Journal of Family and Economic Issues (2018) 39:551–565
https://doi.org/10.1007/s10834-018-9579-2

ORIGINAL PAPER

The Impact of Educational Pairing and Urban Residency on Household Financial Investments in Urban China

Ningzi Li[1] · Yue Qian[2]

Published online: 5 July 2018

Abstract
With China's rise in the global economy, more couples participate in financial investing. Using the 2011 China Household Finance Survey, we examined factors influencing stock and fixed-income investments in the cities. Couples with urban residency were more likely to invest than couples without urban residency. Compared to traditional couples with highly-educated husbands only, couples with only highly-educated wives invested similarly, whereas couples with two highly-(less-) educated spouses were more (less) likely to invest. Further, we investigated how these relationships were mediated by household income and wealth, financial literacy, information acquisition, and risk tolerance. Overall, our findings suggest that household investing is shaped by both family structure (i.e., spouses' educational pairing) and institutional advantage (indicated by urban residency).

Keywords Household finance · Educational pairing · Urban residency · Inequality

Introduction

Over the past 20 years, Chinese society has experienced the growing scale and profitability of private investment as happening internationally. In this trend, a variety of countries have adopted financial markets and instruments, and individuals and institutions have been widely engaged in active financial management (Fligstein and Goldstein 2015; Krippner 2005). This trend has taken place within and across different social units, including governments (Pacewicz 2012), companies (Krippner 2005; Van der Zwan 2014), as well as households (Fligstein and Goldstein 2015; Nau 2013).

Private investing among families is gaining scholarly attention in the light of the growing inequity in household wealth. Participation in financial investing could be an important mechanism for the perpetuation and reproduction of economic inequalities. Indeed, prior studies demonstrated that high-income households were more likely than low-income ones to make financial investments (Finke and Huston 2003), and income from financial investments further widened the gap between upper- and lower-income families (Nau 2013; Yao and Xu 2015). Other factors shaping financial investing such as financial literacy (Hogarth et al. 2005; Van der Zwan 2014; Van Rooij et al. 2011), long-term financial plans (Yao and Xu 2015), and the tolerance of riskiness (Fligstein and Goldstein 2015) were also well documented.

However, two important factors affecting household financial decisions remain understudied: the rising levels of education among women and the migration of rural residents to urban areas (DiPrete and Buchmann 2013; Montgomery 2008). Women's higher educational attainment increased employment opportunities (Evertsson et al. 2009), made accumulation of assets more likely (Sanders and Porterfield 2010), and raised financial literacy (Hogarth et al. 2005), all of which could enhance women's bargaining power in financial decision-making within the family (Jianakoplos and Bernasek 2008). Meanwhile, increases in the number of rural-to-urban migrants might enlarge the demand for financial assets in the destination areas, which, in turn, would challenge the institutional arrangements to provide equal

Ningzi Li and Yue Qian contributed equally to the work.

✉ Ningzi Li
ningzi.li@ucdenver.edu

✉ Yue Qian
yue.qian@ubc.ca

[1] University of Colorado Denver Business School, 1475 Lawrence St, Denver, CO 80202, USA

[2] Department of Sociology, University of British Columbia, 6303 NW Marine Drive, Vancouver, BC V6T 1Z1, Canada

financing opportunities and property protections for locals and migrants (Afridi et al. 2015; Cobb-Clark and Hildebrand 2006; Osili and Paulson 2008; Wu 2004). The institutional privileges of the locals might motivate their participation in financial activities to a greater extent, thus further expanding their advantages compared to the migrants.

China provides a unique social context to examine how the above-mentioned neglected factors shape household financial investments. China's financial market has been evolving rapidly since its stock market was formally launched in 1993. Chinese households could choose to invest in stocks, bonds, mutual funds, and other wealth management products, and they did, putting about 12.4% of all assets in these financial products in 2015 (China Household Finance Survey and Research Center 2016). Additionally, the gender gap favoring men has narrowed and even closed at all levels of schooling in recent decades (Treiman 2013; Yeung 2013). Moreover, since the late 1980s, China has entered "the age of migration" (Liang 2001, p. 518): Tens of millions of migrants from rural regions moved to urban areas without changing their residency status (household registration or *hukou*, Liang 2001; Liang et al. 2014). Despite living in urban areas, under the *hukou* system, migrants who are formally registered in rural regions are "in effect treated as second-class citizens" at their places of destination, because they have limited access to social welfare and government-provided services (Chan 2010, p. 357). Hence, in the context of emerging financial markets, women's increasing levels of education, and mass rural-to-urban migration, the current study investigates how spouses' educational pairing and residency status shape financial participation among married couples in urban China.

In this study, we used nationally representative data from the 2011 Chinese Household Finance Survey (CHFS) to explore household investments in depth. Specifically, we asked: Which households were more active in financial investments? What roles were played by spouses' educational pairing and urban residency? How was the relationship between household financial participation and spouses' educational pairing/urban residency mediated by household wealth, financial literacy, information acquisition, and risk tolerance? We expected households with educational advantages and institutional privileges to be more active in financial investing, which we discuss in detail below.

Theories and Hypotheses

Educational Pairing and Household Finance

One explanation for the variability in household financial decisions lies in the pairing of spouses' educational attainment. In traditional heterosexual marriages, women tended to marry men of higher educational levels. In recent decades, women have reached parity and even surpassed men in educational attainment, and there has been a corresponding decline in the traditional model of educational hypergamy among married couples (i.e., women marrying men with higher educational attainment than themselves) (Esteve et al. 2012). Individuals have become increasingly likely to marry similarly-educated spouses in China and elsewhere, and scholars have even observed a tendency for women to marry men with less education than themselves (e.g., Blossfeld 2009; Esteve et al. 2012; Han 2010; Qian 2017a; Qian and Qian 2014).

However, how the educational pairing of spouses affects couples' financial decisions is an important, yet unaddressed, question. When theorizing how family structure could impact social inequality in modern societies, Blossfeld and Buchholz (2009) posited that marriages between two highly-(or less-) educated spouses shaped families' access to social networks and influenced household accumulation (or lack) of educational resources, and thus increases in educational homogamy might exacerbate resource inequality among families. Meanwhile, an educational discrepancy between husbands and wives might influence the balance of marital power, with the more educated spouse possibly having a greater say in household finances (Blood and Wolfe 1960).

Prior studies proposed a bargaining model and a cooperative model to understand household financial decision-making. In general, women exhibited lower risk tolerance than men when making financial investments (Embrey and Fox 1997; Hinz et al. 1997; Jianakoplos and Bernasek 1998; Yao and Hanna 2005). Some research found that households with more resources controlled by women were less likely to invest in risky financial products (e.g., stocks) (Yilmazer and Lyons 2010), suggesting that spouses might make unilateral decisions, depending on who had more bargaining power. However, research findings were mixed. Jianakoplos and Bernasek (2008) showed that whether the husband or the wife was the primary earner did not affect financial risk taking of dual-earner, married households, suggesting that couples made cooperative decisions based on pooled resources rather than bargaining with their spouses. Although these studies did not specifically examine how the educational pairing of spouses shaped household finance, to the extent that higher education is linked to higher income and greater bargaining power in the home (Beegle et al. 2001; Esteve et al. 2016; Qian 2017b), we can draw on this body of literature to formulate our hypothesis, as elaborated below.

According to the bargaining model, financial participation of non-normative couples in which the wife was more educated than her husband would be different from that of traditional couples in which the husband was more educated than his wife. The idea is as follows: If two spouses differed in education, a wife's educational advantage over her

husband in a non-normative couple might enhance her bargaining power and allow her conservative views to influence household decisions about investing; whereas, a husband's educational advantage in a traditional marriage might lead to greater financial risk-taking. In short, differences in financial participation between non-normative couples and traditional couples would suggest that the bargaining model is suitable to explain financial decision-making among couples in urban China. However, we also acknowledged the possibility that non-normative couples and traditional couples might be similar in terms of financial participation, which would suggest the cooperative model in household decision-making.

In addition to spouses' relative education, the couple's total educational levels might also shape household financial participation. Relative to traditional couples with highly-educated husbands only, educationally homogamous couples with two highly- (or less-) educated spouses likely have accessed more (or less) education, achieved higher (or lower) socioeconomic status, and gained differential access to social networks (Blossfeld and Buchholz 2009). Therefore, we suspected that as compared to traditional couples with highly-educated husbands only, highly-educated couples with two well-educated spouses were advantaged in financial investment, whereas less-educated couples with two poorly-educated spouses were disadvantaged.

Overall, we expected household financial participation to be contingent on the absolute education of both spouses and their relative education. Accordingly, we proposed that:

Hypothesis 1a Compared to traditional couples with highly-educated husbands only, non-normative couples with highly-educated wives only were less likely to make financial investments.

Hypothesis 1b Compared to traditional couples with highly-educated husbands only, highly-educated couples with two highly-educated spouses were more likely to make financial investments.

Hypothesis 1c Compared to traditional couples with highly-educated husbands only, less-educated couples with two poorly-educated spouses were less likely to make financial investments.

Urban Residency and Household Finance

Another major explanation to different household decisions is the institutional barrier associated with migrant households that lack urban residency. Indeed, China's *hukou* (household registration) system has affected many fundamental aspects of Chinese people's life for more than half a century (Chan 2009). Under this system, each person has a registration status, classified as "rural" or "urban." Registration status is inherited from parents,[1] and the conversion of this status from rural to urban is tightly controlled (Chan 2010). In the cities, rural migrants without urban *hukou* are "in effect treated as second-class citizens" (Chan 2010, p. 357). Despite living in urban areas, they are not eligible for urban benefits (e.g., access to local school, urban pension plans, public housing, health care, etc.). They tend to work in low-paying jobs disproportionately filled by migrant labors and live in migrant enclaves (Chan 2010; Jie and Taubmann 2002; Meng and Zhang 2001; Song 2014).

While we know little about the impact of urban residency on household financial investing, prior studies on other investments, such as home ownership, revealed that China's *hukou* system created institutional barriers for migrants. Unless they had long-term plans to settle in the city, rural migrants were inclined to rent temporary housing or live in enterprise dormitories instead of owning commodity housing, because they were disadvantaged in employment opportunities and lacked access to bank mortgages and social welfare in cities (Afridi et al. 2015; Wu 2004). These institutional barriers faced by rural migrants might well inhibit their financial investments.

Despite the lack of research on migrant families' financial investments in China, some studies have investigated immigrant families' financial decisions in the United States. These studies can help formulate hypothesis because rural migrants in urban China are similar to immigrants in the United States who cannot automatically acquire citizenship either (Chan 2010). Research on immigrant households revealed that newcomers to the United States usually experienced credit constraints and had sparse access to social welfare; thus, they were more likely to hold liquid assets that could be easily converted to cash (Cobb-Clark and Hildebrand 2006). In addition, compared to their US-born counterparts, immigrants were less likely to invest in stocks or to maintain checking or savings accounts (Cobb-Clark and Hildebrand 2006; Osili and Paulson 2008).

Drawing on the association between institutional disadvantages experienced by Chinese rural migrants and US immigrants and their limited investments, we proposed that:

Hypothesis 2 In urban China, couples with urban residency were more likely than migrant couples to make financial investments.

Overall, because of the broad economic shifts and family changes under way, household finance in urban China is

[1] In 1998, the State Council approved a guideline that children can choose to inherit *hukou* from the father or the mother (previously, *hukou* was inherited from the mother) (Fan 2008).

a research topic of growing interest (Gan et al. 2014; Yao and Xu 2015). In examining how household financial investing varies across educational pairings of spouses and differs between families with and those without urban residency, our study contributes to the literature on family and economic issues in several ways. First, with the reversal of the gender gap in education that is happening in most Western and many non-Western countries, understanding the implications of spouses' educational pairing for family lives is an issue of pressing concern (DiPrete and Buchmann 2013; Esteve et al. 2016). While prior research has analyzed family outcomes such as divorce, the division of household labor, and couples' earnings arrangements (Qian 2017b; Schwartz and Han 2014; see Van Bavel et al. 2018 for a review), our study is among the first to investigate household financial decisions. These decisions could further influence families' wealth accumulation and long-term financial security (Yao and Xu 2015). Second, despite extensive literature on *hukou*-based stratification in China, which mostly focuses on occupational segregation, earnings disparity, and differential access to welfare benefits, housing, and education (e.g., Wu and Treiman 2004; Zhang and Wu 2017; see Song 2014 for a review), little is known about the effect of the *hukou* system on household finance. This is an important question as household financial investments play an increasingly important role in perpetuating inequality (Claessens and Perotti 2007; Demirgüç-Kunt and Levine 2009). Our study fills this research gap and sheds light on how change in *hukou*-related policies may encourage household financial investing. Taken together, by evaluating the role of family structure (i.e., spouses' educational pairing) and institutional advantage (indicated by urban residency) in household finance, our study illuminates which families likely reap the greatest benefits from the rapid expansion of China's financial markets (Barth et al. 2009).

Data and Methods

Data

We analyzed nationally representative data from the 2011 Chinese Household Finance Survey (CHFS). The 2011 CHFS conducted by the Southwestern University of Finance and Economics in China collected rich information on household assets, income, and wealth, family members' sociodemographic characteristics, and respondents' attitudes towards investment. The CHFS was conducted with a computer-assisted personal interviewing system. The sample was selected through a stratified three-stage probability proportion to size (PPS) random sample design. First, 80 counties (out of 2585) were selected as the primary sampling units.[2] Then, four residential communities were drawn from each of the 80 counties. Finally, 20–50 households were selected from each of the residential communities. The number of households in each community was determined by the level of urbanization and economic development. Eventually, 8438 households were successfully interviewed. The refusal rate was 16.5% among urban households.

Sample

Using the CHFS sample, we identified the analytic sample that could best address our research questions. Because financial participation was asked at the household level in the CHFS, we use household as the unit of analysis. We first restricted our sample to 6583 married couple households in which both spouses were present, and either the respondent or his/her spouse was head of household. We dropped households where the household heads were neither the respondents nor their spouses, since the household data that were not provided by either spouse of the married couples were likely subject to substantial measurement errors. We then excluded 106 same-sex couples (because same-sex marriage is not legal in China, these couples were likely in the CHFS due to measurement errors) and 12 households in which either the respondents or their spouses were not Mainland Chinese (i.e., their nationality was Hong Kong, Macao, Taiwan, or a foreign country; these households were excluded because our main variable of interest—urban residency—was only asked among Mainland Chinese). Finally, we limited our analytic sample to 3,908 married couples who were living in urban China,[3] and after dropping 60 households with missing data on the variables used in the analysis, we obtained a sample of 3,848 married couples.

[2] According to the CHFS data user manual, the goal was to select 80 counties that not only covered diverse geographic regions but also contained enough observations from relatively wealthy areas in China. Therefore, the survey team sorted the 2585 counties into ten strata based on their GDP per capita. In each stratum, eight counties were randomly drawn with PPS where each county was weighted by its population size. In this way, 80 counties covering 25 provinces in China were selected.

[3] We excluded households in rural China from our analysis for two reasons. First, household financial participation was very low in rural China (Gan et al. 2016) and the sample size was too small to yield valid results. Our supplementary analysis showed that in the 2011 CHFS, 1.68% (43 out of 2557) and 1.60% (41 out of 2557) of the households in rural China invested in stocks and fixed-income financial commodities, respectively. Second, there was limited variation in the independent variables of our interest. Specifically, because urban-to-rural migration was very rare, 91.98% of the couples in rural China involved at least one spouse with agricultural *hukou*. Additionally, couples in which neither spouse had any college education accounted for 96.56% of the 2557 couples in the rural sample.

Dependent Variables

The dependent variables indicated household financial participation, and we considered both stocks and fixed-income financial products. Because fixed-income financial products pay interest to the holders regularly, they are commonly considered as the financial item of lower risks than are stocks. Examining both types of investment items would thus provide a more comprehensive understanding of investment decisions. The CHFS asked, "Does your family have any stock accounts?" We code yes as 1 and no as 0. Note that holding own-company stock might be different from buying other stocks, as research showed that employees tended to underestimate the risk of own-company stock investment (Benartzi et al. 2007). Only 19 households (0.5%) in our sample, however, held stocks in the companies where family member(s) worked. Sensitivity analysis confirmed that our results were substantively the same if we excluded these households.

As for fixed-income investments,[4] the CHFS asked, "Which of the following assets does your family own?" Respondents could choose (1) bonds, (2) mutual funds, (3) derivatives, (4) wealth management products, and (5) none. If respondents chose any of the first four options, households were coded as 1 to indicate investing in fixed-income assets (0 = otherwise).

Independent Variables

Our main independent variables were the educational pairing of spouses and urban residency. The CHFS asked respondents to identify their own and their spouses' educational levels ranging from no formal schooling to doctoral degrees. Because of the importance of higher education in financial investing (Van der Zwan 2014), we classified the married couples into four groups: traditional couples in which only the husband had at least some college education (i.e., vocational college, bachelor's degree, or advanced degree), non-normative couples in which only the wife had at least some college education, highly-educated couples in which both spouses had at least some college education, and less-educated couples in which neither spouse had any college education.[5] We use the traditional couples as the reference category. To be clear, according to our operationalization, "highly-educated" means "having some college education or above," and hereafter we use them interchangeably for ease of writing.

Meanwhile, the other main independent variable—urban residency—was also a couple-level measurement. If either spouse had non-agricultural (urban) *hukou*, we coded this couple as an urban couple. Alternatively, if both spouses of a married couple held agricultural (rural) *hukou*, we coded this couple as a migrant couple (reference group). Note that as marriage could serve as a channel of gaining urban *hukou* status for rural-origin individuals (Wu and Treiman 2004), only 7.4% of the couples in the urban sample (285 out of 3848) had mixed *hukou*. We classified couples with mixed *hukou* as urban couples,[6] but results were substantively the same if they were grouped into migrant couples.

Mediators

In addition to investigating the relationships between the educational pairing of spouses/urban residency and financial investments, we examined the extent to which these relationships were mediated or explained by household income and wealth, spouses' methods of obtaining financial information, and respondents' attitudes toward risk. Prior research showed that income, wealth, financial literacy, and risk tolerance were important factors shaping financial investments because these factors determined material resources, knowledge, and willingness necessary for investing (Finke and Huston 2003; Nau 2013; Van der Zwan 2014; Van Rooij et al. 2011; Yao and Xu 2015). Figure 1 shows the conceptual relationships of all relevant variables. The independent variables "Educational pairing of spouses" and "Urban residency" had a direct effect on the dependent variable "Buying stocks/fixed-income financial products" (Path C). The

[4] We grouped all the non-stock financial products into one category for two reasons. First, stock is the major instrument in China's financial market while other financial instruments are still developing (Gan et al. 2014, p. 95). The values of stocks are more volatile than the others and those emerging instruments often promise low-risk (i.e., rigid redemption) in the early days. Even though mutual funds, derivatives, and wealth management products are not fixed-income securities by name, they come with much lower risks than stocks in China and resemble each other. Second, all the financial products that we referred to as "fixed-income products" were asked in one multiple choice question during the survey. Thus, they were likely considered to belong to the same category of financial products from both interviewers' and interviewees' perspectives.

[5] US studies tend to differentiate college graduates from those with some college education (e.g., Finke et al. 2011; Joo and Grable 2004), but for our sample, in which the husbands' and wives' mean ages were about 49 and 47 years, most couples were in college ages before the onset of China's higher education expansion in 1999 (Yeung 2013). As a result, sample sizes were too small to allow for breaking down the college educated into individuals with some college education and college graduates (see Yao and Xu 2015, a study of Chinese urban households' financial market participation, for a similar coding of college-educated individuals).

[6] In 1998, the State Council approved one guideline, which specifies that rural residents who have lived in the city for more than one year and whose spouses hold urban *hukou* may be granted urban *hukou* (Fan 2008). Thus, arguably, spouses with agricultural *hukou* who married individuals with urban *hukou* could eventually convert from rural to urban *hukou* status.

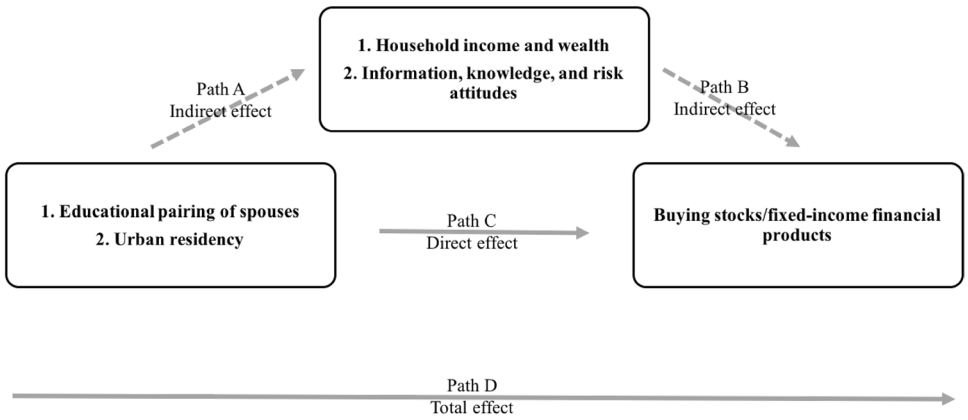

Fig. 1 Direct and indirect effects of educational pairing of spouses and urban residency on household holdings of stocks and fixed-income financial products

independent variables also influenced the dependent variables through the indirect effect of the mediators "Household income and wealth" and "Information, knowledge, and risk attitude" (Paths A and B). Taken together, the sum of direct effect and indirect effect reflected the total effect of couples' educational pairing/urban residency on investing (Path D). As our data were cross-sectional, our analysis did not establish causality. For ease of reading, however, we adopted the common causal language (i.e., "effect") used in path analysis (Breen et al. 2013).

A first mediator, total household income (including gains and losses from all sources in 2010), was imputed by the data provider based on the returns to labor, agricultural productions, business projects, investments of all household members as well as the transferred income from governments, other institutions, and other individuals (Survey and Research Center for China Household Finance, personal communication, May 10, 2016). As high-income groups tended to be reluctant to disclose their wealth, this imputation based on information revealed in the interviews could help reduce bias (Nau 2013). This imputed income indicated the total capital flow of each family during 2010. Because household income was positively skewed, we applied logarithmic transformation to the total household income to correct for skewness. As 136 households had no income, we added one to each household's income before applying logarithmic transformation, and for 16 households with negative net income, we assigned 0 as their logged household income.

In addition to capital flows, the capital stock of each family (i.e., household wealth) might also shape household financial participation (Campbell 2006). We used two measures of property ownership from the CHFS as proxies for household wealth: the number of houses (ranging from 0 to 15) and vehicles (including cars, buses, and trucks; ranging from 0 to 6) possessed by each family. These two variables were good proxy indicators of household wealth because housing assets alone accounted for 79% of the total household wealth in urban China (durable goods including items like cars contributed another 6%; Xie and Jin 2015).[7]

We also considered respondents' methods of information acquisition, knowledge of finance, and subjective attitudes toward risk. The CHFS asked, "What are your main methods of obtaining information?" Respondents could choose multiple answers from newspaper/magazines, television, radio, the Internet, SMS (short messages), family/friends/coworkers, and others. We coded couples who acquired information via the Internet, SMS, and/or family/friends/coworkers as maintaining "information acquisition" channels (=1; otherwise=0), because (1) most couples in our sample had access to newspaper/magazines, television, and radio, and (2) financial literacy and social network played roles in financial decision-making (Zhang et al. 2012). The CHFS also asked, "What type of information are you most interested in?" Multiple answers could be chosen from politics, economics, society, science and education, sports, entertainment, military, health, and others. While the CHFS did not have a direct measure of financial literacy, prior research found that economics knowledge and interest in economics were closely related to financial literacy that was an important predictor of stock ownership (Christiansen et al. 2008; van Rooij et al. 2011). Thus, used as our best available proxy for financial literacy, respondents were coded as 1 if they were interested in economics and 0 otherwise. In addition, self-classified financial risk tolerance was found to be associated with actual risk-taking

[7] Indeed, the share of housing assets in total household wealth is higher in China than in the United States, whereas the share of financial assets is lower in China than in the United States (Xie and Jin 2015, pp. 212–213; China Household Finance Survey and Research Center 2016, p. 3). These differences in the composition of household wealth portfolios likely reflect China's recent history of economic reforms and the privatization of housing properties. They may also be due to differences in the development stage of financial markets and cultural variations in wealth building strategies between China and the United States (see Barth et al. 2009; Xie and Jin 2015; Killewald et al. 2017 for detailed discussions).

investing behaviors. For example, individuals who were more willing to take risks tended to hold less cash, invest in riskier assets, and build riskier portfolios with higher stock (instead of fixed-income product) allocations (Grable et al. 2009; Hanna and Chen 1997; Hinz et al. 1997). The CHFS asked, "Assume you have some assets to invest, which type of project would you be interested in?" The respondents were asked to rate on a 5-point scale, with 1 meaning "high risk, high return" and 5 meaning "unwilling to take any risk." To measure risk tolerance, we recoded scores to create a variable ranging from 0 to 4, so that higher values indicated greater willingness to take risk. Note that these three variables were measured at the individual level instead of at the couple level. We believe, however, this was not problematic for our analysis because the CHFS respondents were spouse members that had better knowledge about household financial situations.

Other Covariates

We controlled for other covariates correlated with the dependent, independent, and mediating variables. Age—capturing individuals' life stages and birth cohorts—was found to be associated with investing, income, and whom they marry (Agarwal et al. 2009; Cheng 2014; Qian and Qian 2014). Therefore, we controlled for husbands' age and its squared term. We did not include wives' age because individuals tended to marry spouses of similar ages (Qian and Qian 2014). Indeed, spouses' ages were highly correlated in our sample, with a correlation coefficient as high as 0.97. Additionally, who was head of household might reflect power differentials between husband and wife. Hence, we controlled for whether the husband (=1) or the wife (=0) is the household head.

Chinese couples' fertility decisions tended to differ by *hukou* status and socioeconomic status (Gu et al. 2007; Jin et al. 2015), and the presence of children might in turn influence parents' spending and investment decisions (Kornrich and Furstenberg 2013). Therefore, we controlled for a continuous variable indicating the total number of children. Moreover, couples' Communist Party membership and employment status were likely correlated with their *hukou* status (Chan 2010; Wu and Treiman 2004), and might determine their access to income, wealth, information, and social networks (Zhou et al. 1996), which could in turn shape their investing (Zhang et al. 2012). Thus, we included Chinese Communist Party (CCP) membership and employment status at the couple level. We coded a couple's party membership as 1 if at least one spouse was a party member, and as 0 if neither spouse was a party member. Additionally, we used a dummy variable to indicate whether the couple was a dual-earner couple (=1) or not (=0).

Analytic Strategies

Because our two dependent variables (owning stock or not; owning fixed-income financial products or not) were both binary variables, we used logistic regression models to analyze the likelihood that households bought stocks or fixed-income financial products (Long 1997). First, we only included the main independent variables (the educational pairing of spouses and urban residency) and other covariates in the model. Second, we added the mediators (i.e., household income and wealth as well as respondents' information acquisition and subjective attitudes) to see how the effect of the main independent variables changed after we held mediators constant.

To estimate the contribution of each mediator in explaining the relationship between educational pairing/urban residency and investing, we used a decomposition method—the KHB method (via the khb command in Stata). In fact, to assess mediation in nonlinear probability models like logistic regressions, it is problematic to directly compare regression coefficients between nested models because changes in coefficients across models may be due to differences in residual variability rather than the inclusion of additional variables (Breen et al. 2013; Karlson et al. 2012). Accordingly, in reduced and full models, coefficients of the variables of interest can differ not only because of mediating effects but also because of a rescaling of the model (Karlson et al. 2012). But the KHB method can estimate the true amount of mediation by adjusting the rescaling bias that arises in comparisons across nonlinear models (Karlson and Holm 2011).

Results

Descriptive Results

Table 1 presents descriptive results for the overall sample and by the educational pairing of spouses and urban residency, respectively. Investing was not widespread in urban China. The share of married couples who owned stocks was 14% of all married couples (consistent with the statistic reported by Yao and Xu 2015), while only 9% had fixed-income financial products. Urban couples were about six times as likely as migrant couples to own stocks or fixed-income financial products. About 18% of urban couples owned stocks, whereas only 3% of migrant households did. While 11% of urban couples owned fixed-income financial products, only 2% of migrant couples did. By comparing across educational pairings of spouses, we found that highly-educated couples in which both spouses had at least some college education were most likely to own stocks (37%) and fixed-income financial products (21%); whereas,

Table 1 Descriptive statistics for variables used in the analyses, married-couple households, urban China. Reproduced with permission from the 2011 Chinese Household Finance Survey

	Mean (%)						
	Urban residency			Educational pairings of spouses			
	Total	Urban couples	Migrant couples	Only husband college+	Both spouses college+	Neither spouse college+	Only wife college+
Dependent variables							
Owned stocks	14%	18%	3%	18%	37%	8%	27%
Owned fixed-income financial products	9%	11%	2%	15%	21%	5%	17%
Independent variables							
Educational pairings of spouses							
Only husband college+	10%	14%	1%				
Both spouse college+	14%	19%	1%				
Neither spouse college+	71%	62%	96%				
Only wife college+	4%	5%	1%				
Urban couple	73%			97%	98%	64%	91%
Mediators							
Logged household income	10.08 (2.37)	10.24 (2.32)	9.64 (2.46)	10.60 (1.99)	11.13 (1.89)	9.77 (2.45)	10.46 (2.05)
Number of houses owned	1.09 (0.61)	1.09 (0.63)	1.09 (0.55)	1.14 (0.61)	1.18 (0.64)	1.06 (0.60)	1.13 (0.61)
Number of cars owned	0.22 (0.48)	0.24 (0.49)	0.18 (0.42)	0.28 (0.51)	0.47 (0.65)	0.16 (0.40)	0.33 (0.51)
Information acquisition	61%	64%	52%	73%	87%	52%	86%
Interested in economics	56%	59%	49%	62%	72%	52%	58%
Risk tolerance	1.21 (1.22)	1.22 (1.22)	1.18 (1.21)	1.31 (1.23)	1.73 (1.16)	1.07 (1.20)	1.56 (1.18)
Other covariates							
Husband's age	48.59 (13.13)	49.32 (13.34)	46.58 (12.30)	49.78 (14.98)	41.39 (11.54)	50.14 (12.69)	43.57 (11.22)
Husband is household head	72%	70%	77%	74%	62%	74%	58%
Total number of children	0.95 (0.74)	0.84 (0.64)	1.26 (0.91)	0.84 (0.59)	0.81 (0.51)	1.00 (0.81)	0.91 (0.49)
Dual-earner couple	46%	40%	62%	40%	72%	40%	61%
Party membership	30%	38%	9%	59%	64%	19%	42%

$N = 3848$. Standard deviations are in parentheses. Values may not add up to 100 due to rounding. The variable "information acquisition" means that respondents' main methods of obtaining information included the Internet, SMS, and/or family/friends/coworkers

less-educated couples in which neither spouse had any college education were the least likely to invest in stocks (8%) and fixed-income financial products (5%). Interestingly, non-normative couples in which only the wife had higher education were more likely than traditional couples in which only the husband had higher education to own stocks (27% vs. 18%) and fixed-income financial products (17% vs. 15%).

Educational homogamy was the dominant pattern among Chinese couples (Han 2010; Qian and Qian 2014): about 14% of married couples had two spouses with at least some college education, and 71% had two spouses without any college education. If two spouses differed in education, the husband was more likely to be the more educated spouse: 10% of households were traditional couples in which only the husband had at least some college education, whereas only 4% were non-normative couples in which only the wife had at least some college education. Additionally, urban couples in which at least one spouse had urban residency at the time of survey constituted 73% of all married couples, and 27% were migrant couples in which both spouses held rural *hukou*.

Compared with their rural or less-educated counterparts, urban and highly-educated couples had higher levels of household income and wealth, were more likely to obtain information through the Internet, SMS, or social networks, were more interested in information on economics, and

Table 2 Results from logit models predicting household financial participation, married-couple households, urban China. Reproduced with permission from the 2011 Chinese Household Finance Survey

	Stocks		Fixed-income financial products	
	(1)	(2)	(3)	(4)
Independent variables				
Educational pairings of spouses (ref. = Only husband college+)				
Both spouse college+	0.816***	0.679***	0.272	0.047
	(0.164)	(0.172)	(0.183)	(0.190)
Neither spouse college+	−0.489**	−0.207	−0.924***	−0.667***
	(0.159)	(0.165)	(0.179)	(0.183)
Only wife college+	0.479*	0.467	0.166	0.168
	(0.233)	(0.242)	(0.262)	(0.269)
Urban couple	1.512***	1.435***	1.148***	1.015***
	(0.202)	(0.205)	(0.236)	(0.238)
Mediators				
Logged household income		0.173***		0.212***
		(0.038)		(0.052)
Number of houses owned		0.331***		0.161
		(0.082)		(0.083)
Number of cars owned		0.260**		0.373***
		(0.097)		(0.109)
Information acquisition		0.638***		0.469**
		(0.135)		(0.162)
Interested in economics news		0.170		0.578***
		(0.111)		(0.139)
Risk tolerance		0.326***		0.137**
		(0.044)		(0.053)
Other covariates				
Husband's age	0.112***	0.124***	0.049	0.044
	(0.030)	(0.031)	(0.033)	(0.033)
Husband's age Squared	−0.001***	−0.001***	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Husband is household head	0.112	0.043	0.014	−0.046
	(0.109)	(0.113)	(0.129)	(0.133)
Total number of children	−0.052	−0.149	−0.157	−0.242*
	(0.087)	(0.091)	(0.107)	(0.111)
Dual-earner couple	0.365**	0.114	0.378**	0.123
	(0.119)	(0.126)	(0.146)	(0.152)
Party membership	0.376***	0.263*	0.255	0.117
	(0.112)	(0.116)	(0.134)	(0.137)
Constant	−5.847***	−9.486***	−4.226***	−7.370***
	(0.757)	(0.891)	(0.841)	(1.019)

$N = 3848$. Standard errors are in parentheses. The variable "information acquisition" means that respondents' main methods of obtaining information included the Internet, SMS, and/or family/friends/coworkers

***$p < .001$; **$p < .01$; *$p < .05$

exhibited higher levels of risk tolerance, all of which might contribute to their higher likelihood of investing.

Educational Pairing and Household Finance

Next, we used logistic regression to examine the relationships between the educational pairing of spouses/urban residency and investing. Table 2 presents results from logistic models predicting investing, and the coefficients in Table 2 are log-odds. Models 1 and 2 present results from models predicting household investments in stocks, and Models 3 and 4 present results from models predicting investments in fixed-income financial products. In addition to other covariates, Models 1 and 3 only included the main independent variables (i.e., the educational pairing of spouses and urban residency). Models 2 and 4 added all the mediators.

We found that better education did encourage household financial participation. As shown in Models 1 and 3, holding other covariates constant, compared with couples in which only the husband had some college education,

Table 3 Comparing coefficients between models including and excluding mediators, using the KHB method. Reproduced with permission from the 2011 Chinese Household Finance Survey

	Stocks			Fixed-income financial products		
	Coefficient	Standard error	P > |z|	Coefficient	Standard error	P > |z|
Both spouse college+						
Reduced (excluding mediators)	0.892	0.171	.000	0.286	0.188	.128
Full (including mediators)	0.679	0.172	.000	0.047	0.190	.805
Difference	0.213	0.099	.032	0.239	0.097	.014
Neither spouse college+						
Reduced (excluding mediators)	−0.514	0.164	.002	−0.956	0.182	.000
Full (including mediators)	−0.207	0.165	.210	−0.667	0.183	.000
Difference	−0.307	0.100	.002	−0.289	0.099	.004
Only wife college+						
Reduced (excluding mediators)	0.527	0.242	.029	0.188	0.269	.484
Full (including mediators)	0.467	0.242	.054	0.168	0.269	.533
Difference	0.060	0.097	.535	0.021	0.094	.827
Urban couple						
Reduced (excluding mediators)	1.589	0.205	.000	1.180	0.238	.000
Full (including mediators)	1.435	0.205	.000	1.015	0.238	.000
Difference	0.154	0.098	.117	0.166	0.096	.086

$N = 3848$. Reduced models refer to Models (1) and (3) in Table 2 while full models refer to Models (2) and (4) in Table 2. Some values of the "Difference" coefficients may be not equal to the corresponding "Reduced" coefficients minus the "Full" ones, due to rounding

couples in which both spouses had at least some college education were 126% more likely to invest in stocks ($\beta = 0.816$, $\exp(\beta) = 2.261$, $p < .001$), whereas couples in which neither spouse had higher education were 39% less likely to buy stocks and 60% less likely to own fixed-income financial products (stock: $\beta = -0.489$, $\exp(\beta) = 0.613$, $p < .05$; fixed-income financial product: $\beta = -0.924$, $\exp(\beta) = 0.397$, $p < .001$). These results suggest that highly-educated couples were more likely to purchase the riskier financial item, i.e., stocks, but were not necessarily more likely to purchase the less risky fixed-income financial products. Less-educated couples were less likely to invest in either, but especially the fixed-income financial products.

In addition, Models 2 and 4 in Table 2 show that most mediators, including household income, household wealth (i.e., number of houses or vehicles owned), information acquisition, and risk tolerance, were positively associated with investing in stocks and fixed-income financial products. Being interested in information on economics appeared not to be associated with the purchase of stocks, but was positively related to investing in fixed-income financial products.

We noticed that, from Model 1 to 2 and from Model 3 to 4, the magnitude of the coefficients for dummy variables indicating educational pairings of spouses became attenuated, suggesting that the relationship between the educational pairing of spouses and investing might be partially explained by the mediators. Yet, for nonlinear probability models such as logistic regression models, we cannot directly compare coefficients across nested models because coefficients in reduced and full models can differ due to both mediation and a rescaling of the model (Breen et al. 2013; Karlson et al. 2012). To solve this problem, we used the KHB method to formally compare coefficients for our main independent variables across nested logistic regression models and to quantify the contribution of each mediator to the indirect path (Kohler et al. 2011). Results are shown in Tables 3 and 4.

Table 3 shows the estimated coefficients of the independent variables from the reduced model that excluded mediators and from the full model that included mediators, as well as the estimated differences in the coefficients between these two models. Thus, Table 3 reveals how the total effect of each educational pairing was decomposed into direct effect and indirect effect. The total effect was represented by the coefficient from the reduced model, the direct effect was captured by the coefficient from the full model, and the indirect effect was measured by the difference between the two coefficients. For example, the total effect of being highly-educated on investing in stock was 0.892. The full coefficient for highly-educated couples in which both spouses had higher education was 0.679, which was the direct effect of this educational pairing on stock investment. The coefficient difference for this variable was 0.213, which was the indirect effect explained by the aggregation of the mediators. In other words, the mediators explained 24% (=0.213/0.892) of the relationship between being highly educated and buying stocks. Notably, the estimated difference in the log-odds of buying stocks between the full model and the reduced model

Table 4 The contribution of each mediator to the indirect effects, using the KHB method. Reproduced with permission from the 2011 Chinese Household Finance Survey

	Stocks (%)	Fixed-income financial products (%)
Both spouse college+		
Logged household income	32	35
Number of houses owned	6	3
Number of cars owned	20	25
Information acquisition	8	5
Interested in economics	7	22
Risk tolerance	26	10
Neither spouse college+		
Logged household income	29	37
Number of houses owned	9	4
Number of cars owned	9	14
Information acquisition	31	24
Interested in economics	3	11
Risk tolerance	20	9

$N = 3848$. Values may not add up to 100 due to rounding. The variable "information acquisition" means that respondents' main methods of obtaining information included the Internet, SMS, and/or family/friends/coworkers

was statistically significant ($p = 0.032$). Overall, Table 3 shows that adding the mediators significantly explained some of the relationship between investing in stocks/fixed-income financial products and being either a highly-educated couple in which both spouses had at least some college education or being the least-educated couple in which neither spouse had higher education. In contrast, the difference in investing between couples in which only the husband had higher education and couples in which only the wife had higher education could not be significantly explained by these mediators.

Since the mediators only significantly explained some of the relationship between investing and being highly educated or less educated, in Table 4, we present the contribution of each mediator to the indirect effect. As for the relationship between investing and being highly educated, we found that the degree of mediation was the largest for household income (32%), risk tolerance (26%), and number of cars owned (20%) in the model predicting stock purchasing, and the largest for household income (35%), number of cars owned (25%), and interested in economics (22%) in the model predicting household holdings of fixed-income financial products. In other words, compared with traditional couples in which only the husband had some college education, highly-educated couples in which both spouses had at least some college education were more likely to buy stocks partially because they had higher household income and wealth and were more risk tolerant; highly-educated couples' greater household income, wealth, and interest in information on economics mainly accounted for their higher likelihood of buying fixed-income financial products. Thus, it seems that while household income and wealth were very important for both investment items, attitudes toward risks played a larger role in predicting whether to buy stocks, and spouses' interest in economics (as a proxy for financial literacy) played a larger role in predicting household holdings of fixed-income financial products.

As for the relationship between the less-educated couples and investing, we found that the degree of mediation was largest for information acquisition (31%), household income (29%), and risk tolerance (20%) in the model predicting the purchase of stocks. In the model predicting the purchase of fixed-income financial products, the degree of medication was largest for household income (37%), information acquisition (24%), and number of cars owned (14%). In other words, compared with traditional couples, the less-educated couples were less likely to buy stocks partially because they lacked the means to obtain information (either through the Internet, SMS, or social networks), income, and risk tolerance; they were also less likely to buy fixed-income financial products because they had limited economic resources and information.

These results demonstrated that if two spouses differed in education, couples with more-educated wives were not drawn toward more conservative financial decisions than couples with more-educated husbands, suggesting that spouses were more likely to follow the cooperative model in making investment decisions. Meanwhile, the educationally homogamous couples (involving two highly-educated spouses or two less-educated spouses) were significantly different from traditional couples in financial participation. Based on these results, we found evidence that partially supported *Hypothesis 1* about the relationship between couples' educational pairing and investing in stocks and fixed-income financial products. In contrast to *Hypothesis 1a*, we observed that non-normative couples with highly-educated wives only and traditional couples with highly-educated husbands only did not significantly differ in owning either stocks or fixed-income financial products. *Hypothesis 1b* was partially supported as couples with two highly-educated spouses were more likely to purchase stocks than traditional couples but were not significantly different in owning fixed-income financial products. In line with *Hypothesis 1c*, couples with two less-educated spouses were less likely to purchase both stocks and fixed-income financial products than traditional couples.

Urban Residency and Household Finance

In terms of urban residency, we found that urban couples were more likely to invest. In Models 1 and 3 in Table 2, holding other covariates constant and compared with migrant couples, urban couples were 354% more likely to own stocks and 215% more likely to own fixed-income financial products (stocks: $\beta = 1.512$, $\exp(\beta) = 4.536$, $p < .001$; fixed-income financial products: $\beta = 1.148$, $\exp(\beta) = 3.152$, $p < .001$).

Tables 2 and 3 indicate that urban couples were still more likely than migrant couples to make financial investments even after controlling for their economic resources, information acquisition, interests in economics, and risk tolerance. In Table 2, the coefficients for urban couples barely changed from Model 1 to 2 or from Model 3 to 4. Results in Table 3 further confirmed that the estimated difference in the log-odds of owning stocks or fixed-income assets between the full model and the reduced model for urban couples was not significant ($p = .117$ and .086, respectively). In other words, urban couples' advantages in household financial participation over migrant couples could not be explained by the mediators considered here.

These findings supported *Hypothesis 2* that urban couples who lived in urban areas and had urban *hukou* were more likely than migrant couples to own stocks and fixed-income assets. In contrast to prior research showing that immigrant couples living in the United States were disadvantaged in investing mainly due to their limited wealth and low risk tolerance (Cobb-Clark and Hildebrand 2006), the gap in investing between urban and migrant couples living in Chinese cities was so stark that it was not significantly explained by economic resources, information acquisition, interest in economic information, or risk attitudes.

Discussion and Conclusion

This study investigated which type of married couple in urban China was more likely to buy stocks and fixed-income financial products. We paid attention to the impact of household structures in terms of the educational pairing of spouses and institutional structures represented by couples' urban residency. The findings of this study demonstrate that in addition to being influenced by economic resources, financial literacy, and risk tolerance (Cobb-Clark and Hildebrand 2006; Finke and Huston 2003; Nau 2013), household financial decisions are shaped by both family structures and political institutions. Results show that the more educated the couples are, the more likely they are to purchase stocks and fixed-income financial products. Couples with two highly-educated spouses have a higher likelihood of purchasing high-risk stocks than couples with well-educated husbands only. Couples with two less-educated spouses are the least likely to make either type of investment. Compared with migrant couples, urban couples are more likely to buy both stocks and fixed-income financial products. Although fixed-income financial products are less risky than stocks in general, households that are willing to buy stocks are not necessarily interested in purchasing fixed-income financial products; households that are unwilling to purchase fixed-income financial products are sometimes interested in stocks.

We find that couples with only highly-educated wives are just as likely to invest as couples with only highly-educated husbands, controlling for risk tolerance attitudes, gender of the household head, and other covariates. Our result is in keeping with other research that showed financial risk taking of households with wives as primary earners was similar to that of households with husbands as primary earners (Jianakoplos and Bernasek 2008). These findings suggest that even though women are generally less risk tolerant than men, it does not mean that households with advantaged wives (e.g., better-educated or higher-earning wives relative to their husbands) are always less active in their investments. In our case, it is possible that when only one spouse is college educated, he or she influences the less-educated partner by sharing social network, knowledge, and risk attitudes, leading the couple to make cooperative financial decisions based on pooled resources. Our study thus adds to the existing literature by providing empirical evidence for the cooperative model rather than the bargaining model in explaining financial decisions among Chinese families.

This study advances the literature by showing that despite China's surge in economic prosperity, households are not participating equally in financial investments. This is due to inequality in the allocation of resources such as assets and education as well as institutional advantages associated with urban residency (Afridi et al. 2015; Chen et al. 2015; Wu 2004). Urban couples are consistently more likely to invest in stocks and fixed-income financial products compared to migrant couples. Migrant couples without urban residency, even those with high household income and wealth, generally resist investing. They may prioritize savings due to a sense of insecurity or may be culturally attached to their original families in rural areas where investing is outside of the cultural norm. There is already growing wealth inequality between migrants and urban residents in large Chinese cities (Xie and Jin 2015). The concern is that if the disparity between groups' financial habits continues as it has in American society (Nau 2013), it will perpetuate the same growing inequities in Chinese society. Notably, there is no specific policy that prohibits rural migrants from opening financial accounts in the cities. The within-household decision-making process may thus be particularly important for household financial participation.

Our study has several limitations that need to be addressed in future research. First, due to data limitation, we only examined household participation in financial investing as a binary outcome. An investigation into investment portfolio composition, such as percentage allocations to stocks and fixed-income products, would help better understand the role of educational pairing and urban residency in household finances. Future research could also consider other household investments, such as savings and social welfare (e.g., pension plan), and investigate how they are affected by couples' educational pairings and residency statuses. In addition, due to the lack of longitudinal data, this study is not able to draw causal conclusions. Instead, we could only identify the association between primary factors (i.e., household financial participation and couples' educational pairings/urban residency). Future longitudinal research could track changes in primary factors over time to better identify their causal relationships. Finally, we find that migrant couples are less likely than urban couples to invest in financial products, but this disparity cannot be explained by variables we considered, including economic resources, financial literacy, methods of information acquisition, and risk tolerance. Qualitative research is much needed to uncover the mechanisms that prevent migrant couples from investing. It would also be helpful if longitudinal data or additional survey questions become available to assess whether disadvantages of migrants in investing shrink among those who remain in cities for long periods (Kim et al. 2012), who plan to settle down (Yao and Xu 2015), or whose hometowns resemble the destination cities to a high extent (Osili and Paulson 2008).

In summary, the findings of this study suggest that the trend that involves households in private investing probably starts with high-status groups, considering that more-educated, non-migrant couples are more likely than their less-educated, migrant counterparts to make financial investments. In other words, we found that financial markets are dominated by families with knowledge, economic resources, and institutional privileges. These benefited families could translate their advantages in education and political institutions into additional income through financial activities. As household wealth increases dramatically in China (Xie and Jin 2015) and financial markets evolve, our study contributes to the understanding of the causes and consequences of household financial investment decisions.

Acknowledgements The authors appreciate comments on earlier drafts from Megan Doherty Bea, Bill Lavely, and Erin York Cornwell and feedback from the Center for China Financial Research at University of Colorado Denver. We gratefully acknowledge funding support from the Department of Sociology at the University of British Columbia and thank Southwestern University of Finance and Economics in China for providing the data and responding to our questions. An earlier version of this paper was presented at the 2017 Annual Meeting of American Sociological Association.

Funding Yue Qian received funding support from the Department of Sociology at the University of British Columbia.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Research Involving Human and Animal Participants This article does not contain studies with human participants or animals by any of the authors.

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Ningzi Li is currently a postdoctoral research assistant at University of Colorado Denver Business School. She received her Ph.D. in sociology from Cornell University in 2017. Her research focuses on sociology of finance. She has been investigating how financial behaviors of governments, corporations, and households are shaped by socio-political institutions in emerging economies.

Yue Qian is an Assistant Professor in the Department of Sociology at the University of British Columbia, which she joined in 2016 after receiving her Ph.D. from the Ohio State University. Her research interests include social demography, family, and gender. Her recent projects have focused on how gender intersects with family and population processes, such as assortative mating, divisions of labor, parenthood, and migration, to shape individual well-being and societal inequality. She has conducted research on both East Asia and the United States.