaption and validation. This is particularly the case when it comes to culture-sensitive, context-relevant measures in Chinese context. This study introduced and empirically tested a financial literacy measure that was designed to assess Chinese rural migrant workers' financial knowledge. The Basic Financial Literacy Survey, BFLS, is a survey that aims to test financial knowledge and skills that are relevant to financial lives of low-income individuals in China, especially Chinese migrant workers who are often less-paid, less-educated. This is the first known study providing psychometric evidence of a financial literacy measure in the Chinese context.

TABLE 4. BFLS and Subscales Reliability Test (*N* = 329)

	Item-test Correlation	Item-rest Correlation	Average interitem covariance	Alpha
BFLS	–	–	0.49	0.69
Daily Money Management	0.80	0.59	0.34	0.57
Math Skills	0.53	0.33	0.61	0.68
Saving and Borrowing	0.73	0.45	0.42	0.65
Inflation	0.66	0.45	0.50	0.64
Long-term Investment	0.64	0.50	0.56	0.64

One of the salient findings of this study was that the factors daily money management, math skills, and saving and borrowing knowledge explained the most variance of financial literacy. Compared to the other two categories (i.e., inflation and long-term investment), these three domains of knowledge are fairly related to daily money activities and are fundamental to overall financial capability of migrant workers. Consistent with previous studies (Xiao & O'Neil, 2018), This finding suggests that the three knowledge domains are a crucial component of financial knowledge and should be measured when the population under study is Chinese migrant workers or groups who are similarly socially and economically disadvantaged.

Meanwhile, math skills are important to other types of financial knowledge, as findings show that math skills were correlated with other four factors. Most existing financial knowledge studies did not include measures to assess basic math skills including those in the Chinese context (e.g., Lyon et al., 2019; Zhu et al., 2019; Zou & Deng, 2019). The findings of this study highlight the importance of math literacy in determining financial literacy level, calling for future research to include measures that evaluate math skills. Math skills is particularly relevant given its correlations with math skills and savings and borrowing knowledge, as well as long-term investment shown in this study. This suggests that numeracy and arithmetic may be critical to understanding financial concepts such as simple interest and compound interest, which is essential to short- and long-term savings and borrowing decisions.

Limitations

This study has several limitations. The first limitation is that the content of the financial literacy measurement examined in this study was intentionally constructed to assess the financial literacy level among Chinese rural migrant workers and the measure under study may not be suitable for assessing financial literacy among other populations. This is because questions were selected from existing instruments and altered to the economic context in China and to the financial life of Chinese rural migrant workers. For instance, while basic financial knowledge questions about numeracy, saving, budgeting were included, those regarding credit card use were excluded because credit cards were not commonly used by the Chinese rural migrant population at the survey time (Chen & Lemieux, 2016). Similarly, questions about bonds, stocks, and other investment tools were also eliminated and replaced with questions that asked respondents to make judgments regarding the basic relationship between risk and return. Despite the extensive content covered by the financial literacy measure, content validity is yet to be established. Additional items may be needed to assess knowledge fully in some of the categories. For example, this study only included one multi-optional question concerning financial attitude and one multi-optional concerning perceived need of financial knowledge. If additional items to assess each of these categories fit within the identified factor structure, the reliability of the categories would likely be improved.

Another limitation concerns the nonprobability sampling method used to collect data. Although the researcher attempted to obtain as representative a sample as possible through the stratification and proportional recruitment of migrant workers from each job industry on campus, participants were not sampled randomly therefore data are subject to potential sampling bias. Additionally, some of the migrant workers from whom (Chen & Lemieux, 2016) sought participation were either unwilling or unable to participate, which may have also introduced sampling bias to the study. Future research is warranted to further test this scale with representative samples.

Implications

Despite limitation, this study is the first attempt to explore the underlying structure of a financial knowledge scale with

a sample of Chinese rural migrant workers. The findings of this study provide support for the Basic Financial Literacy Survey (BFLS) as a useful financial literacy assessment tool and highlight the importance of assessing knowledge domains that are closely related to daily money management tasks, especially when the target population is socially and economically disadvantaged groups. Practitioners who work with migrant workers or groups with lower income, lower educational levels can use this instrument to assess financial knowledge levels and identify knowledge deficiency areas. The 22-item BFLS is easy to administer, and five knowledge domains revealed by this study can guide practitioners to explore interventions to improve financial knowledge of specific areas.

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