

# **Women and Finance-Specific Human Capital: Impact of Gender Role Attitudes**

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*The benefits and costs of investing in finance-specific human capital are affected by subjective attitudes about the expected improvement in consumption from higher-quality financial decisions and the expected psychic costs of investing. This study investigates how gender role attitudes of women predict their acquisition of finance-specific human capital. Results indicate that women with the most traditional gender role attitudes are less financially literate than women with non-traditional gender role attitudes and men. Gender role attitudes formed early in life explain differences in financial literacy between men and women observed in prior studies. Multivariate analyses that control for attained human capital suggest that traditional gender role attitudes affect finance-specific human capital investment and investment in formal education. Women with traditional gender role attitudes are the least knowledgeable and have the lowest confidence in applying their financial knowledge.*

*Keywords: gender role attitudes, financial knowledge, financial well-being, women, human capital*

## **INTRODUCTION**

Women have lower financial literacy scores than men, lower lifetime earnings because of interrupted labor market participation, and lower pay (Lusardi and Mitchell, 2014). Women also tend to live longer and have more health issues in retirement (Hasler and Lusardi, 2017; Preston and Wright, 2019). The persistence of the financial literacy gap is surprising, as U.S. women are getting wealthier (Preston and Wright, 2019), receiving more bachelor's degrees than men (Rose, 2015), consistently increasing their business ownership (Hait, 2021), and improving their financial capability (Lusardi and Scheresberg, 2017). The financial literacy gender gap is a worldwide issue (Hasler and Lusardi, 2017), particularly in more developed countries, but it is still largely unexplained.

Scholars have partially explained the gender gap in financial knowledge using human capital variables such as age, income, and education (Grohmann, 2016). But at an aggregate level, they provide little support for gender differences (Mahdavi and Horton, 2014; Preston and Wright, 2019). Financial education efforts have resulted in mixed results in improving financial knowledge and closing the gender gap (Lusardi, 2017; Sholevar and Harris, 2019).

Women are aware of their deficiency in financial knowledge; therefore, they tend to delegate financial decisions to others (Nigam, Srivastava, and Banwet, 2018). A married woman may delay acquiring

financial knowledge, thinking that allocating financial responsibilities to the husband can make the household more efficient (Hsu, 2016). Less experience in dealing with financial matters at home can make women delay acquiring financial knowledge until they can no longer delegate. However, Fonseca, Mullen, Zamarro, and Zissimopoulos (2012) found little support for couples making household decisions based on individual specialization. Lack of bargaining power vis-à-vis the husband may also prevent married women from investing in financial knowledge (Sen, 1990), where the spouse with higher levels of human capital and earnings controls more power.

Gender role attitudes may override the most efficient division of household labor and marital bargaining power (Lundberg and Pollak, 1996; Sevilla-Sanz, Gimenez-Nadal, and Fernández, 2010). A woman's traditional gender role attitude may dictate her choice to specialize in household work and delegate acquiring financial knowledge to her husband, regardless of relative earnings or power (Hsu, 2016).

Gender role attitudes impact women's preferences, resulting in lower investment in finance-specific human capital. The decision to invest in financial knowledge is a function of perceived benefits and costs, which can be influenced by gender differences, including attitudes and abilities (Becker, 1993; Kramer and Kramer, 2016). Women are generally less willing to participate in education related to personal finance (Chen and Volpe, 2002) because their cost of investment in financial knowledge appears to be higher. This may be because traditional women perceive the returns on their investments in education to be low or not high enough to outweigh the psychic costs or costs of childcare. Prior research has explored links between the gender role attitudes of women and human capital investments, specifically regarding labor market participation, formal education, and post-school training (Adachi, 2018; Andonova and Blazevski, 2019; Kosteas, 2013). Tang, Baker, and Peter (2015) found a link between gender role attitudes and women's financial behavior; however, gender role attitudes' impact on finance-specific human capital investments has not been explored.

This study investigates how gender role attitudes impact the perceived costs and benefits of investments in finance-specific human capital. *Finance-specific human capital* is an individual's knowledge and capacity for making thoughtful and appropriate personal financial decisions. Objective and subjective measures of financial knowledge are employed, including financial self-efficacy as a measure for the capacity component. The human capital theory provides inputs for evaluating whether the perceived benefits of improved financial knowledge outweigh the perceived costs of investing (Becker, 1993; Lusardi and Mitchell, 2014). The self-efficacy approach provides the basis for understanding how gender role attitudes impact the level and strength of self-efficacy expectations. We posit that traditional gender role attitudes lead to higher perceived costs, lower perceived benefits of financial knowledge investment, and lower attained knowledge and capacity of finance-specific human capital. These relationships have been established by Hackett and Betz (1981) and Betz and Hackett, (1981; 1986), and Kosteas (2013) in previous studies. However, they focused on the connection between working and human capital, and we examine finance-specific human capital outcomes.

## LITERATURE REVIEW

The human capital theory seeks to explain how individuals make personal resource investment decisions, such as in education, skills, labor market participation, health, and financial knowledge. Human capital investments are similar to investments in financial capital (Becker, 2008). Both involve a decision to give up consumption in the present to increase expected future well-being.

Decisions regarding investment in human capital are much like investment decisions in physical assets concerning weighing the costs against the benefits of making such investments. Ben-Porath's (1967) basic model of human capital accumulation inputs includes leisure time and an initial stock of human capital. Thus, investment in financial knowledge requires an initial endowment of human capital. Becker (1962) described an individual's complete knowledge as either innate or attained (Becker, 1975). Becker (1993) modeled the cost of human capital investment as a combination of the direct costs of education, opportunity cost of forgone earnings, and psychic costs of the learning process. Household efficiencies can be gained

by spouses specializing, such as in finance-specific human capital investment, by spreading costs over a long period (Alon, 2018; Arrow, 1979; Rosen, 1983).

In financial self-efficacy, the capacity to make personal financial decisions may be as important as actual financial knowledge. Lind, Ahmed, Skagerlund, Strömbäck, Västfjäll, and Tinghög (2020) suggested that subjective financial knowledge is a stronger predictor of financial behavior than objective financial knowledge. Women are found to engage more frequently in optimal financial behaviors than men despite lower objective scores; yet, they worry more about their financial situation and experience more anxiety. Negative emotions toward finances may be an important determinant of the strength of financial self-efficacy and, thus, the perceived costs of acquiring financial knowledge.

Much research examines the underrepresentation of women in highly quantitative fields such as science, technology, engineering, and mathematics (STEM). Perez-Felkner, Nix, and Thomas (2015) found that students' quantitative ability beliefs influence more advanced coursework in high school and undergraduate majors in areas of physics, engineering, mathematics, and computer science. Despite parity in mathematics performance, women forgo taking these advanced courses. Even when women in college pick a STEM major, many abandon it (Morgan, Gelbgiser, and Weeden, 2013). Work-family attitudes and academic preparation do not explain this phenomenon (Morgan, Gelbgiser, and Weeden, 2013). Perceived benefits for women may be low for careers stereotyped as masculine (Cheryan, 2012).

Alternatively, perceived costs may be high if girls do not believe their abilities can improve. Perez-Felkner, Nix, and Thomas (2015) found that boys tend to have a growth mindset, where they believe they can improve their abilities in mathematics. Dweck (2007) found that high-achieving girls are the most vulnerable to losing confidence and effectiveness when faced with difficulty. The result is not the same for men. How women cope with experiences that call their abilities into question may explain lower investment in STEM-related human capital, which may be like investing in financial knowledge.

Traditional gender role attitudes reflect the idea that men and women should behave differently. An egalitarian attitude, or non-traditional gender role attitude, is a belief in equality and equal rights principles. These attitudes are developed in youth through various channels of socialization, such as family and the cultural environment (Sani and Quaranta, 2017).

Gender role attitudes impact human capital investment decisions for women, particularly labor market participation and return on education (Corrigall and Konrad, 2007). Kosteas (2013) found that women with more traditional gender role attitudes have lower education attainment, lower post-school training, and lower participation in the labor market. However, the same is not true for men (Adachi, 2018; Sani and Quaranta, 2017; Vella, 1994). Interestingly, women tend to have more non-traditional attitudes than men, particularly at higher levels of education. This suggests that the gender role attitudes of a husband and wife impact each other (Adachi, 2018).

Despite household efficiency and bargaining power, gender role attitudes influence marital responsibilities (Lundberg and Pollak, 1996; Sevilla-Sanz, Gimenez-Nadal, and Fernández, 2010). Marital status impacts human capital investments. For example, marriage is negatively associated with female job market participation, although formal education increases the likelihood of employment among women (Andonova and Blazevski, 2019). Married women are more likely to participate in household financial decisions when their income, age, and education are close to their husbands (Nigam, Srivastava, and Banwet, 2018). A woman's investment in human capital is negatively impacted by her spouse's employment, income, education, and the number of their children (Andonova and Blazevski, 2019).

Gender role attitudes influence self-efficacy differently for men and women in career development. Hackett and Betz (1981) explained that women lack strong career self-efficacy expectations due to gender differences in the socialization process. Gender role stereotypes (Betz and Hackett, 1986), gender role awareness, and education level (Yu and Jen, 2019) are important determinants of gender-related differences in self-efficacy. Both men and women have higher levels of self-efficacy in occupations where they recognize their own gender represented (Adachi, 2014); this may also be reflected in household work. Self-efficacy expectations of women are lower in occupations not traditional for women versus traditional occupations; however, men do not report this difference regardless of equivalent ability (Betz and Hackett, 1981).

## **METHODS**

This study investigates how the perceived costs and benefits of investments in financial-specific human capital are impacted by gender role attitudes, using both self-efficacy and human capital theories to predict women's financial knowledge and investment decisions. Finance-specific human capital is an individual's knowledge and capacity for making thoughtful and appropriate personal financial decisions. Objective and subjective measures of financial knowledge are employed, including financial self-efficacy as a measure of the capacity component. Human capital theory provides the inputs for evaluating the decision. The self-efficacy approach provides the basis for understanding how gender role attitudes impact the level and strength of self-efficacy expectations.

### **Hypotheses**

We propose five hypotheses, with the first three relating to the effect of gender role attitudes on the three separate components of finance-specific human capital. The last two hypotheses test finance-specific human capital as a composite measure of all three components and a confidence measure using the difference between objective and subjective financial knowledge.

*H1: There is a relationship between traditional gender role attitudes and objective financial knowledge.*

*H2: There is a relationship between traditional gender role attitudes and perceived financial knowledge.*

*H3: There is a relationship between traditional gender role attitudes and financial self-efficacy.*

*H4: There is a relationship between traditional gender role attitudes and composite finance-specific human capital.*

*H5: There is a relationship between traditional gender role attitudes and the difference between perceived and objective financial knowledge.*

We posit that traditional gender role attitudes will lead to higher perceived costs, lower perceived benefits of financial knowledge investment, and lower attained knowledge and capacity of finance-specific human capital.

### **Data and Sample Characteristics**

The National Longitudinal Surveys of Youth 1979 (NLSY79) conducted by the U.S. Department of Labor Statistics were a series of 27 surveys administered annually until 1994, then biennially through 2016. The nationally representative sample of American youth includes data from interviews with 12,686 original respondents and 6,912 in the 2016 wave. Female respondents represented 49.5% of total respondents in 1979 and 51.9% in 2016. Respondents began participating between the ages of 14 and 21 in 1979 and were 51 to 58 in 2016. This study uses data from the NLSY79 cohort of 4,185 respondents from 1979 to 2016 to assess the impact of gender role attitudes on finance-specific human capital investments by women.

The NLSY79 is useful for examining causal relationships involving human capital acquisition. The survey captures changes in education and labor market experience over time along with economic circumstances, life events, attitudes, and personality characteristics. This unique data set tracks the activities of a cohort of respondents for 37 years. Additionally, aptitude assessments, such as the Armed Forces Qualifying Test (AFQT), measure respondents' reading, word comprehension, mathematical knowledge, and reasoning. The AFQT score is commonly used as a proxy for capability, providing the opportunity to assess investments in human capital independent of capability.

## Measures

The gender role attitude measure reflects differences in opinions about home production and labor market activities among men and women. Using Farré and Vella's (2013) Attitude Index (a four-point scale), respondents indicated their level of agreement with "women's role" statements (Table 1) surveyed in four waves of the NLSY79. A composite score of 1979 wave responses was utilized to compile the index, where "1" on the four-point scale indicates "strongly agree" and "4" indicates "strongly disagree." Responses will be inverted for statements 1, 2, 4, 6, and 8 to generate a composite score for traditional attitudes. A higher composite score will correspond with a stronger traditional attitude. Responses 8 and 9 were recoded to 0 and removed from the sample

**TABLE 1  
GENDER ROLE ATTITUDE INDEX**

Women's Role Statements	Mean	SD*
1. A woman's place is in the home, not in the office or shop	1.67	0.7
2. A wife who carries out her full family responsibilities doesn't have time for outside employment	1.91	0.72
3. The employment of wives leads to more juvenile delinquency	2.12	0.72
4. It is much better for everyone concerned if the man is the achiever outside the home and the woman takes care of the home and family	2.1	0.74
5. Men should share the work around the house with women, such as doing dishes, cleaning, and so forth	1.68	0.59
6. Women are much happier if they stay at home and take care of their children	2.2	0.7
Cronbach's alpha	0.79	
N	4185	

\*Standard Deviation

Responses to statement 5 in Table 1 were inverted. Responses for each gender were first separated into three groups, presented in Table 2, non-traditional, traditional, and other. A maximum score of 24 reflects a traditional attitude, and a minimum score of 6 reflects a non-traditional attitude. Summary statistics for each group by gender are presented in Table 3.

**TABLE 2  
SUMMARY STATISTICS OF GENDER ROLE ATTITUDE INDEX**

Gender Role Attitude	N	Min.	Max.	Mean
Non-traditional	951	6.00	9.00	7.78
Other	2,294	10.00	13.00	11.69
Traditional	940	14.00	24.00	15.59
Total	4,185			

Finance-specific human capital, or *FSHC*, is measured by objective financial knowledge, perceived financial knowledge, and financial self-efficacy. Each *FSHC* component is examined individually, then as

part of a composite score, and finally as an over/under confidence measure between perceived and objective financial knowledge.

Financial knowledge is measured by a person’s ability to understand three fundamental economic concepts: interest calculations, inflation, and risk diversification (Lusardi and Mitchell 2014). To measure it, a composite score is calculated based on the percentage of correct answers to the following five questions: 1) Is buying a single company’s stock safer than investing in a mutual fund? 2) What savings amount after five years if \$100 are deposited at 2 percent interest per year? 3) If you deposit \$100 at a 1-percent interest rate, how much can you buy after one year if the inflation rate is 2 percent? 4) What happens to bond prices if interest rates rise? 5) Does a 15-year mortgage require higher monthly payments but lesser total interest than a 30-year mortgage? This measure appears in the 2012, 2014, and 2016 surveys. The 2014 and 2016 responses were provided by those who answered the questions in 2012. We combine the responses for all three years because the 2014 and 2016 responses are for those not answering in 2012.

Respondents’ answers to the question measure perceived financial knowledge: How would you assess your overall financial knowledge? Responses on a Likert scale range from “1,” meaning “very low,” to “7,” meaning “very high.” This measure appears in the 2012, 2014, and 2016 surveys. The 2014 and 2016 responses were provided by those who did not answer the questions in 2012, so we combined these responses.

Financial self-efficacy measures individuals’ confidence in their financial capabilities. This measurement was included in surveys in 2012, 2014, and 2016, in which we combined 7189, 286, and 128 responses for a total of 7600 responses. The measure is the statement: I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses. The responses range on a Likert scale from “1” to “7,” where “1” indicates “strongly disagree” and “7” is “strongly agree.” Financial self-efficacy predicts optimal financial behavior for women, who are more likely to hold investments, mortgages, or savings accounts and less likely to have loans or credit cards (Farrell, Fry, and Risse, 2016). Higher levels of financial self-efficacy are associated with financial knowledge (Heckman and Grable, 2011). The threat of being stereotyped can undermine self-efficacy (Asandimitra and Kautsar, 2017); however, role models, gender roles learned, and occupational stereotypes increase efficacy when the success of others is observed (Manolova, Brush, and Edelman, 2008).

**TABLE 3**  
**MEAN FINANCIAL KNOWLEDGE BY GENDER AND GENDER ROLE ATTITUDE**

Characteristics	Women			Men		
	Non-Traditional	Other	Traditional	Non-Traditional	Other	Traditional
Education						
Less than High School	2.67	2 .30	2 .28	2.41	2.74	2.80
High School	3.04	2 .83	2 .83	3.36	3.29	3.25
Some College	3.33	3 .14	2 .97	3.76	3.59	3.70
College	3.69	3 .66	3 .54	4.26	4.14	4.16
Employment						
Not working	2.87	2 .63	2 .72	3.19	2.85	2.76
Employed	3.37	3 .14	2 .97	3.80	3.60	3.59
Mother’s Education						
Less than High School	3.02	2 .77	2 .64	3.22	3.13	3.12
High School	3.38	3 .18	3 .05	3.80	3.54	3.52
College	3.58	3 .33	3 .42	4.11	3.91	3.96

Characteristics	Women			Men		
	Non-Traditional	Other	Traditional	Non-Traditional	Other	Traditional
Father's Education						
Less than High School	3.04	2.79	2.59	3.32	3.16	3.10
High School	3.40	3.13	3.03	3.91	3.53	3.39
College	3.56	3.35	3.60	4.05	3.83	4.07
Marital Status						
Never married	3.42	3.25	3.19	3.91	3.63	3.70
Married	3.18	2.67	2.47	3.26	2.99	2.73
Separated, Divorced,	3.03	2.86	2.60	3.37	3.26	2.99
Widowed						
Age at 1st Marriage						
Less than 19	3.04	2.88	2.76	3.26	3.29	3.24
Over 19	3.32	3.03	2.91	3.71	3.44	3.37
Race						
Black	2.93	2.76	2.68	3.34	3.17	2.79
Hispanic	3.26	2.79	2.65	3.30	3.27	3.11
Non Black, Non Hispanic	3.45	3.23	3.07	3.97	3.64	3.73
Urbanization						
City	3.25	2.97	2.85	3.62	3.46	3.32
Rural	3.32	3.08	3.04	3.94	3.35	3.48
Region						
Northeast	3.39	2.95	2.84	3.57	3.43	3.27
North Central	3.26	3.07	2.93	3.90	3.56	3.64
South	3.24	2.98	2.80	3.70	3.36	3.24
West	3.21	2.96	2.99	3.54	3.42	3.40
N	649	1,158	431	302	1,136	509

Using the same empirical model, a composite score of varying components of finance-specific human capital is constructed to provide a cumulative understanding of how endowed human capital relates to personal finance and is impacted by gender role attitudes. A higher composite score corresponds to a higher level of finance-specific human capital. The response range is from 0 to 28, with 21 coming from each of the 7-point Likert scales for perceived financial knowledge, financial self-efficacy, and financial knowledge investment. All five objective knowledge questions receive a point value of 1.4 each to equally weigh this component with the other three.

Objective financial knowledge measures what a respondent knows, and perceived financial knowledge measures a respondent's perception of his/her knowledge. Each measure is standardized using a z-score, then a difference is calculated between perceived and objective financial knowledge. This difference is an over- or under-confidence measure. A positive coefficient indicates higher perceived financial knowledge over objective knowledge.

Using Lusardi and Mitchell (2014) as a model for selecting control variables with evidence of financial knowledge impact, this study controls for age, education, cognitive ability, numeracy, income, net worth, marital status, employment type, region and urbanization, and parental education. These control variables are grouped into categories of endowed human capital, attained human capital, financial capital, and other controls.

### *Endowed Human Capital*

Respondents' age at the most recent survey is included in the model as *Age*. Financial knowledge is lower in young and old people, and higher in middle-aged people. While extant research has tested the

financial knowledge of individuals at a transitory or specific time of a life cycle, like high school students, college students, and those nearing retirement (Mandell and Klein, 2009), Lusardi, Michaud, and Mitchell (2017) suggested that this knowledge is gained over time. Though subjective financial knowledge scores are higher in old age (Finke, Howe, and Huston, 2017), this is not reflected in objective scores (Lusardi and Mitchell, 2014). We consider cohort effects due to the cross-sectional nature of the data.

Early-life development of financial beliefs occurs through a financial socialization process, which involves molding financial values, attitudes, and behaviors through parental observation and reinforcement (Furnham and Milner, 2017). Parental education is positively correlated with financial knowledge and is coded for the mother, *MomEd*, and the father, *DadEd*, for less than high school, high school, and college. Race is controlled for using three categories of race: Black, Hispanic, and Non-black/non-Hispanic. Black and Hispanic individuals tend to score the lowest on financial knowledge (Lusardi and Mitchell 2014). This study includes control measurements for cognitive ability, *AFQT*, and a composite aptitude score, specifically the updated IQ measure, *AFQT3*, in the NYSY79. Lusardi and Mitchell (2014) found cognitive ability positively correlated with financial literacy.

#### *Attained Human Capital*

Those with less education tend to be less financially knowledgeable, which we control by using four dummy variables: less than high school, *LowEd*; high school, *MidEd*; some college, *SomeEd*; and college, *HighEd*. The relationship between education and financial knowledge could be due to low numeracy skills or cognitive ability (Lusardi and Mitchell 2014). Unemployed individuals are less financially knowledgeable than self-employed and employed individuals (Lusardi and Mitchell 2014). Meanwhile, Nitani, Riding, and Orser (2019) found financial knowledge to be no different on average between self-employed individuals and employees. Employment is controlled by using two categories: *Employed* and *not working*. Respondents' income is controlled by using the log of reported income.

#### *Financial Capital*

A household's net worth is positively correlated with the financial knowledge of its members. Economically vulnerable families tend to have riskier financial behavior despite their awareness of the greater risk of job losses, low permanent incomes and wealth-to-income ratios, low availability of human capital, and lack of financial knowledge and experience (Boshara and Emmons, 2015). Financially literate employees are more likely to participate in an employer-sponsored retirement plan and invest better, contributing to wealth inequality. Those with more financial knowledge earn higher returns on investments than those with less financial knowledge (Clark, Lusardi, and Mitchell, 2017). However, approximately 60–70% of differences in retirement wealth cannot be explained by income differences and chance; financial choices also affect wealth accumulation).

#### *Other Controls*

Marital status is controlled using four coding categories: married, *Married*; never married, *NeverM*; and no longer married, *NoLongerM*. Additionally, we control for those married at a young age (age 19 or less) by creating a dummy variable, *Age1M*. Women who have never married are more financially knowledgeable than married women, though still less knowledgeable than unmarried and divorced men (Grohmann 2016). Marital status impacts a wife's investment in financial knowledge due to household specialization (Hsu, 2016), gender role attitudes of both partners (Khoudja, 2018), and control (Cohen, Cohen, and Kiker, 2019). Married women are more likely to participate in household financial decisions when their income, age, and education are close to their husbands (Nigam, Srivastava, and Banwet, 2018).

The place of residence also has an impact on financial knowledge. This study controls for one of the four regions of the United States collected in the survey: North East, *NorthE*; North Central, *NorthC*; West, *West*; and South, *South*. Additionally, individuals who live in rural areas are less financially knowledgeable than those who live in urban areas (Lusardi and Mitchell, 2014). This urbanization variable is a dichotomous variable coded for *City*.

The empirical model, using ordinary least squares (OLS) regression, is as follows:



$$FSHC_i = \beta X_i + Y_{1,i}TradFem + Y_{2,i}NonTradFem + Y_{3,i}NonTradMale + Y_{4,i}Age + Y_{5,i}MidEd + Y_{6,i}SomeEd + Y_{7,i}HighEd + Y_{8,i}AFQT + Y_{9,i}Income + Y_{10,i}NetWorth + Y_{11,i}MarriedM + Y_{12,i}NoLongerM + Y_{13,i}Age1M + Y_{14,i}South + Y_{15,i}West + Y_{16,i}NorthC + Y_{17,i}City + Y_{18,i}Black + Y_{19,i}White + Y_{20,i}Employed + Y_{21,i}MomEd + Y_{22,i}DadEd + \epsilon_i \quad (1)$$

**TABLE 4**  
**T-TEST BETWEEN NON-TRADITIONAL AND TRADITIONAL FOR WOMEN BY DEPENDENT VARIABLES**

Dependent Variable	Non-Traditional Women	Other Women	Traditional Women	Min.	Max.	Difference in Means
Finance-Specific Human Capital						
Objective Financial Knowledge	3.27	3.00	2.87	0	5	0.40***
Perceived Financial Knowledge	4.88	4.82	4.58		7	0.30***
Financial Self-efficacy	5.89	5.64	5.29	1	7	0.60***
Composite Score	15.34	14.65	13.88	2	21	1.46***
Difference between Perceived and Objective	-0.002	0.19	0.15	-3.88	4.08	0.15
N	649	1158	431			

Note: \* p<0 .05, \*\*p<0 .01, and \*\*\*p<0 .001

Table 4 reveals that non-traditional women are significantly more financially knowledgeable than traditional women. This result is significant for both objective and perceived financial knowledge and financial self-efficacy. The composite score of finance-specific human capital is also significant at the .001 p-value. Finance-specific human capital appears to decrease as gender role attitudes among women become more traditional.

**TABLE 5**  
**T-TEST BETWEEN NON-TRADITIONAL WOMEN AND OTHER MEN BY DEPENDENT VARIABLES**

Dependent Variable	Non-Traditional Women	Other Men	Difference in Means
Finance-Specific Human Capital			
Objective Financial Knowledge	3.27	3.43	-0.16***
Perceived Financial Knowledge	4.88	4.91	-0.03
Financial Self-efficacy	5.89	5.48	0.41***
Composite Score	15.34	15.19	0.15
Difference between Perceived and Objective	-0.002	-0.12	0.12
N	649	1136	

Note:\* p<0.05, \*\*p<0.01, and \*\*\*p<0.001

Table 5 presents differences in finance-specific human capital outcomes between traditional women and the group of other men. Results show that non-traditional women have significantly lower objective financial knowledge than other men. Interestingly, however, non-traditional women have higher confidence in their ability to apply their financial knowledge than other men. Perceived knowledge differences between non-traditional women and the group of other men are not significantly different.

## RESULTS AND DISCUSSION

Regression coefficients are illustrated for each of the five measures of finance-specific human capital, first as a base model without control variables and then progressively adding controls for endowed human capital, attained human capital, financial capital, and other control variables. The explanatory power of the empirical model increases significantly from the base model to the model controlling for endowed human capital. The largest increase in explanatory power results from human capital characteristics that cannot be changed, such as age, parents' education, and race.

Results of OLS regression for Hypothesis 1 (Table 6) indicate a significant relationship between gender role attitudes for women and objective knowledge. However, there is no evidence for such a relationship among men. Women are less financially knowledgeable than men, especially traditional women. Non-traditional women have the highest objective financial knowledge but are still less knowledgeable than men.

**TABLE 6**  
**REGRESSIONS OF OBJECTIVE KNOWLEDGE ON GENDER ROLE ATTITUDES:**  
**SELECTED COEFFICIENTS**

	Base Model	+ Endowed Human Capital	+ Attained Human Capital	+ Financial Capital	+ Other Controls
<b>Regression coefficients:</b>					
Non Traditional Women	-0.16213**	-0.26760***	0.26117***	-0.26286** *	-0.25801***
Other Women	-0.43388***	-0.35475***	-0.32314***	-0.32223***	-0.32366***
Traditional Women	-0.56095***	-0.39136***	-0.32165***	-0.31168***	-0.31730***
Non Traditional Men	0.25342***	0.01316	-0.00624	-0.00737	0.00393
Traditional Men	-0.07113	0.02894	0.03891	0.03585	0.03633
Endowed Human Capital	NO	YES	YES	YES	YES
Attained Human Capital	NO	NO	YES	YES	YES
Financial Capital Controls	NO	NO	NO	YES	YES
Other Demographic Controls	NO	NO	NO	NO	YES
N	4185	4185	4185	4185	4185
Adj R-Squared	0.04	0.23	0.26	0.27	0.27

\* p<0.05, \*\*p<0.01, and \*\*\*p<0.001

The OLS regression's results for Hypothesis 2 indicate a significant relationship between traditional gender role attitudes for women and perceived financial knowledge. There is no evidence of this relationship between the gender role attitudes of other groups and perceived financial knowledge. Traditional women have significantly lower perceived financial knowledge than both categories of men.

**TABLE 7**  
**REGRESSIONS OF PERCEIVED KNOWLEDGE ON GENDER ROLE ATTITUDES:**  
**SELECTED COEFFICIENTS**

	Base Model	+ Endowed Human Capital	+ Attained Human Capital	+ Financial Capital	+ Other Controls
Regression coefficients:					
Non Traditional Women	-0.03238	-0.06459	-0.07574	-0.08635	-0.10133
Other Women	-0.33369***	-0.28084**	0.21662*	-0.20699*	-0.24605**
Traditional Women	-0.09767	-0.08049	-0.06039	-0.06734	-0.10355
Non Traditional Men	0.00349	-0.06817	-0.09716	-0.11006	-0.09044
Traditional Men	-0.04929	-0.01102	0.00079	-0.00688	-0.00272
Endowed Human Capital Controls	NO	YES	YES	YES	YES
Attained Human Capital Controls	NO	NO	YES	YES	YES
Financial Capital Control	NO	NO	NO	YES	YES
Other Demographic Controls	NO	NO	NO	NO	YES
N	4185	4185	4185	4185	4185
Adj R-Squared					

\* p<0.05, \*\*p<0.01, and \*\*\*p<0.001

The OLS regression's results for Hypothesis 3 are shown in Table 8, which indicate that no evidence exists of a relationship between traditional gender role attitudes and financial self-efficacy; however, a significant relationship exists between non-traditional gender role attitudes for women and financial self-efficacy. There is no evidence of a relationship between gender role attitudes and financial self-efficacy among men. As gender role attitudes become more non-traditional, financial self-efficacy for women increases, and women have higher financial self-efficacy than men, particularly non-traditional women. The traditionality of the male gender role attitude does not seem to impact financial self-efficacy.

Regression coefficients are presented in Table 9 for the OLS regression of the finance-specific human capital composite score on gender role attitudes. The composite score reflects the combined survey responses for financial self-efficacy, perceived knowledge, and weighted objective knowledge. Tables 6–10 present the base model without control variables first and then progressively add controls for endowed human capital, attained human capital, and financial capital. The full empirical model is presented in the right column with other control variables.

The results of Hypothesis 4 indicate that a significant relationship exists between traditional gender role attitudes for women and the composite score of finance-specific human capital. The same significance is not present for non-traditional women or all gender role attitudes of men. Traditional women's composite score is significantly lower than that of non-traditional women and all attitude categories for men. This results from traditional women having low objective and perceived financial knowledge and lower financial self-efficacy. Non-traditional women have lower objective financial knowledge than men but not significantly different perceived financial knowledge.

**TABLE 8**  
**REGRESSIONS OF FINANCIAL SELF-EFFICACY ON GENDER ROLE ATTITUDES:**  
**SELECTED COEFFICIENTS**

	Base Model	+ Endowed Human Capital	+ Attained Human Capital	+ Financial Capital	+ Other Controls
Regression coefficients:					
Non Traditional Women	0.41129***	0.34087***	0.34237***	0.31544***	0.29113**
Other Women	-0.18621	-0.07249	0.02958	0.02788	-0.01002
Traditional Women	0.16021*	0.21405**	0.25092**	0.23437**	0.19506*
Non Traditional Men	0.14297	-0.01497	-0.03285	-0.05827	-0.04935
Traditional Men	-0.10688	0.03978	-0.01906	-0.03564	-0.03051
Endowed Human Capital Controls	NO	YES	YES	YES	YES
Attained Human Capital Controls	NO	NO	YES	YES	YES
Financial Capital Control	NO	NO	NO	YES	YES
Other Demographic Controls	NO	NO	NO	NO	YES
N					
Adj R-Squared					

\* p<0.05, \*\*p<0.01, and \*\*\*p<0.001

Additionally, non-traditional women have higher financial self-efficacy than men, which offsets lower objective scores. A significant relationship exists between the composite score of finance-specific human capital and individual factors such as IQ, respondent income, household wealth, education, region, marital status, and marriage at a young age.

**TABLE 9**  
**REGRESSIONS OF FINANCE-SPECIFIC HUMAN CAPITAL COMPOSITE ON GENDER**  
**ROLE ATTITUDES: SELECTED COEFFICIENTS**

	Base Model	+ Endowed Human Capital	+ Attained Human Capital	+ Financial Capital	+ Other Controls
Regression coefficients:					
Non Traditional Women	0.15192	-0.09836	-0.09901	-0.13891	-0.17141
Other Women	-1.30522***	-0.90123***	-0.63734***	-0.61547***	-0.7003***
Traditional Women	-0.54489***	-0.36309	-0.26187	-0.28409*	-0.36161***
Non Traditional Men	0.50125*	-0.06471	-0.13874	-0.17866	-0.13429
Traditional Men	-0.25576	-0.01028	0.0362	0.00767	0.01763
Endowed Human Capital Controls	NO	YES	YES	YES	YES
Attained Human Capital Controls	NO	NO	YES	YES	YES
Financial Capital Control	NO	NO	NO	YES	YES
Other Demographic Controls	NO	NO	NO	NO	YES
N					
Adj R-Squared					

\* p<0.05, \*\*p<0.01, and \*\*\*p<0.001

Selected coefficients are presented in Table 10 for the OLS regression of the standardized difference between perceived and objective financial knowledge on gender role attitudes. The difference is a measure of overconfidence. The objective financial knowledge is a measure of what respondents actually know, and the perceived financial knowledge is a measure of what they perceive they know. A positive coefficient indicates that the perceived financial knowledge is higher than the objective knowledge.

Hypothesis 5's results indicate a significant relationship between gender role attitudes for women and overconfidence pertaining to financial knowledge. As women's gender role attitudes become more non-traditional, their financial self-efficacy increases. Financial self-efficacy is confidence in one's ability to apply their financial knowledge. These results are surprising, as women are more likely to respond "I do not know" on an objective financial literacy survey than men, even when they know the correct answer. Yet, the perceived financial knowledge involves a self-assessment of overall financial knowledge, and these results reveal that as women become more non-traditional, they not only have a higher perception of their financial knowledge, but they also have a higher confidence in applying it. Yet, women, even non-traditional women, have lower financial knowledge than men, which is consistent with the literature. Traditional women appear to have a higher perception of their financial knowledge but are not confident in applying it. Traditional women are the least financially knowledgeable.

**TABLE 10**  
**OLS REGRESSIONS OF THE DIFFERENCE BETWEEN PERCEIVED AND OBJECTIVE FINANCIAL KNOWLEDGE ON GENDER ROLE ATTITUDES**

	Base Model	+ Endowed Human Capital	+ Attained Human Capital	+ Financial Capital	+ Other Controls
Regression coefficients:					
Non Traditional Women	0.11736	0.18678**	0.1744**	0.16924**	0.15583*
Other Women	0.26840***	0.15743*	0.1382	0.13573	0.11624
Traditional Women	0.30721***	0.25079***	0.23647***	0.23138***	0.21011***
Non Traditional Men	-0.21269*	-0.05349	-0.05504	-0.06208	-0.05948
Traditional Men	0.0297	-0.03138	-0.03250	-0.03467	-0.03249
Endowed Human Capital Controls	NO	YES	YES	YES	YES
Attained Human Capital Controls	NO	NO	YES	YES	YES
Financial Capital Control	NO	NO	NO	YES	YES
Other Demographic Controls	NO	NO	NO	NO	YES
N					
Adj R-Squared					

\*p<0.05, \*\*p<0.01, and \*\*\*p<0.001

Coefficients are presented in Table 11 for the OLS regression of the objective financial knowledge of women on each measure of gender role attitudes without controlling for other variables. The results show a significant relationship between objective financial knowledge and women's role statements 2 and 5. Interestingly, both questions involve the allocation of time resources and household specialization. Women who respond that there is no time for outside employment and that men should share the household work have lower objective financial knowledge. This may be because women may perceive that they do not have time to invest in financial knowledge.

**TABLE 11**  
**WOMEN ONLY REGRESSION OF OBJECTIVE FINANCIAL KNOWLEDGE ON GENDER**  
**ROLE RESPONSES**

Womens' Role Statements	Regression Coefficients
1 A woman's place is in the home, not in the office or shop	-0.04333
2 A wife who carries out her full family responsibilities doesn't have time for outside employment	-0.14990***
3 The employment of wives leads to more juvenile delinquency	-0.02774
4 It is much better for everyone concerned if the man is the achiever outside the home and the woman takes care of the home and family	-0.01233
5 Men should share the work around the house with women, such as doing dishes, cleaning, and so forth	-0.08519*
6 Women are much happier if they stay at home and take care of their children	0.01345
N	2238
Adj R-Squared	0.0178

\*p<0.05, \*\*p<0.01, and \*\*\*p<0.001

This study's primary objective was to investigate how gender role attitudes impact the perceived costs and benefits of finance-specific human capital acquisition, specifically for women. Past research has sought to explain the financial literacy gender gap through household production, a lack of bargaining power, family roles and behaviors, and education; however, the gap is still largely unexplained. Women face other economic challenges that impact their financial well-being apart from financial knowledge, such as lower lifetime earnings, lower pay, and living longer. The lack of an adequate human capital safeguard subjects women to significant downside exposure to financial shocks. This study adds to the body of knowledge on the financial well-being of women. It provides insights to policymakers, financial professionals, and financial educators seeking to increase the financial well-being of women.

This study reveals that women are less financially knowledgeable than men, especially the most traditional women. Women with the most traditional gender role attitudes are the most vulnerable from the viewpoint of their financial well-being because they are the least knowledgeable and have the lowest confidence in applying their financial knowledge. Women with the most non-traditional gender role attitudes do not lack confidence in their ability to apply their financial knowledge, as originally hypothesized. The directional significance reveals that non-traditional women have high financial self-efficacy but low financial knowledge, which indicates that they do not perceive the high benefits of increasing their financial knowledge. This could be because they are unaware of their lack of financial knowledge.

Financial knowledge investment is motivated by the perceived benefits of improved financial decisions. However, the perceived costs of investing in financial knowledge may be deemed too expensive for women. Such perceived high costs appear to be associated with allocating time resources to the learning process. Perceived benefits appear low for non-traditional women who report high confidence in their ability to apply their financial knowledge and may not see the benefits of increasing their financial knowledge.

Though household efficiency and power may play a role in a woman's decision to acquire financial knowledge, gender role attitudes contribute to household efficiency and bargaining power. Gender role attitudes impact preferences among women, which results in lower investment in financial knowledge regardless of their capability. Efforts to empower women in business and the financial industry have

perhaps focused on eliminating their fears of gaining financial knowledge; however, it seems that women are adequately empowered but inadequately educated. Financial knowledge may be increased by improving awareness of the benefits of investing in knowledge and increasing opportunities to improve financial education opportunities for women.

## CONCLUSION

Optimizing financial well-being is the primary motivation for research efforts to increase finance-specific human capital among women. Many consumers, including women, simply do not want to be financially knowledgeable despite understanding the importance, which underlines the significance of examining what impacts the perceived costs and benefits of making such investments. Attitudes toward gender roles impact perceptions and preferences among women, which is the primary contribution of this study. Women are economically vulnerable due to unique challenges faced with pivots in and out of the workforce, lower pay, lower lifetime earnings, and longer lifespans; thus, increases in finance-specific human capital can improve the financial well-being of women.

This study's results indicate that women are less financially knowledgeable than men, especially women with the most traditional gender role attitudes. The most traditional women are the most vulnerable because they are the least knowledgeable and have the lowest confidence in applying their financial knowledge. Women with the most non-traditional gender role attitudes do not lack confidence in their ability to apply their financial knowledge as originally hypothesized; non-traditional women have high financial self-efficacy but low financial knowledge, indicating that non-traditional women do not perceive the high benefits of increasing their financial knowledge. This could be because they are unaware of their lack of financial knowledge.

Financial knowledge investment is motivated by the perceived benefits of improved financial decisions and the perceived costs of investing. Investing in financial knowledge may be perceived as too costly by women. Perceived high costs appear to be associated with allocating time resources to the learning process. Perceived benefits appear low for non-traditional women, who report high confidence in their ability to apply their financial knowledge and may not see the benefits of increasing their financial knowledge.

A significant relationship exists between gender role attitudes for women and objective knowledge. The same relationship does not exist for men. Women are less financially knowledgeable than men, especially the most traditional women. Women with more non-traditional gender role attitudes appear to be more financially knowledgeable. Most of the explanatory power in the empirical model comes from endowed human capital, which respondents cannot control; however, attaining human capital, such as earning income and attaining higher education, increases objective financial knowledge.

No evidence of a relationship between gender role attitudes and perceived financial knowledge exists, though the most traditional women have significantly lower perceived knowledge than the most traditional men. Respondents have significantly higher perceived financial knowledge when they are no longer married or were married at a young age.

We posited that women have lower levels of financial self-efficacy than men, like objective financial knowledge; yet, we found that as gender role attitudes become more non-traditional, financial self-efficacy for women increases, and women have higher financial self-efficacy than men, particularly non-traditional women. The traditionality of the male gender role attitude does not seem to impact financial self-efficacy.

Traditional women have low objective and perceived financial knowledge, as well as lower financial self-efficacy than non-traditional women. Non-traditional women have lower objective financial knowledge than men but not significantly different perceived financial knowledge. Additionally, non-traditional women have higher financial self-efficacy than men, which offsets lower objective scores.

As women's gender role attitudes become more non-traditional, they have higher financial self-efficacy. These results reveal that as women become more non-traditional, they not only have a higher perception of their financial knowledge but also have higher confidence in their ability to apply it. Yet, women have lower financial knowledge than men. Traditional women appear to have a higher perception

of their financial knowledge, but they are not confident in applying that knowledge. Traditional women are the least financially knowledgeable.

This study uses some subjective measures that are also single-item instruments. Both perceived financial knowledge and financial self-efficacy are subjective, where the measure is a self-report. Though these measures are frequently used in other research, a multiple-item and/or objective measure may produce different results.

Gender role attitudes impact women's preferences, resulting in lower investment in financial knowledge independent of capability. However, the present study was not able to control for the gender role attitude of the spouse. Previous research has examined how the spouse's gender role attitude impacts human capital acquisition but not finance-specific human capital, which is an opportunity for future research.

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