Financial Decision-Making Responsibility and Household Wealth Accumulation Among Older Adults: A Comparative Advantage Perspective

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This article introduces collective rationality and comparative advantage into understanding household financial decision-making responsibility allocation and its relationship to wealth accumulation. Evidence from the Health and Retirement Study (HRS) shows that conscientiousness, memory, and numeracy are favorable personal attributes for household financial decision-making. Greater relative advantages in these attributes predict a higher probability of assuming financial responsibility. Households that assign the disadvantaged spouse as the financial decision-maker tend to have a lower total net worth and a lower financial net worth. Our results suggest that it is critical for financial planning professionals to engage both spouses in the initial discussion of household finances and to assess the efficiency of the status quo financial decision-making responsibility allocation.

Keywords: cognitive ability, financial decision-making, financial responsibility, personality, wealth

Household financial decision-making is critical to household wealth accumulation. It determines how much money is saved, how household financial resources are invested, what investment products are utilized, how much risk is taken, and therefore how much return can be achieved. These actions, in turn, directly lead to differences in household wealth. In the household context, who makes financial decisions for the household can be as critical as the financial decisions to make. In the intra-household bargaining framework, whether a person assumes financial decision-making responsibility for the household depends on their bargaining power. In the collective model, whether a person takes financial responsibility depends on the relative weights that the household assigns to this person's utility function. To this stream of literature, we introduce collective rationality and comparative advantages to household financial decision-making responsibility allocation.

Collective rationality (Browning & Chiappori, 1998; Chiappori, 1988) implies that deciding who makes financial decisions within a household is purely an efficiency problem where a Pareto efficient allocation implies the highest possible household wealth accumulation. The Roy model (1951) and household labor division model (Pollak, 2012) imply that whoever has comparative advantages in financial decision-making should assume the responsibility. We first empirically identify personal attributes that are associated with a higher likelihood of assuming the financial decision-making responsibility. Having a higher level of these attributes thus indicates higher productivity for sound financial decision-making as opposed to alternative household tasks. Thus, whoever has higher endowments of these attributes, that is, having relative advantages of favorable attributes than their spouse, would have comparative advantages in financial decision-making. We explicitly test whether relative advantages within a couple in personal attributes that favor financial decision-making enhance one's chance of taking the household financial decision-making responsibility. Finally, we provide the first empirical evidence that financial responsibility allocation is indeed an efficiency matter as suggested by the collective rationality model.

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At the individual level, ample evidence has shown that certain personal attributes such as the Big Five personality traits and cognitive abilities, especially numeracy and memory, contribute to sound financial decision-making. In general, conscientiousness and mental stability are positively (e.g., Davis & Runyan, 2016; Nyhus & Webley, 2001; Parise & Peijnenburg, 2017) and neuroticism is negatively (Ksendzova et al., 2017) associated with better financial management. These three traits also predict savings, debts, and financial distress (Asebedo et al., 2019; Nyhus & Webley, 2001; Parise & Peijnenburg, 2017; Xu et al., 2015). Studies also show that higher numeracy predicts better financial decisions (Agarwal & Mazumder, 2013; Banks et al., 2010; Estrada-Mejia et al., 2016; Gerardi et al., 2013), and poor working memory interferes with financial decision-making especially for seniors (e.g., Banks et al., 2010; Christelis et al., 2010). In the household context, evidence from Australia suggests that the husband's and wife's respective personality and cognitive abilities explain financial responsibility allocation (Johnston et al., 2016). In a US study, word recall ability and numeracy explain who makes the financial decision for the household (Smith et al., 2010).

We add to household financial decision-making literature by unifying the effects of personality and cognitive abilities such as numeracy and memory under the framework of comparative advantage. We identify personality and cognitive abilities that favor household financial decision-making as opposed to alternative housework, and we show a spouse who has relative advantages in these personal attributes that are more likely to assume financial decision-making responsibility. This result shows that relative advantage in these attributes is an indicator of comparative advantage in financial decision-making. Based on these empirical rules of financial responsibility allocation, we construct measures of responsibility misallocation that show their negative association with household wealth, a measure of the efficiency of household financial decision-making.

We use the Health and Retirement Study (HRS) data to study household financial decision-making responsibility allocation and its impact on household wealth. For the rest of the article, we refer to the financial decision-making responsibility as "financial responsibility." Following Smith et al. (2010) and Hsu and Willis (2013), we define the financial decision-maker of a household as the financial respondent reported in the HRS, that is, the spouse who was more knowledgeable about household finances and answered survey questions about housing, income, and assets. We first examine how financial responsibility is determined by the couple's respective personality and cognitive abilities and whether the gradients of these personal attributes vary by gender. We find that conscientiousness and numeracy are favorable for taking the decision-making role regardless of gender; however, memory and numeracy have higher marginal effects for men than for women in predicting financial responsibility assumption. In addition, in light of the Roy model of self-selection into an occupation, we examine whether the within-couple relative strengths in personality and cognitive abilities also determine financial responsibility allocation. We find that the spouse with greater relative advantages in conscientiousness, memory, and numeracy is more likely to assume the financial responsibility and that whoever has relative advantages in memory and numeracy is more likely to assume the responsibility.

Moreover, we test the notion of collective rationality that the ultimate goal of household financial responsibility allocation is to achieve the highest possible household wealth. We quantify how much an inefficient allocation takes its toll on household wealth. Allocation efficiency is achieved when the financial responsibility is allocated based on the couple's respective strengths and relative advantages in personality and cognitive abilities. We measure the inefficiency of the status quo financial responsibility allocation by the counterfactual probability of the non-financial respondent taking the financial responsibility. We show that inefficient financial responsibility allocation lowers household total net worth and total financial net worth. We interpret the lower household wealth associated with financial responsibility misallocation as the opportunity cost of sound financial decision-making. We establish the notion of Pareto efficient allocation based on personality and cognitive abilities, which could be the mechanism that explains the link between financial respondent's personality and the wealth of Irish households (Mosca & McCrory, 2016) and that between a couple's respective personality and the wealth of US households (Duckworth & Weir, 2010). Our findings add to the descriptive findings that households that choose the less-numerate spouse to make financial decisions tend to have lower total net worth and financial net worth than their counterparts (Smith et al., 2010).

Conceptual Framework

Allocation of Household Financial Responsibility

Various theoretical models have been introduced to conceptualize the household financial decision-making process (Bertocchi et al., 2014; Elder & Rudolph, 2003; Johnston et al., 2016; Smith et al., 2010). The bargaining model assumes that each household member has a utility function, and they negotiate with each other to reach Pareto efficiency. Hence, who assumes financial responsibility depends on each spouse's bargaining power. Factors such as employment status, earnings/income, education, and age affect financial responsibility allocation through bargaining power. A study found that a wife was more likely to take the decision-making role in Australian households if she was working (Johnston et al., 2016). Similarly, a husband was less likely to be the financial respondent in US households after he retired (Elder & Rudolph, 2003). A higher wife's wage increases her chance of assuming household financial responsibility, which is true with Italian, US, and Australian households (Bertocchi et al., 2014; Elder & Rudolph, 2003; Johnston et al., 2016). Likewise, a higher husband's earning increased his chance of being the decision-maker in Italian, US, and Australian households (Bertocchi et al., 2014; Elder & Rudolph, 2003; Johnston et al., 2016). Besides, a greater gender wealth gap was associated with a higher probability of the husband having the final say about finances in German households (Grabka et al., 2015). In Italian households, a wife was more likely to be the financial respondent if she was older, or had attained more education, or made more income than her husband (Bertocchi et al., 2014).

In the collective model (Browning & Chiappori, 1998; Chiappori, 1988), the household utility function is a weighted sum of the household members' utility functions, where the weights are called the Pareto weights. The collective model allows personal attributes such as personality, cognitive abilities, and health to affect household financial responsibility allocation. Conscientiousness increased and agreeableness decreased one's probability of making financial decisions in Australian households regardless of gender (Johnston et al., 2016). The same study also concluded that mental health is more important than physical health in predicting financial responsibility allocation. Among US HRS households, word recall and numeracy increased both husband's and wife's probability of being the financial respondent for the family (Smith et al., 2010). Moreover, cognition decline often led to switching financial responsibility allocation within the household, especially after a diagnosis of memory disease (Hsu & Willis, 2013).

Comparative Advantage in Household Economics

The Roy model of occupational choice and Becker's sexual division of labor provide insights on how to select a decision-maker for the household based on comparative advantages. In the original Roy model (Roy, 1951), two agents choose between two occupations that demand two different sets of skills, and each agent possesses both sets of skills but can only use one skill or the other. An income maximizing agent will self-select into an occupation that gives them the higher expected earnings based on their skills. Heckman and Sedlacek (1990) extended the income-maximizing model to a utility-maximizing model, relaxed the assumption of a normal distribution of skills, and introduced nonparticipation in the market. The Roy model has been applied to explain women's choice between market and nonmarket work (Heckman, 1974), a worker's choice between the union and nonunion sectors (Lee, 1978), and later to high-dimensional occupational choices. In a household setting, Becker introduced a household production model to understand the allocation of time between leisure and labor (Becker, 1965), an extension was made in Becker (1981) to include sector-specific human capital in the framework.

The sexual division of labor within a household was first discussed in Becker (1981), focusing on the intrinsic comparative advantages of women in production of children and childcare. The "specialization theorems" concluded that efficiency implies specialization, that is, both spouses do not allocate time to both sectors. A later model moved away from intrinsic comparative advantages and found that investments in specific human capital encourage a division of labor that reinforces the effects of comparative advantage (Becker, 1985). Pollak (2012) formalized a model and showed that spouses in an efficient household will specialize if their time inputs are perfect substitutes. The Roy model and its extensions have important implications on the financial responsibility allocation of a household: an efficiency-seeking household will assign whoever has comparative advantage in financial decision-making to assume the responsibility. The psychology and economics literature show that certain personality traits and cognitive abilities are related with better financial outcomes, which implies that the person who processes higher levels of these

personal attributes has comparative advantages in making financial decisions.

Hypotheses

If we consider a production function where personal attributes are factors for production of sound financial decisions, certain personality traits and cognitive abilities have higher productivities in making sound financial decisions as opposed to alternative housework. We thus begin our empirical analysis by testing the following hypothesis to identify personal attributes that favor household financial responsibility assumption:

> **H1:** A couple's respective personality traits and cognitive abilities predict their probability of being the financial decision-maker of the household.

The Roy model of self-selection into an occupation and its extensions imply that whoever has the comparative advantages in managing household finances should take the financial decision-making responsibility. In this context, comparative advantage means achieving financial decision-making efficiency with a lower sacrifice of the efficiency of alternative housework. From H1, we can identify personal attributes that have higher marginal productivity in financial decision-making as opposed to alternative household tasks. As a result, who have higher endowments in these personal attributes would have the comparative advantage in household financial decision-making. To achieve the maximum efficiency, this person should be the primary financial decision-maker of the household. We empirically test the following hypothesis:

> **H2:** Relative advantages in personality attributes that favor financial decision-making are associated with a higher probability of taking financial responsibility.

In light of the collective rationality, who makes financial decisions in a household is an efficiency problem. Thus, if a household achieves its Pareto optional financial responsibility allocation based on a couple's respective or relative advantages in personality and cognitive abilities, they would have achieved the highest possible wealth level. If the allocation violates the empirical rules, the allocation is inefficient and would harm their wealth. We thus developed a measure of allocation inefficiency based on the empirical model of financial responsibility allocation discussed above and tested the following hypothesis:

> **H3:** Inefficient allocation of financial responsibility is associated with lower household wealth.

Method

Data

Our sample was drawn from the HRS, the largest survey in the United States on retirees and those approaching their retirement age. The HRS first started in 1992 and took place every two years. This baseline sample used 10 waves of the HRS from 1992 to 2012 excluding Wave 3 due to the unavailability of total wealth in that wave. Each observation was a married couple observed in an HRS wave. The sample was selected by the following standards: (1) households in which the respondent and spouse were both alive; (2) households with available information on the number of marriages; (3) households with available information on both spouses' personality measures; and (4) households in which the spouses were of different genders. In the raw sample of the HRS, only 46 households were same-sex couples. Across all waves, they contributed a total of 214 observations, equivalent to less than 0.2% of our sample. We dropped them from the sample because the sample size was too small for a separate analysis to distinguish the difference between same-sex couples and opposite-sex couples.

If a couple divorced and either partner formed a new household with a new partner, we defined the new couple as a new household. We had 26,057 observations for the baseline analysis. For a robustness check, we only used the subsample of household observations in the wave where they first appeared in the HRS survey, which resulted in 3,579 observations. As a second robustness check, we controlled for potential confounders including risk preference, financial planning horizon, life expectation, and money management difficulty. The sample size was reduced to 2,335 due to missing values of these additional control variables.

We followed Smith et al. (2010) and Hsu and Willis (2013) to define the major financial decision-maker in a household as the HRS financial respondent, the member of the couple who was most knowledgeable about household finance and answered the household-level survey questions about housing, income, and assets. We used three variables to quantify household wealth accumulation: total net worth, financial

net worth, and the share of financial wealth held in risky assets. The total net worth was the net value of the primary and secondary residence and real estate, plus the net value of vehicles and financial net worth. The financial net worth was the sum of the net values of businesses, IRA, Keogh accounts, stocks, mutual funds, and investment trusts, the value of checking, savings, or money market accounts, value of CD, government savings bonds, and T-bills, the net value of bonds and bond funds, and the net value of all other savings. We defined risky assets as stocks, mutual funds, and investment trusts, following a narrow definition of risky assets in Friend and Blume (1975). In our baseline sample of 26,057 observations, 588 observations had negative total net worth, and only one observation had negative financial net worth. To adjust for the skewness of the dollar amount measures and the negative values, we took the inverse hyperbolic sine (IHS) transformation (Burbridge et al., 1988) of the total net worth and the financial net worth. The advantage of the IHS transformation is that it can transform negative values. The coefficient of the regression can be interpreted as the percentage change in the outcome variables (Bellemare & Wichman, 2019).

For psychological characteristics, we used the Big Five personality traits and two measures of cognitive ability—memory and numeracy. The Big Five—conscientiousness, emotional stability, agreeableness, extraversion, and openness—were measured through the HRS Leave Behind survey. Each respondent was measured twice in total. The respondents were drawn in each biennial wave from a rotating and random 50% sample of the core panel. Those surveyed in Wave 8 and Wave 9 were surveyed again in Wave 10 and Wave 11. The Midlife in the United States (MIDUS) personality scales (Lachman & Weaver, 1997) were used in Waves 8 and 9 and additional items from the International Personality Item Pool (Goldberg et al., 2006) were added in Waves 10 and 11 to expand coverage of facets of conscientiousness. All items used to construct the personality measures were reported in Table A1. The Big Five personality trait measures have been validated for the HRS data in various studies (e.g., Iveniuk et al., 2014; Tharp et al., 2020). The measure of memory was available from Wave 1 to Wave 10, while the measure of numeracy was available from Wave 2 to Wave 10. To deal with attrition, we extrapolated missing values of cognitive abilities for the remaining waves, and we standardized the measures to ease the interpretation of estimation results. We followed Johnston et al. (2016) to take the average of a trait measured in available waves and standardized the average to have mean zero and standard deviation one. The standardized score was then assigned to all waves.

Empirical Models

We used the following linear probability models to test H1 to identify personal attributes that favor household financial responsibility assumption:

$$MFR_{it} = \sum_{k=h,w} \left(\alpha_c^k C_i^k + \alpha_s^k S_i^k + \alpha_e^k E_i^k + \alpha_a^k A_i^k + \alpha_o^k O_i^k + \alpha_m^k M_i^k + \alpha_n^k N_i^k\right) + \sum_{k=h,w} X_{it}^k \beta_i^k + X_{it}\gamma + \epsilon_{it} \quad \text{(Eq1)}$$

The dependent variable was the allocation of financial decision-making responsibility, which was assigned to either the husband or the wife since we only included opposite-sex couples in our sample. Thus, MFR_{it} took a value of 1 if the financial respondent of household i observed at time t was a male and 0 otherwise. The vector, C_i^k, S_i^k, E_i^k, A_i^k, O_i^k, M_i^k, N_i^k, represented the value of conscientiousness, emotional stability, extraversion, agreeableness, openness, memory, and numeracy for husband (if $k = h$) or wife (if $k = w$) of household I, respectively, which were measures of the couple's *absolute* strengths in personality and cognitive abilities. X_i^k represented a vector of individual characteristics for husband (if $k = h$) or wife (if $k = w$) of household i observed at time t, X_{it} represented a vector of household-level characteristics for household i observed at time t, and ϵ_{it} was an error term. Specifically, X_{it} included husband's and wife's respective employment status, race, physical health, and HRS birth cohorts, their differences in their age, education, and earnings, their number of children, and the HRS wave fixed effects. The household-level cross-sectional weights were applied and standard errors were clustered at the household level. For a robustness check, we controlled for potential confounders including risk preference, financial planning horizon, life expectation, and money management difficulty.

To test H2, we measured the couple's relative strength in personality and cognitive abilities by (1) the difference between the husband's and wife's values in each of these personal attributes and (2) a vector of dummy variables that took a value of 1 if the husband had a higher value than the

wife for each of these personal attributes. In a regression model, we first regressed MFR_{it} on a vector of spousal differences in each of the Big Five personality traits and the two cognitive ability measures, defined by the husband's value minus the wife's value, controlling for the individual-level and household-level characteristics as in Equation 1. In the following estimation equation, the household-level cross-sectional weights were applied and standard errors were clustered at the household level:

$$MFR_{it} = \alpha_c\left(C_i^h - C_i^w\right) + \alpha_s\left(S_i^h - S_i^i\right) + \alpha_e\left(E_i^h - E_i^i\right) + \alpha_a\left(A_i^h - A_i^i\right) + \alpha_o\left(O_i^h - O_i^i\right) + \alpha_m\left(M_i^h - M_i^i\right) + \alpha_n\left(N_i^h - N_i^i\right) + \sum_{k=h,w} X_i^k\beta_i^k + X_i\gamma + \epsilon_{it} \quad \text{(Eq2)}$$

In a second model, we regressed MFR_{it} on a vector of indicators for husband having a relative advantage, that is, a higher value of a personal attribute than the wife, controlling for individual-level and household-level characteristics as in Equation 1. The estimation equation was:

$$Male\,FR_{it} = \alpha_c 1_{\left(C_i^h > C_i^w\right)} + \alpha_s 1_{\left(S_i^h > S_i^w\right)} + \alpha_e 1_{\left(E_i^h > E_i^w\right)} + \alpha_a 1_{\left(A_i^h > A_i^w\right)} + \alpha_o 1_{\left(O_i^h > O_i^w\right)} + \alpha_m 1_{\left(M_i^h > M_i^w\right)} + \alpha_n 1_{\left(N_i^h > N_i^w\right)} + \sum_{k=h,w} X_i^k\beta_i^k + X_i\gamma + \epsilon_{it} \quad \text{(Eq 3)}$$

where $1_{(x)}$ was an indicator function that took a value of 1 if the statement was true and 0 otherwise. The household-level cross-sectional weights were applied and standard errors were clustered at the household level.

To H3, we needed to convert multidimensional strengths and relative advantages in these personal attributes to a one-dimensional measure of allocation inefficiency. We first constructed an index of financial responsibility misallocation, defined as the counterfactual probability of the comparatively disadvantaged spouse assuming household financial responsibility. A greater probability indicated a higher degree of financial responsibility misallocation. In a regression framework, we used the following model:

$$F_{it} = \theta M_{it} + \gamma Z_{it} + \epsilon_{it}$$

$$where\ M_{it} = \left\{ \begin{array}{ll} 1 - \widehat{p_{it}}, & if\ FR_{it}\ is\ male; \\ \widehat{p_{it}}, & if\ FR_{it}\ is\ female. \end{array} \right\} \quad \text{(Eq 4)}$$

The dependent variable, F_{it}, was one of three financial outcomes for a d *i* observed at time *t*, namely, total net worth, financial net worth, and share of financial net worth in risky assets. M_{it}, was an index of financial responsibility misallocation. To construct this index, we first estimated the probability of a male financial respondent based on Equation 1, denoted as $\widehat{p_{it}}$. If the husband indeed was the financial decision-maker, we used the predicted probability of the wife assuming financial responsibility as the misallocation index, that is, $1\text{-}\widehat{p_{it}}$. If the wife was the financial decision-maker, the misallocation index was defined by the predicted value of the husband's probability of assuming financial responsibility, that is, $\widehat{p_{it}}$. In this equation, we only controlled for household-level characteristics Z_{it}, namely, total household income in $10,000, the number of children, and wave fixed effects. The household-level cross-sectional weights were used and standard errors were clustered at the household level.

Sample Description

Table 1 reports summary statistics for financial respondent and the spouse's characteristics, as well as household-level information. In our sample, 65% of the households had a male financial respondent. Compared with their spouse, financial respondents had a higher average value of conscientiousness (0.04 vs. 0.02), emotional stability (0.09vs. -0.05), openness (0.03 vs. 0.01) but a lower value of extroversion (0.00 vs. 0.03) and agreeableness (-0.07 vs. 0.11). However, both financial respondents and spouses had the same standardized memory ability value of 0.02 on average. By comparison, financial respondents had a higher numeracy ability (0.14 vs. -0.05).

The self-reported health status for financial respondents and spouses were close to each other (3.48 and 3.45, respectively). On average, financial respondents were better educated than spouses with an additional 0.5 years of education. Financial respondents also had average earnings of $21,000, compared with the average earnings of $14,300 of spouses (all dollar values were in US currency). While 39% of financial respondents were employed and 54% were retired, these shares were slightly lower for the spouses (37% and

TABLE 1. Summary Statistics

	Mean	SD	Min	Max
FR: conscientious	0.040	0.900	−4.850	2.390
FR: stability	0.090	0.970	−3.620	1.960
FR: extroversion	0.000	0.970	−4.340	2.100
FR: agreeableness	−0.070	1.010	−5.690	1.260
FR: openness	0.030	0.940	−4.440	2.680
FR: memory	0.020	0.910	−5.800	14.430
FR: numeracy	0.140	0.870	−9.680	12.370
FR: self-reported health	3.480	1.020	1.000	5.000
FR: years of education	13.400	2.800	0.000	17.000
FR: earnings in $10,000	2.100	4.390	0.000	104.600
FR: age	64.730	9.000	37.000	100.000
FR: employed	0.390	0.490	0.000	1.000
FR: retired	0.540	0.500	0.000	1.000
FR: White	0.900	0.300	0.000	1.000
FR: Black	0.070	0.250	0.000	1.000
SP: conscientious	0.020	0.970	−5.220	2.390
SP: stability	−0.050	0.960	−3.440	1.960
SP: extroversion	0.030	0.980	−3.860	2.070
SP: agreeableness	0.110	0.950	−5.260	1.280
SP: openness	0.010	0.980	−4.630	2.680
SP: memory	0.020	1.050	−15.910	15.640
SP: numeracy	−0.050	1.050	−11.650	10.410
SP: self-reported health	3.450	1.030	1.000	5.000
SP: years of education	12.900	2.800	0.000	17.000
SP: earnings in $10,000	1.430	2.980	0.000	110.000
SP: age	63.500	9.500	32.000	96.000
SP: employed	0.370	0.480	0.000	1.000
SP: retired	0.500	0.500	0.000	1.000
SP: White	0.890	0.310	0.000	1.000
SP: Black	0.070	0.250	0.000	1.000
Male financial respondent	0.650	0.480	0.000	1.000
Total net worth in $10,000	57.790	116.680	−224.550	4351.200
Financial net worth in $10,000	31.680	84.620	−0.520	4309.500
% in risk assets	0.150	0.260	0.000	1.000
Total household income in $10,000	7.920	10.040	0.000	553.900
Number of children	3.270	1.890	0.000	20.000
N				26,057

Note. Each observation is a married couple observed in an HRS wave. FR refers to the financial respondent of each family, while SP refers to the spouse.

50% respectively), indicating a larger share of spouses than financial respondents were unemployed, disabled, or not in the labor force. At the household level, the average total net worth was about $577,900; the average financial net worth was about $316,800, among which an average of 15% was in the form of risky assets. Finally, the mean total household income was $79,200 with an average of 3.3 living children per household including adult or minor children or step-children of the HRS respondent and spouse.

Results

Allocation of Financial Responsibility

We first investigated how a couple's respective strengths and relative advantages in personality and cognitive abilities explain household financial responsibility allocation (Table 2). In Column 1, we used the husband's and wife's respective personality traits and cognitive abilities to predict the allocation of financial responsibility. Results suggest that the husband's conscientiousness, memory, and numeracy increased and his openness decreased his probability of assuming financial responsibility. At the same time, the wife's conscientiousness, mental stability, and numeracy decreased her husband's probability and, thus, increased her own probability of assuming financial responsibility. Such patterns imply that anyone with higher conscientiousness was more likely to be the financial respondent. The same pattern held for numeracy, while other personal attributes only statistically enhanced one spouse's chance of assuming financial responsibility.

We used a series of *t* tests to formally test whether the same personality trait or ability could have different effects on the two genders' probability of assuming financial responsibility. Results show that memory and numeracy had greater effects for husbands than for wives at the 0.1% significance level, and openness had different effects for husband and wife at the 2% significance level. In other words, the wife needed to outperform her husband significantly in these traits to achieve the same probability of being the financial decision-maker. Such gender difference may reflect the gender stereotype that exaggerates men's ability (Bordalo et al., 2019) or men's overconfidence in their financial ability (Barber & Odean, 2001).

Column 2 reports how a couple's degree of relative advantages in personality and cognitive abilities explained household financial responsibility allocation. Results show that a higher husband's advantage over the wife in conscientiousness predicted a higher probability of the husband assuming financial responsibility. Given that the dependent variable of the husband being the financial respondent was the opposite of the wife being the financial respondent, the results could also be interpreted as a wife's greater relative advantage in conscientiousness, memory, and numeracy enhanced her probability of assuming financial responsibility.

In Column 3, we used relative advantages in personality and cognitive abilities to predict the allocation of financial responsibility. Results show that male disadvantages in memory and numeracy increased the husband's chance of having financial responsibility. They also imply that the wife's advantages in these two personal attributes increased the wife's chance of taking financial responsibility. In sum, the findings shown in Table 2 suggest that conscientiousness, memory, and numeracy consistently favored household financial responsibility, and whoever had relative advantages in these attributes within the household tended to assume the financial responsibility.

Robustness Checks

We performed two robustness checks. First, although the allocation of financial responsibility rarely switched hands in our sample (descriptive table available upon request), we would like to test whether the patterns discovered in Table 2 held for the initial allocation of financial responsibility. We ran the same analysis as in Table 2 but only used the subsample of household observations in the wave where they first appeared in the HRS survey. The sample size reduced to 3,579. Overall, results reported in Table 3 show similar patterns. In summary, the financial responsibility allocation rules based on strengths and relative advantages in consciousness, memory, and numeracy in subsequent waves still applied to the initial allocation of financial responsibility.

For a second robustness check, we included additional control variables, such as the husband and wife's risk aversion, financial planning horizon, life expectation, and difficulty in managing money. These are potential confounders that could be correlated with household financial decision-making (Hsu & Willis, 2013; Mazzocco, 2007; Spaenjers & Spira, 2015; Yao & Xu, 2015; Yilmazer & Lich, 2015). Results in Table 4 came from a subsample of observations in HRS Waves 4, 5, 6, 8 (N = 2,335), where additional control variables were available. To ease the comparison, odd-numbered columns show

TABLE 2. The Allocation of Financial Responsibility—Baseline

Variables	(1)	(2)	(3)
	Male financial respondent	Male financial respondent	Male financial respondent
Husband: conscientious	0.032**		
	(0.010)		
Wife: conscientious	−0.023*		
	(0.010)		
Husband: stability	−0.003		
	(0.009)		
Wife: stability	−0.020*		
	(0.009)		
Husband: extroversion	0.002		
	(0.012)		
Wife: extroversion	0.010		
	(0.012)		
Husband: agreeableness	−0.013		
	(0.010)		
Wife: agreeableness	0.011		
	(0.013)		
Husband: openness	−0.024*		
	(0.011)		
Wife: openness	−0.009		
	(0.010)		
Husband: memory	0.073***		
	(0.011)		
Wife: memory	−0.001		
	(0.011)		
Husband: numeracy	0.103***		
	(0.011)		
Wife: numeracy	−0.052***		
	(0.010)		
H-W difference in conscientious		0.027***	
		(0.007)	
H-W difference in stability		0.009	
		(0.007)	
H-W difference in extroversion		−0.002	
		(0.008)	
H-W difference in agreeableness		−0.015	
		(0.008)	
H-W difference in openness		−0.009	
		(0.008)	
H-W difference in memory		0.039***	

(*Continued*)

TABLE 2. The Allocation of Financial Responsibility—Baseline *(Continued)*

Variables	(1)	(2)	(3)
		(0.009)	
H-W difference in numeracy		0.075***	
		(0.008)	
Conscientious: husband is higher			0.030
			(0.019)
Stability: husband is higher			0.028
			(0.018)
Extroversion: husband is higher			−0.017
			(0.020)
Agreeableness: husband is higher			−0.028
			(0.022)
Openness: husband is higher			0.012
			(0.018)
Memory: husband is higher			0.049*
			(0.019)
Numeracy: husband is higher			0.150***
			(0.018)
H-W difference in age	0.002	0.002	0.000
	(0.003)	(0.003)	(0.003)
H-W Difference in education	0.016***	0.017***	0.021***
	(0.003)	(0.003)	(0.003)
H-W Difference in earnings	0.004**	0.005***	0.005***
	(0.001)	(0.001)	(0.001)
Constant	0.678***	0.495***	0.407***
	(0.087)	(0.085)	(0.089)
H0: Effects of husband's conscientious and wife's conscientious had the same absolute value			
p-value	.532		
H0: Effects of husband's stability and wife's stability had the same absolute value			
p-value	.072		
H0: Effects of husband's extroversion and wife's extroversion had the same absolute value			
p-value	.434		
H0: Effects of husband's agreeableness and wife's agreeableness had the same absolute value			
p-value	.860		
H0: Effects of husband's openness and wife's openness had the same absolute value			
p-value	.020		

TABLE 2. The Allocation of Financial Responsibility—Baseline *(Continued)*

Variables	(1)	(2)	(3)
H0: Effects of husband's memory and wife's memory had the same absolute value			
p-value	.000		
H0: Effects of husband's numeracy and wife's numeracy had the same absolute value			
p-value	.000		
Observations	26,057	26,057	26,057
R^2	0.131	0.112	0.091

Note. Each observation is a married couple observed in an HRS wave. Dependent variable takes value of one if husband is the financial respondent and zero otherwise. Only the household observations in their initial wave of HRS are used. Additional control variables include husband's and wife's respective employment status, race, physical health, and their HRS birth cohorts, their differences in their age and education, the number of children, and wave fixed effects. The household-level cross-sectional weights are applied. The standard errors clustered at the household level are reported in parenthesis.
$^{*}p<.05$. $^{**}p<.01$. $^{***}p<.001$.

results without additional controls, while even-numbered columns report results with those controls. Overall, adding those control variables did not attenuate the effects of absolute and relative values of personality traits and cognitive abilities on financial responsibility allocation. Conscientiousness, memory, and numeracy remained the strongest predictors of financial responsibility allocation.

Misallocation of Financial Responsibility

In this section, we investigated the consequence of inefficient financial responsibility allocation on household wealth accumulation. Panel A used the inefficiency indicator that was constructed based on the husband's and wife's strengths in personality traits and cognitive abilities (Model 1 of Table 2). The constructed indicator of financial responsibility misallocation had an average of 0.39 for the sample, indicating that most coupled households efficiently allocated financial responsibility. In the sample, 30.76% of the households had an indicator greater than 0.5, meaning their financial responsibility was misallocated. In Panel B, when the inefficiency indicator was constructed based on the degree of relative advantages (Model 2 of Table 2), the sample average inefficiency indicator was 0.40 and 31.00% of the sample had an indicator greater than 0.5. In Panel C, the indicator was constructed based on whether the husband had relative advantages in personal attributes (Model 3 of Table 2). The constructed indicator of financial responsibility misallocation had a sample average of 0.41, and 32.22% of the households in the sample had an indicator greater than 0.5.

Based on the three indices of inefficiency, we tested whether inefficiency in financial responsibility would result in less favorable financial outcomes (Table 5). We controlled for the average personality traits and cognitive abilities as well as total household income and the number of children to account for cross-household variations that contribute to wealth. Results in Panel A suggest that a 100% financial responsibility inefficiency, for example, the husband made financial decisions when the couples' respective personality and cognitive abilities predicted that the wife should be the decision-maker with a probability of 1 or vice versa, resulted in an 88.3% reduction of total net worth and 85.9% reduction of financial net worth. The inefficient allocation did not appear to have statistically significant effects on the share of financial wealth held in risky assets. Results in Panel B show that a 100% financial responsibility inefficiency resulted in an 85.9% reduction of total net worth and a 76.3% reduction of financial net worth. Results in Panel C show that a 100% financial responsibility inefficiency resulted in an 86.4% reduction of total net worth, a 79.1% reduction of financial net worth, and a 4.1% lower share of risky assets. Results in Table 5 show a consistent wealth penalty of inefficient financial responsibility allocation.

Discussions, Limitations, and Implications

We contribute to the literature on household financial decision-making by introducing collective rationality and comparative advantage in explaining the allocation of financial responsibility. We first identify personality traits and cognitive abilities that have higher productivity in

TABLE 3. The Allocation of Financial Responsibility—Initial Wave

Variables	(1)	(2)	(3)
	Male financial respondent	Male financial respondent	Male financial respondent
Husband: conscientious	0.033**		
	(0.011)		
Wife: conscientious	−0.016		
	(0.011)		
Husband: stability	−0.011		
	(0.010)		
Wife: stability	−0.023*		
	(0.010)		
Husband: extroversion	−0.000		
	(0.013)		
Wife: extroversion	0.010		
	(0.012)		
Husband: agreeableness	−0.015		
	(0.011)		
Wife: agreeableness	−0.003		
	(0.014)		
Husband: openness	−0.024*		
	(0.012)		
Wife: openness	−0.003		
	(0.011)		
Husband: memory	0.055***		
	(0.012)		
Wife: memory	0.001		
	(0.012)		
Husband: numeracy	0.088***		
	(0.012)		
Wife: numeracy	−0.051***		
	(0.010)		
H-W difference in conscientious		0.025**	
		(0.008)	
H-W difference in stability		0.008	
		(0.008)	
H-W difference in extroversion		−0.003	
		(0.009)	
H-W difference in agreeableness		−0.012	
		(0.009)	
H-W difference in openness		−0.010	
		(0.009)	
H-W difference in memory		0.029**	
		(0.009)	

TABLE 3. The Allocation of Financial Responsibility—Initial Wave *(Continued)*

Variables	(1)	(2)	(3)
H-W difference in numeracy		0.067***	
		(0.008)	
Conscientious: husband is higher			0.029
			(0.020)
Stability: husband is higher			0.026
			(0.019)
Extroversion:hHusband is higher			−0.023
			(0.021)
Agreeableness: husband is higher			−0.015
			(0.023)
Openness: husband is higher			0.013
			(0.020)
Memory: husband is higher			0.042*
			(0.021)
Numeracy: husband is higher			0.135***
			(0.019)
H-W difference in age	−0.000	−0.000	−0.001
	(0.003)	(0.003)	(0.003)
H-W difference in education	0.014***	0.015***	0.018***
	(0.003)	(0.003)	(0.003)
H-W difference in earnings	0.008***	0.009***	0.010***
	(0.002)	(0.002)	(0.002)
Constant	0.785***	0.642***	0.576***
	(0.112)	(0.108)	(0.111)
Observations	3,579	3,579	3,579
R^2	0.144	0.131	0.116

Note. Each observation is a married couple observed in an HRS wave. Dependent variable takes value of one if husband is the financial respondent and zero otherwise. Only the household observations in their initial wave of HRS are used. Additional control variables include husband's and wife's respective employment status, race, physical health, and their HRS birth cohorts, the number of children, and wave fixed effects. The household-level cross-sectional weights are applied. The standard errors clustered at the household level are reported in parenthesis.
*p<.05. **p<.01. ***p<.001.

household financial decision-making. As discussed in the literature review, the Roy model and its extensions imply that whoever has the comparative advantage in household decision-making should be assigned the job to make financial decisions for the household. We show empirical evidence that greater relative advantages in conscientiousness, memory and numeracy or simply having relative advantages in memory and numeracy increase one's probability of taking financial responsibility. Our results confirm that the financial responsibility assignment in US households is consistent with what the Roy model suggests. We also find empirical support for the notion of Pareto efficiency in the collective model. Based on the prediction of personality and cognitive abilities, households that assign financial responsibility to the spouse who is less favored by the model prediction end up having lower household wealth and financial wealth. Lower wealth can be interpreted as forgone opportunities for sound savings and investment decisions. Such opportunity costs are hardly acknowledged by households, yet households' active choices of saving versus spending

TABLE 4. The Allocation of Financial Responsibility—Additional Control Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Male financial respondent	Male financial respondent	Male financial respondent	Male financial respondent	Male financial respondent	Male financial respondent
Husband: conscientious	0.026	0.029				
	(0.017)	(0.017)				
Wife: conscientious	−0.027	−0.022				
	(0.018)	(0.018)				
Husband: stability	0.001	−0.001				
	(0.016)	(0.016)				
Wife: stability	−0.022	−0.023				
	(0.015)	(0.015)				
Husband: extroversion	0.003	0.002				
	(0.020)	(0.019)				
Wife: extroversion	0.007	0.009				
	(0.019)	(0.019)				
Husband: agreeableness	−0.008	−0.007				
	(0.017)	(0.016)				
Wife: agreeableness	0.023	0.021				
	(0.022)	(0.022)				
Husband: openness	−0.028	−0.033				
	(0.018)	(0.017)				
Wife: openness	−0.004	−0.005				
	(0.017)	(0.017)				
Husband: memory	0.053**	0.051**				
	(0.018)	(0.018)				
Wife: memory	0.012	0.012				
	(0.019)	(0.019)				
Husband: numeracy	0.114***	0.112***				
	(0.020)	(0.020)				
Wife: numeracy	−0.076***	−0.076***				
	(0.016)	(0.016)				
H-W difference in conscientious			0.025*	0.025*		
			(0.013)	(0.012)		
H-W difference in stability			0.014	0.013		
			(0.011)	(0.011)		
H-W difference in extroversion			0.001	−0.000		
			(0.014)	(0.014)		
H-W difference in agreeableness			−0.016	−0.016		
			(0.014)	(0.014)		
H-W difference in openness			−0.012	−0.014		
			(0.013)	(0.013)		

TABLE 4. The Allocation of Financial Responsibility—Additional Control Variables *(Continued)*

Variables	(1)	(2)	(3)	(4)	(5)	(6)
H-W difference in memory			0.021	0.020		
			(0.014)	(0.014)		
H-W difference in numeracy			0.096***	0.095***		
			(0.013)	(0.013)		
Conscientious: husband is higher					0.030	0.027
					(0.031)	(0.030)
Stability: husband is higher					0.029	0.025
					(0.030)	(0.030)
Extroversion: husband is higher					−0.013	−0.016
					(0.033)	(0.033)
Agreeableness: husband is higher					−0.031	−0.027
					(0.036)	(0.036)
Openness: husband is higher					0.008	0.005
					(0.030)	(0.030)
Memory: husband is higher					0.019	0.017
					(0.032)	(0.031)
Numeracy: husband is higher					0.210***	0.211***
					(0.030)	(0.030)
Husband: risk aversion		−0.025**		−0.026**		−0.028**
		(0.009)		(0.009)		(0.009)
Wife: risk aversion		0.002		−0.001		−0.000
		(0.011)		(0.011)		(0.011)
Husband: financial planning horizon		−0.011		−0.010		−0.010
		(0.011)		(0.011)		(0.011)
Wife: financial planning horizon		−0.008		−0.007		−0.007
		(0.009)		(0.009)		(0.009)
Husband: probability to live 75+		0.001		0.001		0.001
		(0.001)		(0.001)		(0.001)
Wife: probability to live 75+		−0.000		−0.000		−0.001
		(0.001)		(0.001)		(0.001)
Husband: difficulty managing money		−0.003		−0.017		−0.026
		(0.102)		(0.102)		(0.107)
Wife: difficulty managing money		−0.129		−0.162		−0.147
		(0.086)		(0.090)		(0.097)
H-W difference in age	−0.004	−0.004	−0.004	−0.004	−0.006	−0.006
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
H-W difference in education	0.019**	0.019**	0.020***	0.020***	0.022***	0.021***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
H-W difference in earnings	0.003	0.003	0.004	0.004	0.005	0.005
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)

(*Continued*)

TABLE 4. The Allocation of Financial Responsibility—Additional Control Variables *(Continued)*

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.187	0.382*	0.067	0.272	−0.216	0.003
	(0.166)	(0.187)	(0.163)	(0.182)	(0.167)	(0.188)
Observations	2,335	2,335	2,335	2,335	2,335	2,335
R^2	0.144	0.151	0.130	0.138	0.123	0.131

Note. Each observation is a married couple observed in an HRS wave. Dependent variable takes value of one if husband is the financial respondent and zero otherwise. Only the subsample from waves 4–6 and 8 are used. Additional control variables include husband's and wife's respective employment status, race, physical health, and their HRS birth cohorts, the number of children, and wave fixed effects. The household-level cross-sectional weights are applied. The standard errors clustered at the household level are reported in parenthesis.

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

can lead to different trajectories of household wealth accumulation (Venti & Wise, 2001). The household wealth effect has implications for marriage stability and social welfare. Research has shown that financial strain is associated with marital instability (Dew, 2011; Gudmunson et al., 2007). Financially insecure households would demand public assistance, which will be a cost to society. Moreover, inefficient savings and investment decisions made by households could lead to inefficient business investment at the macroeconomic level.

A few caveats are needed to understand our empirical results First, the HRS data sets do not allow us to identify couples who share financial decision-making responsibility equally. Unlike Johnston et al. (2016), our conclusions only apply to couples that have a primary decision-maker. Second, our analyses only apply to a sample of married couples. Presumably, matching based on personality (Dupuy & Galichon, 2014) can shape the couple's relative strengths and, therefore, financial responsibility allocation. In extreme cases, inefficient financial responsibility allocation and the resulting financial standing can lead to divorce (Dew, 2011), which can explain how personality predicts divorce (Lundberg, 2012). Future research that incorporates assortative mating and marriage dissolution in the context of household financial decision-making can be promising.

Our findings have important implications for household financial management. Our findings suggest that assigning financial decision-making responsibility based on relative advantages in personal attributes could be an alternative to financial education interventions that aim at improving financial wellbeing, given that the latter interventions have proven to have limited and short-lived effects (Fernandes et al., 2014; Willis, 2011). A study has shown that the initial allocation of financial responsibility within an intimate relationship does not necessarily depend on relative advantage in financial literacy (Ward & Lynch, 2019). Although the assigned financial decision-maker tends to gain financial literacy over time in their decision-maker role (Ward & Lynch, 2019), our results show that the inefficiency of initial allocation could lead to different trajectories of household wealth accumulation. Thus, when new couples assign their financial decision-making responsibility, it is important to recognize the role of comparative advantages in household financial responsibility allocation.

Our findings have important implications for the financial planning profession. Based on the prediction of the couple's respective personality traits, cognitive abilities or the relative advantages in these personal attributes, inefficient allocation of financial responsibility still exists in about 30% of the households in our sample. Several reasons could explain why households end up with inefficient allocation. For example, experiments have shown that irrational financial respondents are unwilling to give up their control of income in return for investment efficiency (Mani, 2011). The awareness of inefficient status quo financial responsibility allocation and its contributing factors enables the financial planning professionals to better serve their clients. Financial planners and extension agents have an active role in providing advising and counseling services to counter the effects of factors that interfere with the efficient allocation of financial responsibility. Our results suggest that it is

TABLE 5. Financial Responsibility Misallocation and Household Wealth Accumulation

Variables	(1)	(2)	(3)
	IHS (total net worth)	IHS (financial net worth)	Share in stocks Mutual funds Investment trusts
	Panel A: Model 1		
Misallocation	−0.896***	−0.751***	−0.024
	(0.246)	(0.188)	(0.016)
Ave conscientiousness	0.315**	0.447***	0.020***
	(0.106)	(0.072)	(0.006)
Ave stability	0.400***	0.312***	0.005
	(0.083)	(0.064)	(0.005)
Ave extroversion	0.179	0.141	0.007
	(0.101)	(0.081)	(0.006)
Ave agreeableness	−0.338**	−0.307***	−0.020**
	(0.106)	(0.076)	(0.006)
Ave openness	−0.158	0.013	−0.002
	(0.094)	(0.069)	(0.006)
Ave memory	0.043	0.149*	0.007
	(0.087)	(0.063)	(0.005)
Ave numeracy	0.795***	1.154***	0.044***
	(0.090)	(0.069)	(0.005)
Constant	12.733***	11.283***	0.147***
	(0.156)	(0.130)	(0.011)
Observations	26,057	26,057	26,057
R^2	0.063	0.211	0.045
	Panel B: Model 2		
Misallocation	−0.859***	−0.763***	−0.025
	(0.245)	(0.187)	(0.016)
Ave conscientiousness	0.314**	0.445***	0.020***
	(0.106)	(0.072)	(0.006)
Ave stability	0.396***	0.309***	0.005
	(0.083)	(0.064)	(0.005)
Ave extroversion	0.183	0.144	0.007
	(0.101)	(0.081)	(0.006)
Ave agreeableness	−0.337**	−0.305***	−0.020**
	(0.106)	(0.076)	(0.006)
Ave openness	−0.166	0.007	−0.002
	(0.093)	(0.069)	(0.006)

(*Continued*)

TABLE 5. Financial Responsibility Misallocation and Household Wealth Accumulation *(Continued)*

Variables	(1)	(2)	(3)
Ave memory	0.058	0.161*	0.008
	(0.087)	(0.062)	(0.005)
Ave numeracy	0.797***	1.156***	0.044***
	(0.091)	(0.070)	(0.005)
Constant	12.722***	11.291***	0.147***
	(0.156)	(0.130)	(0.011)
Observations	26,057	26,057	26,057
R^2	0.062	0.211	0.045
Panel C: Model 3			
Misallocation	−0.864***	−0.791***	−0.041*
	(0.250)	(0.189)	(0.017)
Ave conscientiousness	0.314**	0.445***	0.020***
	(0.106)	(0.072)	(0.006)
Ave stability	0.396***	0.309***	0.005
	(0.083)	(0.064)	(0.005)
Ave extroversion	0.181	0.142	0.007
	(0.101)	(0.081)	(0.006)
Ave agreeableness	−0.341**	−0.309***	−0.020**
	(0.106)	(0.076)	(0.006)
Ave openness	−0.166	0.008	−0.002
	(0.093)	(0.069)	(0.006)
Ave memory	0.058	0.160*	0.008
	(0.087)	(0.062)	(0.005)
Ave numeracy	0.781***	1.142***	0.044***
	(0.090)	(0.070)	(0.005)
Constant	12.732***	11.309***	0.154***
	(0.155)	(0.130)	(0.011)
Observations	26,057	26,057	26,057
R^2	0.062	0.211	0.045

Note. In Panels A-C, Misallocation is measured by an indicator of inefficiency of financial responsibility allocation, which is the predicted probability of the counterfactual scenario that financial respondent's spouse had assumed financial responsibility based on models 1–3 in Table 2, respectively. Additional control variables include total household income, the number of children, and wave fixed effects. The household-level cross-sectional weights are applied. The standard errors clustered at the household level are reported in parenthesis.

*p<.05. **p<.01. ***p<.001.

critical for the financial planning professionals to engage both spouses in the initial discussion of household finances and to assess the efficiency of the status quo financial decision-making process. Couple-based financial coaching may help facilitate such conversations between couples (Zeamer & Estey, 2020).

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