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THE MATH GENDER GAP AND WOMEN'S CAREER OUTCOMES

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We show that the gender gap in mathematics is related to women's career outcomes. The math gender gap predicts the proportion of women in the investment profession across countries and across states in the US. Our results suggest that societal factors jointly affect the math gender gap and women's career outcomes. Identifying and addressing these barriers could decrease the math gender gap and increase the representation of women in highly quantitative fields such as finance, which might help to reduce the gender pay gap since these fields tend to pay well.

In the US, women represent only 26% of workers in Science, Technology, Engineering, and Math (STEM) fields (Landivar, 2013). Similar figures have been reported in other countries (OECD, 2006). One plausible explanation for the under-representation of women in STEM fields is that by age 15 girls tend to lag boys on math scores (OECD, 2015). While the math gender gap is observed in most countries in middle school, there is large variation in the math gender gap across countries—a gap that widens at the right tail of the score distribution (Ellison and Swanson, 2010; Wai *et al.*, 2010). However, there is little direct evidence that the math gender gap affects the proportion of women in quantitative careers, because it is difficult to find consistent measures of the proportion of women in quantitative fields across countries. We use high-quality data on the representation of women in investment management, a highly quantitative field in which women represent less than 20% of workers, to test the hypothesis that geographical variation in the math gender gap is related to the career outcomes of women.

There is evidence of geographic variation in cultural factors correlated with the math gender gap. Across countries, the math gender gap is related to cultural beliefs on the role of women in society (Nollenberger *et al.*, 2016), measures

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of implicit gender-science stereotyping (Nosek *et al.*, 2009), and measures of gender inequality (Guiso *et al.*, 2008; Hyde and Mertz, 2009).[1] Across US states, the math gap is also related to measures of gender inequality (Pope and Sydnor, 2010). The representation of women across academic disciplines is correlated with beliefs about the importance of raw intellectual ability for the discipline (Leslie *et al.*, 2015). Mere exposure to scientific theories can improve women's math performance (Dar-Nimrod and Heine, 2006), and random assignment of students to female math or science professors improves the performance of female but not male students (Carrell *et al.*, 2010). The world's major religions are patriarchal and, for the most part, subordinate the role of women (Gudorf, 2013). Religion has been shown to influence both gender differences in occupational choice (Rhodes, 1983; Bainbridge and Hatch, 1982; Jones and McNamara, 1991) and gender differences in educational attainment (Norton and Tomal, 2009; Cooray and Potrafke, 2011).

While these studies provide evidence that religion and other cultural factors affect the math education of women, there is little direct evidence that math education is relevant for understanding economic outcomes, which is what we analyze in this paper. It is possible that math education may directly affect the relative ability of men and women to compete for jobs. More plausibly, cultural factors that vary across geography influence both the math attainment of girls and boys, and the occupational choices of women. Regardless of the mechanism, evidence of a correlation between the math gender gap and later career outcomes would suggest policy interventions that affect the math gender gap might also improve the representation of women in highly quantitative fields. This in turn has the potential to reduce the gender pay gap, since highly quantitative fields command an earnings premium and gender differences in occupations and industries are important determinants of the gender pay gap (Langdon *et al.*, 2011; Blau and Kahn, 2017).

We provide novel evidence on the relation between the math gender gap and women's career outcomes by exploiting geographical variation in our data. To do so, we analyze, by country and by state within the US, the proportion of Chartered Financial Analyst (CFA) members who are women. CFA members are investment professionals who generally work in asset management or related fields that require strong math training.

We focus on investment professionals for four reasons. First, women represent less than 20% of US investment professionals (Stumpp, 2013), which is even lower than the representation of women in STEM. Among mutual fund managers, an important subfield of investment management, less than 10% of all US fund managers are women (Lutton and Davis, 2015). Second, investment management jobs like many jobs in STEM fields require extensive math training. To become a CFA member, a person must hold a bachelor's degree or equivalent, possess four years of work experience as an investment professional, provide three professional references, and pass a math-intensive exam (CFA Level I) with a pass rate of 43% in 2015. To become a CFA charterholder, a person must pass two additional exams (CFA Level II and III) with pass rates of 46% and 53% in 2015; more than 90% of CFA members are charterholders. Third, we have high-quality data on the gender representation of more than 130,000 finance professionals across 151 countries from the CFA Institute. These data allow us to test the hypothesis that the gender gap in math affects career outcomes in a math-intensive field. Fourth, finance is an important profession that represents a large part of the economy in many developed countries and pays high wages. For example, in the US the total compensation of financial intermediaries

represents about 9% of Gross Domestic Product (GDP) (Philippon, 2012). Wage structure, that is differences in rewards to working in particular sectors, has an enormous impact on the gender pay gap, particularly in the US (Blau and Kahn, 2017). Thus, the underrepresentation of women in well-paid math-intensive fields such as investment management contributes to the gender pay gap.

We merge the data on the proportion of women investment professionals by region with data on the math gender gap by region. Because investment professionals are likely drawn from people in the upper end of the math distribution, we define the math gender gap as the math test scores of boys at the 75th percentile less that of girls at the 75th percentile for each region (though the results are qualitatively similar using alternative measures of the math gender gap). For our country analysis, we use math gender gap from the Programme for International Student Assessment (PISA). For our state analysis, we use data from the National Assessment of Education Progress (NAEP).

In our primary analysis, we show that a country's math gender gap predicts the proportion of investment professionals who are women in the country ($p < 0.01$). In multivariate analyses, a one standard deviation decrease in a country's math gender gap is associated with a 4.6 to 6.4 percentage point increase in the proportion of investment professionals in that country who are women. Moreover, the math gender gap is more robust and economically more important as a predictor of the proportion of women investment professionals than female labor force participation rates. General rates of female labor force participation and the proportion of women who are investment professionals are, at best, weakly related across countries. Importantly, the inclusion of female labor force participation rates in our multivariate regressions *increases*, rather than decreases, the strength of the math gap finding, which further suggests a mechanism distinct from general factors that affect female labor force participation.

To explore cultural factors that could influence both the gender math gap and women's career choice we turn first to religion. Since all the world's major religions favor the role of men in society, we focus on cross-country differences in religiosity rather than differences in affiliations. Focusing on religiosity also facilitates analyses across US states where the religiosity varies significantly across states, while the major religious affiliation (Christianity) is a constant. Our religiosity measures are based on Pew Research Center surveys reported in "The Age Gap in Religion Around the World" (2018) and "2014 Religious Landscape Study." We combine survey responses about frequency of prayer, importance of religion, affiliation with a religion, religious service attendance, and belief in God to create a religiosity index for each country and state. (See the online Appendix for details). In multivariate analyses, a one standard deviation decrease in a country's religiosity index is associated with a 1.9 to 2.6 percentage point increase in the proportion of investment professionals in that country who are women. However, including religiosity in the analysis does not diminish the relationship between the math gender gap and gender representation in finance.

Perhaps gender inequality jointly affects the math gender gap and women's desire to pursue a career in finance. Our measures of gender inequality include the World Economic Forum Gender Gap Index (WEF GGI), gender inequality measures from the World Values Survey (WVS), and gender inequality and political empowerment measures from the World Economic Forum. None of these variables are robustly related to the proportion

of investment professionals who are women. In addition, their inclusion does not modulate the estimated relation between the math gender gap and the proportion of investment professionals who are women.

Perhaps women eschew finance because of preferences. Falk and Hermle (2018) document that the gender gap, in preferences increases with economic development, which they interpret as evidence that increased gender-equal access to social and economic resources allows for the expression of gender preferences along a number of dimensions. We explore three dimensions that might affect gender representation in finance: the gender gap in attitudes about competition, risk-taking, and pro-social behavior across countries.

Variation across countries in gender attitudes toward competition, which has been linked to the observed math gender gap, does not explain nor diminish our results. Niederle and Vesterlund (2007) document that men are more competitive than women in an experimental setting. Buser *et al.* (2014) find gender differences in competitiveness explain about 20% of the differences in academic track choices using data on the academic track choices of pre-university students in the Netherlands. Örs *et al.* (2013) analyze test performance on college entrance exams in France and find that women perform better than men on tests in noncompetitive environments, while men perform better in competitive environments. Cai *et al.* (2019) document a bigger gender gap in the high stakes Chinese national college entrance exam versus that observed in a low stakes mock exam. All of these studies indicate attitudes about competition help to explain the differences in math test scores for men and women. Moreover, many consider finance a competitive occupation, so it is plausible that gender attitudes toward competition might directly affect women's participation in finance and also reduce women's representation in math-related classes that would prepare them for a finance career. To control for the gender gap in competition attitudes, we use data from the WVS that measures whether women or men view competition as harmful. In 43 of 46 countries in our sample, women view competition as more harmful than do men. Consistent with the conjecture that the math gender gap is related to competition, there is a positive correlation between the gender gap in competition attitudes and the math gender gap (48.9%, $p < 0.01$). We find, at best, weak evidence that the gender difference in attitudes about competition across countries is correlated with gender representation in finance; gender differences in competition attitudes do not affect observed relation between the gender math gap and gender representation in finance.

Cross-sectional variation in gender attitudes toward risk-taking also does not explain our results. Many studies document that women are more risk averse than men (Croson and Gneezy, 2009; Charness and Gneezy, 2012). Phillipon and Reshef (2012) document that finance is an industry with more volatile earnings than other professions, thus it is plausible that attitudes about risk-taking help explain gender representation in finance. Consistent with this idea, Sapienza *et al.* (2009) document that both testosterone levels and risk aversion affect career choice among MBA students. To test whether the gender gap in risk aversion explains cross-country variation in the proportion of women in finance, we include the gender gap in risk-taking from the Global Preference Survey (Falk and Hermle, 2018) in our country analysis. Though on average women are more risk averse than men in all the countries we analyze, we do not find a significant relation between the gender gap in risk-taking and the proportion of women in finance across countries.

Finally, gender preferences for pro-social behavior combined with a general view that the finance

industry is less concerned with social impact than other professions might explain the relative dearth of women in finance. To test this hypothesis, we use two variables from the Global Preference Survey: the gender gaps in altruism and in positive reciprocity. Women are more altruistic than men in 88% of countries we analyze and more inclined to display positive reciprocity in 78% of sampled countries.

In multivariate analyses, we do not find reliable relationships between gender representation in finance and gender differences in competition, risk-taking, or pro-social behavior. Including risk-taking and pro-social behavior in the analysis reduces the influence of religion. However, the math gender gap remains reliably related to gender representation in finance. This suggests that factors that affect the math gender gap in middle school, rather than religion or gender preferences alone, play an important role in affecting career outcomes.

As a final robustness check, we confirm the relation between the math gender gap and women in finance by analyzing the variation in the two variables across states within the US. Strongly confirming our cross-country analysis, we find a state's math gender gap predicts the proportion of investment professionals who are women at the state level ($p < 0.05$). A one standard deviation decrease in the math gender gap is associated with a 1.3 percentage point increase in the proportion of investment professional in that state who are women.

At the state level, religiosity predicts the proportion of investment professionals who are women at the state level ($p < 0.01$). Including the math gender gap and religiosity in multivariate analysis does not materially affect the predictive ability of either variable. As was the case for the country analysis, these results survive a number of robustness checks.

In summary, we show that the math gender gap dominates other factors (general female labor force participation, measures of gender inequality, and gender attitudes about competition, risk-taking, and pro-social behavior) as a predictor of women's career outcomes by providing novel evidence on the relation between the math gender gap and the proportion of investment professionals who are women across countries and states. There are three potential explanations for our results. First, math training may directly affect educational choices and career outcomes, which is consistent with recent evidence that math training directly affects later educational attainment, college enrollment, and subsequent earnings (Cortes *et al.*, 2015; Dougherty *et al.*, 2017; Goodman *et al.*, 2019; Joensen and Nielsen, 2014). Second, other cultural factors that vary geographically may affect both the math gender gap and women's career outcomes. Note that cultural factors could affect women's career outcomes by influencing the industries in which women choose to pursue careers, the receptivity of those industries to women, or a combination of these two (i.e., women may avoid careers in industries they perceive to be biased against women). Third, women with strong career skills may choose to move to and work in regions they perceive to be less culturally biased against women with professional careers.[2]

Of the variables we consider, religiosity is related to gender representation in finance, however, it does not explain the relationship between the math gender gap and women's career outcomes. Our work relates to a few studies that specifically address gender differences in finance careers. Bertrand *et al.* (2010) analyze MBA graduates from the University of Chicago (who predominantly place in corporate and finance positions) and document three factors that account for the observed gender pay gap one decade after graduation: differences in training prior to MBA

graduation, differences in career interruptions, and differences in weekly hours. Adams *et al.* (2017) compare the values of people in finance with people in the general population; the value gap between women in finance and women in the general population is much larger than that observed for men in finance and men in the general population. More closely related to the analysis in this paper, Adams *et al.* (2018) use the CFA Institute survey data and document that women in finance are much more likely than men in finance to have a parent (particularly a mother) who worked in a STEM-related occupation, which is consistent with evidence that role models (particularly female role models) affect the career choices of women. None of these studies analyze geographical variation in the representation of women in finance, which is the focus of our inquiry.

1 Data and Methods

1.1 Country dataset

To analyze variation in career outcomes across countries, we use May 2016 membership data from the Chartered Financial Analyst (CFA) Institute, which identifies the gender and country of residence for each CFA member. The CFA Institute has over 135,000 members in 151 countries. Worldwide 18.4% of CFA members are women. With these data, we calculate the percentage of CFA members who are women by country. About half (48%) of CFA members reside in the US. With the US data, we calculate the percentage of CFA members who are women by state.

We use the PISA data on individuals to calculate the math gender gap at the 75th percentile by country using the six test years ending in 2015. We focus on the 75th percentile because the investment professionals are likely drawn from the top end of the math distribution and the gender gap in math tends to be larger at the higher ends of the math distribution (Hedges and Nowell, 1995). Our results are qualitatively similar if we use the median or 90th percentile.

As a control we include the percentage of the country's total labor force that is women in 2014 to account for factors that generally affect women's labor force participation.

To examine the influence of religion and other cultural factors on the gender math gap and women's representation in finance careers, we include a religiosity index, each country's 2015 WEF GGI, the gender gap in competition attitudes from the last five waves of the WVS, the gender gap in risk-taking (from the 2012 GPS), and the gender gap in pro-social attitudes (from the 2012 GPS). We describe these variables briefly here and provide details for each in the online Appendix.

Religion has been shown to influence both gender differences in education and gender differences in career choices. We include a religiosity index based on the Pew Research Center's "The Age Gap in Religion Around the World" (2018) to test whether religion is the cultural factor driving the positive relationship between the math gender gap and the percentage of CFA members who are women.

We include the World Economic Forum Gender Gap Index (WEF GGI) to control for the general adversity that women face in a country, which includes health, empowerment, and labor market scores. In the online Appendix, we show that alternative measures of gender inequality (United Nations Gender Inequality Index, Political Empowerment Index, and measures from the WVS suggested by Guiso *et al.*, 2008) perform no better than the WEF GGI in predicting the proportion of CFA members who are women.

The gender gap in competition attitudes might affect both the math gender gap and women's career outcomes (Niederle and Vesterlund, 2007;

Buser *et al.*, 2014; Örs *et al.*, 2013). To measure the gender gap in competition attitudes by country, we calculate the difference between men and women in the response to a WVS question that asks respondents whether competition is good or harmful on a 10-point Likert Scale with 10 (1) indicating competition is harmful (good). A positive gender gap in competition indicates that women view competition as more harmful than men, which is the case in 43 of 46 countries.

Earnings in finance are more volatile than other industries (Phillipon, 2012) and women are generally more risk averse than men (Croson and Gneezy, 2009; Charness and Gneezy, 2012). Thus, the gender gap in attitudes about risk-taking might affect women's representation in finance. To measure the gender gap in risk-taking, we use 2012 Global Preference Survey (GPS) questions that elicit risk-taking preferences from two multiple price lists in which subject chose between a lottery and varying safe options. A negative gender gap in risk-taking indicates that women are more risk averse than men, which is the case in all 40 of the GPS countries for which we have CFA membership and PISA data.[3]

To test the conjecture that women are more inclined to pursue pro-social careers and finance careers are not viewed as pro-social, we use two measures of pro-social behavior from the 2012 GPS. Altruism is measured using the questions that ask subjects how much they will donate to a good cause. A positive gender gap in altruism indicates that women are more altruistic than men, which is the case in 35 of the 40 GPS countries for which we have CFA membership and PISA data. Positive reciprocity is based on questions that measure a willingness to return a favor. A positive gender gap in positive reciprocity indicates that women are more willing to return a favor than men, which is the case in 31 of the 40 GPS countries.

In Table 1, Panel A, we present descriptive statistics on the main country dataset, restricting our analysis to 55 countries with more than 30 CFA members and data on the two main control variables (female labor force participation and the WEF GGI). The gender gap in competition from the WVS is available for 46 of the 55 countries; the gender gaps in risk-taking, altruism, and positive reciprocity is available in 40 of the 66. In the average country, 18.1% of CFA members are women, which varies from a minimum of 4.6% in Colombia to 43.0% in Vietnam. Consistent with prior work, we observe a math gender gap at the median, which tends to grow at the 75th and 90th percentiles. The country dataset yields strong variation in the percentage of the total labor force that is women, ranging from 13.5% in Qatar to 50.1% in Lithuania. The WEF GGI is highest in the most equal country of Finland (WEF GGI = 0.845) and lowest in the least equal country of Jordan (WEF GGI = 0.603). The countries with the highest religiosity index are Indonesia, Jordan, and Colombia; those with the lowest are China, the Czech Republic, and Vietnam. Finally, women view competition as more harmful than men, display higher levels of altruism and positive reciprocity, and are less willing to take risks.

1.2 State dataset

For each state and seven most recent waves of the NAEP ending in 2015, we use percentile statistics for math and Grade 8 by gender. The math gender gap for the state is the 75th percentile for boys' scores less the 75th percentile for girls' scores averaged across years. We obtain similar results if we measure the math gender gap at the median or 90th percentile.

As in the cross-country analysis, we include a religiosity index (based on the Pew Research Center's "2014 Religious Landscape Study") to test whether religion is the cultural factor driving the positive relationship between the math gender gap

Table 1 Descriptive statistics.

Variable Description	N	Mean	Std. Dev.	Min.	Max.
Panel A : Country Dataset					
% Women, CFA Members	47	17.63	7.61	4.55	43.04
Girls Math Score, Median	47	467.11	56.26	344.05	613.44
Girls Math Score, 75 th Percentile	47	526.38	57.40	404.89	676.04
Girls Math Score, 90th Percentile	47	578.21	56.16	462.45	726.48
Math Gender Gap, Median	47	8.36	7.35	−10.22	22.78
Math Gender Gap, 75th Percentile	47	13.22	7.30	−4.21	26.94
Math Gender Gap, 90th Percentile	47	16.71	7.32	−2.63	30.05
% Religious Affiliation	47	77.66	20.32	13.00	100.00
% Pray Regularly	47	29.00	19.96	1.00	84.00
% Religion Very Important	47	30.98	23.83	3.00	93.00
% Women, Total Labor Force	47	44.14	5.34	18.37	50.09
Gender Gap Index (WEF)	47	0.72	0.05	0.60	0.85
Gender Gap in Competition (WVS)	40	0.27	0.14	−0.13	0.48
Gender Gap in Altruism	38	0.16	0.11	−0.08	0.35
Gender Gap in Positive Reciprocity	38	0.08	0.08	−0.14	0.25
Gender Gap in Risk Taking	38	−0.21	0.10	−0.39	−0.05
Number of CFA Members	47	2,460	9,749	35	65,032
Panel B: State Dataset					
% Women, CFA Members	45	15.75	3.76	10.17	26.92
Girls Math Score, Median	45	280.81	7.82	255.08	297.00
Girls Math Score, 75th Percentile	45	303.38	7.67	279.18	319.80
Girls Math Score, 90th Percentile	45	322.84	7.40	301.54	338.74
Math Gender Gap, Median	45	1.18	1.20	−2.95	3.02
Math Gender Gap, 75th Percentile	45	2.40	1.05	−1.45	3.77
Math Gender Gap, 90th Percentile	45	3.42	0.87	0.87	4.88
% Religion Important	45	53.56	10.23	33.00	77.00
% Religion Attend	45	36.09	7.27	22.00	53.00
% Religion Believe	45	63.73	8.79	40.00	82.00
% Pray Regularly	45	54.78	8.74	35.00	75.00
% Women, Total Labor Force	45	47.38	1.32	43.99	50.23
Number of Finance Majors in State	45	745.24	713.84	31.00	3318.00
% Women, Finance Majors	45	29.49	5.37	16.56	48.39
Number of CFA Members	45	1,433	2,222	42	11,009

For the country dataset (Panel A), math scores are from PISA. For the state dataset (Panel B), math scores are from NAEP. The math gender gap is boys less girls scores. The religion variables are from the Pew survey. The gender gap index is from the WEF. The gender gap in competition is from the WVS and is positive when women view competition as more harmful than men in a country. The gender gap in altruism, positive reciprocity, and risk taking are from the GPS and are positive when women display more of the preference than men in a country.

and the percentage of CFA members who are women. As control variables, we include the percentage of the state's labor force that is women and the percentage of a state's finance majors who are women. To calculate the percentage of the state's labor force that is women we use the 2013 American Community Survey (ACS) and restrict the sample to those over the age of 16. The data on finance majors are from the Integrated Postsecondary Education Data System (IPEDS)[4]. For all reporting institutions, we collect the total number of 2015 graduating finance majors by gender.

In Table 1, Panel B, we present descriptive statistics on the states with at least 30 CFA members and 30 finance majors in 2015. In the average state, 15.7% of CFA members are women, which varies from a minimum of 7.9% in Montana to 26.9% in South Dakota. Consistent with prior work, we observe a small math gender gap at the median in the US, which tends to grow at the 75th and 90th percentiles. Hawaii and DC are the only regions where girls outperform boys at the 75th percentile; we observe the biggest gap in Pennsylvania. The state dataset yields only modest variation in the percentage of the total labor force that is women, ranging from 44.0% in Utah to 50.2% in the District of Columbia. The states with the highest religiosity index are Alabama, Mississippi, and Tennessee; those with the lowest are Vermont, Massachusetts, and New Hampshire. In the average state, 29.2% of finance majors are women, ranging from 16.6% in Utah to 48.4% in Alaska.

2 Results

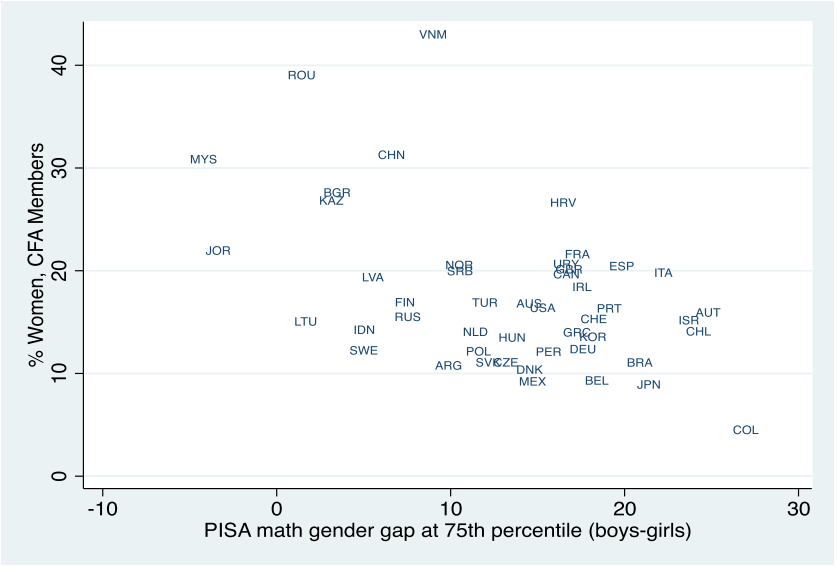
2.1 Country results

In Figure 1, we plot the percentage of CFA members who are women in a country (y axis) against the math gender gap (x axis) and document a negative relation between the two ($p < 0.001$ in a univariate regression).

In Table 2, we present the results of member-weighted country regressions. In each model, we standardize the independent variables and weight observations by the square root of the number of members within a country since the precision of our estimate of women representation within a country will differ depending on our sample size. Unweighted regressions are presented in the online Appendix and yield similar results. In column (1), we present the results of a weighted univariate regression of the proportion of CFA members who are women on the math gender gap. The coefficient of -6.161 ($p < 0.01$) on the math gender gap indicates that a one standard deviation increase in a country's math gender gap is associated with a 6.161 percentage point decrease in the proportion of CFA members who are women.

In column (2), we present the results of a weighted univariate regression of the proportion of CFA members who are women on the religiosity index. The coefficient of -2.677 ($p < 0.05$) on the religiosity index indicates that a one standard deviation increase in a country's degree of religiosity is associated with a 2.677 percentage point decrease in the proportion of CFA members who are women.

In column (3), we include as independent variables both the gender math gap and the religiosity index as well as the percentage of the total labor force that is women and the WEF GGI. The coefficients of -6.095 ($p < 0.01$) on the gender math gap and -2.535 ($p < 0.01$) on the religiosity index are extremely close to their univariate estimates, suggesting that the influence of religiosity on the proportion of CFA members who are women is independent of the relationship between the gender math gap and the proportion of CFA members who are women. The coefficients on the percentage of the total labor force that is women and the WEF GGI are statistically insignificant.



ARG, Argentina; **AUS**, Australia; **AUT**, Austria; **BEL**, Belgium; **BGR**, Bulgaria; **BRA**, Brazil; **CAN**, Canada; **CHE**, Switzerland; **CHL**, Chile; **CHN**, China; **COL**, Colombia; **CZE**, Czech Republic; **DEU**, Germany; **DNK**, Denmark; **ESP**, Spain; **FIN**, Finland; **FRA**, France; **GBR**, United Kingdom; **GRC**, Greece; **HRV**, Croatia; **HUN**, Hungary; **IDN**, Indonesia; **IRL**, Ireland; **ISR**, Israel; **ITA**, Italy; **JOR**, Jordan; **JPN**, Japan; **KAZ**, Kazakhstan; **KOR**, Korea; **LTU**, Lithuania; **LVA**, Latvia; **MEX**, Mexico; **MYS**, Malaysia; **NLD**, Netherlands; **NOR**, Norway; **PER**, Peru; **POL**, Poland; **PRT**, Portugal; **ROU**, Romania; **RUS**, Russian Federation; **SRB**, Serbia; **SVK**, Slovakia (Slovak Republic); **SWE**, Sweden; **TUR**, Turkey; **URY**, Uruguay; **USA**, United States; **VNM**, Vietnam.

Figure 1 The Percentage of CFA Members who are Women and the Math Gender Gap across Countries.

For each country, the percentage of CFA members who are women is from the 2016 CFA Institute membership data and the math gender gap is the average difference between the 75th percentile PISA math score for boys and girls across the six PISA test years ending in 2015.

In column (4), we add the gender gap in competition from the WVS as an explanatory variable; the estimated coefficient has the wrong sign and is statistically insignificant; it does not affect the conclusions about the math gap and religiosity variables. In columns (5) and (6), we add variables related to risk-taking, altruism, and positive reciprocity from the GPS without and then with the gender gap in competition variable. (Adding these variables reduces the sample size.) The magnitudes of the coefficient estimates on the math gender gap and religiosity variables drop slightly and the coefficient on religiosity is no longer statistically significant. The risk-taking variable has the wrong sign (the variable is negative when women are more risk averse than men) and is statistically insignificant. The altruism and positive reciprocity coefficient variables have the correct sign, but are statistically insignificant.

In the online Appendix, we present a number of additional robustness checks. When we equal weight countries, the math gap coefficients remain significant and none of the other variable coefficients are statistically significant (Table A.5). The results are not driven by Asia and Europe; when we include fixed effects for these two regions, neither is statistically significant and the remaining results are similar to those reported in Table 2 (Table A.6). The results are also similar when we restrict our sample to countries with at least 100 (rather than 30) CFA members (Table A.7). We also explore a number of alternative measures of gender inequality; none

Table 2 The math gender gap and women in finance across countries.

	(1)	(2)	(3)	(4)	(5)	(6)
Gender Gap in Math	−6.161***		−6.095***	−6.355***	−4.649**	−5.482**
	[2.262]		[1.510]	[1.729]	[1.950]	[2.286]
Religiosity Index		−2.677**	−2.535***	−2.649***	−2.070	−1.925
		[1.304]	[0.625]	[0.887]	[1.421]	[1.395]
% Women, Total Labor Force			3.275	3.485	6.986	6.738
			[2.887]	[3.260]	[4.125]	[4.259]
Gender Gap Index (WEF)			−1.002	−1.063	−0.939	−1.533
			[1.535]	[1.801]	[1.720]	[2.259]
Gender Gap in Competition (WVS)				0.191		1.725
				[1.860]		[1.990]
Gender Gap in Risk Taking (GPS)					−2.441	−2.281
					[1.906]	[1.745]
Gender Gap in Altruism (GPS)					−1.336	−2.331
					[1.714]	[1.959]
Gender Gap in Positive Recip. (GPS)					−0.618	−0.656
					[0.955]	[0.930]
Constant	20.470***	16.287***	18.236***	18.140***	18.232***	18.517***
	[1.465]	[0.424]	[0.902]	[1.010]	[1.746]	[1.962]
Observations	47	47	47	40	38	34
Adj. R-squared	0.314	0.221	0.516	0.525	0.557	0.546

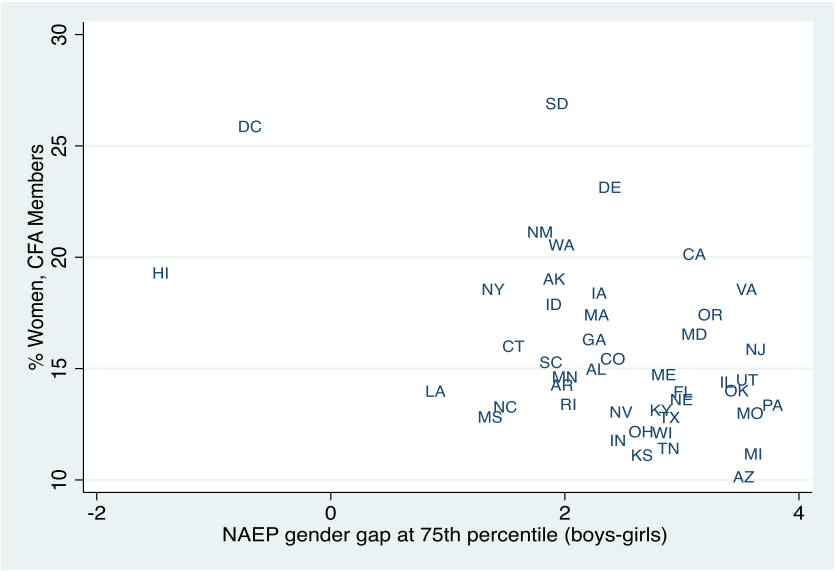
The dependent variable is the percent of CFA members within a country who are women. The independent variables are the gender gap in math at the 75th percentile (mean of 2000 through 2015 data from PISA), the religiosity index (from Pew), the percent of the total labor force that is female (2014 World Bank), the Gender Gap Index (WEF 2015), and Gender Gap in Competition (mean of six WVS waves from 1981 to 2014), and the Gender Gap in Altruism, Positive Reciprocity, and Risk Taking (2012 Global Preference Survey). The regressions use standardized independent variables and weighted least squares (WLS) with weights based on the number of CFA members in the country.
Robust standard errors in brackets
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

of these alternative measures show economically or statistically significant correlations with gender representation in finance (Table A.8).

In summary, the math gender gap and religiosity have the strongest relationships with gender representation in finance, however the introduction of risk-taking, altruism, and positive reciprocity variables erodes the statistical significance of the religiosity variable.

2.2 State results

To provide further evidence on the links between the math gender gap, religion, and women's occupational outcomes, we conduct a similar analysis



AK, Alaska; **AL**, Alabama; **AR**, Arkansas; **AZ**, Arizona; **CA**, California; **CO**, Colorado; **CT**, Connecticut; **DC**, District of Columbia; **DE**, Delaware; **FL**, Florida; **GA**, Georgia; **HI**, Hawaii; **IA**, Iowa; **ID**, Idaho; **IL**, Illinois; **IN**, Indiana; **KS**, Kansas; **KY**, Kentucky; **LA**, Louisiana; **MA**, Massachusetts; **MD**, Maryland; **ME**, Maine; **MI**, Michigan; **MN**, Minnesota; **MO**, Missouri; **MS**, Mississippi; **NC**, North Carolina; **NE**, Nebraska; **NJ**, New Jersey; **NM**, New Mexico; **NV**, Nevada; **NY**, New York; **OH**, Ohio; **OK**, Oklahoma; **OR**, Oregon; **PA**, Pennsylvania; **RI**, Rhode Island; **SC**, South Carolina; **SD**, South Dakota; **TN**, Tennessee; **TX**, Texas; **UT**, Utah; **VA**, Virginia; **WA**, Washington; **WI**, Wisconsin.

Figure 2 The Percentage of CFA Members who are Women and the Math Gender Gap across States.

For each state, the percentage of CFA members who are women is from the 2016 CFA Institute membership data and the math gender gap is the average difference between the 75th percentile math score for boys and girls across the seven most recent NAEP test years ending in 2015.

across states and the District of Columbia (DC) within the US. We restrict the analysis to 45 states with 30 members and the key control variables. In Figure 2, we plot the percentage of CFA members who are women in a state (y axis) against the math gender gap (x axis) and document a negative relation between the two ($p < 0.01$ in a univariate regression).

In Table 3, we present the results of the weighted regression analysis. In each model, we standardize the independent variables and weight observations by the square root of the number of members within a state. In columns (1) and (2), we present the results of weighted univariate regressions with the math gender gap and religiosity as independent variables; both are economically and statistically significant. Column (3) regresses the percentage of CFA members who are women on the math gender gap, religiosity, the percentage of the state's labor force that is women and the percentage of a state's finance majors who are women. A one standard deviation increase in the state's math gender gap is correlated with a 1.3 percentage point decrease in the percentage of CFA members who are women in the state. Thus the economic magnitude of the gender math gap is less than that observed in the country-level analysis. This is reasonable since there is almost certainly more cultural similarity across states within the US than across countries around the world. For example, there is less variation in the math gender gap across states within the US than there is in the math gender gap across countries. There is also less variation across states in the percentage of CFA members who are women

Table 3 The math gender gap and women in finance across states.

Gender Gap in Math	−1.255**		−1.270***	−1.268***	−1.106***
	[0.560]		[0.373]	[0.396]	[0.382]
Religiosty Index		−1.643***	−1.901***	−1.925***	−1.944***
		[0.547]	[0.431]	[0.441]	[0.427]
% Women, Total Labor Force			−0.235	−0.229	−0.373
			[0.493]	[0.518]	[0.502]
% Women, Finance Majors			2.509***	2.538***	2.322***
			[0.599]	[0.623]	[0.575]
Constant	16.621***	15.809***	15.436***	15.414***	15.420***
States > N CFA Members	[0.609]	[0.563]	[0.419]	[0.429]	[0.427]
States > N Finance Majors					
Excluded States in Main Sample:	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY
Additional States Excluded:				AL, HI, ID, ME, MS, NM, SD	HI, DC
Observations	45	45	45	38	43
Adj. R-squared	0.126	0.201	0.530	0.532	0.513

The dependent variable is the percent of CFA members within a state who are women. The independent variables are the gender gap in math (mean of 75th percentile across 2003 to 2015 data from NCES), the religiosity index (from Pew), the percent of the total state labor force that is female (2013 ACS data), and the percent of finance majors in the state who are women (IPEDS 2015 data). The regressions use standardized independent variables and weighted least squares with weights based on the number of CFA members in the state. Column 4 restricts the sample to states with 100 CFA members and 100 finance majors. Column 5 drops Hawaii and the District of Columbia.
Robust standard errors in brackets
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

(standard deviation of 3.76%) than there is across countries (standard deviation of 8.58%). Finally, NAEP focuses on curriculum-based mathematics outcomes, while PISA assesses "the preparedness of 15-year-olds to be able to apply mathematics to solve novel, real-world problems" (Niedorf *et al.*, 2006). Real-world problem solving may correlate more highly with the skills required of CFA members.

As reported in column (2), a one standard deviation increase in the state's religiosity index is correlated with a 1.6 percentage point decrease in the percentage of CFA members. This is only a slightly lower magnitude than in the cross-country analysis perhaps because, unlike the math gender gap, the variation in religiosity is as great or greater across states as across countries.

As controls, we include the percentage of the state's total labor force that is women and the state's percentage of undergraduate finance majors who are women. In column (3), we find no reliable relation between the percentage of the labor force that is women and the percentage of CFA members who are women, but the percentage of women who major in finance is related to the percentage of CFA members who are women.

In column (4), we restrict the analysis to states with a minimum of 100 CFA members and 100 finance majors and obtain qualitatively similar results. In column (4), we drop the obvious outliers in Figure 1 (Hawaii and DC), which has no material affect on the estimated relations. In the online Appendix, we show that these results are very similar when we equal, rather than member weight the regressions (Table A.9).

3 Conclusion

Women are underrepresented in math-intensive careers in STEM fields and finance. This lack of participation reduces the talent pool in these fields. Furthermore, because many math-intensive careers are often well paid, the lack of women in these fields contributes to the gender gap in pay.

We find that the math gender gap in middle school covaries with the percentage of CFA members who are women across countries and across states within the US. We believe that, most likely, common cultural factors influence both. We examine religion as potential factor and find that while religion influences the gender representation in finance, including religion in the analysis does not diminish the effect of the math gender gap. In our country analysis introducing general levels of female labor force participation, general measures of gender inequality, and a measure of the gender gap in competition do not diminish the observed relationships between the math gender gap, religiosity, and the percentage of CFA members who are women. When we simultaneously introduce measures of gender differences in pro-social behavior (altruism and positive reciprocity) as well as a measure of gender differences in risk-taking, none have a statistically significant relationship with the percentage of CFA members who are women; however, including these factors weakens the relationship of religion and gender representation of CFA members. Even in this multifactor setting, the math gender gap has a large and statistically significant relationship with the gender representation of CFA members. Either the early math training of women leaves them insufficiently prepared for an investment management career, women seeking investment management careers move to places with fewer cultural impediments to women's careers (and move at faster rates than men), or the same cultural factors that affect math training may prevent women from pursuing careers in well-paid math-intensive fields. These cultural factors appear to be distinct from religion and gender differences in attitudes toward competition, risk-taking, altruism, and reciprocity since the introduction of variables that measure geographic variation in these factors has little influence on the observed relation between the math gender gap and the representation of women in finance. Our results suggest—though do not prove—that policy interventions that address the math gender gap could improve the representation of women in quantitative careers like finance. This would, in turn, help to reduce the gender pay gap since these professions command a wage premium.

Endnotes

[1] Fryer and Levitt (2009) find no relationship between gender inequality and the math gender gap when Middle Eastern countries are added to the analysis. They propose that this may be due to a single-gender classroom or to an Islamic religion effect. Kane and Mertz (2012) dispute these explanations and argue that gender inequality and sociocultural factors are the primary determinants of the gender math gap.

[2] Both male and female CFA members are more likely to move to regions with more finance jobs. Our results would only be affected if men and women moved to these regions at different rates.

[3] For the three GPS variables (risk-taking, altruism, and positive reciprocity), z-scores are calculated for each respondent and the country-level gender difference is the mean z-score for women less men.

[4] https://nces.ed.gov/ipeds.

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JEL Classification: G20; I24; J24

Supporting Online Material

1. Data and Methods

1.1 Country level data

The Chartered Financial Analyst (CFA) Institute provided us with CFA member data as of May

2016. For each member, we know the member's gender and country of residence.

We use the individual PISA data to calculate the math gender gap by country using the six most recently available sample years: 2000, 2003, 2006, 2009, 2012, and 2015. PISA generates five plausible values for each student's math score for the waves through 2012 and ten in 2015. For the 2000 wave, we calculate the median math score for boys (and girls) weighted by final student weights *(W_FSTUWT)* for each plausible value, *PV1MATH* to *PV5MATH*. The median math score for each of the five plausible values is then averaged to yield an estimate of the boy's (and girl's) median score for each year. The median math gender gap for the country is the boy's median score less the girl's median score. We repeat this calculation to estimate the math gender gap at the 75th and 90th percentile. There is a similar calculation for each PISA sample year, which yields up to six observations of (e.g.) the median math gender gap for a country. We average the median math gender gap across sample years for each country, where the number of sample years with math scores varies across countries (see table S1). In our main analysis, we match PISA data for country code QCN, which is based on tests in the province of Shanghai, to CFA data for China and PISA data for country code TAP, which is based on tests in Taipei, to CFA data for Taiwan. As we discuss below, excluding China and Taiwan from our analysis does not materially affect our results.

We measure religious commitment by calculating the principal component of responses to three survey questions included in the Pew Research Center's "The Age Gap in Religion Around the World" (2018)[1]. The responses indicate whether the respondent is affiliated with a religion, prays daily, and considers religion very important. (See the report for the wording of the questions in different countries and see Appendix B of the report for the data.) We do not include a fourth question about weekly attendance of religious services because of missing data for Japan, India, and Vietnam. The first principal component explains 83.1% of the observed variation in the three variables and weights the three components similarly (0.52 affiliation, 0.60 daily prayer, and 0.61 religion very important).

As a control, we include the percent of the country's total labor force who are women in 2014 and the country's 2015 United Nations (UN) Gender Inequality Index. The labor force data is from the World Bank website[2]. The World Bank does not have data on labor force participation by gender for Taiwan; we use the National Statistics, Republic of China (Taiwan), to fill in data for Taiwan[3].

In the main paper, we use the World Economic Forum Global Gender Gap Index (WEF GGI) as a general measure of gender inequality (see "The Global Gender Gap Report 2016"[4]). The GGI examines the gap on a country level between men and women in four categories: economic participation and opportunity, educational attainment, health and survival, and political empowerment.

As an alternative to the WEF GGI, we consider the United Nations Gender Inequality Index (GII)[4]; it "...measures gender inequalities in three important aspects of human development—reproductive health, measured by maternal mortality ratio and adolescent birth rates; empowerment, measured by proportion of parliamentary seats occupied by females and proportion of adult females and males aged 25 years and older with at least some secondary education; and economic status, expressed as labour market participation and measured by labour force participation rate of female and male populations aged 15 years and older."

Our third measure of gender inequality is the Political Empowerment Index (PEI). It is also taken from the World Economic Forum "The Global Gender Gap Report 2016"[5]. The PEI is a subindex of the GGI based on (1) the ratio of females with seats in parliament the male value, (2) the ratio of females with ministerial level jobs over the male value, and (3) the number of (the last 50) years with a female head of state over the male value.

Our final measure of gender inequality follows prior research[6] and is created from responses to questions on the role of women in society taken in the European and World Values Surveys (WVS) Integrated Data File, 1981-2014[7]. The questions used are "When jobs are scarce, men should have more right to a job than women" (C001), "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work" (D056),"Being a housewife is just as fulfilling as working for pay" (D57), "Both the husband and wife should contribute to household income" (D58), "On the whole, men make better political leaders than women do" (D59), "If a woman earns more money than her husband, it's almost certain to cause problems" (D66) and "A university education is more important for a boy than for a girl" (D60). (Respectively, questions V61, V98-V103 in the WVS Wave 4). For all but the first question, levels of agreements are expressed on a scale from 1 to 4. In the first question the answers were "agree," "neither," and "disagree." Following prior work (4), we recode the answers to the first question to respective scores of 1.5, 2.5, and 3.5 and invert the answers to questions D056 and V058, so that higher values indicate a better position of women in society. We average responses to each question within each country for Waves 2, 3, and 4 (1989–2004) exclude "Don't know" and missing answers. (None of the questions appear in Wave 1, and only four of seven questions appear subsequent to Wave 4.) The Average WVS Indicators is the average by country of the mean answers to all seven questions.

To measure the gender gap in competition attitudes by country, we calculate the difference between men and women in the response to a WVS question that asks respondents whether competition is good or harmful. Respondents are asked to respond on a ten point Likert scale with responses ranging from "1—Competition is good" to "10—Competition is harmful." The WVS provides general population responses to this question (E039) across five survey waves spanning the years 1989–2014. To calculate the gender gap in competition attitudes, we calculate the mean response of men and women by country for each of the five waves (using survey weights S017). We then calculate an average across waves of these country-wave means. A positive value for the gender gap in competition indicates women view competition as more harmful than men; the gender gap in competition is positive in 43 of 46 countries in our sample.

To measure the gender gap in risk taking, altruism, and positive reciprocity, we use the variables as defined in Falk and Hermle (2018). Risk taking was elicited through two multiple price lists in which subjects choose between a lottery and varying safe options. The average of the two switching rows served as the experimental measure of risk taking. Altruism is based on the following question:

"Imagine the following situation: Today you unexpectedly received 1,000 Euro. How much of this amount would you donate to a good cause? (Values between 0 and 1000 are allowed.)"

Positive reciprocity is based on the following question:

"Please think about what you would do in the following situation. You are in an area you are not familiar with, and you realize you lost your way. You ask a stranger for directions.

The stranger offers to take you to your destination. Helping you costs the stranger about 20 Euro in total. However, the stranger says he or she does not want any money from you. You have six presents with you. The cheapest present costs 5 Euro, the most expensive one costs 30 Euro. Do you give one of the presents to the stranger as a "thank-you"- gift? If so, which present do you give to the stranger? No present / The present worth 5 / 10 / 15 / 20 / 25 / 30 Euro."

Falk and Hermle (2018) calculate the individual-level preference measures as follows: First, for each of the 12 survey items z-scores were computed at the individual level. Second, for each preference the respective z-scores were averaged using weights developed in the experimental validation. Technically, these weights had been computed as coefficients in OLS 9 regressions of observed choices in the experimental validation on the respective survey items, restricting the sum of coefficients to one. See the supplementary materials of Falk and Hermle (2018) for additional details.

Table A.1 provides descriptive statistics on the key variables in our analysis. Table A.2 provides data for the 151 countries with CFA members with the exception of the GPS data.

1.2 State level data

The CFA Institute provided us with CFA member data as of May 2016 for the United States. For each member, we know the member's gender and state of residence.

Table A.1 Country variable list.

Variable	Description	N	Mean	Std. Dev.	Min.	Max.
CFAfemale	% Women, CFA Members	81	18.71	8.71	3.07	46.77
pgirl50_m	Girls Math Score, Median	57	469.35	58.30	344.05	613.44
pgirl75_m	Girls Math Score, 75 th Percentile	57	529.24	59.52	404.89	676.04
pgirl90_m	Girls Math Score, 90th Percentile	57	581.60	57.96	462.45	726.48
gendergap_med	Math Gender Gap, Median	57	7.15	8.73	−15.80	22.78
gendergap_75	Math Gender Gap, 75th Percentile	57	12.15	8.19	−11.49	26.94
gendergap_90	Math Gender Gap, 90th Percentile	57	15.91	8.01	−8.84	30.05
rel_affil	Religious Affiliation %	57	81.33	20.12	13.00	100.00
rel_pray	Pray Regularly %	57	35.49	24.20	1.00	95.00
rel_veryimp	Religion Very Important %	57	38.65	28.63	3.00	94.00
numyrs	Years of Math Gap Data	57	5.02	1.41	1.00	6.00
female_percLF	% Women, Total Labor Force	79	40.97	9.56	13.12	50.09
GllValue	UN Gender Inequality Index	76	0.25	0.16	0.02	0.57
fem_comp	WVS Womens Competition Attitude	61	3.91	0.65	2.44	6.33
WVS_comp	WVS Gender Gap in Competition	61	0.25	0.19	−0.27	0.94
wvs_wom	Avg. WVS Indicators	60	2.70	0.18	2.25	3.19
ggi	WEF Gender Gap Index	77	0.70	0.06	0.56	0.85
pol_emp	WEF Women's Political Empowerment	77	0.21	0.14	0.01	0.61
genderdif_altruism	GPS Gender Gap in Altruism	52	0.12	0.12	−0.15	0.35
genderdif_posrecip	GPS Gender Gap in Positive Reciprocity	52	0.06	0.10	−0.17	0.28
genderdif_risktaking	GPS Gender Gap in Risk Taking	52	−0.20	0.10	−0.39	0.05
members	Number of CFA Members	81	1,666	7,500	35	65,032

Table A.2 Country dataset.

country	cnt	label	CFAfemale	pgirl50_m	pgirl75_m	pgirl90_m	gendergap_med	gendergap_75	gendergap_90	rel_affil	rel_pray	rel_veryimp	numyrs	female_percLF	GIIValue	fem_comp	WVS_comp	wvs_wom	ggi	pol_emp	members
1	ALB	Albania	58.33	398.93	458.45	511.30	-10.96	-6.82	-1.75	99	15	15	4	41.27	0.22	3.17	0.06	2.85	0.70	0.21	12
2		Andorra	30.00													4.79	0.75				10
3		Angola	0.00											46.20					0.64	0.25	2
4		Antigua And Barbuda	100.00																		1
5	ARG	Argentina	10.81	385.43	449.03	503.53	6.87	9.87	14.58	89	40	43	4	40.43	0.38	4.36	0.39	2.79	0.74	0.35	111
6		Armenia	18.18							98	45	53		46.18	0.32	3.90	0.23	2.44	0.67	0.07	22
7		Aruba	0.00																		1
8	AUS	Australia	16.85	511.50	571.87	624.67	10.33	14.50	17.32	57	18	18	6	45.39	0.11	3.45	0.09	2.76	0.72	0.19	2511
9	AUT	Austria	15.97	497.11	559.87	609.25	20.73	24.78	28.88	84	8	12	6	46.00	0.05			2.68	0.72	0.25	382
10	AZE	Azerbaijan	11.11	447.87	484.59	521.12	4.09	4.79	4.72	100	76	38	2	48.63	0.30	3.87	0.09	2.46	0.68	0.07	18
11		Bahamas	33.78											48.30	0.30				0.73	0.11	74
12		Bahrain	18.02											19.57	0.26	6.33	0.51		0.62	0.04	172
13		Bangladesh	7.14							100	57	80		40.41	0.50	2.44	0.03	2.53	0.70	0.46	56
14		Barbados	26.00											48.90	0.36				0.74	0.15	50
15		Belarus	0.00							97	25	21		48.73	0.15	4.00	0.52	2.60	0.74	0.15	5
16	BEL	Belgium	9.35	519.96	585.27	635.94	10.97	18.39	20.87	62	11	11	6	45.78	0.06			2.76	0.75	0.28	321
17		Benin	0.00											47.01	0.61				0.64	0.07	1
18		Bermuda	19.14																		209
19		Bolivia	0.00							96	56	71		44.63					0.75	0.42	3
20		Bosnia And Herzegovina	33.33							97	33	54		38.04	0.20			2.78	0.69	0.19	3
21		Botswana	14.29							91	66	71		47.06	0.48				0.72	0.07	21
22	BRA	Brazil	11.10	355.70	416.04	474.01	16.22	20.85	26.51	92	61	72	6	43.77	0.46	3.97	0.33	2.77	0.69	0.13	829
23		Brunei Darussalam	20.00											39.68					0.67	0.02	10
24	BGR	Bulgaria	27.65	433.01	497.29	554.73	-5.88	3.46	9.59	95	15	19	5	46.61	0.21	3.61	0.02	2.68	0.73	0.22	170
25		Cambodia	0.00											49.82	0.48				0.66	0.10	5
26		Cameroon	0.00							98	82	90		45.70	0.59				0.68	0.18	1
27	CAN	Canada	19.70	522.17	578.50	627.05	12.03	16.64	18.51	67	25	27	6	47.12	0.13	3.87	0.40	2.91	0.73	0.22	16603
28		Cayman Islands	17.95																		117
29	CHL	Chile	14.13	400.41	457.85	510.61	20.41	24.23	25.03	84	39	41	5	40.76	0.34	4.61	0.26	2.71	0.70	0.25	92
30	CHN	China	31.32	613.44	676.04	726.48	3.29	6.59	9.86	13	1	3	2	43.87	0.19	3.25	0.11	2.72	0.68	0.16	3634
31	COL	Colombia	4.55	366.63	417.92	466.62	22.78	26.94	29.11	94	73	77	4	42.60	0.43	3.99	0.27	2.69	0.73	0.18	66
32	CRI	Costa Rica	44.44	391.49	435.21	477.78	19.63	24.83	27.83	91	78	76	2	37.27	0.35				0.74	0.37	9
33		Cote D'Ivoire	33.33											37.96	0.68				0.60	0.08	6
34	HRV	Croatia	26.67	458.62	516.98	567.85	11.37	16.45	22.16	93	41	42	4	45.69	0.15	3.07	0.35	2.84	0.70	0.15	75
35		Curacao	33.33																		3
36		Cyprus	24.14											43.18	0.12	4.16	0.17		0.68	0.10	116
37	CZE	Czech Republic	11.11	496.86	561.71	616.42	9.80	13.16	17.00	28	9	7	6	44.12	0.09	3.11	0.28	2.69	0.69	0.13	144
38	DNK	Denmark	10.41	504.44	561.61	609.90	13.59	14.52	15.46	70	10	9	6	47.69	0.05			2.99	0.75	0.31	269
39		Dominican Republic	0.00							82	74	78		40.09	0.48	3.52	0.45	2.88	0.68	0.09	2
40		Ecuador	0.00							95	63	76		40.39	0.41	3.89	0.17		0.73	0.30	5
41		Egypt	28.87							100	72	72		24.12	0.57	2.64	0.06	2.25	0.61	0.09	142
42		El Salvador	0.00							88	77	85		42.19	0.43	3.86	0.23	2.63	0.70	0.21	2
43	EST	Estonia	16.00	513.93	567.46	614.38	6.04	9.00	12.18	55	9	6	4	49.06	0.16	3.62	0.14	2.68	0.75	0.31	25
44		Ethiopia	0.00							100	65	98		47.31	0.56	4.08	0.37		0.66	0.23	2
45		Fiji	0.00											33.68	0.42						1
46	FIN	Finland	16.96	533.78	586.96	632.31	2.31	7.36	10.62	78	18	10	6	47.74	0.07	4.04	0.25	3.04	0.85	0.61	112
47	FRA	France	21.65	500.82	561.64	611.67	10.45	17.27	19.39	72	10	11	6	47.14	0.09	5.13	0.22	2.87	0.76	0.37	984
48		Georgia	25.00							100	38	51		46.36	0.38	3.35	0.29	2.47	0.68	0.09	8
49	DEU	Germany	12.40	502.44	566.28	618.41	13.05	17.58	21.20	76	9	10	6	45.91	0.04	4.06	0.37	2.89	0.77	0.43	2693
50		Ghana	13.64							99	76	89		49.71	0.55	2.97	0.21		0.71	0.11	22
51		Gibraltar	0.00																		2
52	GRC	Greece	14.04	451.50	510.27	563.13	9.50	17.25	21.45	96	30	56	6	42.83	0.15			2.99	0.68	0.10	171
53		Guam	0.00											44.06							1
54		Guatemala	33.33							94	82	89		38.17	0.53	4.24	0.56		0.67	0.11	3
55		Guernsey	0.00																		2
56		Haiti	0.00											47.47	0.60						1
57		Honduras	0.00							90	78	90		34.64	0.48				0.69	0.16	3
58	HKG	Hong Kong	26.29	553.66	611.42	658.53	14.23	18.30	21.30				6	46.77		3.89	0.03				6953
59	HUN	Hungary	13.53	483.12	543.76	597.58	5.87	13.52	18.59	79	16	14	6	45.82	0.21	4.02	0.16	2.75	0.67	0.04	133
60	ISL	Iceland	0.00	507.72	566.32	616.54	-3.87	-0.18	4.27				6	47.63	0.09			2.87	0.87	0.72	11
61		India	10.74							100	75	80		24.17	0.56	3.19	0.07	2.59	0.68	0.43	1406
62	IDN	Indonesia	14.29	370.01	422.34	474.24	3.40	5.02	5.38	100	84	93	6	37.97	0.49	3.53	0.17	2.75	0.68	0.17	196
63		Iran	0.00							100	87	78				3.03	0.15	2.45	0.59	0.05	3
64	IRL	Ireland	18.46	495.79	549.22	595.19	13.54	17.53	19.25	85	19	22	6	44.46	0.11			2.66	0.80	0.50	455
65	ISR	Israel	15.22	450.17	519.56	577.23	11.23	23.67	30.05	97	27	36	5	46.84	0.10				0.72	0.22	46
66	ITA	Italy	19.84	467.40	527.41	579.29	16.16	22.21	27.16	85	21	21	6	41.84	0.07	4.58	0.30	2.73	0.72	0.33	378
67		Jamaica	46.77											44.87	0.43				0.72	0.18	62
68	JPN	Japan	8.96	532.40	589.30	637.89	14.66	21.38	24.65	44	33	10	6	42.71	0.13	4.46	0.46	2.55	0.66	0.10	1239
69	JOR	Jordan	22.00	389.41	440.82	487.51	-10.22	-3.37	1.66	100	76	85	4	18.37	0.47	2.80	0.08	2.25	0.60	0.07	50
70	KAZ	Kazakhstan	26.87	415.36	466.81	517.28	-1.57	3.13	5.48	95	20	22	2	49.32	0.27	4.90	0.10		0.72	0.15	67
71		Kenya	24.05							100	79	87		46.54	0.55				0.70	0.18	79
72	KOR	Korea	13.60	538.96	598.27	648.18	14.56	18.16	20.36	54	32	16	6	41.59	0.12	3.82	0.11	2.50	0.65	0.12	890
73		Kuwait	12.00											27.16	0.39	3.68	0.35		0.62	0.02	150
74	LVA	Latvia	19.40	482.41	537.63	585.63	0.19	5.52	10.25	79	18	11	6	49.94	0.17	3.40	0.20	2.65	0.76	0.26	67
75		Lebanon	28.66							100	51	57		24.54	0.38	4.19	-0.14		0.60	0.02	157
76	LIE	Liechtenstein	4.17	526.09	586.64	634.54	16.27	15.37	20.27				5								24

Table A.2 (*Continued*)

country	cnt	label	CFAfemale	pgirl50_m	pgirl75_m	pgirl90_m	gendergap_med	gendergap_75	gendergap_90	rel_affil	rel_pray	rel_veryimp	numyrs	female_percLF	GIIValue	fem_comp	WVS_comp	wvs_wom	ggi	pol_emp	members
77	LTU	Lithuania	15.09	481.24	540.58	590.83	-2.43	1.66	7.75	94	15	16	4	50.09	0.12	3.78	0.48	2.55	0.74	0.24	53
78	LUX	Luxembourg	18.88	475.69	537.92	588.44	18.49	21.38	26.00				6	44.20	0.10			2.76	0.73	0.21	286
79	MAC	Macau	24.14	529.95	585.20	632.77	8.70	14.04	15.64				5	48.28							29
80	MKD	Macedonia	16.67	379.89	441.92	497.67	-5.69	0.61	7.78				2	39.39		3.06	0.23	2.86	0.70	0.18	6
81		Malawi	25.00											51.37	0.61				0.70	0.11	8
82	MYS	Malaysia	30.89	421.13	476.30	530.88	-9.66	-4.21	-2.63	99	61	77	1	36.08	0.21	3.77	-0.13		0.67	0.05	641
83		Malta	10.53											36.60	0.23			2.40	0.66	0.14	38
84		Mauritius	19.35											37.99	0.42				0.65	0.09	62
85	MEX	Mexico	9.26	397.47	450.32	497.56	10.29	14.70	18.32	93	40	45	6	37.16	0.37	3.88	0.31	2.64	0.70	0.28	162
86		Moldova	0.00							98	49	42		48.49	0.25	4.13	0.20	2.66	0.74	0.20	3
87		Monaco	8.70																		23
88		Mongolia	0.00											45.81	0.33				0.71	0.08	3
89	MNE	Montenegro	0.00	402.96	458.85	511.45	5.10	10.00	12.26				4	43.98	0.17	3.49	0.21	2.74	0.68	0.11	3
90		Morocco	4.17							100	80	91		27.04	0.52	3.04	0.08	2.40	0.60	0.11	24
91		Myanmar	0.00											49.42	0.41						1
92		Namibia	13.33											48.52	0.40				0.77	0.30	15
93		Nepal	0.00											50.85	0.49				0.66	0.18	4
94	NLD	Netherlands	14.08	532.56	593.45	638.93	7.79	11.41	13.75	51	20	20	6	46.06	0.06	4.85	0.21	2.72	0.76	0.40	987
95	NZL	New Zealand	16.16	513.27	576.03	628.58	10.32	16.18	21.01				6	47.27	0.16	3.47	0.13	2.82	0.78	0.39	328
96		Nicaragua	0.00							93	75	88		38.71	0.45				0.78	0.51	2
97		Nigeria	20.92							100	95	88		42.40		3.41	0.23	2.54	0.64	0.10	153
98	NOR	Norway	20.59	494.58	552.75	602.91	5.08	10.48	13.21	57	18	19	6	47.11	0.07	3.71	0.38	3.09	0.84	0.58	102
99		Oman	10.71											13.41	0.28				0.61	0.02	56
100		Pakistan	14.23							100	67	94		22.26	0.54	4.81	0.94	2.37	0.56	0.13	267
101		Palestinian Territory, Occupie	20.00							100	78	86									5
102	PAN	Panama	5.00	351.53	408.54	469.86	6.60	-0.51	-7.12	93	69	61	1	37.61	0.45				0.72	0.21	20
103		Papua New Guinea	0.00											48.26	0.61						5
104	PER	Peru	12.15	344.05	404.89	462.45	14.33	15.62	16.33	96	51	73	4	45.26	0.41	3.58	0.19	2.77	0.69	0.19	107
105		Philippines	31.46							100	82	91		39.22	0.42	4.08	0.09	2.54	0.79	0.39	213
106	POL	Poland	12.19	492.53	553.09	603.92	5.76	11.58	18.38	93	29	30	6	45.13	0.14	4.60	0.45	2.58	0.73	0.24	517
107	PRT	Portugal	16.36	470.86	531.22	581.95	13.63	19.10	22.33	85	38	36	6	48.43	0.11			2.93	0.74	0.27	110
108		Puerto Rico	18.52							92	67	77		42.62		3.53	0.17	2.82			27
109	QAT	Qatar	5.94	363.19	426.55	493.46	-14.94	-2.42	9.92				4	13.53	0.52	3.47	-0.27		0.64	0.01	101
110	ROU	Romania	39.08	429.34	489.82	545.56	0.27	1.42	5.43	99	45	50	5	45.00	0.33	3.08	0.05	2.66	0.69	0.09	174
111	RUS	Russian Federation	15.55	475.61	535.31	589.55	3.16	7.52	9.31	85	18	16	6	48.78	0.28	4.13	0.41	2.59	0.69	0.07	521
112		Rwanda	0.00							99	62	90		53.95	0.40	4.10	0.11		0.80	0.45	3
113		Saint Lucia	33.33											46.54							3
114		Saint Vincent And The Grenadin	0.00											41.34							1
115		San Marino	0.00																		1
116		Saudi Arabia	3.07											15.23	0.28			2.27	0.58	0.08	261
117		Senegal	50.00							100	88	98		44.97	0.53				0.69	0.32	2
118	SRB	Serbia	20.00	438.81	498.29	551.20	4.49	10.52	18.35	96	27	34	3	43.80	0.18	3.29	0.29	2.76	0.72	0.24	35
119		Sierra Leone	0.00											49.51	0.65						1
120	SGP	Singapore	29.24	571.44	636.29	688.31	2.41	7.16	11.10				3	44.21	0.09	4.04	0.26	2.71	0.71	0.11	3717
121	SVK	Slovakia (Slovak Republic)	11.11	486.13	549.62	601.84	7.23	12.14	19.38	75	31	23	5	44.75	0.16	3.58	0.33	2.65	0.68	0.09	45
122	SVN	Slovenia	13.46	502.58	565.16	618.99	2.13	6.23	10.52				4	46.07	0.02	3.93	0.28	2.84	0.79	0.39	52
123		South Africa	16.78							93	52	75		43.84	0.41	3.86	0.02	2.74	0.76	0.40	1710
124	ESP	Spain	20.48	478.82	534.79	582.26	13.81	19.82	23.96	70	23	22	6	45.65	0.10	4.40	0.29	2.86	0.74	0.32	581
125		Sri Lanka	19.50											33.53	0.37				0.67	0.20	159
126		Sudan	0.00											29.41	0.59						1
127		Swaziland	100.00											39.11	0.56				0.67	0.11	1
128	SWE	Sweden	12.28	498.69	559.91	610.94	1.85	5.00	8.76	58	11	10	6	47.37	0.05	3.65	0.35	3.19	0.82	0.49	114
129	CHE	Switzerland	15.34	524.87	588.19	640.85	15.82	18.21	19.20	79	8	9	6	46.15	0.03	3.62	0.46	2.75	0.78	0.39	3019
130	TWN	Taiwan	30.96	548.55	618.99	674.73	12.61	13.93	12.79				4	44.34		3.90	0.43	2.61			478
131		Tajikistan	0.00							100	48	50		43.32	0.36				0.68	0.10	1
132		Tanzania	0.00							99	56	93		50.13		3.47	0.76	2.96	0.72	0.30	1
133	THA	Thailand	30.82	419.62	473.73	527.45	-5.62	-2.90	0.69				6	45.51	0.38	4.73	-0.06		0.70	0.06	477
134		Togo	0.00											50.93	0.59						1
135	TTO	Trinidad And Tobago	37.35	420.80	489.78	549.39	-15.80	-11.49	-8.84				2	42.29	0.37	3.48	0.39		0.72	0.22	83
136	TUN	Tunisia	14.29	360.88	417.02	469.38	12.85	14.49	16.82	100	67	78	5	26.99	0.24	2.61	-0.12		0.64	0.17	7
137	TUR	Turkey	16.94	420.37	484.17	549.50	7.99	11.95	16.37	99	60	68	5	30.55	0.36	4.18	0.36	2.55	0.62	0.09	124
138		Turks And Caicos Islands	0.00																		1
139		Uganda	14.29							100	66	86		49.32	0.54	2.99	0.89	2.78	0.70	0.26	14
140		Ukraine	13.08							93	30	23		49.01	0.29	4.34	0.47	2.63	0.70	0.10	107
141	ARE	United Arab Emirates	14.08	430.22	491.01	547.79	-9.43	4.84	16.98				2	13.12	0.23				0.64	0.14	952
142	GBR	United Kingdom	20.17	496.92	556.87	610.07	13.50	16.79	18.02	77	6	10	6	45.96	0.18	4.38	0.43	2.73	0.75	0.34	10407
143	URY	Uruguay	20.69	414.81	476.58	531.31	12.15	16.62	20.52	63	29	29	5	44.54	0.31	4.94	0.36	2.70	0.68	0.10	58
144	USA	United States	16.43	476.21	537.83	593.81	10.06	15.27	15.34	77	55	53	6	45.84	0.28	3.58	0.42	2.79	0.72	0.16	65032
145		Vanuatu	0.00											43.64							1
146		Venezuela	0.00							93	47	67		39.86		3.89	0.34	2.83	0.69	0.13	5
147	VNM	Vietnam	43.04	500.25	555.84	606.77	2.30	8.97	12.92	36	14	18	2	48.37	0.31	3.99	0.40	2.67	0.70	0.14	158
148		Virgin Islands (British)	0.00																		1
149		Virgin Islands (U.S.)	10.00											45.90							10
150		Zambia	0.00							99	78	91		46.44	0.59	4.18	0.17				11
151		Zimbabwe	6.52											49.46	0.50	3.22	0.24	2.75	0.71	0.18	46

We use the National Assessment of Education Progress (NAEP) data to calculate the math gender gap for each state. For each state and seven most recent waves (biannual assessments from 2003 to 2015), we download percentile statistics for the mathematics subject and Grade 8 by gender from the National Center for Educational Statistics website[8] using "Composite Scale" as the measure and "State" as the group. The median math gender gap for the state is the boy's median score less the girl's median score. We repeat this calculation to estimate the math gender gap at the 75th and 90th percentile. Finally, we average the math gender gap across the seven sample years for each state.

We measure religious commitment at the state level by calculating the principal component of responses to four survey questions included in the Pew Research Center's "2014 Religious Landscape Study." We focus on the percent of respondents in each state who attend religious services weekly, pray daily, consider religion very important in their lives, and believe in God with absolute certainty.[9] The first principal component explains 94.3% of the variation in the three variables and weights the four components similarly (0.51 religion very important, 0.51 daily prayer, 0.50 believe in God, and 0.49 weekly attendance).

As controls, we include the percent of the state's labor force who are women and the percent of finance majors within the state who are women. To calculate the percent of the state's labor force who are women we use the 2013 American Community Survey, which we download from the Integrated Public Use Microdata Series (IPUMS) website[10]. We restrict the sample to those over the age of 16 who report their labor force status *(labforce)*. With this sample, we calculate the percent of the labor force who are women within each state using the ACS person weights *(perwt)*.

The data on finance majors are from the Integrated Postsecondary Education Data System (IPEDS). For all reporting institutions within a state, we collect the total number of 2015 graduating finance majors who are men and women using

Table A.3 State variable list.

Variable	Description	N	Mean	Std. Dev.	Min.	Max.
CFAfemale	% Women, CFA Members	45	15.75	3.76	10.17	26.92
girl50	Girls Math Score, Median	45	280.81	7.82	255.08	297.00
girl75	Girls Math Score, 75 th Percentile	45	303.38	7.67	279.18	319.80
girl90	Girls Math Score, 90th Percentile	45	322.84	7.40	301.54	338.74
gendergap_50	Math Gender Gap, Median	45	1.18	1.20	−2.95	3.02
gendergap_75	Math Gender Gap, 75th Percentile	45	2.40	1.05	−1.45	3.77
gendergap_90	Math Gender Gap, 90th Percentile	45	3.42	0.87	0.87	4.88
rel_import	% Religion Important	45	53.56	10.23	33.00	77.00
rel_attend	% Religion Attend	45	36.09	7.27	22.00	53.00
rel_believe	% Religion Believe	45	63.73	8.79	40.00	82.00
rel_pray	% Pray Regularly	45	54.78	8.74	35.00	75.00
female_perclf	% Women, Total Labor Force	45	47.38	1.32	43.99	50.23
fin	Number of Finance Majors in State	45	745.24	713.84	31.00	3318.00
gap_fin	% Women, Finance Majors	45	29.49	5.37	16.56	48.39
members	Number of CFA Members	45	1,433	2,222	42	11,009

Table A.4 State dataset.

state	CFA female	girl50	girl75	girl90	gender gap_50	gender gap_75	gender gap_90	rel_ import	rel_ attend	rel_ believe	rel_ pray	female _perclf	fin	gap_fin	members
Alabama	15.00	267.31	289.79	309.71	0.71	2.27	3.13	77	51	82	73	47.21	667	30.43	240
Alaska	19.05	282.67	305.22	324.27	0.57	1.91	3.13	41	30	55	49	44.69	31	48.39	42
Arizona	10.17	277.32	300.73	321.00	2.48	3.53	3.99	51	34	62	55	46.31	955	36.13	472
Arkansas	14.29	276.28	297.79	316.13	-0.27	1.97	3.43	70	41	77	65	46.96	375	23.20	105
California	20.16	271.27	296.63	319.30	1.62	3.11	3.46	47	31	54	51	45.68	980	36.73	8030
Colorado	15.46	286.89	310.85	331.18	1.69	2.41	2.09	47	30	55	50	46.12	238	32.35	1345
Connecticut	16.03	285.87	309.99	329.90	0.49	1.56	3.17	42	28	54	47	47.97	547	21.39	2464
Delaware	23.16	280.41	303.34	323.27	1.96	2.38	3.03	46	34	61	49	48.87	264	31.44	177
District of Columbia	25.89	255.08	279.18	301.54	-2.68	-0.69	1.59	50	28	55	51	50.23	380	31.84	475
Florida	13.98	276.47	299.66	319.70	2.10	3.01	3.96	53	35	64	56	47.62	2618	30.71	2024
Georgia	16.33	275.49	298.97	320.13	0.63	2.25	3.43	64	42	74	64	47.79	1115	31.48	1592
Hawaii	19.32	276.41	299.11	318.28	-2.95	-1.45	0.87	44	28	62	52	45.48	117	25.64	88
Idaho	17.91	285.02	306.53	324.30	1.07	1.90	3.21	51	35	62	50	45.19	135	22.22	67
Illinois	14.42	281.36	304.26	324.45	1.82	3.38	4.34	50	34	61	51	47.78	1320	30.98	4666
Indiana	11.80	284.84	306.97	325.72	2.59	2.45	3.26	53	37	63	52	47.30	658	23.71	449
Iowa	18.42	285.29	306.98	325.78	1.82	2.29	2.76	53	36	66	50	47.90	798	35.09	467
Kansas	11.14	287.68	308.97	326.86	1.37	2.66	3.32	50	37	66	53	46.58	382	30.37	359
Kentucky	13.16	278.01	299.68	318.72	0.72	2.82	4.45	63	39	75	63	46.87	379	28.76	266
Louisiana	14.01	270.87	292.05	310.56	-0.30	0.89	2.62	71	46	75	68	47.49	585	31.62	157
Maine	14.75	285.22	306.82	325.82	1.86	2.84	3.66	34	22	48	35	49.23	73	23.29	122
Maryland	16.57	283.59	308.82	330.28	1.53	3.11	4.42	50	31	64	51	49.33	447	33.56	1394
Massachusetts	17.44	297.00	319.80	338.74	1.46	2.27	2.79	33	23	40	37	48.98	999	22.92	5655
Michigan	11.20	278.11	301.92	321.66	2.73	3.61	4.62	50	33	63	53	48.33	1133	26.92	652
Minnesota	14.65	294.87	316.67	334.92	0.75	2.00	3.05	46	34	56	47	48.29	691	25.90	1331
Mississippi	12.86	266.75	288.52	307.41	-0.15	1.36	2.92	74	49	82	75	48.86	285	32.98	70
Missouri	13.03	281.21	302.76	321.51	1.98	3.58	4.47	56	37	70	59	48.40	470	37.45	1021
Montana	7.94	289.95	310.17	327.96	1.37	2.64	2.53	44	31	64	51	46.89	1	0.00	63
Nebraska	13.64	284.71	306.43	325.14	2.49	3.00	3.27	54	39	66	52	47.33	479	29.85	242
Nevada	13.08	273.62	297.20	317.43	1.45	2.48	3.16	44	31	59	48	45.87	192	32.81	130
New Hampshire	20.39	291.00	312.77	330.68	1.11	1.62	3.11	33	22	43	36	47.41	23	13.04	255
New Jersey	15.89	291.04	314.06	334.24	1.87	3.63	4.34	50	35	60	53	47.53	786	28.24	4392
New Mexico	21.15	268.63	291.26	310.96	1.11	1.79	3.29	59	36	63	55	46.85	58	36.21	104
New York	18.58	281.53	304.85	325.07	0.68	1.39	2.07	45	29	56	48	48.31	2143	29.77	11009
North Carolina	13.31	284.59	307.74	328.63	-0.32	1.49	2.30	62	39	73	66	48.00	832	28.49	1315
North Dakota	15.79	290.49	309.31	325.74	1.76	3.20	3.32	53	33	64	51	45.09	113	30.09	19
Ohio	12.19	285.95	307.60	326.66	1.66	2.65	2.93	56	38	67	57	48.27	1806	26.41	1468
Oklahoma	14.04	274.85	295.18	313.17	2.03	3.47	4.56	64	43	71	65	45.87	452	26.55	171
Oregon	17.45	283.11	306.28	326.01	2.25	3.24	4.27	45	29	57	45	47.34	273	29.30	470
Pennsylvania	13.38	285.22	308.04	326.90	3.02	3.77	4.71	51	34	61	54	48.18	2515	27.44	2645
Rhode Island	13.42	279.37	302.31	321.93	0.53	2.03	2.25	48	36	60	48	48.69	395	25.06	149
South Carolina	15.31	279.43	302.90	323.15	0.51	1.88	3.45	69	47	74	66	48.27	516	22.87	209
South Dakota	26.92	289.16	308.92	325.02	0.79	1.93	3.52	57	36	69	56	47.70	45	31.11	52
Tennessee	11.44	274.26	296.71	316.64	1.40	2.89	3.88	71	51	78	70	47.44	355	29.58	568
Texas	12.83	284.59	305.70	324.66	1.39	2.89	3.99	63	42	69	63	45.43	3318	31.31	3553
Utah	14.52	283.50	305.72	323.69	2.41	3.56	4.55	58	53	61	61	43.99	489	16.56	241
Vermont	18.97	291.59	313.89	332.62	0.88	2.52	3.83	32	21	41	33	49.12	0		116
Virginia	18.58	285.74	308.32	328.41	2.00	3.55	4.88	60	44	67	60	47.51	690	30.58	1819
Washington	20.58	287.60	310.82	330.76	1.07	1.97	3.40	44	30	55	46	45.98	650	34.00	1215
West Virginia	17.86	271.99	293.00	310.80	0.57	1.86	3.68	64	46	77	68	45.74	158	25.32	28
Wisconsin	12.15	288.41	310.05	328.39	1.29	2.83	3.71	44	27	56	46	48.02	900	25.56	988
Wyoming	10.34	286.04	305.80	323.31	2.21	2.98	3.30	49	38	66	53	45.36	37	18.92	29

the Classification of Instructional Programs (CIP) code 52.08 "Finance and Financial Management Services."

Table A.3 provides descriptive statistics on the key variables in our analysis. Table A.4 provides data for the 50 states and the District of Columbia.

2. Supplementary Analysis

2.1 Country regressions

Table A.5 replicates our main results, but equal-weights rather than member-weights countries. The gender math gap remains statistically significant in all but one specification. Besides the

Table A.5 The math gender gap and women in finance across countries (equal weighted).

	(1)	(2)	(3)	(4)	(5)	(6)
Gender Gap in Math	−4.269***		−4.641***	−4.017**	−3.044	−2.961*
	[1.149]		[1.259]	[1.524]	[1.818]	[1.685]
Religiosity Index		−0.734	−1.047	−1.501	−2.417	−2.457
		[1.703]	[1.577]	[1.627]	[1.712]	[1.745]
% Women, Total Labor Force			2.703	2.811	4.048	4.110
			[2.046]	[2.059]	[2.600]	[2.602]
Gender Inequality Index (UN)			−2.075	−1.801	−0.881	−0.466
			[1.469]	[1.728]	[2.080]	[1.831]
Gender Gap in Competition (WVS)					−3.236	−3.483
					[2.132]	[2.246]
Gender Gap in Risk Taking (GPS)					−0.906	−0.678
					[1.467]	[1.551]
Gender Gap in Altruism (GPS)					2.349	2.649
					[1.446]	[1.670]
Gender Gap in Positive Recip. (GPS)				−2.696		−1.789
				[2.004]		[2.397]
Constant	18.525***	17.162***	17.956***	17.717***	18.298***	18.385**
	[1111]	[1.510]	[1.171]	[1.175]	[1.599]	[1.672]
Observations	47	47	47	40	38	34
Adj. R-squared	0.218	−0.015	0.231	0.255	0.336	0.336

The dependent variable is the percent of CFA members within a country who are women. The independent variables are the gender gap in math at the 75th percentile (mean of 2000 through 2015 data from PISA), the religiosity index (from Pew), the percent of the total labor force that is female (2014 World Bank), the Gender Gap Index (WEF 2015), and Gender Gap in Competition (mean of six WVS waves from 1981 to 2014), and the Gender Gap in Altruism, Positive Reciprocity, and Risk Taking (2012 Global Preference Survey). The regressions use standardized independent variables and ordinary least squares (OLS).
Robust standard errors in brackets
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table A.6 The math gender gap and women in finance across countries (Asia and Europe Fixed Effects).

	(1)	(2)	(3)	(4)	(5)	(6)
Gender Gap in Math	−5.042**		−5.992***	−6.474***	−4.194*	−5.690**
	[2.036]		[1.756]	[1.893]	[2.080]	[2.199]
Religiosity Index		−2.531**	−2.815**	−3.086**	−3.532**	−4.359**
		[1.150]	[1.155]	[1.137]	[1.671]	[1.762]
% Women, Total Labor Force			2.118	1.971	4.044	1.826
			[3.466]	[3.468]	[4.130]	[4.717]
Gender Inequality Index (UN)			−0.003	−0.246	1.439	1.214
			[1.950]	[2.540]	[2.562]	[3.198]
Gender Gap in Competition (WVS)				0.358		2.863
				[1.870]		[1.798]
Gender Gap in Risk Taking (GPS)					−4.323*	−4.909**
					[2.208]	[2.017]
Gender Gap in Altruism (GPS)					−0.645	−1.633
					[1.796]	[1.838]
Gender Gap in Positive Recip. (GPS)					−0.048	0.139
					[0.993]	[0.919]
Asia	4.092	3.828	0.166	−0.474	−2.307	−4.468
	[3.788]	[4.634]	[4.341]	[4.338]	[3.382]	[3.797]
Europe	1.228	−1.591	−1.276	−1.262	−3.517	−4.945
	[1.762]	[1.730]	[2.175]	[2.367]	[2.342]	[2.957]
Constant	19.457***	16.447***	18.350***	18.443***	20.162***	21.560***
	[1.203]	[0.246]	[1.564]	[1.621]	[2.257]	[2.853]
Observations	47	47	47	40	38	34
Adj. R-squared	0.352	0.289	0.500	0.502	0.571	0.590

The dependent variable is the percent of CFA members within a country who are women. The independent variables are the gender gap in math at the 75th percentile (mean of 2000 through 2015 data from PISA), the religiosity index (from Pew), the percent of the total labor force that is female (2014 World Bank), the Gender Gap Index (WEF 2015), and Gender Gap in Competition (mean of six WVS waves from 1981 to 2014), and the Gender Gap in Altruism, Positive Reciprocity, and Risk Taking (2012 Global Preference Survey). The regressions use standardized independent variables and weighted least squares (WLS) with weights based on the number of CFA members in the country.

Robust standard errors in brackets

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table A.7 The math gender gap and women in finance across countries (>100 CFA Members).

	(1)	(2)	(3)	(4)	(5)	(6)
Gender Gap in Math	−6.378**		−6.436***	−6.790***	−4.817**	−5.783**
	[2.377]		[1.626]	[1.944]	[2.068]	[2.552]
Religiosity Index		−2.680*	−2.538***	−2.682***	−2.014	−1.885
		[1.320]	[0.614]	[0.902]	[1.519]	[1.504]
% Women, Total Labor Force			4.036	4.292	9.275	8.978
			[3.574]	[4.133]	[5.455]	[5.769]
Gender Inequality Index (UN)			−0.993	−1.085	−1.139	−1.754
			[1.564]	[1.841]	[1.803]	[2.350]
Gender Gap in Competition (WVS				0.294		1.886
				[1.982]		[2.062]
Gender Gap in Risk Taking (GPS)					−2.641	−2.498
					[1.903]	[1.712]
Gender Gap in Altruism (GPS)					−1.430	−2.475
					[1.782]	[2.066]
Gender Gap in Positive Recip. (GI					−0.555	−0.599
					[1.035]	[1.030]
Constant	20.578***	16.280***	18.061***	17.925***	17.729***	18.039**
	[1514]	[0.432]	[1111]	[1.234]	[1.937]	[2.192]
Observations	36	36	36	30	30	27
Adj. R-squared	0.316	0.219	0.516	0.518	0.555	0.538

The dependent variable is the percent of CFA members within a country who are women. The independent variables are the gender gap in math at the 75th percentile (mean of 2000 through 2015 data from PISA), the religiosity index (from Pew), the percent of the total labor force that is female (2014 World Bank), the Gender Gap Index (WEF 2015), and Gender Gap in Competition (mean of six WVS waves from 1981 to 2014), and the Gender Gap in Altruism, Positive Reciprocity, and Risk Taking (2012 Global Preference Survey). The regressions use standardized independent variables and weighted least squares (WLS) with weights based on the number of CFA members in the country.

Robust standard errors in brackets

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table A.8 Country regressions with different measures of gender inequality.

	(1)	(2)	(3)	(4)
	WEF GGI	UN	WEF PEI	WVS
Panel A : Correlation Matrix				
Global Gender Gap Index (WEF GGI)	1.00			
Gender Inequality Index (UN GII)	−0.57	1.00		
Political Empowerment Index (WEF PEI)	0.91	−0.51	1.00	
Gender Attitudes (WVS)	0.68	−0.42	0.58	1.00
Panel B: Regression Results				
Gender Gap in Math	−6.095***	−5.644***	−5.924***	−5.872***
	[1.510]	[1.616]	[1.610]	[1.657]
Religiosity Index	−2.535***	−3.683***	−2.861***	−2.635***
	[0.625]	[0.989]	[0.809]	[0.681]
% Women, Total Labor Force	0.392	0.300	0.287	0.144
	[0.346]	[0.332]	[0.302]	[0.363]
Global Gender Gap Index (WEF GGI)	−1.002			
	[1.535]			
Gender Inequality Index (UN)		2.228		
		[1.714]		
Political Empowerment Index (WEF PEI)			−0.819	
			[1.176]	
Gender Attitudes (WVS)				1.260
				[1.482]
Constant	1.692	5.944	5.827	11.762
	[15.268]	[14.933]	[13.397]	[15.831]
Observations	47	47	47	44
Adj. R-squared	0.558	0.578	0.560	0.541

The dependent variable is the percentage of CFA members women within a country who are women. This table presents correlations (Panel A) and regression results (Panel B) using alternative measures of gender inequality. The UN Gender Inequality Index is high in gender unequal societies, while the alternative measures are high in gender equal societies (see correlations in Panel A). In Panel B, Column 1 presents the main results from Table 2, column 3, using the WEF Gender Gap Index; columns 2 and 3 replace the WEF measure with the UN Gender Inequality Index and WEF Political Empowerment Index (respectively); Column 4 uses gender attitude questions from the World Values Survey. The regressions use standardized independent variables and weighted least squares (WLS) with weights based on the number of CFA members in the country.
Robust standard errors in brackets
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

gender math gap, none of the remaining variables are robust to equal and member-weighting regression analyses.

Table A.6 estimates the main results but introduces fixed effects for Asia and Europe. This specification addresses concerns that are main results are driven by something specific to Asian or European countries. These results are quantitatively and qualitatively similar to those in Table 2.

Table A.7 estimates the main results but restricts the sample to countries with a minimum of 100 members. Though this reduces the power of the tests, these results are quantiatively and qualitatively similar to those in Table 2.

Table A.8 explores alternative measures of gender inequality including the UN Gender Inequality Index (UN GII), the World Economic Forum Political Empowerment Index (WEF PEI), and gender attitudes from the WVS. In Panel A, we show the correlation between the four measures of gender inequality. Note the UN GII takes on high values when inequality is high, while the remaining three take on high values with equality is high. Table A.6, Panel B, column (1), replicates Table 2, column (3). The remaining columns use the alternative measures, where we anticipate

Table A.9 The math gender gap and women in finance across states (equally weighted).

Gender Gap in Math	−1.616***		−1.581***	−1.653***	−1.489**
	[0.508]		[0.443]	[0.596]	[0.616]
Religiosty Index		−1.643***	−1.061***	−1.091**	−1.055***
		[0.547]	[0.375]	[0.425]	[0.347]
% Women, Total Labor Force			0.111	0.164	−0.228
			[0.501]	[0.682]	[0.484]
% Women, Finance Majors			1.237**	1.213	1.069**
			[0.569]	[0.843]	[0.515]
Constant	15.735***	15.809***	15.596***	15.396***	15.592***
States > N CFA Members	[0.506]	[0.563]	[0.470]	[0.504]	[0.487]
States > N Finance Majors					
Excluded States in Main Sample:	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY	MT, NH, ND, VT, WV, WY
Additional States Excluded:				AL, HI, ID, ME, MS, NM, SD	HI, DC
Observations	45	45	45	38	43
Adj. R-squared	0.183	0.201	0.268	0.287	0.145

The dependent variable is the percent of CFA members within a state who are women. The independent variables are the gender gap in math (mean of 75th percentile across 2003 to 2015 data from NCES), the religiosity index (from Pew), the percent of the total state labor force that is female (2013 ACS data), and the percent of finance majors in the state who are women (IPEDS 2015 data). The regressions use standardized independent variables and ordinary least squares with robust standard errors. Column 4 restricts the sample to states with 100 CFA members and 100 finance majors. Column 5 drops Hawaii and the District of Columbia.
Robust standard errors in brackets
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

a positive relation between gender equality and the representation of women in finance. None of the alternative measures yield statistically or economically important coefficient estimates.

2.2 State regressions

Table A.9 replicates our main results, but equal-weights rather than member-weights states. These results are very similar to our main results, though the percent finance majors is somewhat less important in these equally weighted regressions.

Endnotes

1 https://www.pewfomm.org/2018/06/13/how-religious-commitment-varies-bv-countrv-among-people-of-all-ages/.

2 http://data.worldbank.org/indicator/SL.TLF.TOTL.FE.ZS.

3 http://eng.stat.gov.tw/public/data/dgbas04/bc4/english/timeser/table02.XLS.

4 https://www3 . weforum.org / docs / GGGR16 / WEF_Global_Gender_Gap_Report_2016.pdf.

5 http://hdr.undp.org/en/content/gender-inequalitv-index-gii.

6 L. Guiso, F. Monte, P. Sapienza, L. Zingales, Culture, Gender, and Math, *Science*, 320.5880 (2008): 1164–1165.

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