I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 15253

A Study of the Chinese Gender Gap in Financial Literacy

Alison Preston
Lili Qiu
Robert E. Wright

APRIL 2022

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 15253

A Study of the Chinese Gender Gap in Financial Literacy

Alison Preston
University of Western Australia

Lili Qiu
University of Western Australia

Robert E. Wright
University of Glasgow and IZA

APRIL 2022

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

A Study of the Chinese Gender Gap in Financial Literacy*

This paper uses data from the 2015 China Household Financial Survey to analyse the gender gap in financial literacy in China. The sample consists of 36,311 adult respondents. A variety of financial literacy measures are employed. We show that important predictors of financial literacy include age, education and geographic location and that there are strong cohort effects, with younger respondents significantly more financially literate than older respondents. Males, on average, are more financially literate than females. Blinder-Oaxaca decomposition analysis shows that the gender gap in financial literacy, in part, reflects gender differences in schooling that favours males. There are also large and significant urban-rural differences in financial literacy, with the gender gap markedly higher in rural areas. Overall the gender gap in financial literacy is largely unexplained by gender differences in characteristics. Indeed, were females in China to look like males in China (in terms of age and geographic location) the gender gap in financial literacy would be even wider. Policy responses are discussed in the paper.

JEL Classification: G53, I22

Keywords: financial literacy, decomposition, gender-gap, urban-rural gap, China

Corresponding author:
Alison Preston
Department of Economics
UWA Business School,
University of Western Australia
35 Stirling Hwy
Crawley WA 6009
Australia

E-mail: Alison.Preston@uwa.edu.au

* The paper uses data from the China Household Finance Survey (CHFS) administered by The Survey and Research Center for China Household Finance at Southwestern University of Finance and Economics. The findings and views reported in this paper, are those of the authors and should not be attributed to the Survey and Research Center or Southwestern University of Finance and Economics.

A Study of the Chinese Gender Gap in Financial Literacy

1. Introduction

Financial literacy is increasingly considered an essential life skill and has been shown to matter for a range of individual outcomes including borrowing decisions, economic well-being and the capacity to deal with economic shocks (Stoddard and Urban 2020; Lusardi et al. 2017; Klapper, Lusardi and Panos 2013). This is particularly the case in markets financial products and services are rapidly changing as a result of digital technologies and where those with low financial literacy are increasingly exposed to new risks (Cordray 2020; OECD 2018). Notwithstanding the recognised importance of financial literacy, studies show that, globally, it is low. In major advanced economies less than two thirds (59%) of adult males are considered financially literate, while in major emerging economies the corresponding share is significantly lower at 30% (Hasler and Lusardi 2017). In most countries the average situation for females is worse with males, on average, more financially literate than females (ibid.). From a policy perspective such gender gaps matter, particularly given the established link between financial literacy and economic well-being. There is, accordingly, a growing literature seeking to identify the correlates of financial literacy and shed light on the factors giving rise to gender gaps in financial literacy (Robson and Peetz 2020; Preston and Wright 2019; Cupak et al. 2018; Bucher-Koenen et al. 2017; Fonseca et al. 2012). Much of the empirical work thus far is centred on adults and based on data from advanced economies. A common finding in this literature is that gender differences in characteristics explains around one-fifth to one-quarter of the gender gap in financial literacy and that the main source of the gap stems from differences in the way males and females acquire financial literacy.

In this paper our focus is on understanding the gender gap in financial literacy amongst adults in China. There are several reasons why China makes for an interesting case study.

Firstly, China is an important emerging economy and, as noted, much of the research examining the determinants of financial literacy and gender gaps in financial literacy thus far is based on data from advanced economies. Secondly, there is a timely need to understand the extent and determinants of financial literacy in China. China has one of the highest household saving rates in the world (OECD 2021), a rapidly developing financial sector characterised by imperfect regulation (Chu et al. 2017) and a rising demand for investment products. China is also in the process of reforming its pension system, including increasing the retirement age for males and females (Cai and Cheng 2014; Niu et al. 2020) and is experiencing increased income inequality, particularly amongst the old (Hanewald et al. 2021). Thirdly, when compared with developed economies, financial literacy in China appears to be relatively low and the gender gap smaller (Hasler and Lusardi 2017; Liao et al. 2017).

The paper contributes to the literature on financial literacy in two main ways. Firstly, and to the best of our knowledge, there is no study providing an analysis of the gender gap in financial literacy in China. This is a concerning void in the literature, especially given China-based studies demonstrating the importance of financial literacy to well-being and wealth accumulation (Lu, Xiao & Wu, 2021; Duh, Yu & Ni, 2021; Gui, Huang & Zhao, 2021). Second, it examines financial literacy for a representative sample of household respondents in urban and rural areas of China. Previous studies offering insights into the determinants of financial literacy in China have had an urban focus (Nana et al. 2020; Liao et al. 2017).

Overall, the findings show that males, generally have significantly higher levels of financial literacy than females, holding constant age, schooling, prior studies in finance/economics, marital status and geographic location. The size of the gap differs according to financial literacy measure employed. A consistent finding is the presence of a highly significant and negative relationship between age and financial literacy. The latter is suggestive of strong cohort effects that correlate with China's recent economic development

and growth in the finance sector. The Shanghai Stock Exchange, for example, only re-opened in 1990 after decades of closure and participation in financial markets by Chinese households is low (Zou and Deng 2019). This negative sign on age contrasts with most other studies where an inverted-U shaped relationship is generally observed (showing financial literacy rates lower amongst the young and the old) (Lusardi and Mitchell 2014).

Decomposition analysis shows that gender differences in the way financial literacy is produced or acquired accounts for all of the gap at the national level. In other words, unlike the situation in advanced economies where around one quarter of the male-female difference in financial literacy may be explained by gender differences in characteristics, in China the share is zero. Indeed, the estimates suggest that if women in China were to look like males in terms of their characteristics the gap would be wider! This result reflects the fact that women are more likely than men to reside in an urban area and financial literacy in urban areas is higher than in rural areas. Our research suggests that particular interventions to raise the schooling of women and the financial literacy of rural households might help close the overall gender gap in financial literacy.

The remainder of the paper is organised as follows. Section 2 provides a review of previous studies. Section 3 presents the data and summary statistics. Section 4 outlines the empirical approach. The results are presented in Section 5 along with robustness checks. A conclusion follows in Section 6.

2. Previous studies

In empirical studies of financial literacy the dominant framework is human capital theory. The basic proposition is that individuals have an incentive to invest in the acquisition financial knowledge or financial literacy (a form of human capital) where there is an expected

pay-off from the investment (e.g. lower borrowing rates). In short, investment or acquisition decisions are based on an optimisation decision that reflects the costs and benefits of the investment. Within this framework observed differences in financial literacy across individuals, regions, countries etc. is assumed to reflect differing investments in the acquisition of financial literacy and differing returns (pay-offs) to those investments.

Consistent with theory, evidence shows that individuals residing in countries with relative generous social security systems have relatively lower financial literacy than those residing in countries where retirement planning and provisioning is more of an individual responsibility and where the need to invest in the acquisition of financial literacy is, arguably, higher (Jappelli and Padula 2013; Bucher-Koenen and Lusardi 2011). Gender differences in financial literacy may also reflect choice effects and may correlate with characteristics such as marital status. For example, married males may have greater financial literacy than married females if, within a couple household, they are more likely to take on the management of household finances and thus have a greater incentive to acquire financial literacy (Hsu 2016; Brown and Graf 2013). (For a more detailed discussion of the human capital model as a framework for studying financial literacy see Lusardi and Mitchel (2014) and Lusardi, Michaud and Mitchell (2017)).

While there is a growing empirical literature examining financial literacy in China, much of it is concerned with the effect of financial literacy on outcomes such as loan return and loan default rates (Chen et al. 2018), portfolio choice (Chu et al. 2017; Liao et al. 2017), stock market participation (Pan et al. 2020), investment decisions (Gui et al. 2021) and retirement planning (Niu et al. 2020; Niu and Zhou 2018). There appears to be no specific study examining the predictors or correlates of financial literacy in China. It is, however, possible to form a picture as to the key correlates of financial literacy in China from studies employing instrumental variable (IV) techniques. Liao et al. (2017), for example, study the

relationship between financial literacy and risky asset holding amongst responding urban householders. In their first stage regressions the dependent variable, financial literacy, is an index variable based on a set questions testing advanced financial knowledge. Consistent with the predictions from human capital theory, the coefficient estimates in their first stage regressions show that males have significantly higher levels of financial literacy than females and that financial literacy is higher amongst the more educated. Age is entered as a quadratic with the coefficient estimates only significant (and negative) on the squared term implying that older people in China have significantly lower levels of financial literacy than younger people. Nana et al. (2020) also employ IV techniques in their study of the link between financial literacy and the financial status and credit access of informal businesses. Their sample is comprised of small business owners in urban households. Estimates reported in their first stage OLS regressions show that being male is a highly significant predictor of financial literacy, as is education. The coefficient on age is negative and significant and, again, shows that in China financial literacy declines with age.

3. Data and method

Data and sample

The empirical analysis in this paper is based on data from the 2015 China Household Financial Survey (CHFS). The CHFS is a nationally representative survey of household finance undertaken through the Southwestern University of Finance and Economics in Chengdu. The survey commenced in 2011 and is conducted on a bi-annual basis. The analysis in this paper is cross-sectional and based on the 2015 CHFS where we exploit responses to three financial literacy questions. All results are weighted to adjust for oversampling of wealthy regions and

urban areas. Quoting from the English translation of the survey (see CHFS (2015), pp43-44), the questions are described as follows:

- Q1 (interest). *Given a 4% interest rate, how much would you have in total after 1 year if you have 100 yuan deposited?* Response options: 1= under 104; 2=104; 3=over 104; 4=Cannot figure out. Respondents could also respond do not know (coded '.d') or refused to answer the question (coded '.r'). [question a4004a in CHFS (2015)].
- Q2 (inflation). *With an interest rate of 5% and an inflation rate of 3%, the stuff you buy with the money you have saved in the bank for 1 year is?* Response options: 1=More than last year; 2= the same as last year; 3= Less than last year; 4= Cannot figure out. Respondents could also respond do not know (coded '.d') or refused to answer the question (coded '.r'). [question a4005a in the survey].
- Q3 (risk). *Which one do you think is more risky, stock or fund?* Response options: 1= stock; 2=fund; 3=haven't heard about stock; 4=haven't heard about fund; 5=Neither of them have been heard about. Respondents could also respond do not know (coded '.d') or refused to answer the question (coded '.r'). [question a4007aa in the survey].

The questions are based on those widely used in other international surveys of financial literacy (Gianni 2019; Lusardi and Mitchell 2014) and follow from a position that considers a person financially literate if they can "… process economic information and make informed decisions about financial planning, wealth accumulation, debt and pensions" (Lusardi and Mitchell 2014, 5). There is, of course, some debate as to the definition of financial literacy and its measurement. Warmath and Zimmerman (2019, 1605), for example, argues that financial literacy "… involves more than being able to pass an economics or finance quiz". They advocate for a definition that takes into consideration three domains of knowledge (explicit knowledge (such as that captured by the questions above, self-efficacy and skill (using information). The tendency to use financial knowledge as a proxy for financial literacy, however, is typically one of pragmatism. It commonly relates to a trade-off in the design and

administration of surveys (Gianni 2019) and in this case the CHFS is no exception. The limitation of this measure is, however, acknowledged.

The CHFS is conducted using face-to-face interviews and telephone interviews, including computer-assisted telephone interviewing (CATI). In the 2015 CHFS the survey respondent was identified by the interviewer as the person best placed to answer questions about his/her family's economic conditions. The financial literacy questions were only asked of the responding person. While the CHFS is nationally representative in terms of the sampling of households (thus permitting us to make statements about the financial literacy of households in China) it is not, necessarily representative of adult males and females in China. The particular advantage of the CHFS is that it contains a large sample with representative responses from rural and urban households. In 2015 the CHFS sample was comprised of 36,599 responding persons. After restricting the sample to those with observable age data the sample falls to 36,466 persons. Restricting it further to those aged 18 years or more reduces it to 36,311 persons, comprised of 19,099 (53%) male respondents and 17,212 (47%) female respondents.

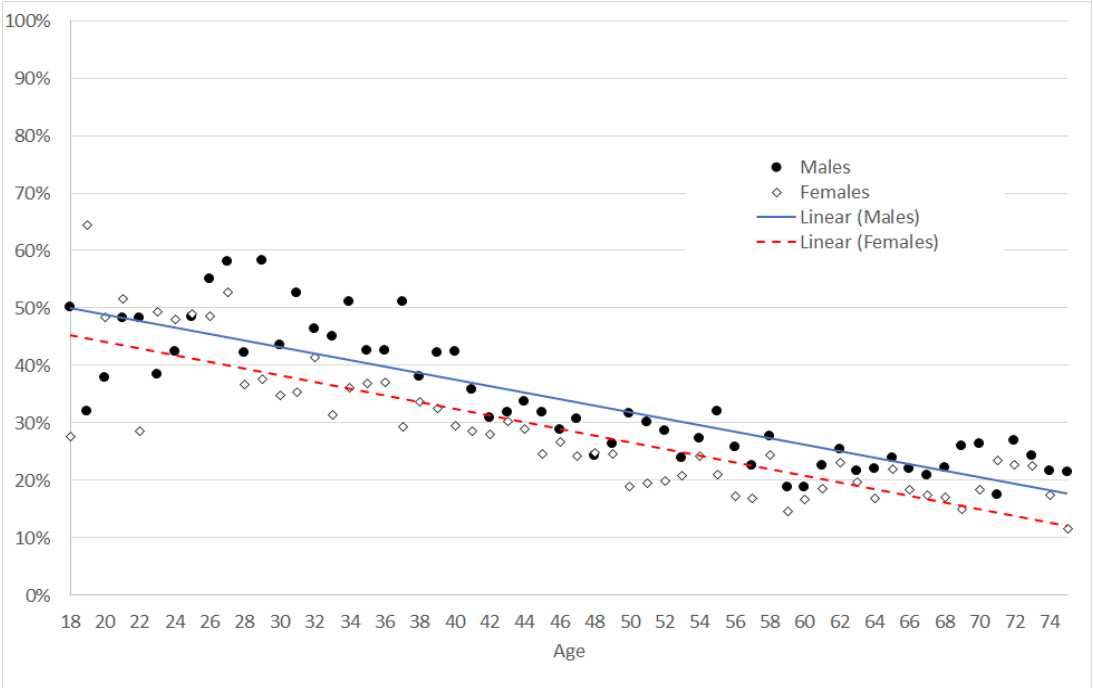
Dependent Variables

In the 2015 CHFS there were, as noted, three questions testing financial literacy that are relevant for this paper. Figures 1, 2 and 3 show, respectively, the shares of male and female respondents who were able to correctly answer each of the individual questions described above. For convenience Q1, Q2 and Q3 are labelled 'interest', 'inflation' and 'risk', respectively. The information is also summarised in Table 1. It is apparent from these data that financial literacy (as measured by these three questions) is greater for younger cohorts than it is for older cohorts. This is consistent with estimates included in previous Chinese studies (Nana et al. 2020; Liao et al. 2017) but, as noted, differs from the pattern observed in advanced economies. There is a particularly poor understanding of interest and inflation concepts

amongst adults in China; only 30% and 25% of responding adult male and females could, respectively, correctly answer the interest rate question. The corresponding shares for the inflation question were 18% and 14%, respectively. For each of the three questions nearly half of the respondents selected the 'do not know' or 'refused' option. This poor comprehension of key financial literacy concepts such as inflation together with the high tendency to choose the 'do not know' and 'refused' options is also observed in other Chinese based studies. Gui et al. (2021) attribute it to the country's history as a planned economy and to cultural effects (notably a lack of self-confidence).

In addition to the above there is a highly significant gender difference in the financial literacy of the respondents. At the mean male respondents correctly answered a total of 0.95 (out of three) questions while the corresponding total for female respondents was 0.88. The difference translates to a gender gap in financial literacy of 7.9%. When weighted by question difficulty this gap increases to 13.7% and to 38.5% if the financial literacy measure is defined as the share able to correctly answer all three questions (see Table 2).

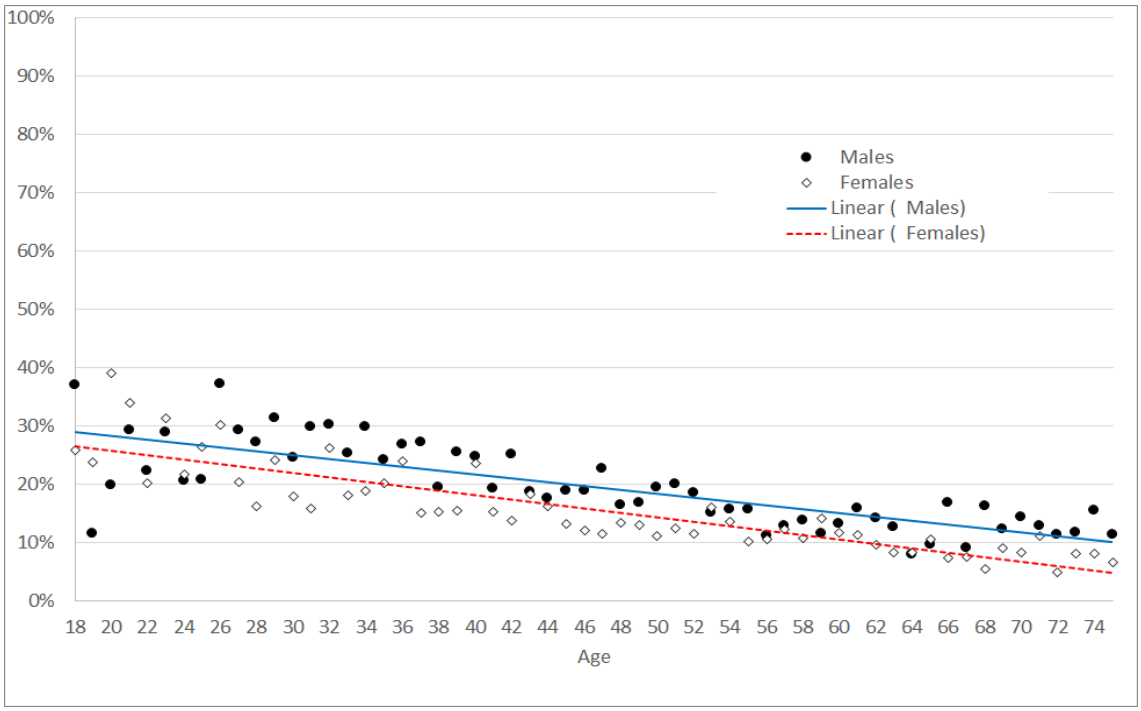
FIGURE 1
Shares (%) able to correctly answer Q1 on interest rates.



Source: CHFS, 2015. Adults. Estimates weighted.

FIGURE 2

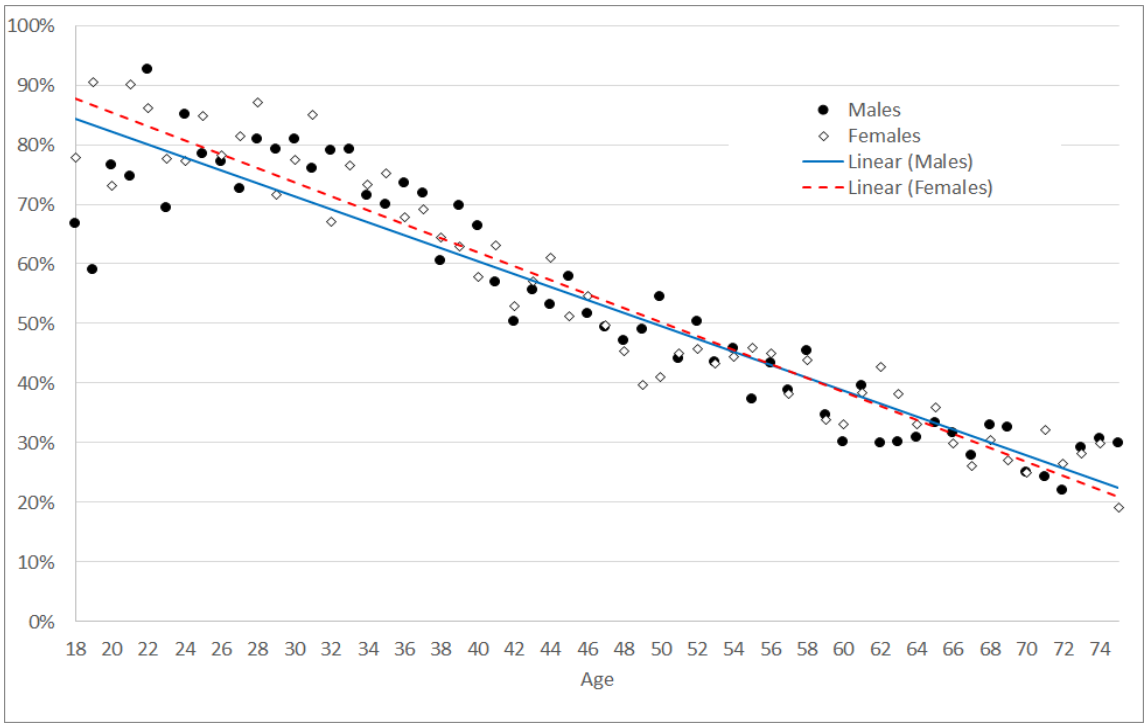
Shares (%) able to correctly answer Q2 on inflation.



Source: CHFS, 2015. Adults. Estimates weighted.

FIGURE 3

Shares (%) able to correctly answer Q3 on risk.



Source: CHFS, 2015. Adults. Estimates weighted.

TABLE 1

Percentage Distribution of Responses to Three Financial Literacy Questions, Persons, Males and Females, Aged 18+, China, 2015

Response:	(1) Correct	(2) Incorrect	(3) Do Not Know	(4) Refused	(4) All
(a) Persons (N=36,111)					
Q1. Interest rate	27.9%	22.5%	49.4%	0.2%	100%
Q2. Inflation	15.8%	37.1%	46.7%	0.2%	100%
Q3. Risk	48.2%	4.1%	47.5%	0.2%	100%
All 3:	*6.3%*	*0.9%*	*29.2%*	*0.01%*	-
(b) Males (N=19,099)					
Q1. Interest rate	30.2%	23.4%	46.2%	0.2%	100%
Q2. Inflation	17.6%	38.1%	44.0%	0.3%	100%
Q3. Risk	47.4%	4.5%	47.9%	0.3%	100%
All 3:	*7.2%*	*1.1%*	*27.6%*	*0.01%*	-
(c) Females (N=17,212)					
Q1. Interest rate	25.3%	21.5%	53.1%	0.1%	100%
Q2. Inflation	13.8%	36.0%	50.2%	0.1%	100%
Q3. Risk	49.2%	3.7%	47.0%	0.2%	100%
All 3:	*5.2%*	*0.7%*	*31.1%*	*<0.01%*	-

Source: *China Household Finance Survey*, 2015.

Notes: 1. Estimates weighted to be geographically representative.

In the empirical literature financial literacy is, as noted, defined and measured in a variety of different ways. A common approach when proxying financial literacy through a knowledge-based measure is to use a count measure (the total number of questions correctly answered) (e.g. Cupak et al. 2018; Preston and Wright 2019). In studies where this approach is adopted the fraction scoring zero is generally small (fewer than 5% in Preston and Wright's analysis based on Australian data). This contrasts with the CHFS survey where 40% of adult respondents scored zero. An alternative to a count measure is to use an index. Fonseca et al. (2012), for example, construct an index based on responses to a 23-questions financial literacy test. In Hasler & Lusardi (2017) a person is considered financially literate if they correctly

answer three out of four questions. Bucher-Koenen et al. (2017) used a similar approach with their dependent variable (a binary variable) set equal to 1 if the respondent correctly answers all questions in a three-question set.

In the empirical analysis that follows we consider several measures: two count measures, one based on unadjusted data (*NCorrect*) and one where the count is adjusted for question difficulty (*NCorrectAdj*). We also consider a rate measure, equal to 1 if the respondent answers all three questions correctly (*AllCorrect*); and we separately examine the probability of answering each individual question correctly (*Q1Interest, Q2Inflation, Q3Risk*). The use of alternative measures also serves as an important robustness check. The descriptive statistics associated with these various financial literacy measures are contained in Table 2.

TABLE 2

Descriptive Statistics for Financial Literacy Measures Used in Regression Analysis, Persons, Males and Females Aged 18+, China, 2015

Mnemonic	Definition	(1) Persons	(2) Males	(3) Females	(4) Gap (3-2)	(5) %Gap (3-2)/(2)
NCorrect	Number of correct responses	0.919 (0.916)	0.952 (0.940)	0.882 (0.886)	0.070***	7.9%
NCorrectAdj	Number of correct responses, weighted by question difficulty	0.752 (0.882)	0.796 (0.918)	0.700 (0.836)	0.096***	13.7%
AllCorrect	=1 if correct responses to all three questions; =0 if otherwise	6.3%	7.2%	5.2%	2.0%-pts***	38.5%
Q1Interest	=1 if correct response to interest rate question; =0 if otherwise	27.9%	30.2%	25.3%	4.9%-pts***	19.4%
Q2Inflation	=1 if correct response to inflation question; =0 if otherwise	15.8%	17.6%	13.8%	3.8%-pts***	27.5%
Q3Risk	=1 if correct response to risk question; =0 if otherwise	48.2%	47.4%	49.1%	-1.7%-pts**	-3.5%
N		36,311	19,099	17,212	--	--

Source: *China Household Finance Survey*, 2015

Notes: 1. Estimates weighted to be geographically representative.
2. Standard deviations in parentheses.
3. Difference is statistically significant at: *** *p <1%;* ** *< 5%* and * *< 10%*.

Independent Variables

Our choice of independent variables is informed human capital theory and previous studies. As previously explained, the underlying hypothesis is that financial literacy is a skill, i.e. a form of human capital that one invests in. Age is a key independent variable and in this paper is employed in a linear form. This choice of functional form is informed by previous Chinese studies and by the trend data in Figures 1-3. Education is also an important predictor of financial literacy and is controlled for via four dummy variables capturing highest qualification attained. The base case consists of those with primary schooling only. In recognition that the incentive to invest in financial literacy may differ by marital status the regression includes two dummy variables capturing marital status at the time of the survey.

Differences in financial literacy across individuals may also arise from differing exposure to financial or economic education. While acknowledging potential endogeneity problems associated with such a control, a dummy variable (*FinCourse*) is used to control for those who have previously undertaken a course in economics or finance. (It should be stressed that the focus in this paper is on understanding the gender gap in financial literacy in China and not on estimating the determinants of financial literacy per se.) In addition to the variables previously described, the regressions also control for geographical location. Specifically, we include a dummy if the respondent is residing in an urban area in one of four municipalities (Beijing, Shanghai, Tianjin and Chongqing) and we incorporate a control for 'other-urban' areas. The base case is rural. Table 3 describes the variables and presents associated descriptive statistics, including the gender gaps associated with each of the control variables. Male respondents, for example, are much more likely (41%) to reside in a rural location than female respondents. As will be shown, this difference is important, particularly when it comes to understanding the gender gap in financial literacy.

TABLE 3

Descriptive Statistics for Explanatory Variables Used in Regression Analysis, Persons, Males and Females Aged 18+, China, 2015

Mnemonic	Definition	(1) Persons	(2) Males	(3) Females	(4) Gap (3-2)	(5) %Gap (3-2)/(2)
Age	=age of respondent in years,18 to 75+ (top coded at 75 years)	51.4 (14.4)	52.4 (14.5)	50.3 (14.1)	2.15***	4.2%
NoSchool	=1 if has had no schooling =0 otherwise	9.5%	5.7%	13.8%	-8.1%-pts***	-58.7%
Primary	=1 if highest level education primary school; =0 otherwise (excluded category)	23.4%	24.7%	21.8%	2.9%-pts	13.3%
Secondary	=1 if highest level of education high school; =0 otherwise	49.9%	51.6%	47.9%	3.6%-pts***	7.7%
College	=1 if highest level of education college/vocation =0 otherwise	8.4%	8.7%	8.2%	0.5%-pts	6.1%
Degree	=1 if highest level of education degree or higher; =0 otherwise	8.8%	9.3%	8.3%	1.0%-pts**	12.0%
FinCourse	=1 if have ever taken a course in economics or finance =0 have not taken	7.1%	7.7%	6.4%	1.2%-pts***	20.3%
Single	=1 if not married ; 0= otherwise	5.3%	6.7%	3.7%	3.0%pts***	81.1%
Married	=1 if married (or cohabiting); 0= otherwise (excluded category)	85.8%	87.5%	83.8%	3.8%-pts***	4.4%
Wsd	=1 if widowed, separated or widowed; 0= if married	8.9%	5.8%	12.5%	-6.7%-pts***	53.6%
Rural	=1 if resides in rural location; =0 if resides in urban area (excluded category)	37.4%	43.3%	30.8%	12.5%-pts****	40.6%
Shanghai	=1 if resides in Shanghai & urban=1; =0 if resides rural	2.2%	1.9%	2.6%	-0.7%-pts****	-26.9%
Beijing	=1 if resides in Beijing & urban=1; =0 if resides rural	1.7%	1.4%	2.1%	-0.7%-pts***	-33.3%
Tianjin	=1 if resides in Tianjin & urban=1; =0 if resides rural	1.2%	0.9%	1.5%	-0.6%-pts***	-40.0%
Chongqing	=1 if resides in Chongqing & urban=1; =0 if resides rural	1.4%	1.2%	1.5%	-0.3%-pts**	-20.0%
OthUrban	=1 if resides other urban; =0 if resides rural	56.1%	51.4%	61.4%	-10.0%-pts***	-16.3%
N		36,311	19,099	17,212	--	--

Source: *China Household Finance Survey*, 2015

Notes: 1. Estimates weighted to be geographically representative
2. Standard deviations in parentheses
3. Difference is statistically significant at: *** *p < 1%;* ** *< 5%* and * *< 10%.*

4. Research approach

The empirical approach begins with the estimation of pooled (male and female) regressions for each of the six dependent variables detailed in Table 2. A dummy variable (set equal to 1 if male and 0 if female) is used to compare the financial literacy of adult male and female respondents. There after we use the Oaxaca (1973) and Blinder (1973) (OB) decomposition approach to decompose the observed gender gap in financial literacy into a component that reflects differences in characteristics (e.g. schooling or geographic location) and a component that is due to the coefficients.

The OB decomposition requires the estimation of separate male and female regressions as follows. The subscripts "*M*" and "*F*" denote males and female respectively:

$$FL_M = \alpha_M + \beta_M X_M + \varepsilon_M \quad (1)$$

$$FL_F = \alpha_F + \beta_F X_F + \varepsilon_F \quad (2)$$

and "*FL*" is a measure of financial literacy; "X " is a vector of characteristics thought to impact on financial literacy; "ε" is an error term; " α" is a constant to be estimated; and "β" is a vector of coefficients to be estimated.

The standard Oaxaca-Blinder decomposition approach then requires the subtracting of equation (2) from equation (1). In the linear case and, after rearranging the terms, this gives:

$$Gap = \overline{FL_M} - \overline{FL_F} = = (\overline{\mathbf{X}}_M - \overline{\mathbf{X}}_F)\hat{\boldsymbol{\beta}}_M + \overline{\mathbf{X}}_F(\hat{\boldsymbol{\beta}}_M - \hat{\boldsymbol{\beta}}_F) + (\hat{\alpha}_M - \hat{\alpha}_F) \quad (3)$$

"*Gap*" is the difference between male and female financial literacy. The first term on the right hand side, $(\overline{\mathbf{X}}_M - \overline{\mathbf{X}}_F)\hat{\boldsymbol{\beta}}_M$, is the amount of the gap that may be attributed to differences in the values of "$\mathbf{X}$" between males and females. It is common to refer to this as the "explained" component. The second component, $\overline{\mathbf{X}}_F(\hat{\boldsymbol{\beta}}_M - \hat{\boldsymbol{\beta}}_F)$, is the amount that may be attributed to differences in the regression coefficients, "β", between males and females. The third term, $(\hat{\alpha}_M - \hat{\alpha}_F)$, is the amount of the gap that can be attributed to differences in the constant terms, " α", of males and females. Taken together the second and third terms are typically referred to as the "unexplained" component. Each of these components may be expressed as percentage shares of the raw gap (*Gap*). The relative shares of explained and unexplained components are usually of substantive interest. A convenient summary measure is the unexplained component expressed as a share (%) of the mean female value. In percentage terms, it indicates how much female financial literacy would need to increase to equal male financial literacy. In the empirical analysis below we refer to this as the "%D*f*".

5. Results

OLS and Probit regression results

Table 4 presents the regression results (OLS and Probit) associated with the estimation of the pooled male and female regressions. Gender differences are captured via a male dummy variable. Columns (1) and (2) are estimated using OLS, while columns (4) to (7) are estimated using a Probit estimator. Average marginal effects are reported for columns (4) to (7). The R^2 values (and pseudo R^2 values for the Probit regressions) show the extent to which differences in financial literacy amongst individuals in the sample may be accounted for by variables in the regression. When the dependent variable is the number of correct answers (*NCorrect*)

(without adjusting or weighting for question difficulty) the specification explains 26.7% of the variance in financial literacy. An F-test indicates that this is statistically significant. It is also on par with R^2 results in other published studies. In short, this suggests that the human capital framework is a suitable framework for the analysis of financial literacy in China.

With the exception of column (7) (on risk) the positive coefficients on the male dummy variable shows that males have significantly higher financial literacy than females in China. The column (1) estimates show that the mean difference in total (unweighted) financial literacy scores between males and females is 0.09 points, *ceteris paribus*. Column (5) estimates show that, *ceteris paribus*, males are 5.4 percentage points more likely than females to correctly answer the interest rate question. These gaps are estimated under the assumption that the effect of the other variables in the regression are the same for males and females. In Table 5 we relax this assumption when we estimate the regressions separately for males and females.

Consistent with previous China based studies (as discussed above) the estimates show that, in China, financial literacy is significantly higher amongst younger respondents than it is older respondents. This is a cohort effect and derives from the significant economic and social reforms that have occurred in China in recent decades. The pooled regressions also suggest important schooling effects. Focusing on column (5) (where the dependent variable is equal to 1 if the interest rate question was correctly answered and 0 otherwise) the estimates show that, relative to those whose highest education level was primary (reference group), those who report no schooling were 12.9 percentage points less likely to provide a correct response. Degree qualified respondents, in contrast, were 29.8 percentage points more likely than those in the reference group to correctly answer the interest rate question.

The coefficients on the indicator variables capturing the respondent's marital status suggest that, for most measures of financial literacy, there is no difference in the financial

literacy of single and married respondents, while those who are widowed, separated or divorced have significantly less financial literacy than their married counterparts. This result differs from findings elsewhere. Preston and Wright (2019), for example, using Australian data, find that never married persons have significantly lower financial literacy rates than their married, divorced and widowed counterparts. It is beyond the scope of this paper to unpack this particular finding in the Chinese data.

There are important geographic differences in financial literacy in China. The reference group is comprised of respondents living in a rural household. The estimates show that, for most measures of financial literacy employed, the urban residents had higher financial literacy than rural residents. T-tests (not reported and based on columns (1) and (2)) also show that residents in the urban areas of the Shanghai, Beijing and Tianjin municipalities have qualitatively similar levels of financial literacy and that their financial literacy is significantly higher than urban residents in Chongqing and those in the remaining urban areas. Shanghai respondents, for example, have financial literacy count scores which are 0.523 points higher than the corresponding means of their rural respondents. Such rural / urban differences in financial literacy are also observed in other countries (e.g. Klapper and Panos (2011) using Russian data). In the Chinese case it may relate, in part, to China's *hukou* system of population registration and related factors such as urban/rural differences in the quality of education (Hanewald et al. 2021)

Table 5 reports the regression estimates separately for males and females. The main purpose in reporting these estimates is to understand and see if the returns (coefficients) on particular variables are equivalent for males and females. Gender differences in financial literacy may derive from differences in characteristics and/or from differences in coefficients. F-tests for differences in the coefficients indicates various instances where statistically significant differences in the returns to male and female characteristics may be observed. For

example, when the dependent variable is the financial literacy score (unweighted for degree of difficulty - columns (1) and (2) of Table 5), we observe a statistically significant (1% level) gender difference in the effect of college education on financial literacy. There is similarly a statistically significant gender difference in the financial literacy effects that arise from being single (significant at the 5% level) and from the returns associated with residing in urban Shanghai (significant at the 1% level). These results suggest that part of the observed gender gap in financial literacy may relate to differences in the 'returns' to factors that correlate with financial literacy.

TABLE 4

Regression Estimates of Financial Literacy Equations, Persons Aged 18+, China, 2015

	(1)	(2)	(4)	(5)	(6)	(7)
FL Measure:	*NCorrect*	*NCorrectAdj*	*AllCorrect*	*Q1Interest*	*Q2Inflation*	*Q3Risk*
Estimator:	OLS	OLS	Probit	Probit	Probit	Probit
Male	0.089***	0.107***	0.018***	0.054***	0.039***	-0.001
	(0.013)	(0.013)	(0.003)	(0.007)	(0.006)	(0.009)
Age	-0.010***	-0.008***	-0.001***	-0.002***	-0.002***	-0.008***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
NoSchool	-0.156***	-0.119***	-0.023**	-0.129***	-0.034***	-0.172***
	(0.018)	(0.018)	(0.010)	(0.018)	(0.012)	(0.020)
Secondary	0.317***	0.228***	0.031***	0.123***	0.027***	0.205***
	(0.015)	(0.015)	(0.005)	(0.010)	(0.007)	(0.011)
College	0.648***	0.500***	0.057***	0.226***	0.068***	0.390***
	(0.029)	(0.031)	(0.006)	(0.015)	(0.012)	(0.019)
Degree	0.849***	0.764***	0.086***	0.298***	0.146***	0.395***
	(0.029)	(0.031)	(0.006)	(0.015)	(0.012)	(0.020)
FinCourse	0.269***	0.235***	0.021***	0.074***	0.044***	0.177***
	(0.027)	(0.030)	(0.004)	(0.013)	(0.010)	(0.020)
Single	-0.046	-0.054	-0.005	0.009	-0.034***	-0.036
	(0.034)	(0.036)	(0.006)	(0.017)	(0.013)	(0.025)
Wsd	-0.078***	-0.056***	-0.005	-0.041***	-0.010	-0.064***
	(0.019)	(0.018)	(0.006)	(0.013)	(0.010)	(0.015)
OthUrban	0.283***	0.191***	0.032***	0.091***	0.013*	0.223***
	(0.014)	(0.014)	(0.004)	(0.009)	(0.007)	(0.010)
Shanghai	0.523***	0.368***	0.049***	0.229***	0.006	0.332***
	(0.029)	(0.029)	(0.006)	(0.015)	(0.012)	(0.020)
Beijing	0.507***	0.357***	0.044***	0.184***	0.022	0.364***
	(0.032)	(0.033)	(0.006)	(0.017)	(0.013)	(0.023)
Tianjin	0.471***	0.312***	0.036***	0.166***	0.007	0.361***
	(0.032)	(0.032)	(0.007)	(0.017)	(0.014)	(0.023)
Chongqing	0.290***	0.181***	0.034***	0.077***	0.005	0.260***
	(0.038)	(0.040)	(0.008)	(0.021)	(0.017)	(0.025)
Constant	0.922***	0.765***	-	-	-	-
	(0.033)	(0.033)	-	-	-	-
R^2(%)	26.7%	18.7%	14.9%	10.6%	4.8%	21.1%
N	36,311	36,311	36,311	36,311	36,311	36,311

Source: *China Household Finance Survey*, 2015

Notes: 1. Estimates weighted to be geographically representative
2. Absolute value of standard errors reported in parentheses
3. Effect is statistically significant at: *** $p < 1\%$; ** $< 5\%$ and * $< 10\%$
4. Reported estimates for probit regressions are average marginal effects

TABLE 5

Regression Estimates of Financial Literacy Equations, Males and Females, Aged 18+, China, 2015

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)Males	(10)	(11)	(12)
	Males	Females	Males	Females	Males	Females	Males	Females		Females	Males	Females
FL Measure:	*NCorrect*	*NCorrect*	*NCorrectAdj*	*NCorrectAdj*	*AllCorrect*	AllCorrect	*Q1Interest*	Q1Interest	*Q2Inflation*	Q2Inflation	*Q3Risk*	Q3Risk
Estimator:	OLS	OLS	OLS	OLS	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit
Age	-0.011***	-0.009***	-0.009***	-0.007***	-0.001***	-0.001***	-0.002***	-0.001***	-0.002***	-0.002***	-0.008***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
NoSchool	-0.151***	-0.162***	-0.125***	-0.129***	-0.013	-0.030***	-0.100***	-0.139***	-0.046**	-0.033**	-0.151***	-0.169***
	(0.032)	(0.022)	(0.032)	(0.022)	(0.019)	(0.010)	(0.031)	(0.021)	(0.022)	(0.014)	(0.034)	(0.025)
Secondary	0.292***	0.350***	0.215***	0.246***	0.037***	0.025***	0.123***	0.121***	0.030***	0.025**	0.186***	0.226***
	(0.021)	(0.023)	(0.020)	(0.021)	(0.007)	(0.006)	(0.013)	(0.014)	(0.011)	(0.010)	(0.014)	(0.016)
College	0.626***	0.678***	0.506***	0.495***	0.063***	0.049***	0.227***	0.225***	0.087***	0.046***	0.356***	0.433***
	(0.042)	(0.040)	(0.045)	(0.042)	(0.010)	(0.008)	(0.022)	(0.021)	(0.018)	(0.016)	(0.027)	(0.028)
Degree	0.850***	0.845***	0.811***	0.698***	0.100***	0.070***	0.309***	0.286***	0.184***	0.100***	0.347***	0.464***
	(0.040)	(0.042)	(0.043)	(0.046)	(0.009)	(0.008)	(0.021)	(0.022)	(0.016)	(0.016)	(0.027)	(0.029)
FinCourse	0.260***	0.279***	0.224***	0.244***	0.026***	0.015***	0.063***	0.086***	0.046***	0.039***	0.174***	0.185***
	(0.038)	(0.037)	(0.041)	(0.042)	(0.006)	(0.005)	(0.019)	(0.019)	(0.014)	(0.014)	(0.026)	(0.029)
Single	-0.088**	0.028	-0.103**	0.044	-0.016*	0.008	-0.000	0.020	-0.055***	0.002	-0.049	-0.017
	(0.043)	(0.056)	(0.044)	(0.063)	(0.009)	(0.008)	(0.023)	(0.024)	(0.018)	(0.019)	(0.031)	(0.041)
Wsd	-0.114***	-0.064***	-0.099***	-0.037*	-0.018	0.002	-0.053**	-0.035**	-0.026	0.002	-0.064**	-0.067***
	(0.033)	(0.023)	(0.032)	(0.023)	(0.011)	(0.006)	(0.021)	(0.015)	(0.017)	(0.012)	(0.025)	(0.018)
OthUrban	0.295***	0.258***	0.210***	0.156***	0.041***	0.020***	0.093***	0.089***	0.024**	-0.005	0.212***	0.240***
	(0.020)	(0.020)	(0.020)	(0.019)	(0.006)	(0.005)	(0.012)	(0.013)	(0.009)	(0.009)	(0.013)	(0.016)
Shanghai	0.593***	0.449***	0.422***	0.304***	0.060***	0.035***	0.254***	0.205***	0.016	-0.008	0.364***	0.314***
	(0.043)	(0.040)	(0.043)	(0.039)	(0.009)	(0.008)	(0.023)	(0.021)	(0.018)	(0.017)	(0.029)	(0.028)
Beijing	0.491***	0.499***	0.380***	0.321***	0.059***	0.028***	0.189***	0.174***	0.046**	-0.003	0.289***	0.431***
	(0.052)	(0.040)	(0.054)	(0.041)	(0.009)	(0.008)	(0.026)	(0.021)	(0.020)	(0.017)	(0.035)	(0.030)
Tianjin	0.498***	0.432***	0.345***	0.266***	0.055***	0.016*	0.161***	0.162***	0.027	-0.015	0.367***	0.363***
	(0.052)	(0.041)	(0.055)	(0.040)	(0.010)	(0.009)	(0.027)	(0.022)	(0.022)	(0.019)	(0.034)	(0.031)
Chongqing	0.292***	0.274***	0.176***	0.168***	0.045***	0.021*	0.063**	0.089***	0.005	-0.002	0.277***	0.251***
	(0.056)	(0.053)	(0.061)	(0.053)	(0.013)	-0.001***	(0.030)	(0.028)	(0.025)	(0.022)	(0.033)	(0.037)
Constant	1.067***	0.861***	0.899***	0.743***	-	-	-	-	-	-	-	-
	(0.047)	(0.045)	(0.049)	(0.045)	-	-	-	-	-	-	-	-
R^2(%)	25.5%	28.3%	18.5%	18.7%	14.9%	14.4%	9.4%	11.8%	5.4%	3.7%	16.6%	22.2%
N	19,099	17,212	19,099	17,212	19,099	17,212	19,099	17,212	19,099	17,212	19,099	17,212

Source: *China Household Finance Survey*, 2015. Notes: 1. Estimates weighted to be geographically representative; 2. Absolute value of standard errors reported in parentheses; 3. Effect is statistically significant at: *** $p < 1\%$; ** $< 5\%$ and * $< 10\%$. 4. Reported estimates for probit regressions are average marginal effects.

Decomposition results

The Oaxaca-Blinder decomposition results are summarised in Table 6. In columns (1) and (2) the estimator is OLS and the decomposition undertaken in Stata using Jann's (2008) 'oaxaca' command. In columns (3) to (6) the estimator is Probit and the non-linear Oaxaca-Blinder decomposition undertaken using Fairlie's (2005) approach which, in Stata, is available via Jann's (2006) 'fairlie' command.

We begin by focusing on column (1) where the dependent variable is an unadjusted count measure. The mean value for males is 0.952 and for females 0.882 and the difference translates to a gender gap of 7.9%. After adjusting for gender differences in characteristics we observe an unexplained component of 0.092 which, as a share of the female mean of 0.882 translates into an adjusted gender gap (%Df) of 10.5% (row 11). This counterfactual decomposition suggests that if the adult female respondents to the 2015 CHFS looked like their adult male counterparts in terms of age, schooling, marital status and geographic location, the gender gap in financial literacy would be *wider* (i.e. larger).

A disaggregation of the explained components (shown in the lower part of Table 6 (Panel B)) shows that, in terms of financial literacy, females in this study benefit from being younger and from living in urban areas. Males, on the other hand, benefit from education effects. Gender differences in schooling (favouring males) accounts for 0.035 points or half (50%) of the overall observed 0.07 point gender gap in financial literacy (*NCorrect*). Prior studies in a finance/economics area also explains, in part, the gender gap in financial literacy – although the effect is relatively small. When the dependent variable is *NCorrect*, only 4% of the observed gap in financial literacy arises from gender differences in finance/education training.

More generally, and with the exception of the '*Q3Risk*' measure of financial literacy, the results show that there are large, significant and unexplained gender gaps and that these gaps would be larger if females were to look like males in terms of age and geographic location. The decomposition results in column (6) (*Q3Risk*) are fundamentally different and show that, at the mean, a higher share of females than males correctly answered this risk question. The gender gap (favouring females) is equal to 0.018 points and may be entirely explained by gender differences in the characteristics controlled for. The key factor is geographic location. This suggests that rural residents in China have a particularly poor understanding of risk (as captured by a test question concerning stocks and funds) and that the gender gap in financial literacy (as measured by this risk question) favours females by virtue of the fact that a greater proportion of female CHFS respondents are urban residents.

TABLE 6

Decomposition of the Male-Female Financial Literacy Gap, Adults 18+, China, 2015

FL Measure:	(1) *NCorrect*	(2) *NCorrectAdj*	(3) *AllCorrect*	(4) *Q1Interest*	(5) *Q2Inflation*	(6) *Q3Risk*
Estimator:	OLS	OLS	Probit	Probit	Probit	Probit
(1) Mean value males	0.952	0.796	0.072	0.302	0.176	0.474
(2) Mean value females	0.882	0.700	0.052	0.253	0.138	0.491
(3) Gap (1-2)	0.070***	0.096***	0.021***	0.049***	0.038***	-0.018**
	(0.014)	(0.014)	(0.004)	(0.007)	(0.006)	(0.008)
(4) %Gap (3/2•100)	7.9%	13.7%	40.3%	19.6%	27.9%	-3.6%
(5) Explained Component	-0.022**	-0.013	-0.004	-0.005	-0.001	-0.019
	(0.009)	(0.008)				
(6) Unexplained Component	0.092***	0.109***	0.025	0.054	0.039	0.001
	(0.013)	(0.013)				
(7) Gap (5+6)	0.070	0.096	0.021	0.049	0.038	-0.018
(8) % of Gap explained	-32.0%	-13.5%	-19.2%	-2.8%	-1.1%	106.4%
(9) % of Gap unexplained	132.0%	113.5%	119.2%	102.8%	101.0%	-6.4%
(10) Total (8+9)	100%	100%	100%	100%	100%	100%
(11) %Df (6/2•100)	10.5%	15.6%	48.0%	20.1%	28.2%	0.2%
Panel B. Explained component details:						
Age	-0.024***	-0.019***	-0.003***	-0.005***	-0.005***	-0.014***
	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Education	0.035***	0.029***	0.003***	0.013***	0.006***	0.017***
	(0.005)	(0.005)	(0.000)	(0.001)	(0.001)	(0.001)
FinCourse	0.003***	0.003***	0.001***	0.001***	0.001***	0.002***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Marital status	0.005**	0.004	0.000	0.003**	-0.000	0.002
	(0.002)	(0.002)	(0.000)	(0.001)	(0.001)	(0.001)
Location	-0.042***	-0.030***	-0.004***	-0.012***	-0.003***	-0.025***
	(0.003)	(0.008)	(0.001)	(0.001)	(0.001)	(0.001)

Source: *China Household Finance Survey*, 2015

Notes:

1. Estimates weighted to be geographically representative
2. Absolute value of standard errors reported in parentheses
3. Components/estimates statistically significant at: *** *p < 1%; ** < 5%* and * *< 10%*.
4. Standard errors (and therefore significance levels) not available for rows (5) and (6) and columns (3) to (7).
5. Estimates may not sum due to rounding.
6. %Df computed as: (unexplained component / mean-Female FL) * 100.

Table 7 provides a summary of the robustness checks. These checks focus on the %Df (i.e. the % adjusted Gap) as the main robustness criteria. As previously indicated, the %Df is policy relevant and shows how much female financial literacy needs to change to equal that of males. The checks are with respect to particular sub-samples of household respondents. Rows (1) and (2) compare the results for two groups, those who self-report having an interest in economics and financial information and those who do not. (This disaggregation exploits information collected as part of question a4002a in the 2015 CHFS on financial engagement). As shown, 33% of the respondents report being interested / engaged in financial matters and the adjusted gender gap amongst those who are engaged is 8.2% (column 1). This compares to a gender gap of 5.9% amongst those not interested in financial matters. (Note, financial engagement was not included as a covariate in the regressions as it is likely to be endogenous with respect to financial literacy).

In rows (3) and (4) the focus is, respectively, on those in employment and those who are retired. The gender gap amongst the former (those employed) is 11% and amongst retirees is 8.8%. Rows (5) to (7) disaggregate by age and show that the gender gap is substantially smaller (4.4%) amongst younger respondents than it is amongst older respondents. This gives some hope for the future. It is also lower amongst urban residents (8%) than rural residents (20%), however, within particular urban areas (eg. Shanghai and Tianjin) it increases to 16.4%. This may reflect gender differences in other characteristics not accounted for in the regression. Examples include spill-over effects, such as networks and occupation of employment within particular urban areas such as Shanghai. The main conclusion is that there are sizeable and significant gender gaps in financial literacy across various sub-groups of Chinese respondents, including by age, employment status, geographic location and level of engagement in financial matters.

TABLE 7

Robustness Checks,
%Df Estimates for Decomposition of the Male-Female Financial Literacy Gap, Adults 18+, China, 2015

		(1)	(2)	(3)	(4)	(5)	(6)
	FL Measure	*NCorrect*	*NCorrectAdj*	*AllCorrect*	*Q1Interest*	*Q2Inflation*	*Q3Risk*
	Estimator	OLS	OLS	Probit	Probit	Probit	Probit
	Baseline	10.5%	15.6%	48.0%	20.1%	28.2%	0.2%
1	Sample: *FinEngage*=1 (N=11,921)	8.2%	14.3%	48.5%	15.1%	32.2%	-2.7%
2	Sample: *FinEngage*=0 (N=24,390)	5.9%	9.0%	25.4%	17.4%	13.3%	-2.3%
3	Employed (N=21,998)	11.0%	16.2%	51.0%	19.4%	29.5%	0.6%
4	Retired (N=3,500)	8.8%	14.9%	38.2%	17.7%	38.3%	-13.7%
5	Age <30 (N=2,751)	4.4%	8.0%	21.2%	8.7%	17.9%	-2.1%
6	Age 30-59 (N=21,557)	11.2%	16.2%	52.7%	21.9%	28.4%	1.1%
7	Age 60+ (N=12,003)	11.4%	17.5%	60.1%	20.1%	34.9%	-0.9%
8	Sample: Urban only (N=25,054)	8.0%	13.9%	47.0%	16.5%	23.8%	-1.8%
9	Sample: Rural (N=11,257)	20.0%	19.6%	48.8%	44.0%	9.7%	12.6%
10	Beijing & Urban (N=1,210)	1.8%	11.0%	35.8%	10.5%	50.5%	-13.3%
11	Shanghai & Urban (N=1,382)	16.4%	19.4%	19.4%	25.3%	25.9%	8.2%
12	Tianjin & Urban (N=928)	16.4%	12.9%	104.3%	8.8%	42.6%	2.5%
13	Chongqing & Urban (N=902)	9.2%	12.2%	58.3%	13.0%	23.9%	3.6%

Source: *China Household Finance Survey*, 2015

Notes: 1. Estimates weighted to be geographically representative

6. Summary and conclusion

There is growing recognition that financial literacy is an important life skill and an important factor for the functioning of financial markets (Cordray 2020; OECD 2018). Accordingly, there is increasing interest in the determinants of financial literacy and in the factors giving rise to male-female differences in financial literacy. To date much of the empirical work on understanding financial literacy is based on survey data collected from adults in developed economies. There is a dearth of evidence on the determinants of financial literacy in emerging economies and even less investigating gender gaps in financial literacy in these markets. This paper seeks to rectify these gaps. Using data from the 2015 China Household Finance Survey (CHFS) we examine the correlates of financial literacy (proxied through financial knowledge) amongst adult male and female household respondents in urban and rural China. We then use the Oaxaca-Blinder counterfactual decomposition technique to shed light on the factors giving rise to observed male-female gaps in financial literacy. A variety of financial literacy measures are employed.

The analysis shows that human capital variables such as age and education are important predictors of male and female financial literacy in China. In the case of age the relationship is negative, suggestive of strong cohort effects. This is in stark contrast to the relationship in developed economies. In terms of the gender gap, our analysis shows that a key factor driving gender gaps in financial literacy in China is gender differences in schooling. Depending on the measure of financial literacy employed (and not including the risk-based measure employed in this paper), gender differences in schooling account for between 14% and 50% of the observed gender gap in financial literacy. Policy interventions aimed at narrowing the gender gap in schooling and improving the financial literacy in rural areas could

be expected to narrow the gender gap in China. Such initiatives may also help minimised fraud in China's rapidly evolving financial markets (Gui et al. 2021).

Much work remains to be done in understanding the determinants of financial literacy in China and the factors giving rise to gender gaps. Work might fruitfully examine why such a large share of respondents (around 50%) to the CHFS survey provide a 'do not know' or 'refuse to answer' response to each of the individual financial literacy test questions in the survey. Around 40% of respondents failed to correctly answer any of the three test questions. This is markedly higher than rates observed elsewhere. The financial literacy questions in the CHFS have been validated using data from developed economies and commonly used in surveys in advanced economies. It may be that the prevailing question set is not well suited to respondents in emerging economies and/or economies that were previously planned. Research might also fruitfully examine why the gender gap in financial literacy is particularly large in urban locations such as Shanghai (notwithstanding the relatively higher levels of financial literacy in such locations) and how these gaps impact on other gendered outcomes in China.

References

Blinder, Alan. 1973. Wage Discrimination: Reduced Form and Structural Estimates. *Journal of Human Resources,* 84: 436-455.

Brown, Martin and Roman Graf. 2013. Financial Literacy and Retirement Planning in Switzerland. *Numeracy,* 6(2), Article 6.

Bucher-Koenen, Tabea and Annamaria Lusardi. 2011. Financial Literacy and Retirement Planning in Germany. *Journal of Pension Economics and Finance*, 10(4): 565–584.

Bucher-Koenen, Tabea, Annamaria Lusardi, Rob Alessie, and Maarten van Rooij. 2017. How Financially Literate are Women? An Overview and New Insights. *Journal of Consumer Affairs*, 51: 255-283.

Cai, Yong and Yuan Cheng. 2014. Pension Reform in China: Challenges and Opportunities. *Journal of Economic Surveys*, 28(4): 636-651.

Chen, Jia, Jiajun Jiang and Yu-jane Liu. 2018. Financial Literacy and Gender Difference in Loan Performance. *Journal of Empirical Finance*, 48: 307-320.

China Household Finance Survey (CHFS) (2015) CHFS CAPI Questionnaire 2015 (English Version), June 2015.

Chu, Zhong, Zhengwei Wang, Jin Jian Xiao, Weiqiang Zhang. 2017. Financial Literacy, Portfolio Choice and Financial Well-Being. *Social Indicators Research*, 132(2): 799-820.

Cordray, Richard. 2020. The Evolution of the Consumer Movement: The Rise of Consumer Financial Protection. *Journal of Consumer Affairs*, 54: 1375-1382.

Cupâk, Andrej, Pirmin Fessler, Alyssa Schneebaum and Maria Silgoner. 2018. Decomposing Gender Gaps in Financial Literacy: New International Evidence. *Economic Letters,* 168: 102-106.

Duh, Helen Inseng, Hong Yu and Yuefeng Ni. 2021. Chinese Millenials' Happiness and Materialism: Explanations from Two Life-Course Theories, Self-Esteem, and Money Attitudes. *Journal of Consumer Affairs*, 55: 1306-1332.

Fairlie, Robert, W. 2005. An Extension to the Blinder-Oaxaca Decomposition Technique to Logit and Probit models. *Journal of Economic and Social Measurement*, 30: 305-316.

Fonseca, Raquel, Kathleen J. Mullen, Gemma Zamarro, and Julie Zissimopoulos. 2012. What Explains the Gender Gap in Financial Literacy? The Role of Household Decision Making. *Journal of Consumer Affairs*, 46: 90-106.

Gianni, Nicolini. 2019. *Financial literacy in Europe: assessment methodologies and evidence from European countries.* New York: Routledge

Gui, Zhengqing, Yangguang Huang and Ziaojian Zhao. 2021. Whom to Educate? Financial Literacy and Investor Awareness. *China Economic Review*, 67. Online, hhtps://doi.org/10.1016/j.chieco.2021.101608.

Hanewald, Katja, Ruo Jia and Zining Liu. 2021. Why is Inequality Higher Among the Old? Evidence from China. *China Economic Review*, 66. Online, hhtps://doi.org/10.1016/j.chieco.2021.101592.

Hasler, Andrea and Annamaria Lusardi. 2017. The Gender Gap in Financial Literacy: A Global Perspective. Global Financial Literacy Excellence Center, George Washington University, Washington DC

Hsu, Joanne, W. 2016. Aging and Strategic Learning: The Impact of Spousal Incentives on Financial Literacy. *Journal of Human Resources,* 51: 1036-1067.

Jann, Ben. 2006. FAIRLIE: Stata module to generate nonlinear decomposition of binary outcome differentials. Available from https://ideas.repec.org/c/boc/bocode/s456727.html

Jann, Ben. 2008. The Blinder-Oaxaca decomposition for linear regression models. *The Stata Journal,* 8(4), 453-479.

Jappelli, Tullio and Mario Padula. 2013. Investment in Financial Literacy and Saving Decisions. *Journal of Banking and Finance,* 37: 2779-2792.

Jappelli, Tullio. 2010. Economic Literacy: An International Comparison. *The Economic Journal,* 120: F429-F451.

Klapper, Leora and Georgios, A. Panos. 2011. Financial literacy and Retirement Planning: the Russian case. *Journal of Pension Economics and Finance*, 10(4): 599-618.

Klapper, Leora, Annamaria Lusardi and Georgios, A. Panos. 2013. Financial Literacy and its Consequences: Evidence from Russia During the Financial Crisis. *Journal of Banking & Finance,* 37(10), 3904–3923.

Liao, Li, Jing Kian Xiao, Weiqiang Zhang and Congyi Zhou. 2017. Financial Literacy and Risky Asset Holdings: Evidence from China. *Accounting and Finance*, 57: 1383-1415.

Lusardi, Annamaria and Olivia, S. Mitchell. 2014. The Economic Importance of Financial Literacy: Theory and Evidence, *Journal of Economic Literature,* 52: 5-44

Lusardi, Annamaria, Pierre-Carl Michaud and Olivia S. Mithcell. 2017. Optimal Financial Knowledge and Wealth Inequality. *Journal of Political Economy*, 125: 431-477.

Lu, Xiaomeng, Jingna Xiao and Yu Wu. 2021. Financial Literacy and Household Asset Allocation: Evidence from Micro-Data in China. *Journal of Consumer Affairs*, 55: 1464-1488.

Nana, Xu, Shi Jingye, Rong Zhao and Yuan Yan. 2020. Financial Literacy and Formal Credit Accessibility: Evidence from Informal Businesses in China. *Finance Research Letters,* 36. Online, https://doi.org/10.1016/j.frl.2019.101327.

Niu, Geng, Yang Zhou and Hongwu Gan. 2020. Financial Literacy and Retirement Preparation in China. *Pacific-Basin Finance Journal.* Online. https://doi.org/10.1016/j.pacfin.2020.101262

Niu, Geng and Yang Zhou. 2018. Financial Literacy and Retirement Planning: Evidence from China. *Applied Economics Letters*, 25(9), 619-623.

Oaxaca, Ronald. 1973. Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review,* 14: 693-709.

OECD. 2018. G20/OECD INFE Policy Guidance on Digitalisation and Financial Literacy.

OECD. 2021. Household savings (indicator). OECD Data. Household accounts - Household savings - OECD Data. doi: 10.1787/cfc6f499-en (Accessed on 11 March 2021).

OECD. 2016. OECD/INFE International Survey of Adult Financial Literacy Competencies. OECD, Paris, www.oecd.org/finance/OECD-INFE-International-Survey-of-Adult-Financial-Literacy-Competencies.pd

Pan, Xuefeng, Weizing Wu and Xuyang Zhang. 2020. Is Financial Advice a Cure-All or the Icing on the Cake for Financial Literacy? Evidence from Financial Market Participation in China. *International Review of Financial Analysis*, 69. Online, https://doi.org/10.1016/j.irfa.2020.101473.

Preston, Alison and Robert, E. Wright. 2019. Understanding the Gender Gap in Financial Literacy: Evidence from Australia. *Economic Record*, 95: 1-29.

Robson, Jennifer and Johanna Peetz. 2020. Gender Differences in Financial Knowledge, Attitudes, and Behaviors: Accounting for Socioeconomic Disparities and Psychological Traits. *Journal of Consumer Affairs,* 54: 813-835.

Stoddard, Christiana and Carly Urban. 2020. The Effects of State-Mandated Financial Education on College Financing Behaviors. *Journal of Money, Credit and Banking*, 52: 747-776.

Warmath, Dee and David Zimmerman. 2019. Financial Literacy as More than Knowledge: The Development of a Formative Scale Through the Lens of Bloom's Domains of Knowledge. *Journal of Consumer Affairs*, 53(4): 1602-1629.

Zou, Jing and Xiaojun Deng. 2019. Financial Literacy, Housing Value and Household Financial Market Participation: Evidence from Urban China. *China Economic Review*, 55: 52-66.