Gender, Competition, and Performance: International Evidence*

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Abstract

Using a hand-collected sample of 18,269 equity analysts from 42 countries over the period 2004–2019, we establish an intriguing negative association between a country's institutional/economic development and its female share of equity analysts. We next show that, in individualistic countries only, there is no gender gap in analyst forecast accuracy. We further show that female analysts are more skilled and more likely to drop out when underperforming in individualistic countries compared to peers in collectivistic countries. Our evidence supports the proposition that the national cultural value of individualism encourages women to make career choices consistent with their aversion to competition.

Keywords: gender; competition; equity analysts; forecast error; individualism; international evidence

JEL classification: G14; G15; G24

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Using a hand-collected sample of 18,269 equity analysts from 42 countries over the period 2004–2019, we establish an intriguing negative association between a country's institutional/economic development and its female share of equity analysts. We next show that, in individualistic countries only, there is no gender gap in analyst forecast accuracy. We further show that female analysts are more skilled and more likely to drop out when underperforming in individualistic countries compared to peers in collectivistic countries. Our evidence supports the proposition that the national cultural value of individualism encourages women to make career choices consistent with their aversion to competition.

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1. Introduction

There are well-documented gender differences in preference for competition – men are more competitively inclined than women – and in performance under competition – there is a gender performance gap in favor of men – based on laboratory studies and/or relying on participants and samples largely from western industrialized countries (see, for example, Gneezy, Niederle, and Rustichini 2003; Niederle and Vesterlund 2007; Croson and Gneezy 2009; Niederle and Vesterlund 2011; Reuben, Sapienza, and Zingales 2023). There is, however, a scarcity of research on the role of gender differences in preference for competition in women's career choices and job performance in an international setting. This paper fills a gap in current research related to our understanding of gender, competition, and performance by assembling an international sample of equity analysts with data on gender. Equity research is known to be a highly competitive and largely male-dominated profession, in which performance is precisely measured (Clement 1999; Hong and Kacperczyk 2010; Hong, Kubik, and Solomon 2000; Kumar 2010; Fang and Huang 2017).[1] We first present some new and intriguing evidence on cross-country differences in the female share of equity analysts and in the gender performance gap under competition. We then explore a number of possible explanations for the observed patterns.

Countries differ in their levels of institutional and economic development. For measures of formal institutional and economic development, we employ the Global Gender Gap Index (GGGI) from the World Economic Forum as a marker for gender equality, and GDP per capita as a marker for economic development. For a measure of informal institutions, we employ the individualism dimension in Hofstede's (1980, 2001) national

[1] To help establish that equity research is a highly competitive profession in our sample countries, we obtain crowd-sourced pay information for equity analysts and an average job in each country, and compute pay ratios of average equity analyst pay to GDP per capita (average pay in a country). Using pay ratios in the U.S. as benchmarks, we show that equity analysts achieve significantly higher pay ratios in many countries around the world than in the U.S., supporting our premise that equity research is a highly competitive profession in our sample countries.

cultural framework, because this dimension, which captures the degree to which individuals are embedded in in-groups, is the most important driver of cultural differences across countries (Triandis 1995; Aggarwal, Faccio, Guedhami, and Kwok 2016) and is associated with important economic outcomes (e.g., Gorodnichenko and Roland 2011).

Using a hand-collected sample of 18,269 equity analysts for whom we have determined gender based on their biographies from 42 countries over the period 2004–2019, we first show negative associations between a country's GGGI and its female share of equity analysts, between a country's Ln(GDP per capita) and its female share of equity analysts, and between a country's individualism score and its female share of equity analysts.

We next examine whether and how women's on-the-job performance relative to men's under competition varies across countries. To account for time-varying unobservable firm characteristics that could potentially drive analysts' coverage decision and their performance, we include firm times year fixed effects (Clement 1999; Hong and Kacperczyk 2010; Hilary and Shen 2013). We show that there is no significant variation in the gender performance gap under competition across countries with different gender equality policies, or across countries with different levels of economic development. In contrast, we show that in low individualistic countries, female analysts exhibit worse forecast accuracy than male analysts, consistent with experimental evidence on the gender performance gap in favor of men under competition (see, for example, Gneezy et al. 2003). We further show that in high individualistic countries, there is no significant difference in forecast accuracy between genders.

In the remainder of the paper, we explore a number of possible explanations for the observed patterns: 1) There is a negative association between a country's level of institutional/economic development and its female share of equity analysts; and 2) there is no gender performance gap under competition in high individualistic countries.

One possible explanation for the observed patterns is that women face higher barriers to entry into the equity research profession, resulting in both a lower female share of equity analysts and no female underperformance relative to male analysts in high individualistic countries compared to those in low individualistic countries. To explore this possible explanation, we first show that there are positive and significant associations between a country's GGGI and its individualism score, and between a country's Ln(GDP per capita) and its individualism score, suggesting that high individualistic countries are associated with more gender equality policies and higher levels of economic development. In other words, *ceteris paribus*, we would expect lower barriers for women entering the labor force (including becoming equity analysts) in high individualistic countries compared to low individualistic countries. In a regression setting when we include all three country-level institutional/economic development measures to explain a country's female share of equity analysts, we show that only the negative and significant association between a country's individualism score and its female share of equity analysts remains. Had the barriers to entry explanation held true, we would have expected a positive and significant association between a country's individualism score and its female share of equity analysts. We conclude that the evidence thus far is inconsistent with the conjecture that women face higher barriers to entry into the equity research profession in high individualistic countries that also score high in gender equality policies and practices and are also more advanced in economic development.

Instead, our international data set allows us to take a national culture lens to gain new insights into the complex relation between gender, competition, and performance. National cultural values define what constitutes appropriate decisions and behaviors in a society (North 1990; Guiso, Sapienza, and Zingales 2006). Specifically, individualistic societies emphasize independence and equality (Hofstede 2011, p. 11; Griffin et al. 2017), whereas collectivistic societies emphasize in-groups' interests and harmony (Trompenaars 1993;

Hofstede 2001, 2011). *Ceteris paribus*, the national cultural value of individualism encourages women to make career choices more freely based on their preferences (compared to women in collectivistic societies). Given that women are averse to competition and that equity research is a competitive profession, in high individualistic countries, women choose to become equity analysts only if they are good at the job, whereas in low individualistic countries, women do not have the luxury of this choice. This alternative explanation, which embeds the role of national culture into the relation between gender, competition, and performance, has two testable implications: 1) There is a negative association between a country's individualism score and its female share of equity analysts (because women are averse to competition and the national cultural value of individualism encourages women to make career choices consistent with their preferences); and 2) there is no gender difference in performance under competition in high individualistic countries (because only capable females self-select into a competitive profession in those countries). Our empirical evidence thus far is consistent with both implications.

To provide supplemental evidence on the second implication above, we first show that in high individualistic countries, female analysts upon entry, compared to their peers in low individualistic countries, are more likely to work for more prestigious brokerage houses and cover more important stocks than male analysts upon entry. Moreover, we show that female analysts in high individualistic countries, compared to their peers in low individualistic countries, work harder, as measured by their forecast output and timeliness in making earnings forecasts, than male analysts. Consistent with only capable females self-selecting into the equity research profession in high individualistic countries, we show that in such countries, the market reacts more strongly to forecast revisions made by female analysts than to those by male analysts, compared to the market reaction to those made by their peers in low individualistic countries. Finally, we show that female analysts in high individualistic

countries are more likely to drop out when underperforming than male analysts do compared to their peers in low individualistic countries, suggesting that women have more freedom to make career choices, including quitting, in high individualistic countries compared to their peers in low individualistic countries. All these findings are consistent with our alternative explanation that the national cultural value of individualism encourages women to make career choices more freely based on their preferences (compared to women in collectivistic societies) – in high individualistic countries, only women who believe they can excel in competition choose to become and/or to continue to work as equity analysts, whereas in low individualistic countries, women do not have those choices.

We conduct a large number of robustness checks of our main empirical findings. First, to address the concern that our findings are not specific to analysts based in the U.S. and the U.K., which are the two countries with the highest individualism scores as well as the largest number of analysts in our international sample, we repeat our main analysis removing analysts based in those two countries. Second, we include three other national cultural values: masculinity, power distance, and uncertainty avoidance in the analyst performance regression specification. Third, we control a country-level transparency measure. Fourth, we identify high individualistic countries using a different cutoff. Fifth, we employ an updated version of the individualism score using the World Values Survey and European Values Survey. Sixth, we employ standard errors clustered at different levels: analyst country times year, brokerage times year, analyst, or firm. Seventh, we include high-dimensional fixed effects such as firm times year times month fixed effects to control for time-varying unobservable characteristics within short windows, and/or additional fixed effects such as brokerage times year fixed effects to control for time-varying unobservable brokerage characteristics such as labor market pressure faced by analysts. Finally, we remove individuals from our sample if the individualism ranking of an analyst's country of origin as determined by their name differs

from that of their place of work. Our main findings continue to hold across all these additional analyses.

We conclude that there are important cross-country variations in gender differences in performance under competition, and that these differences are shaped by national cultures.

Our paper is among the first in the economics, finance, and accounting literature, as far as we are aware, to assemble an international data set on equity analysts with gender data and to study the role of country-level factors in attenuating the gender performance gap under competition. We contribute to the literature in two ways.

First, our evidence on the important role of national culture in narrowing the gender gap in performance under competition is new to the literature on gender and competition (see the review articles by Croson and Gneezy (2009) and Niederle and Vesterlund (2011)). Prior work in a laboratory setting typically takes great care in randomly allocating participants (of both genders) to the various treatments, while failing to recognize that in the real world, labor market choices and outcomes are not random. As opposed to samples of individuals largely from western industrialized countries in laboratory settings, our global sample of finance professionals allows us to examine the role of individualism in shaping women's choices to enter competitive professions, which in turn narrows the gender performance gap under competition. Moreover, using a global sample of equity analysts with additional data on job performance and job market outcome allows us to provide novel supplemental evidence on how country-level factors help narrow the gender performance gap under competition.

Second, our paper contributes to the large literature on gender differences in labor market outcomes (see, for example, Goldin and Rouse 2000; Bertrand, Goldin, and Katz 2010; Egan, Matvos, and Seru 2022; Benson, Li, and Shue 2023; Huang, Mayer, and Miller 2023, and a survey by Blau and Kahn (2000)). In a seminal paper on equity analysts in the U.S., Kumar (2010) finds female analysts outperform their male counterparts and provides

supporting evidence for his conjecture that only females with superior forecasting abilities self-select to enter the profession. Our global sample and national culture lens extend Kumar's (2010) seminal work and findings. Kumar (2010) employs a sample of equity analysts in the U.S., a country with one of the highest individualism scores, which encourages women to make career choices freely. Due to women's aversion to competition, U.S. females self-select into the equity research profession only when they are good at it. Employing an international sample of equity analysts, our paper provides new insights into the relation between gender, competition, and performance that are impossible to obtain when employing data from only a single country. In contrast and complementary to Kumar (2010), we show that in low individualistic countries, women do not have the freedom to choose careers (to avoid competition), resulting in female analysts' poorer performance relative to male analysts in those countries compared to their counterparts in high individualistic countries.

Given the ongoing debate among regulators, policy makers, and institutional investors around the world on the role of female business leaders (i.e., women in another highly competitive profession) in creating shareholder value and societal impact, our findings will inform government policies and business practices promoting female leadership and representation in highly competitive professions.

2. Literature Review and Empirical Setting

2.1. Literature review on gender, competition, and performance

Economists have long documented gender differences in consumption, investment, trading, and labor market outcomes (see, for example, Sundén and Surette 1998; Goldin and Rouse 2000; Barber and Odean 2001). In a survey of gender differences in economic experiments, Croson and Gneezy (2009) identify robust differences in risk preferences, altruism, and competitive preferences. Observing participants in a laboratory setting solving an actual task, Niederle and Vesterlund (2007) find that women are generally less keen on

being exposed to competition. Running a field experiment on job-entry decisions, Flory, Leibbrandt, and List (2015) show that women disproportionately shy away from competitive work settings as captured by a competitive compensation regime.[2]

There is some suggestive evidence of a gender performance gap in favor of men under competition based on laboratory studies and/or field evidence. Gneezy et al. (2003) present experimental evidence that men's performance increases in competition whereas women's does not. Schurchkov (2012) finds that while women underperform men in a high-pressure math-based tournament, women greatly increase their willingness to compete and their performance levels in a low-pressure verbal environment, suggesting that in stereotypical-male tasks competition does seem to generate a large gender gap in performance.

In summary, based on laboratory studies and/or field evidence, prior work largely shows that in male-dominated tasks/careers, men are more competitively inclined than women and that there is a gender performance gap in favor of men under competition. As far as we are aware, no prior work explores the role of gender differences in preference for competition in women's career choices and job performance in an international setting.

2.2. Our empirical setting

There are a number of reasons for us to use equity analysts as our study subject. First and foremost, equity analysts are known to be in a highly competitive profession in the U.S. (Clement 1999; Hong et al. 2000). Kaplan and Rauh (2010) find that in the U.S., while top executives' representation in the top income brackets has increased from 1994 to 2004, Wall

[2] Based on field evidence, a number of studies further show that social norms/behaviors affect individuals' preferences for competition. For example, Gneezy, Leonard, and List (2009) find that while women in a patriarchal society are less competitively inclined than men, their counterparts in a matrilineal society are more competitive than men. Booth and Nolen (2012) show that girls from single-sex schools behave more like boys in their preferences for competition. Andersen et al. (2013) find that while there is no gender difference in competitiveness at any age in a matrilineal society, girls become less competitive around puberty in a patriarchal society, suggesting that socialization has an impact on gender differences in competitiveness. Almås et al. (2016) find that a father's socioeconomic status is strongly associated with his sons' willingness to compete.

Street's representation, which includes equity analysts, has increased even more. For our purpose, we need to establish that equity research is also a highly competitive profession outside the U.S. Using the Eurostat Structure of Earnings Survey (SES), the largest source with harmonized data across 16 European countries for 2010, Denk (2015) finds that financial sector workers, including equity analysts, comprise 19% of the top 1% earners, despite the fact that the overall employment share of finance is only 4%. Table IA1 in the Internet Appendix presents average analyst pay, average pay, and ratios of average analyst pay to GDP per capita and to average pay in our sample countries. The data for average analyst pay come from the Global Salary Calculator.[3] To properly account for national economic development and labor market conditions, we obtain GDP per capita in 2021 from the World Bank (the latest data available), and average pay in a country from Trading Economics, an online database with historical information for countries around the world.[4] We show that there are wide variations in equity analyst pay ratios across sample countries, with India (8.13), Pakistan (6.66), and Vietnam (6.28) having the highest analyst pay ratios (relative to GDP per capita), and Vietnam (6.77), Turkey (5.14), and Thailand (5.04) having the highest analyst pay ratios (relative to average pay in a country). The mean/median average analyst pay/GDP per capita ratios are 2.43/1.76, and the mean/median average analyst pay/average pay ratios are 2.50/2.03. Compared to the average analyst pay/GDP per capita (average analyst pay/average pay) ratio of 1.54 (2.12) in the U.S., the statistics suggest that equity research is highly competitive in our sample countries.

[3] The Global Salary Calculator (GSC), an online database maintained by the Economic Research Institute, supports international salary management; the GSC reports on gross annual salaries in the form of an overall mean and percentiles from their database of occupations and locations. The GSC uses data provided by both employers and employees, salary survey data, government salary data, and other statistics and data sources. The data are collected on an ongoing basis and in local currency. Data can be downloaded at: https://www.erieri.com/globalsalarycalculator. We employ exchange rates in 2022 from the World Bank to convert pay in local currency to U.S. dollars.

[4] Data can be downloaded at: https://www.erieri.com/globalsalarycalculator. Trading Economics provides average pay in a country in local currency. We employ exchange rates in 2022 from the World Bank to convert pay in local currency to U.S. dollars.

Second, equity research is also known to be a largely male-dominated profession (Green, Jegadeesh, and Tang 2009; Kumar 2010; Fang and Huang 2017). Prior work finds that male-stereotyped tasks could be important confounding factors that help explain gender differences in selection into competition and performance under competition (see, for example, Schurchkov 2012; Flory et al. 2015). Based on laboratory and field studies from mostly western countries that score highly on individualism, Niederle and Vesterlund (2011) find that beliefs about one's relative performance play an important role in women's entry into competition, and call for further research. Our global sample of equity analysts serves as a natural setting for exploring the extent to which the national cultural value of individualism encourages the free expression of women's beliefs about their abilities, with implications for their on-the-job performance relative to men's across countries.

Last but not least, analyst performance, as captured by earnings forecast accuracy using data from the Institutional Brokers Estimates System (I/B/E/S) international files, is precisely measured.[5]

To capture important cross-country differences in institutional and economic development that might play a role in the relationship between gender, competition, and performance, we employ three measures: 1) the World Economic Forum's (WEF) Global Gender Gap Index (GGGI); 2) GDP per capita; and 3) the individualism dimension in Hofstede's (1980, 2001) national cultural framework, the most important driver of cultural differences across countries (Triandis 1995; Aggarwal et al. 2016) and a key determinant of important economic outcomes (e.g., Gorodnichenko and Roland 2011).

[5] In the U.S., Brown, Call, Clement, and Sharp (2015) show that equity analysts compete on multiple dimensions such as industry knowledge, generating underwriting business and/or trading commissions, broker votes, and accurate earnings forecasts. Hong and Kubik (2003) find that both forecast accuracy and optimism are rewarded in the analyst labor market. Given the international setting of our research, we opted to focus on one objective measure of analyst performance – earnings forecast accuracy, which is generally available across countries and is known to be a key determinant of analyst compensation and career advancement (Brown et al. 2015; Hong and Kubik 2003).

Taken together, our global sample of equity analysts is an important addition to the literature examining the complex relationships between gender, competition, and performance, and complements existing laboratory evidence (see the survey by Niederle and Vesterlund 2011).

3. Sample Formation and Overview

To explore cross-country patterns in the female share of equity analysts and in the gender performance gap under competition, we assemble a global sample of equity analysts with information on gender, employment location, and performance.

3.1. Sample formation

One way to determine an analyst's gender is to use their full name (see, for example, Green et al. (2009) and Kumar (2010) using U.S. data).[6, 7] However, the I/B/E/S Detail Recommendations file reports only an analyst's last name and first-name initial, rather than their full name. Regarding an analyst's employment location, one may infer such information from where their brokerage house operates. However, I/B/E/S provides only abbreviated brokerage names.[8] As a result, we cannot determine who the analysts are, the brokerage houses in which they work, and their gender and employment location from I/B/E/S.

To form an international sample of equity analysts for our study, we start with a list of brokerages (with abbreviated names) that provide stock recommendations on global equities in the I/B/E/S Detail Recommendations file over the period 2004–2019. We start our sample period in 2004 because our key data source – Capital IQ's coverage of analyst biographies –

[6] These authors rely on a number of sources to obtain the full names of analysts: the Institutional Investor magazine, Nelson's directory of investment research, and analyst directories available at Yahoo Finance and other financial Web sites, supplemented with searches of news articles on Factiva and Google.
[7] One caveat of our analysis is that analyst gender data is collected only for the lead analyst, whose identity is recorded in the I/B/E/S database.
[8] Before 2006, researchers could get brokerages' full names using the I/B/E/S broker translation file; this translation file is no longer available.

became more comprehensive beginning in 2004.[9] We then conduct manual searches primarily in Capital IQ (supplemented with Bloomberg) to obtain a brokerage's full name; its location, which is used to determine affiliated analysts' respective countries of origin; affiliated analysts' full names; and those analysts' gender information, gleaned from reading their biographies.[10] Appendix IA1 in the Internet Appendix provides a detailed description of our manual search and matching process.

Table 1 reports the impact of various matching steps and data filters to arrive at the final sample of 18,269 (unique) equity analysts affiliated with 1,179 brokerages located in 42 countries/regions.[11] As far as we are aware, ours is one of the largest global samples of equity analysts in the literature (see, for example, 3,482 analysts in Bae, Stulz, and Tan 2008; 11,663 analysts in Bradshaw, Huang, and Tan 2019).

3.2. Key variables

At the country-year level, our key variable of interest is *Female ratio*, constructed as the number of unique female analysts divided by the total number of unique analysts in a country-year.

The data for GGGI are obtained from the WEF, measuring progress toward gender parity in four dimensions: economic opportunities, education, health, and politicial leadership (WEF 2021). The indicator variable, *High GGGI*, takes the value of one if a country is in the top quartile among the sample countries in a year, and zero otherwise. The data for GDP per capita are obtained from the World Bank. The indicator variable, *High GDP per capita*, takes

[9] Capital IQ is a market intelligence platform developed by Standard & Poor's Global. It provides detailed business histories for brokerages and personal information on analysts, including employment history, employment location, and gender. Capital IQ obtains such information directly from Thomson Reuters (Lourie 2019).

[10] Forecasts made by foreign analysts are those covering a firm whose country of primary listing (based on the nation code in Worldscope) differs from the covering analyst's country of employment.

[11] One caveat to our sample formation and variable construction is that we keep only analysts whose gender data is available.

the value of one if a country is in the top quartile among the sample countries in a year, and zero otherwise. The data for individualism scores are obtained from the Hofstede Culture Dimension website.[12] A higher value indicates higher individualism (IDV). The indicator variable, *High IDV*, takes the value of one if a country is in the top quartile of the individualism score among the sample countries, and zero otherwise. There are ten countries with the indicator variable *High IDV* taking the value of one: Australia, Belgium, Canada, Denmark, Hungary, Italy, the Netherlands, New Zealand, the U.K., and the U.S.

At the firm-analyst-year level, our key variable of interest is *Average forecast error*, constructed as the average of absolute forecast errors that an analyst makes during a year. We use analysts' annual earnings per share (EPS) forecasts following the extant literature (see, for example, Clement 1999; Hong and Kacperczyk 2010; Kumar 2010) and because annual EPS forecasts have the widest coverage, which is important given our international sample. Absolute forecast error is the absolute value of the difference between an analyst's annual EPS forecast and actual EPS normalized by the stock price at the prior fiscal year end after accounting for stock splits. This measure is expressed as a percentage of the prior year's stock price following Hong and Kacperczyk (2010).

As alternative measures of analyst performance, we employ the absolute first/last forecast error made by an analyst in their first/last annual EPS forecast. As is well-established, the timing of forecasts matters for assessing analyst performance (Hong et al. 2000; Clement and Tse 2005). For example, when an analyst is making their very first forecast, the role of their private information generated by effort and skill is more prominent than when an analyst is making subsequent forecasts. When an analyst is making their last forecast, more information is available, and the role of their private information diminishes,

[12] Data can be downloaded at: https://geerthofstede.com/research-and-vsm/dimension-data-matrix/.

likely resulting in herding among analysts. We thus expect that if any gender difference in performance will ever appear, it will do so during the first forecast and not in the last.

Although we control for the timing of each forecast using *Forecast horizon* in our regression analyses, the first/last forecasts do not properly control for the exact timing of those forecasts, especially if female analysts might consistently make their forecasts later than their male counterparts. To level the playing field when assessing gender difference in performance, we also employ the absolute same week forecast error made by an analyst in their forecast that is within five days after the prior fiscal year's annual earnings announcement. We expect this measure will give us a clean test of the gender difference in performance after requiring the same timing of those forecasts. The Appendix provides detailed variable definitions.

3.3. Sample overview

Table 2 Panel A presents an overview of our global analyst sample by country. We show that the top three countries with the highest female analyst share (in descending order) are: Vietnam (43.1%), Thailand (37.9%), and Portugal (36.8%), and the top three countries with the lowest female analyst share are: Norway (4.2%), Denmark (7.8%), and New Zealand (9.7%). The top three countries with the largest number of earnings forecasts are: the U.S. (1,276,283 observations, representing 48.5% of the sample); the U.K. (243,251 observations; 9.2%); and Canada (194,929 observations; 7.4%).

Table 2 Panel B presents an overview of country-level variables. We show that the top three countries in terms of gender equality (GGGI) are: Norway, Finland, and Sweden; and the bottom three are: Pakistan, Turkey, and the United Arab Emirates. The top three countries in terms of economic development (GDP per capita) are: Norway, Switzerland, and Denmark; and the bottom three are: India, Vietnam, and Pakistan. The top three countries in

terms of the individualism score are: the U.S., Australia, and the U.K.; and the bottom three are: Indonesia, Pakistan, and South Korea.

Table 3 Panel A presents the summary statistics for key country-level variables.[13] We show that the average country-year female share of equity analysts across the 42 sample countries is 16.5%. We further show that the sample average GGGI is 0.71, the sample average GDP per capita is 30.97 thousands, and the sample average individualism score is 0.51.

Panel B presents the summary statistics for key analyst-level variables. The sample comprises 610,847 firm-analyst-year observations over the period 2005–2020. We show that the mean (median) *Average forecast error* (in percentage points) across the 42 sample countries is 2.90% (0.74%). Using a sample of stocks covered by I/B/E/S over the period 1980–2005, Hong and Kacperczyk (2010) show that the mean absolute forecast error is 3.31%. Our summary statistics for *Average forecast error* are largely consistent with theirs.[14]

At the firm-analyst-year level, the average female share of equity analysts in the international sample is 11.0%. Compared to the statistics at the country-year level in Panel A, the lower share at the firm-analyst-year level is due to a number of factors: 1) Female analysts cover fewer firms than male analysts; and 2) countries with a lower female share of equity analysts (such as the U.S.) have more firm-year observations.

[13] In our lead-lag regression analysis, the dependent variables are firm-analyst-year observations over the (fiscal year) period 2005–2020, and the country-level control variables are over the (calendar year) period 2003–2019 due to different fiscal year-ends for sample firms in different sample countries. For example, if a sample firm has a fiscal year-end of 06/30/2005 (its fiscal year is 2005), an analyst could make her first annual forecast on 05/15/2004 for the 2005 fiscal year. In this case, the lagged one-year country-level control variable will be in 2003, not in 2004.

[14] It is informative to compare our international sample to the U.S. sample, which is well studied in the analyst literature (see, for example, Clement 1999; Hong and Kacperczyk 2010; Hong et al. 2000; Clement and Tse 2005; Kumar 2010). Table IA2 in the Internet Appendix presents the summary statistics for key analyst-level variables for the U.S. sample only. We show that across all four analyst performance measures, the U.S. sample exhibits smaller values than those in the international sample, consistent with the findings in Eun, Wang, and Xiao (2015) that firms located in the country with the highest individualism score—the U.S.—will have information environments that are more transparent than those of firms outside the U.S.

Table IA3 in the Internet Appendix presents the correlation matrix of firm-analyst-level variables. We show that there is no significant association between the indicator variable *Female* and three of the four performance measures: *Average forecast error*, *First forecast error*, and *Same week forecast error*, whereas there is a positive and significant association between the indicator variable *Female* and *Last forecast error*. We further show that the indicator variable *High GGGI* is positively and significantly correlated with, whereas the indicator variable *High GDP per capita* is negatively and significantly correlated with, all four different measures of analyst performance. Moreover, we show that the indicator variable *High IDV* is negatively and significantly correlated with all four different measures of analyst performance. Given that omitted variable bias in univariate correlations can mask the true relations between the variables, we will employ multiple regressions to examine the country-level factors associated with the gender performance gap under competition.

4. Cross-Country Evidence

In this section, we present some new and intriguing evidence on cross-country differences in the female share of equity analysts and in the gender performance gap under competition.

4.1. Cross-country differences in the female share of equity analysts

Figure 1 plots the country-mean female share of equity analysts in a country in relation to its institutional and economic development. In Panel A, we show a negative association between a country's GGGI and its female share of equity analysts. In Panel B, we show a negative association between a country's Ln(GDP per capita) and its female share of equity analysts. As far as we are aware, we are the first to show that in the most developed western countries with the most generous gender equality policies in which women are on par

or exceed men in higher education and many other dimensions, women have the lowest presence in equity research. In Panel C, we show a negative association between a country's individualism score and its female share of equity analysts. We will explore possible explanations for the observed patterns in Section 5.

4.2. Cross-country differences in the gender performance gap under competition

We next examine whether there is any cross-country difference in the gender performance gap under competition using the following panel data regression specification:

$$Forecast\ performance_{c,i,j,t} = \alpha + \beta_1 Female_j + \beta_2 Female_j \times High\ country-level\ marker_{c,t} + \beta_3 Country\ characteristics_{c,t-1} + \beta_4 Analyst\ characteristics_{j,t-1} + \beta_5 Brokerage\ characteristics_{j,t-1} + Firm_i \times Year_t\ FE + e_{c,i,j,t} \quad (1)$$

where the dependent variables are different analyst forecast performance measures: *Average forecast error*, *First forecast error*, *Last forecast error*, and *Same week forecast error*. For example, *Average forecast error* is the average of absolute forecast errors made by analyst *j* residing in country *c* on firm *i* when making the current year *t* EPS forecasts. *Female* is an indicator variable that takes the value of one if analyst *j* is a female, and zero otherwise. *High country-level marker* is an indicator variable for the country-level institutional (economic) development: GGGI, Ln(GDP per capita), or the individualism score, using its respective top quartile as the cutoff. Our control variables largely follow prior literature, such as Clement (1999), Bae et al. (2008), Hong and Kacperczyk (2010), and Bradshaw et al. (2019). Firm times year fixed effects are included to control for time-varying unobservables that might drive an analyst's coverage decisions as well as their performance (Clement 1999; Hong and Kacperczyk 2010; Hilary and Shen 2013). The sample consists of firm-analyst-year observations. Table 4 presents the regression results.

In Panel A (B), our variables of interest are the indicator variable, *Female*, and the interaction term: *Female × High GGGI* (*Female × High GDP per capita*). We show that across all specifications, the coefficient on the interaction term *Female × High GGGI*

(*Female × High GDP per capita*) is not significantly different from zero (with only one exception), suggesting that neither social policies promoting gender equality nor economic development plays any significant role in the gender performance gap under competition.

In Panel C, we first show that the coefficient on the indicator variable, *Female*, is positive and significant, suggesting that in low IDV countries, there is a positive and significant association between female analysts and forecast errors (in three out of the four specifications). That is, there is a significant underperformance of female analysts compared to their male counterparts, consistent with findings in controlled experiments that under competition females perform worse than their male counterparts (see, for example, Gneezy et al. 2003). In terms of economic significance, using column (1) specification as an example, we show that *ceteris paribus*, female analysts in low IDV countries on average produce *Average forecast error* that is 0.042% larger than their male counterparts. Given that the sample average for *Average forecast error* is 2.902%, the performance gap is economically significant.[15]

Next, we show that the coefficient on the interaction term *Female × High IDV* is negative and significant (in three out of the four specifications), suggesting that female analysts in high IDV countries (for example, the U.K.) tend to perform better than their male counterparts compared to their peers in low IDV countries (for example, Japan) – a difference-in-differences interpretation. In terms of economic significance, using column (1) specification as an example, we show that *ceteris paribus*, female analysts in high IDV countries on average produce *Average forecast error* relative to their male counterparts that is

[15] The mean (median) value of sample firms' market capitalization is USD 1.14 billion (USD 0.29 billion). The mean (median) value of sample firms' P/E ratio is 28.44 (17.92). In terms of economic significance, when using mean values, a difference of 0.042% in forecast error corresponds to a difference of USD 0.48 million in earnings, and a difference of USD 13.62 million in market value; when using median values, a difference of 0.042% in forecast error corresponds to a difference of USD 0.13 million in earnings, and a difference of USD 2.18 million in market value.

0.062% smaller than their female peers in low IDV countries. Given that the sample average for *Average forecast error* is 2.902%, the performance gap is economically significant.[16]

To test whether there are cross-country differences in the gender performance gap when sorting countries by their individualism scores, we employ the F-test of the null that the sum of the coefficients on *Female* and *Female* × *High IDV* is zero, i.e., there is no gender performance gap under competition in high IDV countries. The p-value shows that we fail to reject the null, suggesting that female analysts in high IDV countries perform the same as their male counterparts.

In addition to the main findings above, we show that the coefficient on *High IDV* is negative and significant. Given our inclusion of firm times year fixed effects, this coefficient captures the effect of a home country's individualism score on a foreign analyst's forecast performance of domestic stocks (e.g., a British analyst forecasting the performance of German stocks). We show that for these foreign analysts, *Average forecast error* is on average smaller if they are from high IDV countries than if they are from low IDV countries.[17] We also show that the coefficient on *GGGI* is positive and significant. Given our inclusion of firm times year fixed effects, this coefficient captures the effect of a home country's gender equality politics and practices on a foreign analyst's forecast performance of domestic stocks (e.g., a Norwegian analyst forecasting the performance of French stocks.)

Finally, we show that the indicator variable *Foreign analyst* and *Forecast horizon* (i.e., the average number of months between an analyst's forecast date and the date of the

[16] In terms of economic significance, when using mean values, a difference of 0.062% in forecast error corresponds to a difference of USD 0.71 million in earnings, and a difference of USD 20.10 million in market value; when using median values, a difference of 0.062% in forecast error corresponds to a difference of USD 0.18 million in earnings, and a difference of USD 3.22 million in market value.

[17] The social psychology literature establishes that people in high IDV countries are more overconfident and exert more effort (Markus and Kitayama 1991; Heine, Lehman, Markus, and Kitayama 1999; Chui, Titman, and Wei 2010; Gervais, Heaton, and Odean 2011) and have analytical thinking styles (Nisbett, Peng, Choi, and Norenzayan 2001). The negative coefficient on *High IDV* in column (1) is consistent with these interpretations. Our analyses in Section 6 provide further supporting evidence for some of those interpretations.

annual earnings announcement) are both positively and significantly, whereas firm-specific and general experiences, and brokerage size (proxying for resources) are negatively and significantly, associated with *Average forecast error*. All these findings are consistent with prior work (see, for example, Clement 1999; Clement and Tse 2005; Bae et al. 2008).

In summary, using a new international sample of equity analysts with information on gender and performance, we have established two empirical patterns: 1) There is a negative association between a country's level of institutional/economic development and its female share of equity analysts; and 2) there is no gender performance gap under competition in high individualistic countries.[18] In the rest of the paper, we explore a number of possible explanations for the observed patterns.

5. Possible Explanations

5.1. Barriers to entry

One possible explanation for the observed patterns is that women face higher barriers to entry into the equity research profession, resulting in both a lower female share of equity analysts and no female underperformance relative to male analysts in high individualistic countries compared to those in low individualistic countries. Table 5 presents the results from our investigation.

Panel A presents the correlation matrix of country-level variables. We show that there is a negative and significant association between a country's female share of equity analysts and its GGGI, between a country's female share of equity analysts and its GDP per capita, and between a country's female share of equity analysts and its individualism score, consistent with the patterns observed in Figure 1. Moreover, we show that there are positive

[18] We are aware that the association between individualism and the gender performance gap under competition could be affected by omitted variables (such as the cultural value of masculinity) or certain confounding factors (such as economic development). We employ a multi-pronged approach to address those concerns in Appendix IA2 in the Internet Appendix.

and significant associations among GGGI, GDP per capita, and the individualism score, suggesting that high individualistic countries introduce more gender equality policies and enjoy high levels of economic development. In other words, *ceteris paribus*, we would expect lower barriers to entry for women joining the labor force (including becoming equity analysts) in high individualistic countries compared to low individualistic countries.

Panel B presents the country-year regression results where the dependent variable is a country's female share of equity analysts. In columns (1)-(3), we first establish that there is a negative and significant association between a country's level of institutional/economic development and its female share of equity analysts. In column (4) when we include all three country-level institutional/economic development measures to explain a country's female share of equity analysts, we show that only the negative and significant association between a country's individualism score and its female share of equity analysts remains. Had the barriers to entry explanation held true, we would have expected a positive and significant association between a country's individualism score and its female share of equity analysts.

We conclude that the evidence thus far is inconsistent with the conjecture that women face higher barriers to entry into the equity research profession in high individualistic countries that also score high in gender equality policies and practices and are also more advanced in economic development.

5.2. Individualism encouraging women's self-selection

Employing a sample of equity analysts in the U.S., Kumar (2010) finds that female analysts issue more accurate forecasts than their male counterparts. He further shows that stock market participants are aware of the male-female skill differences in favor of female analysts. He concludes that in the U.S., only women with superior forecasting abilities self-select to enter the equity research profession due to a perception of discrimination in the analyst labor market.

Inspired by Kumar's (2010) seminal work and findings, we employ an international data set, which allows us to gain new insights into the complex relation between gender, competition, and performance through a national culture lens. National cultural values define what constitutes appropriate decisions and behaviors in a society (North 1990; Guiso et al. 2006). Specifically, individualistic societies emphasize independence and equality (Hofstede 2011, p. 11; Griffin et al. 2017), whereas collectivistic societies emphasize in-groups' interests and harmony (Trompenaars 1993; Hofstede 2001, 2011). *Ceteris paribus*, the national cultural value of individualism encourages women to make career choices more freely based on their preferences compared to women in collectivistic societies. Given that women are averse to competition and that equity research is a competitive profession, women in high individualistic countries choose to become equity analysts only if they are good at the job, whereas in low individualistic countries, women do not have the luxury of this choice. This alternative explanation, which embeds the role of national culture into the relation between gender, competition, and performance, has two testable implications: 1) There is a negative association between a country's individualism score and its female share of equity analysts (because women are averse to competition and the national cultural value of individualism encourages women to make career choices consistent with their preferences); and 2) there is no gender difference in performance under competition in high individualistic countries (because only capable females self-select into and/or choose to stay in a competitive profession in those countries).

6. Supplemental Evidence on Individualism Encouraging Women's Self-Selection

In this section, we provide supplemental evidence in support of the second implication above, that only capable women self-select into and/or choose to stay in the equity research profession.

6.1. Analyst skills

We employ three proxies for analyst skills: the prestige of the brokerage house with which an analyst upon entry is affiliated, the economic significance of an analyst's stock portfolio upon entry (first-time analysts are identified by their first appearance in the I/B/E/S database), and the market's perception of analyst skills.[19] It is worth emphasizing that we focus on the brokerage and stock portfolio characteristics of analysts at the start of their professional careers to help separate out the innate skills of analysts – which helps support our preferred explanation for the observed patterns in Figure 1 and Table 4 Panel C – from the experience and strong performance accrued from working as analysts.

We employ a univariate DID comparison by first sorting our first-time analysts into high and low IDV country subsamples, then comparing gender differences in brokerage/stock portfolio characteristics within each subsample, and lastly comparing the gender difference in the same characteristic between the two IDV subsamples. Brokerage reputation is based on an annual global ranking using a broker's number of analysts employed. Top stocks are based on a country-year ranking using either total assets or market capitalization. Essentially, we want to explore whether brokerage/stock portfolio characteristics are consistent with our proposed national culture-based explanation, which is that female analysts in high IDV countries are more skilled than their male counterparts compared to their peers in low IDV countries; in high IDV countries, as noted above, only capable women self-select to enter a competitive profession.

Table 6 Panel A presents the results. We first show that in high IDV countries, 42% of new female analysts work for the top ten brokerage houses compared to 28% of new male analysts. In low IDV countries, 21% of new female analysts work for the top ten brokerage

[19] I/B/E/S has been anonymizing the names of contributing brokers and their analysts since 2006, which makes it almost impossible to study inter-brokerage moves, such as an analyst moving to a more prestigious brokerage as a marker for superior analyst skills (Hong and Kubik 2003). We therefore resort to alternative measures in this paper to proxy for analyst skills.

houses compared to 14% of new male analysts. The DID t-test in column (13) shows that the gender gap in women's favor for working at the most prestigious brokerage houses in high IDV countries is significantly larger than that in low IDV countries, suggesting that female analysts are more skilled (based on the prestige of brokerages) in high IDV countries compared to their peers in low IDV countries. Using an alternative measure of prestigious brokerages (i.e., the top 20 brokerages) does not change our main finding.

Panel A further shows, through our use of top stocks based on total assets in the top quintile to capture economically important stocks in an analyst's stock portfolio, that in high IDV countries, 42% of the stock portfolios of new female analysts are important stocks compared to 38% of the stock portfolios of new male analysts. In low IDV countries, 40% of the stock portfolios of new female analysts are important stocks compared to 41% of the stock portfolios of new male analysts. The DID test in column (13) shows that the gender gap in women's favor for covering more important stocks in high IDV countries is significantly larger than that in low IDV countries, suggesting that female analysts are more skilled (using the importance of stock portfolios) in high IDV countries compared to their peers in low IDV countries.[20]

Taken together, the results in Table 6 Panel A provide support for our national culture-based explanation, that in individualistic countries, only women who are capable choose to become equity analysts, resulting in no gender difference in performance.

6.2. Analyst effort

Gervais et al. (2011) show that people who believe in themselves exert more effort than those without such beliefs. We employ two direct measures of effort: # *alternative*

[20] Using top stocks based on total assets in the top decile to capture the economic significance of analysts' stock portfolios gives weaker but consistent results. Relatedly, using top stocks based on market capitalization gives similar findings.

forecasts, defined as the number of other types of forecasts (excluding EPS), such as book value per share and dividend per share made by an analyst; and *Timely forecast,* defined as the number of days between an analyst's forecast and last earnings announcement date times minus one. Thus the higher the value, the more timely a forecast is. We employ the same regression specification as Equation (1). Table 6 Panel B presents the results.

We first show that in low IDV countries, there is a negative and significant association between the indicator variable *Female* and *Timely forecast*. Importantly, the coefficient on the interaction term *Female* × *High IDV* is positive and significant in both columns, and the F-test rejects the null that the sum of the coefficients on *Female* and *Female* × *High IDV* is zero, i.e., female analysts in high IDV countries exert the same effort as their male counterparts.

Taken together, the evidence is consistent with our conjecture that in high individualistic countries, female analysts exert significantly more effort than male analysts compared to their peers in low individualistic countries.

6.3. The market's perception of analyst skills

To investigate the market's perception of analyst skills, we estimate a panel data regression similar to Equation (1) where the dependent variables are three-day cumulative stock return, and three-day cumulative market-adjusted abnormal stock return, centered on an analyst' annual EPS forecast revision date. The independent variables include a triple interaction term *Female* × *High IDV* × *Forecast revision*; three two-way interaction terms *Female* × *High IDV*, *Female* × *Forecast revision*, and *High IDV* × *Forecast revision*; and other controls similar to those in Equation (1). *Forecast revision* is the difference between an analyst's new annual EPS forecast and her last forecast normalized by the stock price at the prior fiscal year end. To calculate *Forecast revision*, we require that an analyst issue at least two annual EPS forecasts for the same firm and year. Firm and market returns are obtained

from Refinitiv Datastream in local currency. The variable of interest is the coefficient on the triple interaction term. Table 6 Panel C presents the result.

We find that the coefficient on the triple interaction term *Female × High IDV × Forecast revision* is positive and significant in both specifications, suggesting that in high individualistic countries the market reacts more strongly to forecast revisions made by female analysts than to those made by male analysts, compared to the market reaction to those made by their peers in low individualistic countries. In other words, the market perceives female analysts relative to male analysts in high individualistic countries to be more skilled compared to their peers in low individualistic countries.[21]

In summary, the results in Table 6 provide support for our national culture-based explanation, that in individualistic countries, only women who are capable and willing to work hard choose to become equity analysts, eliminating the gender performance gap under competition.

6.4. Analyst turnover

In this section, we provide suggestive evidence on only capable females self-selecting to stay in a competitive profession in high individualistic countries by examining the gender difference in analyst turnover rates conditional on bad performance between the high and low IDV country subsamples. The indicator variable, *Turnover,* for analyst *j* in year *t* takes the value of one if this is the year in which analyst *j* makes their last forecasts (i.e., there are no further forecasts after year *t* according to I/B/E/S).[22] The indicator variable, *Bad*

[21] It is worth noting that our main findings remain when using the global sample excluding analysts based in the U.S. only or excluding analysts based in both the U.S. and U.K.

[22] Our analysis assumes that if an analyst no longer produces forecasts, he or she has been turned over. It is possible some of those analysts might have been promoted instead of fired. It is worth noting that our analysis focuses on the difference in turnover rates between genders conditional on an analyst's relatively poor performance among peers. As a result, our performance-based analysis is less subject to the concern that we do not know for certain if a given analyst has left the profession (relating to their poor performance). Due to data limitations, our analysis above does not differentiate between voluntary turnover and forced turnover (i.e., firings). It is worth noting that even if some turnovers are forced, as long as they do not vary systematically in

performance, takes the value of one if the average of an analyst's adjusted forecast accuracy in year *t* and *t-1* is in the bottom quartile, and zero otherwise.[23] Then, for the sample of analysts (sorted by gender and the individualism score of each analyst's country), we compute the turnover rate in year *t+1* based on the information that a female analyst has left the profession. Table 7 presents the results.

We show that female analysts experience a significantly higher turnover rate when underperforming (as measured by their past two-year performance being in the bottom quartile) relative to male analysts in high IDV countries (column (5)): 10% of the underperforming female analysts are gone compared to 7% of the underperforming male analysts in high IDV countries. In contrast, female analysts experience a similar turnover rate when underperforming relative to male analysts in low IDV countries (column (10)): 12% of the underperforming female analysts are gone compared to the same 12% of the underperforming male analysts in low IDV countries. The DID test in column (11) suggests that there is a significant gender gap in turnover rates conditional on bad performance between high and low IDV countries.[24]

We conclude that the evidence in Table 7 supports our national culture-based explanation, that only capable women self-select to stay in a competitive profession in high individualistic countries, eliminating the gender performance gap in those countries.

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high and low IDV countries, the analysis in this section is still consistent with our national culture-based explanation: in individualistic countries, women are more likely to leave equity research if they experience bad performance and recognize their limitations as equity researchers, compared to women in collectivistic countries, thereby narrowing the gender performance gap in individualistic countries.

[23] Our choice of a two-year performance window in the turnover analysis is based on the following considerations. First, Kumar (2010) finds that in his U.S. sample, the average brokerage tenure (i.e., the average number of years an analyst works at a brokerage firm) of female analysts is about five years, whereas the average brokerage tenure for male analysts is about four years. As a result, using a longer performance window will reduce the sample substantially for this analysis. Second, we do not use a one-year window because it might be too short and subject to measurement errors.

[24] In terms of economic significance, we show that there is a turnover rate gap of about 3% between genders in high IDV countries (Table 7). Kumar (2010, p. 429) in his U.S. study finds that the gender gap in the rate of moving up (from a low- to a high-status brokerage firm, hence a promotion) is 3.6%.

7. Additional Investigation

We conduct a large number of robustness checks of our main findings.

7.1. Removing analysts based in the U.S. and the U.K.

Prior studies on gender differences in analyst performance are mainly based on U.S. data (Green et al. 2009; Kumar 2010; Peng, Teoh, Wang, and Yan 2022).[25] In a recent study, Drake, Moon, Twedt, and Warren (2023) document a continuous decline in the number of sell-side equity analysts in the U.S. and a rise in the so-called social media analysts since the early 2000's due to changes in regulation such as Regulation Fair Disclosure, the Global Analyst Research Settlements, and the growth in passive investing.[26] As a result, brokerages face heightened pressure to hire and retain the best talent. Consistent with this observation, we find no gender difference in analyst performance in the U.S. over the more recent period 2005–2020.

To address the concern that our main findings are not specific to analysts based in the U.S. and the U.K., which are the two countries with the highest individualism scores as well as the largest numbers of analysts in our international sample, we repeat our analysis in Table 4 Panel C removing analysts based in these two countries. Table IA4 in the Internet Appendix presents the results.[27] We show that in two out of the four specifications, the F-test of the null

[25] In an untabulated analysis, using either our sample that overlaps with that of Kumar (2010) over the period 2004–2005, or our sample that backfills analyst gender information in 2004 up to 1996 and hence overlaps with that of Kumar (2010) over the period 1996–2005, we find that female analysts indeed outperform male analysts over those sample periods.

[26] In an untabulated analysis, we find that the share of U.S. female analysts reached 11% leading up to the Global Analyst Research Settlements in 2003; experienced a small decline to 9% after the 2008 Financial Crisis; and rose to about 10% thereafter, a figure that has remained unchanged over the ensuing years. In other words, the female share of equity analysts is relatively stable over our sample period.

[27] In untabulated analyses, we repeat Table 4 Panel C regressions, removing countries with five or fewer female analysts: Argentina, Denmark, Hungary, Israel, and New Zealand, resulting in a drop in sample size by 3,698 observations (representing 0.6% of the sample). To ensure our premise holds that equity analysts are in a competitive profession with high pay, we also repeat Table 4 Panel C regressions, removing the top five countries with the highest personal income tax rates: Austria, Belgium, Denmark, Israel, and the Netherlands, resulting in a drop in sample size by 10,123 observations (representing 1.7% of the sample). In both cases, our main findings remain.

that the sum of the coefficients on *Female* and *Female × High IDV* is zero fails to reject the null, suggesting that female analysts in high IDV countries (outside the U.S. and the U.K.) perform the same as (or better than) their male counterparts.

7.2. Controlling other national cultural values

Under the national cultural framework of Hofstede (1980, 2001), there are three other national cultural values in addition to individualism: masculinity (MAS), power distance (PDI), and uncertainty avoidance (UAI). Conceptually, as discussed in Section 5.2, we expect that the value of individualism, as opposed to the other three values, encourages women to make career choices consistent with their preferences (i.e., their aversion to competition). As a result, only capable women self-select into the equity research profession, eliminating the gender performance gap under competition in high individualistic countries. Arguably, these other national cultural values could nonetheless drive our main findings, since these values are positively correlated.

Table IA5 presents the results when we repeat our analysis in Table 4 Panel C by sequentially adding one out of each of the three other national cultural values of Hofstede (1980, 2001). In all cases, we do not see that the gender performance gap varies with any of these three other national cultural value variables in any meaningful way, suggesting that these values do not explain our main findings.

7.3. Controlling country-level transparency

Bae, Tan, and Welker (2008) and Bradshaw et al. (2019) show that a country-level regulatory and institutional environment influences analysts' behaviors. To ensure our main findings are robust to controlling for the level of transparency in the country in which an analyst operates, we add a transparency measure following Bradshaw et al. (2019) in Table 4

Panel C specification. Table IA6 in the Internet Appendix presents the regression results. We show that our main findings remain.

7.4. Using a different cutoff to define High IDV

Table IA7 in the Internet Appendix presents the regression results using the 30% cutoff to define the indicator variable *High IDV*. There are 12 countries with the indicator variable *High IDV* taking the value of one: Australia, Belgium, Canada, Denmark, France, Hungary, Italy, the Netherlands, New Zealand, Sweden, the U.K., and the U.S. We show that our main findings remain.

7.5. Employing an updated version of Hofstede's individualism score

Hofstede's (1980, 2001) individualism score was constructed from answers to a survey of 117,000 IBM employees across the company's subsidiaries in 70 countries between 1967 and 1973 (see the Appendix for the list of survey questions). Although Hofstede's score is based on survey data from the late 1960s and early 1970s, Beugelsdijk, Maseland, and van Hoorn (2015) find that cultural change is absolute rather than relative, i.e., countries' scores on the Hofstede dimensions relative to the scores of other countries have changed little over time, which is important to our empirical analysis.

As a robustness check, we employ an updated version of the individualism score derived from survey data from the World Values Survey (WVS) and its equivalent, the European Values Study (EVS), over the period 1981–2002 (see the Appendix for detailed description). *High IDV_WVS* is an indicator variable that takes the value of one if a country is in the top quartile of updated individualism scores, and zero otherwise. Table IA8 in the Internet Appendix replicates the analysis in Table 4 Panel C using the updated individualism score.

We show that in low IDV countries, across all four forecast performance measures, female analysts significantly underperform their male counterparts. However, in high IDV countries, there is no significant difference in performance between genders.

7.6. Using standard errors clustered at different levels

Our main regression specifications in Table 4 Panel C employ standard errors clustered at the firm times year level to account for cross-firm and time-series dependence in the residuals of a given analyst's forecast errors (Petersen 2009). One could argue that the residuals of analyst forecast errors may also be correlated across observations within a country-year, across observations within a brokerage-year, across observations by an individual analyst, or across observations by a firm. As robustness checks, we employ standard errors clustered at the analyst country times year, brokerage times year, analyst, or firm level to account for possible cross-sectional or temporal correlation at those levels. Table IA9 in the Internet Appendix presents the results. We show that our main findings remain.

7.7. Using forecast-level observations and including high-dimensional fixed effects

As a robustness check, we include high-dimensional fixed effects using firm-forecast-analyst-year observations. We include firm times year times month fixed effects because of known gender differences that might result in female analysts' forecasts being later than those made by their male counterparts. Using more granular fixed effects allows us to compare forecasts made by the different genders within a short window (in this case monthly) to help control for forecast timing differences. Table IA10 Panel A in the Internet Appendix presents the results. We show that our main findings remain unchanged when including different fixed effects and using more granular performance measures at the forecast level.

As a further robustness check, we add brokerage times year fixed effects to the specification in Equation (1) using firm-analyst-year observations to control for time-varying

brokerage characteristics, including labor market pressure faced by analysts working for different brokers over time (Bradley, Gokkaya, and Liu 2017). Table IA10 Panel B presents the results. We show that our main findings remain.

7.8. Removing potentially misclassified analysts

Thus far in our analysis, we have determined an analyst's country of origin by the location of their office. It is possible that using an analyst's office location might potentially misclassify their country of origin; for example, an analyst from the U.S. (based on their name, a high IDV country) might be working in Japan (based on their place of work, a low IDV country), which would create noise in our analysis.

As a final robustness check, we turn to a proprietary database from OriginsInfo Ltd incorporating sources such as the American Dictionary of Family Names and international telephone directories; this database allows us to identify the most likely ethnic origins of analysts in our sample. OriginsInfo's classification assigns an ethnicity to each name based on the family name; when family names are inadequate for accurate identification (e.g., for family names such as Lee), the database uses a combination of an individual's family name and given name to identify ethnicity (Hegde and Tumlinson 2014).

Our full sample consists of 18,269 equity analysts from 42 countries. We are able to determine ethnicity using names for 16,318 analysts. Among those, we keep 11,444 equity analysts from 42 countries for whom the individualism ranking of an analyst's country of origin as determined by their name is the same as that of their place of work.

Table IA10 Panel C presents the regression results. Consistent with our intuition, we show that our main findings become stronger when we employ a subsample of analysts with cross-validated information on their respective countries of origin.

We conclude that the national cultural value of individualism encourages women to make career choices more freely based on their preferences compared to women in

collectivistic societies; only capable females self-select into a competitive profession, resulting in no gender performance gap under competition in high individualistic countries.

8. Conclusions

This paper, as far as we are aware, is the first in the literature to study whether and how gender differences in performance under competition vary across countries. Our measures of country-level differences capture cross-country differences in institutional/economic development: the Global Gender Gap Index, GDP per capita, and the individualism dimension in Hofstede's (1980, 2001) national cultural framework.

Using a hand-collected sample of 18,269 equity analysts from 42 countries over the period 2004–2019, we first establish an intriguing negative association between a country's level of institutional/economic development and its female share of equity analysts. Using a panel data set of analyst forecast errors and firm times year fixed effects to account for time-varying unobservables that could potentially drive analysts' coverage decisions and performance, we next show that, in individualistic countries only, there is no gender gap in analyst forecast accuracy. We further show that female analysts are more skilled and more likely to drop out when underperforming in individualistic countries compared to peers in collectivistic countries. Our evidence supports the proposition that the national cultural value of individualism encourages women to make career choices consistent with their aversion to competition. As a result, only capable women self-select to enter and/or stay in the equity research profession in high individualistic countries, resulting in no gender performance gap in those countries. Our findings will guide government policies and business practices promoting female representation in highly competitive professions.

Appendix
Variable definitions

All continuous variables are winsorized at the 1st and 99th percentiles. All values are reported in 2010 constant US dollars (USD).

Variable	Definition	Source
Country-level variables		
Individualism	The index is a weighted sum of the following four statements: 1) Have sufficient time for your personal or family life 2) Have good physical working conditions (good ventilation and lighting, adequate work space, etc.) 3) Have security of employment 4) Have an element of variety and adventure in the job High individualism is indicated by ratings of "of very little or no importance" to items (2) and (3), and of "of utmost importance" to items (1) and (4). In individualistic cultures, the ties between individuals are loose: Everyone is expected to look after him/herself and his/her immediate family. In collectivistic cultures, people from birth onwards are integrated into strong, cohesive in-groups, often extended families that continue protecting them in exchange for unquestioning loyalty, and oppose other in-groups (Hofstede 1980, 2001, 2011). In a general review of his cultural dimensions, Hofstede (2011) provides 10 contrasts between individualism (IDV) and collectivism. Here are the first five contrasts, which are the most relevant to organizational/individual behaviors: *Individualism* / *Collectivism* "I" – consciousness / "We" – consciousness Right of privacy / Stress on belonging Speaking one's mind is healthy / Harmony should always be maintained Others classified as individuals / Others classified as in-group or out-group Personal opinion expected: one person, one vote / Opinions and votes predetermined by in-group	Hofstede Culture Dimension website
High IDV	Indicator equals one if a country is in the top quartile of individualism among sample countries, and zero otherwise.	Hofstede Culture Dimension website

High IDV_WVS	Indicator equals one if a country is in the top quartile of updated individualism scores, and zero otherwise. Prior work including Schwartz (1994), Triandis (1995), and Beugelsdijk, Maseland, and van Hoorn (2015) associates the following questions in the WVS and EVS with individualism. Based on questions in the WVS, an individual is considered to be individualistic if he/she strongly agrees with: 1) one of my main goals in life is to make my parents proud: 1. strongly agree... 4. strongly disagree; 2) private versus government ownership of business: 1. private ownership should be increased...10. government ownership should be increased; 3) justifiability; homosexuality: 1. never justifiable... 10. always justifiable; and 4) justifiability; abortion: 1. never justifiable... 10. always justifiable. When coding these four items, the response to item 2 corresponding to a high individualism score is the lowest order option (i.e., option 1), whereas for all other three items, the responses are the highest order options (i.e., either option 4 or option 10). To obtain an updated version of the individualism score, we take the following steps. First, for each WVS variable listed above, we compute a country-mean of that variable over the period 1981–2002. Second, we regress Hofstede's individualism score on the country means of the four survey responses to obtain the coefficients on those four countries means. Third, we multiply the estimated coefficients with the corresponding country-means of the same four survey questions over the period 2003–2015 to obtain an updated score for individualism.	World Values Survey (WVS); European Values Survey (EVS)
High IDV_alt	Indicator equals one if a country is in the top 30th percentile of individualism among sample countries, and zero otherwise.	Hofstede Culture Dimension website
Global Gender Gap Index	The Global Gender Gap Index (GGGI) was first introduced by the World Economic Forum (WEF) in 2006 to benchmark progress towards gender parity and compare countries' gender gaps across four dimensions: economic opportunities, education, health, and political leadership (WEF 2021). We fill the missing values before 2006 with applicable values in 2006.	World Economic Forum
High GGGI	Indicator equals one if a country is in the top quartile of global gender gap index among sample counties in a year, and zero otherwise.	World Economic Forum
GDP per capita	GDP per capita (in thousands of dollars).	World Bank
Ln(GDP per capita)	Natural logarithm of GDP per capita (in thousands of dollars).	World Bank

High GDP per capita	Indicator equals one if a country is in the top quartile of GDP per capita among sample counties in a year, and zero otherwise.	World Bank
Transparency	The first principal component of four country-level investor protection and legal enforcement variables: 1) the aggregate annual index of legal system and property rights from the Economic Freedom Data Set by Fraser Institute; 2) the assessment of corruption in government by the country-risk rating agency International Country Risk (ICR); 3) the assessment of efficiency and integrity of the legal environment as it affects business, particularly foreign firms produced by the country-risk rating agency Business International Corporation; and 4) the rule of law indicator from the Worldwide Governance Indicators (WGI).	Bradshaw, Huang, and Tan (2019)
Female ratio	Number of unique female analysts divided by the total number of unique analysts in a country-year. We determine whether an I/B/E/S analyst is a female or not based on hand-collected biographic information from Capital IQ, Bloomberg, and online search. Please see Appendix IA1 in the Internet Appendix for details.	I/B/E/S; Capital IQ; Bloomberg
Analyst-level variables		
Average forecast error	Average of absolute forecast errors that an analyst makes during a year. Absolute forecast error is the absolute value of the difference between an analyst's annual EPS forecast and actual EPS normalized by the stock price at the prior fiscal year end, expressed as a percentage of the prior year's stock price following Hong and Kacperczyk (2010).	I/B/E/S
First forecast error	Absolute value of the forecast error made in an analyst's first forecast during a year.	I/B/E/S
Last forecast error	Absolute value of the forecast error made in an analyst's last forecast during a year.	I/B/E/S
Same week forecast error	Absolute value of the forecast error made in an analyst's forecast that is within five days after the prior fiscal year's annual earnings announcement.	I/B/E/S
Bad performance	Indicator equals one if the average of an analyst's adjusted forecast accuracy in year *t* and *t-1* is in the bottom quartile, and zero otherwise. Adjusted forecast accuracy is the difference between an analyst's average forecast error and the mean of the same variable across analysts following the same firm in the same year.	I/B/E/S
Top10 brokerage	Indicator equals one if a brokerage's size is in the global top decile in a year, and zero otherwise.	I/B/E/S
Top20 brokerage	Indicator equals one if a brokerage's size is in the global top quintile in a year, and zero otherwise.	I/B/E/S
%Top10 stock_assets	The share of prestigious stocks in an analyst' stock portfolio in a year. Prestigious stocks are those stocks in the top decile by total assets across firms covered by both Worldscope and I/B/E/S in a country-year.	I/B/E/S; Worldscope

%Top20 stock_assets	The share of prestigious stocks in an analyst's stock portfolio in a year. Prestigious stocks are those stocks in the top quintile by total assets across firms covered by both Worldscope and I/B/E/S in a country-year.	I/B/E/S; Worldscope
%Top10 stock_mkt cap	The share of prestigious stocks in an analyst's stock portfolio in a year. Prestigious stocks are those stocks in the top decile by market capitalization across firms covered by both Worldscope and I/B/E/S in a country-year.	I/B/E/S; Worldscope
%Top20 stock_mkt cap	The share of prestigious stocks in an analyst's stock portfolio in a year. Prestigious stocks are those stocks in the top quintile by market capitalization across firms covered by both Worldscope and I/B/E/S in a country-year.	I/B/E/S; Worldscope
# alternative forecasts	The natural logarithm of one plus the number of other types of forecasts, excluding EPS, such as book value per share (BPS), dividend per share (DPS), and capital expenditures (CAPX) issued by an analyst during the year.	I/B/E/S
Timely forecast	The natural logarithm of one plus the number of days between analyst forecast date and last earnings announcement date. We put a negative sign to the variable so that the higher the value, the more timely a forecast is.	I/B/E/S
Three-day cumulative return	Three-day cumulative stock return, centered on an analyst's annual EPS forecast revision date, expressed in percentage points.	Refinitiv Datastream; I/B/E/S
Three-day CAR	Three-day cumulative market-adjusted abnormal stock return, centered on an analyst's annual EPS forecast revision date, expressed in percentage points.	Refinitiv Datastream; I/B/E/S
Forecast revision	The difference between an analyst's new annual EPS forecast and her last annual EPS forecast normalized by the stock price at the prior fiscal year end.	I/B/E/S
Female	Indicator equals one if an analyst is a female, and zero otherwise.	I/B/E/S; Capital IQ; Bloomberg
Foreign analyst	Indicator equals one if an analyst's affiliated brokerage is in a country different from the country of primary listing of the firm she follows, and zero otherwise.	Capital IQ; Worldscope
Forecast horizon	Average number of months between the forecast date of an analyst during a year to the date of the annual earnings announcement.	I/B/E/S
Forecast frequency	Number of annual EPS forecasts made by an analyst during a year.	I/B/E/S
# firms followed	Number of firms for which an analyst makes at least one forecast during a year.	I/B/E/S
# industries followed	Number of two-digit SIC industries for which an analyst makes at least one forecast during a year.	I/B/E/S

Firm experience	Number of years for which an analyst makes at least one forecast of the focal firm during a year.	I/B/E/S
General experience	Number of years for which an analyst makes at least one forecast of any firm during a year.	I/B/E/S
Brokerage size	Number of analysts making at least one forecast at the focal brokerage during a year.	I/B/E/S
Ln(Brokerage size)	Natural logarithm of the brokerage size in a brokerage-year.	I/B/E/S

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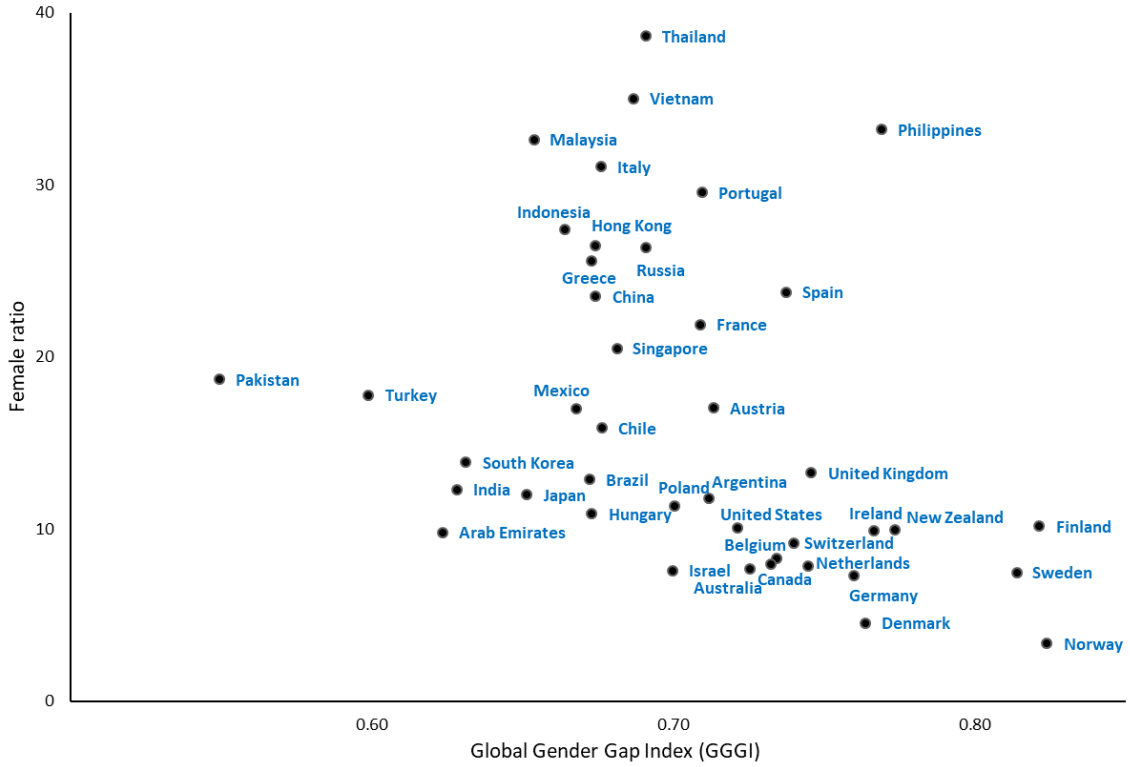
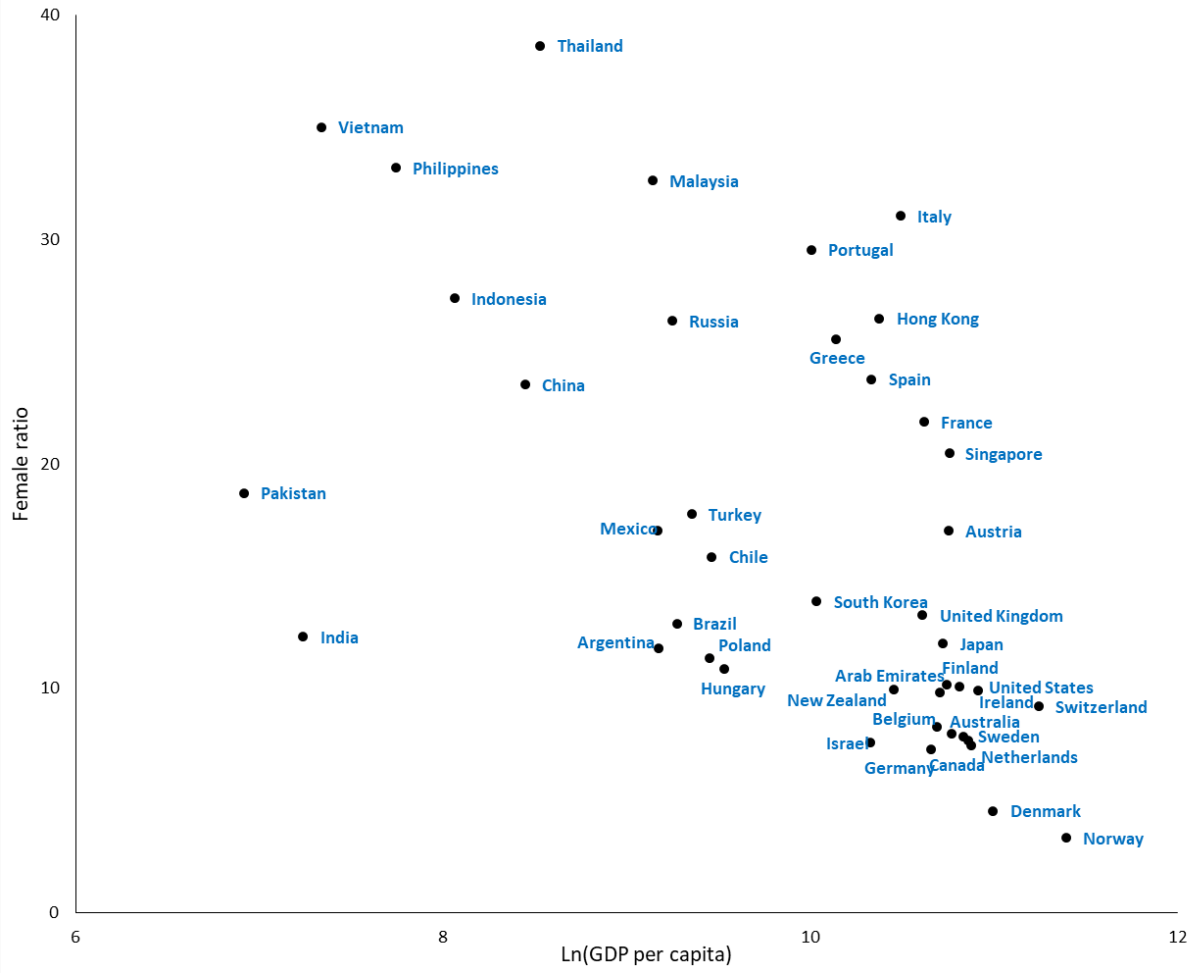
Figure 1
Institutional and economic development and female share of equity analysts

This figure presents an overview of country-level institutional and economic development and female share of equity analysts. Panel A plots the relation between the Global Gender Gap Index (GGGI) and country-mean female share of equity analysts. Panel B plots the relation between GDP per capita and country-mean female share of equity analysts. Panel C plots the relation between the individualism (IDV) score and country-mean female share of equity analysts. Our sample consists of 18,269 equity analysts from 42 countries over the period 2004–2019 for which we have analyst forecast data from I/B/E/S, firm-level data from Worldscope, and country-level data from the World Economic Forum (WEF), World Bank, and Hofstede Culture Dimension website.

Panel A. Global Gender Gap Index and female share of equity analysts



Panel B. GDP per capita and female share of equity analysts



Panel C. Individualism and female share of equity analysts

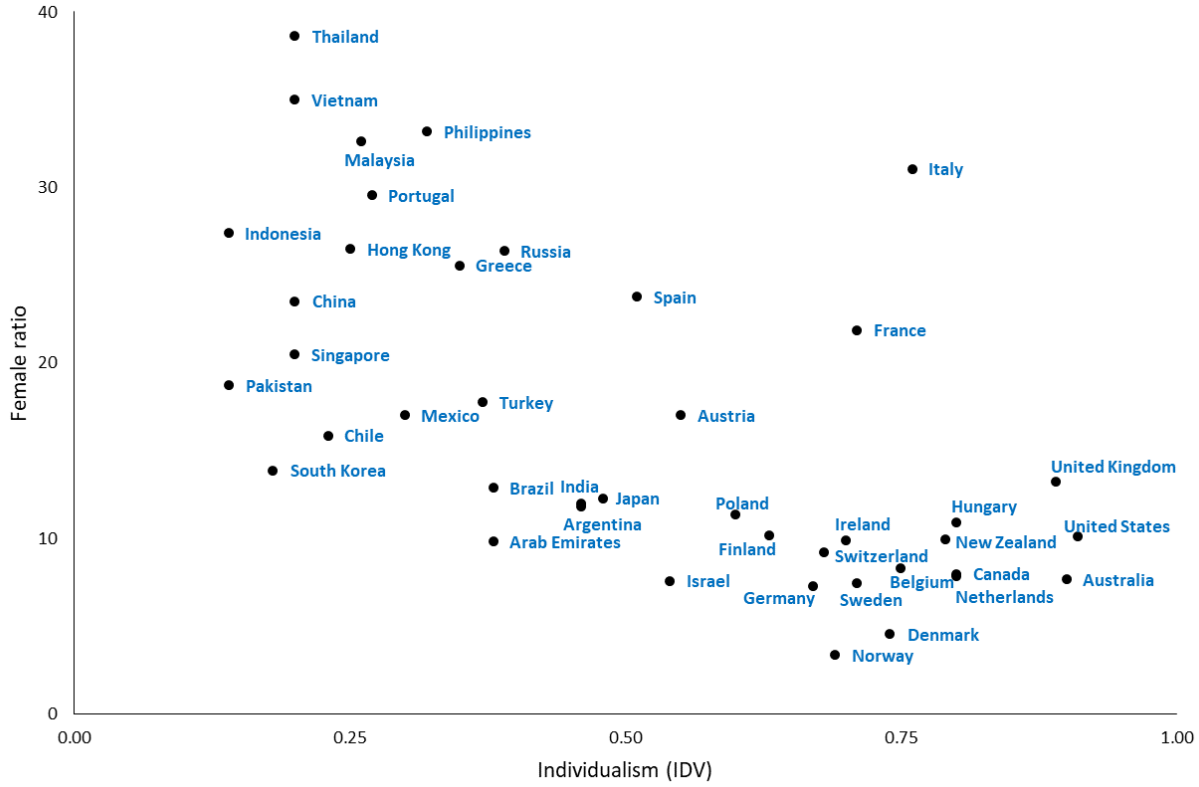


Table 1
Sample formation

This table reports the impact of various matching steps and data filters on the initial sample of analysts covered in the I/B/E/S Detail Recommendations file over the period 2004–2019.

	# analysts	# analysts removed	# brokerage	# brokerage removed	# countries	# countries removed
Obtain unique abbreviated brokerage names and analyst names in the I/B/E/S Detail Recommendations file from 2004 to 2019.	43,193	5,734	1,687	25		
Match abbreviated brokerage names to full brokerage names in Capital IQ.	29,285		1,557		83	
Remove observations with missing information on analyst gender and employment address, and analysts with multiple employment addresses in a year in Capital IQ.	26,841	2,444	1,535	22	80	3
Match I/B/E/S Detail Recommendations file with I/B/E/S EPS files.	23,932	2,909	1,448	87	80	0
Match with Worldscope; remove observations with missing Worldscope unique identifier (ws_id).	19,769	4,163	1,316	132	77	3
Remove firms with stock price less than one unit of local currency and market capitalization less than USD $10 million at the end of the fiscal year.	19,539	230	1,307	9	77	0
Remove countries with fewer than 10 firms over the sample period.	19,472	67	1,288	19	71	6
Remove countries with fewer than 10 analysts or fewer than 10 firm-female analyst-year observations over the sample period.	19,397	75	1,270	18	55	16
Remove countries with missing information on GGGI or Hofstede's individualism measure.	18,583	814	1,191	79	42	13
Remove observations with missing analyst forecast variables.	18,269	314	1,179	12	42	0

Table 2
Sample overview

This table provides an overview of our sample. Our sample consists of 18,269 equity analysts from 42 countries over the period 2005 – 2020 for which we have analyst forecast data from I/B/E/S, firm-level data from Worldscope, and country-level data from the World Economic Forum (WEF), World Bank, and Hofstede Culture Dimension website. Panel A presents an overview of our global analyst sample by country. Panel B presents an overview of country-level variables. Definitions of the variables are provided in the Appendix.

Panel A. Overview of our global analyst sample

Country	# firm-year obs.	# firms	# analysts	# female analysts	% female analysts	# forecasts	# forecasts made by female analysts	% forecasts made by female analysts
Argentina	328	68	19	5	26.32%	1,204	78	6.48%
Australia	4,619	1,163	597	63	10.55%	62,358	3,814	6.12%
Austria	929	155	53	8	15.09%	3,847	487	12.66%
Belgium	1,648	401	112	19	16.96%	9,582	1,082	11.29%
Brazil	2,521	402	211	35	16.59%	18,894	2,315	12.25%
Canada	9,681	1,840	910	94	10.33%	194,929	12,616	6.47%
Chile	234	63	49	7	14.29%	525	56	10.67%
China	10,266	2,474	1,062	209	19.68%	38,501	8,311	21.59%
Denmark	846	161	64	5	7.81%	8,197	242	2.95%
Finland	1,617	265	148	26	17.57%	22,516	1,873	8.32%
France	8,307	1,323	528	123	23.30%	64,854	15,057	23.22%
Germany	7,964	1,500	668	70	10.48%	76,984	3,822	4.96%
Greece	477	85	88	20	22.73%	3,771	840	22.28%
Hong Kong	8,671	1,879	878	245	27.90%	56,274	13,002	23.10%
Hungary	218	44	20	3	15.00%	995	65	6.53%
India	5,406	1,079	1,057	149	14.10%	94,214	8,681	9.21%
Indonesia	1,085	174	176	48	27.27%	7,747	2,070	26.72%
Ireland	609	151	78	12	15.38%	2,688	134	4.99%
Israel	349	77	34	5	14.71%	1,567	44	2.81%
Italy	2,486	479	145	44	30.34%	22,416	6,451	28.78%
Japan	15,015	2,048	797	113	14.18%	158,187	14,301	9.04%

Malaysia	2,041	424	224	71	31.70%	15,750	5,433	34.50%
Mexico	857	171	48	11	22.92%	4,930	626	12.70%
Netherlands	2,921	852	234	36	15.38%	15,274	592	3.88%
New Zealand	665	91	31	3	9.68%	4,406	349	7.92%
Norway	2,638	498	265	11	4.15%	32,338	582	1.80%
Pakistan	199	56	89	15	16.85%	738	122	16.53%
Philippines	654	88	69	23	33.33%	3,747	1,289	34.40%
Poland	927	200	103	13	12.62%	3,944	241	6.11%
Portugal	616	115	57	21	36.84%	2,430	535	22.02%
Russia	1,140	289	161	44	27.33%	7,716	2,474	32.06%
Singapore	3,353	831	251	61	24.30%	19,497	3,659	18.77%
South Korea	2,677	602	526	84	15.97%	44,430	7,501	16.88%
Spain	1,618	285	127	30	23.62%	10,557	2,937	27.82%
Sweden	2,964	525	263	27	10.27%	35,129	1,660	4.73%
Switzerland	4,663	1,277	293	43	14.68%	27,990	2,148	7.67%
Thailand	2,100	357	198	75	37.88%	20,810	8,816	42.36%
Turkey	810	125	116	28	24.14%	5,439	476	8.75%
United Arab Emirates	1,051	232	37	7	18.92%	4,410	606	13.74%
United Kingdom	20,553	3,862	1,985	338	17.03%	243,251	29,017	11.93%
United States	56,816	9,248	5,426	704	12.97%	1,276,283	103,229	8.09%
Vietnam	240	79	72	31	43.06%	628	293	46.66%
Total	192,779	36,038	18,269	2,979		2,629,947	267,926	

Panel B. Overview of country-level variables

Country	Female ratio (%)	GGGI	GDP per capita ($000)	Ln(GDP per capita)	IDV
Argentina	11.81	0.71	9.64	9.17	0.46
Australia	7.67	0.73	52.00	10.86	0.90
Austria	17.02	0.71	46.83	10.75	0.55
Belgium	8.30	0.73	44.02	10.69	0.75
Brazil	12.89	0.67	10.67	9.27	0.38
Canada	7.97	0.73	47.53	10.77	0.80
Chile	15.87	0.68	12.90	9.47	0.23
China	23.52	0.67	4.66	8.45	0.20
Denmark	4.54	0.76	59.52	10.99	0.74
Finland	10.16	0.82	46.27	10.74	0.63
France	21.87	0.71	41.08	10.62	0.71
Germany	7.31	0.76	42.45	10.66	0.67
Greece	25.56	0.67	25.30	10.14	0.35
Hong Kong	26.49	0.67	32.04	10.37	0.25
Hungary	10.89	0.67	13.79	9.53	0.80
India	12.29	0.63	1.39	7.24	0.48
Indonesia	27.39	0.66	3.18	8.06	0.14
Ireland	9.89	0.77	54.89	10.91	0.70
Israel	7.59	0.70	30.63	10.33	0.54
Italy	31.06	0.68	35.99	10.49	0.76
Japan	12.00	0.65	45.32	10.72	0.46
Malaysia	32.62	0.65	9.37	9.14	0.26
Mexico	17.01	0.67	9.59	9.17	0.30
Netherlands	7.86	0.74	50.78	10.84	0.80
New Zealand	9.94	0.77	34.66	10.45	0.79
Norway	3.36	0.82	88.72	11.39	0.69
Pakistan	18.71	0.55	1.01	6.92	0.14
Philippines	33.20	0.77	2.31	7.74	0.32
Poland	11.36	0.70	12.71	9.45	0.60
Portugal	29.54	0.71	22.24	10.01	0.27
Russia	26.36	0.69	10.39	9.25	0.39
Singapore	20.49	0.68	46.96	10.76	0.20
South Korea	13.89	0.63	22.77	10.03	0.18
Spain	23.77	0.74	30.79	10.33	0.51
Sweden	7.47	0.81	52.90	10.88	0.71
Switzerland	9.21	0.74	76.53	11.25	0.68
Thailand	38.63	0.69	5.06	8.53	0.20
Turkey	17.77	0.60	11.55	9.35	0.37
United Arab Emirates	9.81	0.62	44.62	10.71	0.38
United Kingdom	13.26	0.75	40.57	10.61	0.89
United States	10.09	0.72	49.69	10.81	0.91
Vietnam	35.01	0.69	1.54	7.34	0.20

Table 3
Summary statistics

This table provides the summary statistics for our global analyst sample. The sample consists of 610,847 firm-analyst-year observations over the fiscal year period 2005–2020. Our country- and analyst-level control variables are lagged by one year. Panel A provides the summary statistics of country-level variables. Panel B provides the summary statistics of analyst-level variables. We employ four different measures of analyst forecast performance: *Average forecast error, First forecast error, Last forecast error,* and *Same week forecast error*. The sample for *Same week forecast error* consists of 318,622 firm-analyst-year observations because we require those forecasts are made within five days after the prior fiscal year's annual earnings announcement. *Female* is an indicator variable that takes the value one if an analyst is a female, and zero otherwise. Definitions of the variables are provided in the Appendix. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Country-level variables

	Mean	Median	STD	P25	P75
	(1)	(2)	(3)	(4)	(5)
Female ratio (%)	16.545	14.169	12.071	7.703	24.475
GGGI	0.705	0.700	0.059	0.664	0.744
High GGGI	0.241	0.000	0.428	0.000	0.000
GDP per capita	30.968	32.598	21.728	10.530	47.017
Ln(GDP per capita)	3.005	3.484	1.130	2.354	3.851
High GDP per capita	0.241	0.000	0.428	0.000	0.000
Individualism (IDV)	0.511	0.510	0.238	0.270	0.710
High IDV	0.241	0.000	0.428	0.000	0.000
N	704				

Panel B. Analyst-level variables

	Mean	Median	STD	P25	P75
	(1)	(2)	(3)	(4)	(5)
Average forecast error	2.902	0.740	7.798	0.276	2.073
First forecast error	3.684	0.912	9.627	0.300	2.729
Last forecast error	1.988	0.370	5.867	0.107	1.240
Same week forecast error	3.322	0.881	8.109	0.301	2.603
Female ratio (%)	10.971	0.000	31.253	0.000	0.000
GGGI	0.714	0.718	0.040	0.691	0.740
High GGGI	0.115	0.000	0.319	0.000	0.000
GDP per capita	41.893	47.403	15.643	40.059	49.856
Ln(GDP per capita)	3.533	3.859	0.870	3.690	3.909
High GDP per capita	0.547	1.000	0.498	0.000	1.000
Individualism (IDV)	0.724	0.890	0.246	0.480	0.910
High IDV	0.627	1.000	0.483	0.000	1.000
Foreign analyst	0.185	0.000	0.388	0.000	0.000
Forecast horizon	7.559	7.400	1.983	6.367	8.483
Forecast frequency	4.197	4.000	2.518	2.000	5.000
# firms followed	15.313	14.000	8.299	10.000	19.000
# industries followed	4.262	4.000	2.792	2.000	6.000
Firm experience	4.029	3.000	3.269	2.000	6.000
General experience	7.927	7.000	4.778	4.000	11.000
Brokerage size	105.481	43.000	118.575	18.000	173.000
Ln(Brokerage size)	3.902	3.761	1.328	2.890	5.153
N	610,847				

Table 4
Cross-country gender differences in performance under competition

This table examines cross-country gender differences in performance under competition using OLS regression with firm times year fixed effects. The sample consists of 610,847 firm-analyst-year observations over the period 2005–2020 (the sample size for *Same week forecast error* is 318,622 because we require those forecasts are made within five days after the prior fiscal year's annual earnings announcement). We use four different measures of analyst forecast performance as the dependent variables: *Average forecast error, First forecast error, Last forecast error,* and *Same week forecast error*. Panel A examines the impact of GGGI on gender differences in performance. Panel B examines the impact of GDP per capita on gender differences in performance. Panel C examines the impact of individualism on gender differences in performance. *Female* is an indicator variable that takes the value one if an analyst is a female, and zero otherwise. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. The role of GGGI in gender differences in performance

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	-0.002	-0.024*	0.022	0.012
	(0.011)	(0.014)	(0.014)	(0.015)
Female × High GGGI	0.095	0.105	0.109*	0.149
	(0.059)	(0.071)	(0.061)	(0.095)
High GGGI	0.074***	0.044	0.144***	0.050*
	(0.026)	(0.030)	(0.030)	(0.029)
Ln(GDP per capita)	0.011	0.015	0.017	-0.035*
	(0.017)	(0.021)	(0.018)	(0.021)
Individualism	-0.291***	-0.231***	-0.185**	-0.330***
	(0.073)	(0.082)	(0.074)	(0.112)
Foreign analyst	0.062***	0.012	0.082***	0.027
	(0.019)	(0.022)	(0.020)	(0.021)
Forecast horizon	0.156***	0.081***	0.215***	0.011***
	(0.003)	(0.003)	(0.003)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.002)	(0.003)	(0.002)	(0.002)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005**	0.001	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003***	-0.000	-0.005***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.007**	-0.002	-0.011***	-0.011***
	(0.003)	(0.004)	(0.003)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Panel B. The role of GDP per capita in gender differences in performance

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.023	-0.001	0.041**	0.075**
	(0.019)	(0.022)	(0.020)	(0.031)
Female × High GDP per capita	-0.035	-0.027	-0.020	-0.081**
	(0.023)	(0.028)	(0.026)	(0.035)
High GDP per capita	-0.006	-0.028	-0.029	-0.024
	(0.024)	(0.027)	(0.025)	(0.028)
GGGI	1.246***	1.328***	1.978***	0.974**
	(0.365)	(0.424)	(0.412)	(0.439)
Individualism	-0.350***	-0.269***	-0.273***	-0.371***
	(0.078)	(0.088)	(0.078)	(0.112)
Foreign analyst	0.062***	0.012	0.081***	0.019
	(0.019)	(0.022)	(0.019)	(0.022)
Forecast horizon	0.156***	0.081***	0.216***	0.011***
	(0.003)	(0.003)	(0.003)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.002)	(0.003)	(0.002)	(0.002)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005**	0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003***	-0.000	-0.005***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.007**	-0.002	-0.011***	-0.011***
	(0.003)	(0.004)	(0.003)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Panel C. The role of individualism in gender differences in performance

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.042**	0.033	0.050**	0.111***
	(0.020)	(0.024)	(0.023)	(0.036)
Female × High IDV	-0.062**	-0.082***	-0.031	-0.122***
	(0.026)	(0.031)	(0.029)	(0.041)
High IDV	-0.091***	-0.074***	-0.082***	-0.075***
	(0.024)	(0.027)	(0.026)	(0.028)
GGGI	0.853**	0.960**	1.607***	0.897*
	(0.353)	(0.409)	(0.397)	(0.459)
Ln(GDP per capita)	-0.013	-0.008	-0.011	-0.060***
	(0.017)	(0.021)	(0.018)	(0.022)
Foreign analyst	0.059***	0.010	0.080***	0.023
	(0.019)	(0.022)	(0.020)	(0.021)
Forecast horizon	0.156***	0.081***	0.215***	0.011***
	(0.003)	(0.003)	(0.003)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.002)	(0.003)	(0.002)	(0.002)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005**	0.001	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003***	-0.001	-0.005***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.007**	-0.002	-0.011***	-0.011***
	(0.003)	(0.004)	(0.003)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	1.82	7.70	1.20	0.48
P-value	0.18	0.01	0.27	0.49
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Table 5
Cross-country gender differences in performance under competition: Barriers to entry

This table examines whether the cross-country gender difference in performance under competition is due to barriers to entry. Panel A reports the correlation matrix of country-level variables. Panel B reports the regression results where the dependent variable is *Female ratio*, the share of female analysts in a country-year. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. The correlation matrix of country-level variables

		1	2	3	4	5	6	7	8
1	Female ratio	1.000							
2	GGGI	-0.272***	1.000						
3	High GGGI	-0.238***	0.719***	1.000					
4	GDP per capita	-0.466***	0.588***	0.438***	1.000				
5	Ln(GDP per capita)	-0.415***	0.528***	0.303***	0.887***	1.000			
6	High GDP per capita	-0.388***	0.458***	0.349***	0.717***	0.521***	1.000		
7	IDV	-0.478***	0.569***	0.377***	0.646***	0.634***	0.495***	1.000	
8	High IDV	-0.252***	0.234***	0.077**	0.309***	0.345***	0.302***	0.719***	1.000

Panel B. Country-level institutional and economic development and female share of equity analysts

	Female ratio (1)	Female ratio (2)	Female ratio (3)	Female ratio (4)
GGGI	-0.558***			0.155
	(0.199)			(0.267)
Ln(GDP per capita)		-0.044***		-0.021
		(0.013)		(0.013)
Individualism			-0.243***	-0.201***
			(0.047)	(0.069)
Intercept	Yes	Yes	Yes	Yes
Obs.	704	704	704	704
adj-R^2	0.060	0.162	0.223	0.244

Table 6
Cross-country gender differences in analyst skills

This table presents the univariate DID analysis to help explain female analysts' performance. In Panel A, we compare gender differences in analysts' brokerage affiliations and stock portfolios in the high versus low IDV countries for first-time analysts. First-time analysts are identified by their first appearance in the I/B/E/S database. We sort analyst-year observations (in their first year) into the high IDV (top quartile) and low IDV (the remainder) country subsamples. Within each subsample, we compare the female and male differences in their brokerage affiliations and the characteristics of the stocks that they first cover. We further conduct DID analysis of the female and male differences between the high IDV and low IDV subsamples. Columns (5) and (6) report the female and male differences in the high IDV subsample. Columns (11) and (12) report the female and male differences in the low IDV subsample. We conduct both the t-test and Wilcoxon test for the gender differences. We report the DID analysis comparing columns (5) and (11) in column (13). Panel B examines cross-country gender differences in analysts' other output under competition using OLS regression with firm times year fixed effects. The sample consists of 610,847 firm-analyst-year observations over the period 2005–2020. We use two analyst output measures as the dependent variables: # *alternative forecasts* and *Timely forecast*. *Female* is an indicator variable that takes the value one if an analyst is a female, and zero otherwise. Panel C examines the market perception of analyst skills using OLS regression with firm times year fixed effects. The sample consists of 1,587,729 firm-analyst-revision-year observations over the period 2005–2020. We use two market price reaction measures as the dependent variables: three-day cumulative stock return and three-day cumulative market-adjusted abnormal stock return (CAR), centered on an analyst's annual EPS forecast revision date. Both returns are expressed in percentage points. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Difference-in-differences analysis of an analyst's brokerage affiliation and stock portfolio when first becoming an analyst

	High IDV						Low IDV						
	Female		Male		Difference between female and male analysts in		Female		Male		Difference between female and male analysts in		DID test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Top10 brokerage	0.419	0.000	0.280	0.000	0.139***	0.000***	0.210	0.000	0.144	0.000	0.066***	0.000***	0.073***
Top20 brokerage	0.492	0.000	0.376	0.000	0.116***	0.000***	0.278	0.000	0.215	0.000	0.063***	0.000***	0.054**
%Top10 stock_assets	0.189	0.000	0.198	0.000	-0.009	0.000	0.215	0.000	0.230	0.000	-0.015	0.000	0.006
%Top20 stock_assets	0.415	0.200	0.380	0.182	0.034**	0.018	0.402	0.226	0.411	0.231	-0.009	-0.004	0.043*
%Top10 stock_mkt cap	0.240	0.000	0.225	0.000	0.015	0.000	0.253	0.000	0.260	0.000	-0.008	0.000	0.022
%Top20 stock_mkt cap	0.479	0.333	0.426	0.286	0.053***	0.048**	0.462	0.333	0.460	0.333	0.002	0.000	0.051**

Panel B. Cross-country gender differences in analysts' other output under competition

	# alternative forecasts	Timely forecast
	(1)	(2)
Female	-0.000	-0.066***
	(0.003)	(0.010)
Female × High IDV	0.014***	0.046***
	(0.004)	(0.013)
High IDV	-0.238***	0.025**
	(0.003)	(0.010)
GGGI	-0.071	-0.237
	(0.049)	(0.154)
Ln(GDP per capita)	0.052***	0.102***
	(0.003)	(0.008)
Foreign analyst	-0.075***	-0.244***
	(0.003)	(0.008)
Forecast horizon	-0.033***	0.360***
	(0.000)	(0.001)
Forecast frequency	0.010***	0.119***
	(0.000)	(0.001)
# firms followed	-0.002***	0.002***
	(0.000)	(0.000)
# industries followed	-0.009***	-0.012***
	(0.000)	(0.001)
Firm experience	-0.000	-0.001
	(0.000)	(0.001)
General experience	0.006***	0.009***
	(0.000)	(0.001)
Ln(Brokerage size)	0.088***	0.077***
	(0.001)	(0.002)
Firm × Year Fixed Effects	Yes	Yes
Intercept	Yes	Yes
Test if Female + Female × High IDV = 0		
F value	24.55	5.05
P-value	0.00	0.02
Obs.	610,847	610,847
adj-R^2	0.374	0.419

Panel C. Market perception of analyst skills

	Three-day cumulative return	Three-day CAR
	(1)	(2)
Female × High IDV × Forecast revision	4.520*	3.721*
	(2.314)	(2.178)
Female × High IDV	0.018	0.008
	(0.031)	(0.028)
Female × Forecast revision	-2.673**	-2.654**
	(1.217)	(1.144)
High IDV × Forecast revision	26.662***	26.998***
	(1.024)	(0.973)
Female	-0.022	-0.014
	(0.026)	(0.023)
Forecast revision	20.058***	19.705***
	(0.595)	(0.555)
High IDV	0.071***	0.091***
	(0.023)	(0.020)
GGGI	0.693*	0.622*
	(0.379)	(0.331)
Ln(GDP per capita)	-0.023	-0.029
	(0.023)	(0.020)
Foreign analyst	-0.025	0.001
	(0.018)	(0.016)
Forecast horizon	0.000***	0.001***
	(0.000)	(0.000)
Forecast frequency	-0.004**	-0.005***
	(0.002)	(0.002)
# firms followed	-0.001	-0.001
	(0.001)	(0.001)
# industries followed	-0.002	0.001
	(0.003)	(0.003)
Firm experience	0.001	0.000
	(0.002)	(0.002)
General experience	-0.001	-0.001
	(0.001)	(0.001)
Ln(Brokerage size)	-0.004	-0.006*
	(0.004)	(0.003)
Firm × Year Fixed Effects	Yes	Yes
Intercept	Yes	Yes
Obs.	1,587,729	1,587,729
adj-R^2	0.132	0.142

Table 7
Cross-country gender differences in analyst turnover

This table presents DID analysis to help explain female analysts' performance. We compare the female and male differences in analyst turnover-to-performance sensitivity in the high (low) IDV country subsample. The indicator variable, *Turnover*, takes the value of one for the year when it is the last year that an analyst makes their last forecasts. The indicator variable, *Bad performance,* takes the value of one if an analyst's average relative performance in years *t* and *t-1* is in the bottom quartile, and zero otherwise. For the sample of analysts (sorted by gender and their country's individualism score), we compute the turnover rate in year *t+1* based on the information that she is no longer working as an analyst. We report the gender difference in turnover rates in column (5) for the high IDV subsample and that in column (10) for the low IDV subsample, and the DID test in column (11). Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the analyst and year levels. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	High IDV					Low IDV					
	Female		Male		Difference between female and male analysts in	Female		Male		Difference between female and male analysts in	DID test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Obs.	Mean	Obs.	Mean	Mean	Obs.	Mean	Obs.	Mean	Mean	Mean
Bad performance	1,077	0.101	10,299	0.071	0.030**	1,375	0.122	6,899	0.120	0.002	0.028**

For Online Publication

Appendix IA1
Unmasking brokerage name, analyst name, and analyst gender via Capital IQ, Bloomberg, and Manual Search

From the I/B/E/S Detail Recommendations file, we obtain a list of 1,687 unique brokerages (both in and outside the U.S.) providing recommendations on global equities over the period 2004−2019. I/B/E/S provides an abbreviated brokerage name in the variable *ESTIMID*, a unique brokerage identifier in the variable *EMASKCD,* the last name and first name initial of each analyst in the variable *ANALYST*, and a unique analyst identifier in the variable *AMASKCD.*

To unmask abbreviated brokerage names and analyst names from I/B/E/S, we manually search each brokerage's full name and its analysts from Capital IQ. Our matching process takes three steps. First, we match abbreviated brokerage names in I/B/E/S (*ESTIMID*) to full brokerage names in Capital IQ by resemblance. For example, the abbreviated brokerage name "ZACKSINV" in I/B/E/S resembles Zacks Investment Research, Inc. in Capital IQ. Second, we ascertain that this match is correct by matching analyst names in I/B/E/S (*ANALYST*) with those in Capital IQ using the last name and first name initial.[28] For example, we are able to match 27 out of the 28 analysts affiliated with Zacks Investment Research in I/B/E/S with those in Capital IQ (more on this later). Third and finally, we supplement the above two steps by checking whether Capital IQ analysts' stock coverage is the same as that by matched I/B/E/S analysts. To do so, we search through Bloomberg's "*PEOP*" function. Of the 1,687 brokerages in I/B/E/S, we are able to unmask full brokerage names for 1,557 observations (a 92.3% matching rate).

We then obtain individual analyst information, including biography, prefix (Mr. vs. Ms.), and office address from their employment history in Capital IQ. Using Zacks Investment Research, Inc. as an example, Figures IA1-IA4 illustrate how we obtain such information.

We start by searching "Zacks Investment Research, Inc." in Capital IQ. Figure IA1 shows that each brokerage is assigned a unique *companyId* by Capital IQ that we use as the brokerage identifier. Figure 1A1 also shows that we can search employment history for analysts affiliated with Zacks by navigating to the "*Professionals"* page under the "*People"* tab. Figure IA2 shows that we can identify both former and current analysts affiliated with the brokerage, with each analyst having a unique personal ID (*personId*). By clicking on an analyst, we get to their personal profile in Capital IQ, shown in Figure IA3. We rely on the biography (i.e., "he" vs. "she" is used when referring to an analyst) and the prefix(es) to determine an analyst's gender. We use the office address as the location of employment and to proxy for an analyst' residential address, as analysts often reside in countries where they are employed. Figure IA4 shows that in the case of Zacks Investment Research, Inc., we are able to match all 28 unique analysts in I/B/E/S to those in Capital IQ. However, we note one analyst, "BECKER M", has two I/B/E/S analyst IDs (*AMASKCD*) pointing to the same analyst in Capital IQ. Out of precaution, we remove this analyst from our sample.[29]

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[28] We keep observations with perfect match on brokerage name and analyst name. In cases in which multiple analysts have identical last names and first name initials in a brokerage, we drop those analysts. We also drop analysts with the name "RESEARCH TEAM" (referring to team coverage) or "PERMDENIED" (referring to those permanently denied).

[29] BROKER_NAME in Figure 4 is the full brokerage name identified via Capital IQ. For analyst "BERCKER M", we are able to match their prior brokerage affiliations in four out of the seven employers, suggesting that Capital IQ have broader coverage in terms of analyst employment history than I/B/E/S.

In the end, we are able to unmask 29,285 out of the 37,459 unique analysts in the I/B/E/S Detail Recommendations file (a 78.2% matching rate).

Figure IA1
Zacks Investment Research, Inc. main page in Capital IQ

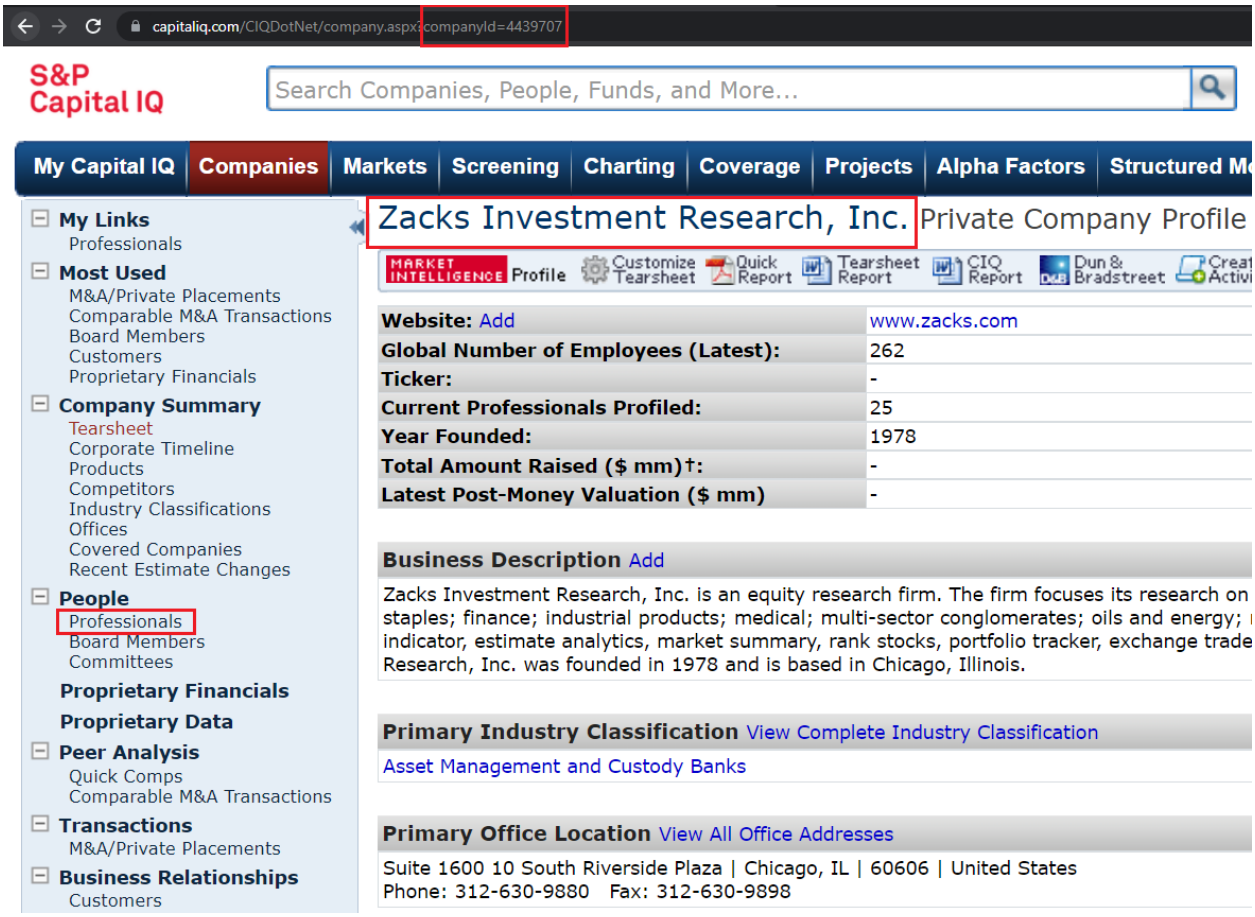
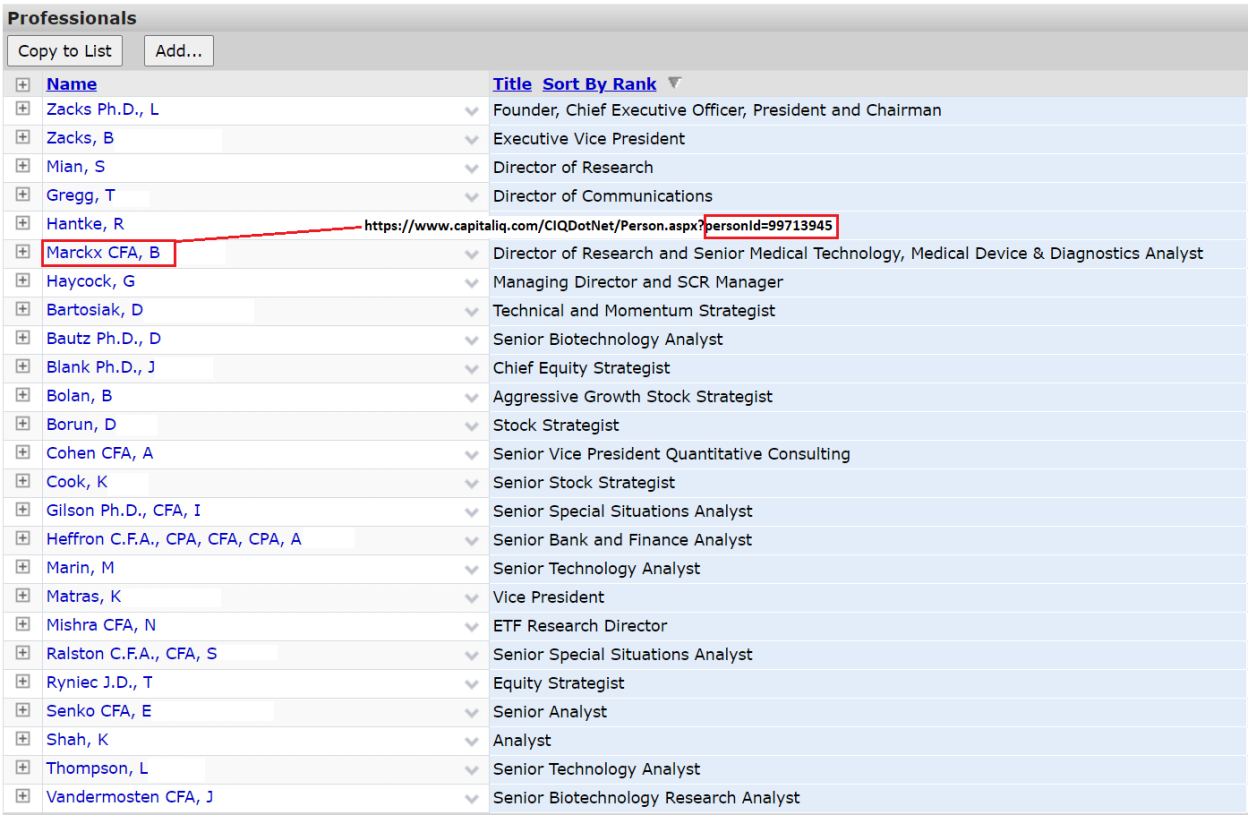


Figure IA2
Analysts affiliated with Zack Investment Research, Inc. as recorded by Capital IQ

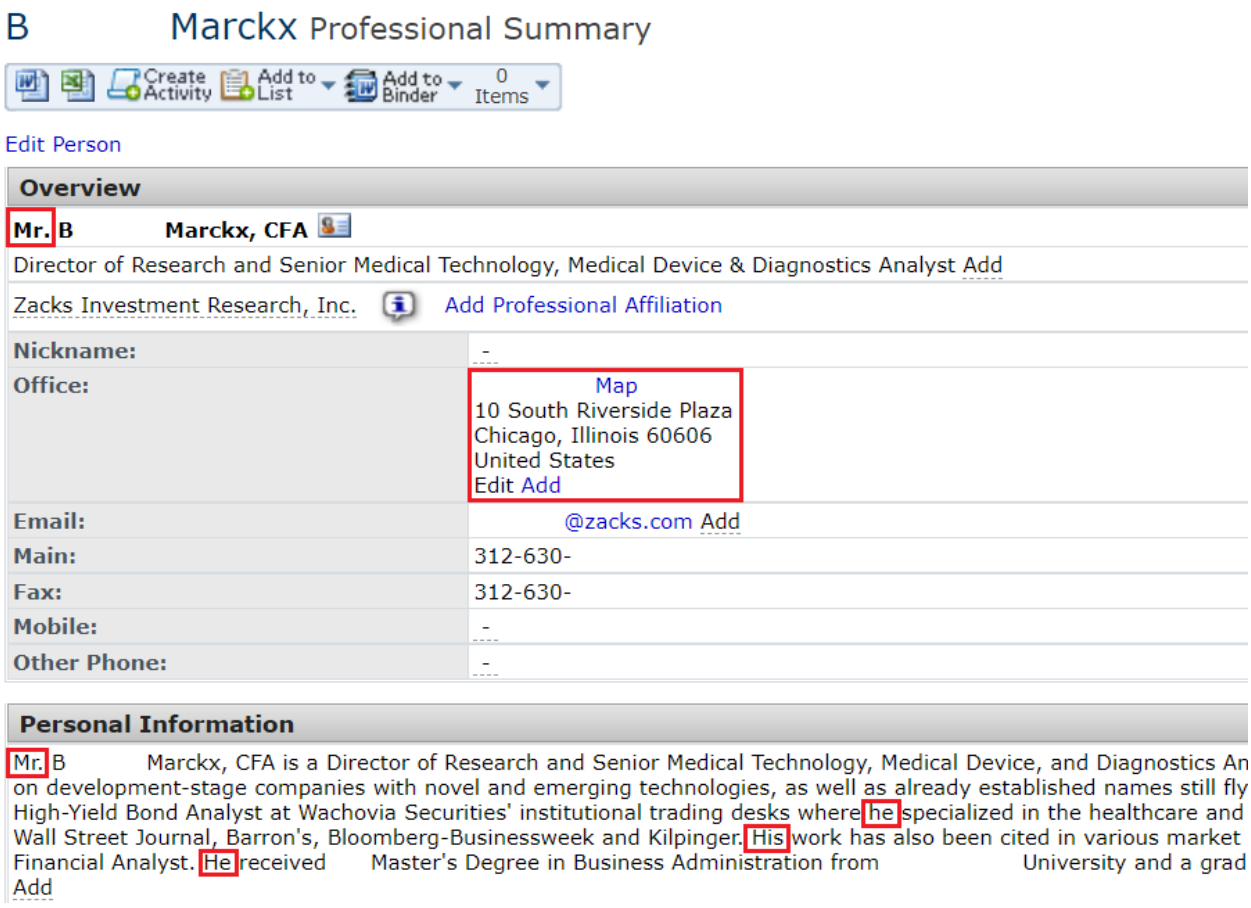


Professionals

Copy to List | Add...

Name	Title Sort By Rank
Zacks Ph.D., L	Founder, Chief Executive Officer, President and Chairman
Zacks, B	Executive Vice President
Mian, S	Director of Research
Gregg, T	Director of Communications
Hantke, R	https://www.capitaliq.com/CIQDotNet/Person.aspx?personId=99713945
Marckx CFA, B	Director of Research and Senior Medical Technology, Medical Device & Diagnostics Analyst
Haycock, G	Managing Director and SCR Manager
Bartosiak, D	Technical and Momentum Strategist
Bautz Ph.D., D	Senior Biotechnology Analyst
Blank Ph.D., J	Chief Equity Strategist
Bolan, B	Aggressive Growth Stock Strategist
Borun, D	Stock Strategist
Cohen CFA, A	Senior Vice President Quantitative Consulting
Cook, K	Senior Stock Strategist
Gilson Ph.D., CFA, I	Senior Special Situations Analyst
Heffron C.F.A., CPA, CFA, CPA, A	Senior Bank and Finance Analyst
Marin, M	Senior Technology Analyst
Matras, K	Vice President
Mishra CFA, N	ETF Research Director
Ralston C.F.A., CFA, S	Senior Special Situations Analyst
Ryniec J.D., T	Equity Strategist
Senko CFA, E	Senior Analyst
Shah, K	Analyst
Thompson, L	Senior Technology Analyst
Vandermosten CFA, J	Senior Biotechnology Research Analyst

Figure IA3
Analyst personal information in Capital IQ



B Marckx Professional Summary

Create Activity | Add to List | Add to Binder | 0 Items

Edit Person

Overview

Mr. B Marckx, CFA

Director of Research and Senior Medical Technology, Medical Device & Diagnostics Analyst Add

Zacks Investment Research, Inc. Add Professional Affiliation

Nickname:	-
Office:	Map 10 South Riverside Plaza Chicago, Illinois 60606 United States Edit Add
Email:	@zacks.com Add
Main:	312-630-
Fax:	312-630-
Mobile:	-
Other Phone:	-

Personal Information

Mr. B Marckx, CFA is a Director of Research and Senior Medical Technology, Medical Device, and Diagnostics An on development-stage companies with novel and emerging technologies, as well as already established names still fly High-Yield Bond Analyst at Wachovia Securities' institutional trading desks where he specialized in the healthcare and Wall Street Journal, Barron's, Bloomberg-Businessweek and Kilpinger. His work has also been cited in various market Financial Analyst. He received Master's Degree in Business Administration from University and a grad Add

Figure IA4
An example of two different I/B/E/S analyst IDs pointing to the same analyst in Capital IQ

I/B/E/S file for analyst "BACKER M"

	ANALYST	AMASKCD	ESTIMID	EMASKCD	BROKER_NAME
BACKER	M	171815	ZACKSINV	7654	Zacks Investment Research, Inc.
BACKER	M	79164	RESASSOC	5797	Research Associates, LLC
BACKER	M	79164	HUDSONSQ	7844	Hudson Square Research, Inc.
BACKER	M	79164	ASCENDIA	41105	Ascendiant Capital Markets LLC, Research Division

Capital IQ file for analyst "BACKER M"

personId		ANALYST	companyId	BROKER_NAME
24165186	BACKER	M	129926045	Ascendiant Capital Markets LLC, Research Division
24165186	BACKER	M	12765513	Hudson Square Research, Inc.
24165186	BACKER	M	24165184	Research Associates, LLC
24165186	BACKER	M	7923367	Sidoti & Company, LLC
24165186	BACKER	M	4891357	Soleil Securities Corporation
24165186	BACKER	M	34211035	Wm Smith & Co.
24165186	BACKER	M	4439707	Zacks Investment Research, Inc.

Two I/B/E/S analyst IDs point to the same analyst in Capital IQ

Appendix IA2
Identification

Informal institutions such as culture change sufficiently slowly that they are not likely to be caused by analyst performance over the time horizon in our study. Further, the individualism scores that we use to moderate analyst performance over the period 2005–2020 were measured in the 1960s and 1970s, which also works against endogeneity or reverse causality. However, the association between individualism and the gender performance gap under competition could be affected by omitted variables (such as the cultural value of masculinity) or some confounding factors (such as economic development). We employ a multi-pronged approach to address those concerns.

IA2.1. The instrumental variables approach

To address the concern that both analyst performance and individualistic values may be determined by a third factor that we fail to control in Equation (1), we employ an instrumental variables approach to isolate the exogenous component of our measure of culture. Following Licht, Goldschmidt, and Schwartz (2007) and Griffin et al. (2018), we use a linguistic variable based on pronoun drop (Kashima and Kashima 1998; Davis and Abdurazokzoda 2016). The instrument is a somatic rule: the license to drop pronouns (*Pronoun drop*). This grammatical rule reflects whether a country's primary language permits speakers to drop a personal pronoun when used as the subject of a sentence. For example, pronoun drop is not permitted in English, as the pronoun "I" is required to make sense of the sentence "I speak". As Kashima and Kashima (1998, p. 465) argue, "An explicit use of 'I' …signals that the person is highlighted as a figure against the speech context that constitutes the ground; its absence reduces the prominence of the speaker's person, thus reducing figure-ground differentiation." The emphasis on the pronominal subject (especially "I" or "you") in languages in which pronoun drop is not permitted is expected to be associated with the cultural dimension of individualism. In contrast, the greater contextualization of the subject in languages that permit pronoun drop is expected to be associated with more collectivistic cultures.

Table IA2-1 in Appendix IA2 presents the results from the instrumental variables analysis. Panel A presents the first-stage regression results where individualism is projected onto the instrumental variable: *Pronoun drop*, as well as all the controls used in Table 4 Panel C. The adjusted R^2 from the first-stage model is 0.831, which shows that our instrumental variable and the control variables have significant explanatory power. To test the strength of the instrument, we note that the Cragg-Donald Wald F-statistic (statistic = 3.10×10^4) is higher than the Stock-Yogo weak ID test critical values. The test rejects the null hypothesis that our instrument is weak. Panel B presents the second-stage regression results. We show that the coefficients on the interaction term *Female × High IDV (instrumented)* are negative and significant in three out of the four specifications. Importantly, we fail to reject the null that there is a gender difference in performance in high IDV countries in three out of the four specifications.

IA2.2. Establishing the cultural channel

To establish that our instrumental variable exerts its effect on narrowing the gender performance gap under competition only through the channel of individualism, we follow Leary and Roberts (2014) to perform a double sort of the data based on the instrumental variable (*Pronoun drop* or not) and a country's individualism score (*High IDV* or not). The intuition for this analysis is as follows. If our instrument (*Pronoun drop*) might affect the gender performance gap through channels other than individualism, we would observe that the gender performance gap varies with our instrument within each high (low) IDV subgroup. If instead, we show the gender performance gap does not vary with our instrument within each IDV subgroup, but only varies between the high and low IDV subgroups after

controlling for our instrument, it is unlikely that our instrument affects the gender performance gap via channels other than individualism.

Table IA2-1 Panel C presents the double sort results. Within each two by two combination, we compute the average gender performance gap across firm-analyst-year observations and conduct a t-test of whether this average is significantly different from zero. The row labeled "Yes – No" presents the t-test for the difference in the average gender performance gap between countries with pronoun drop and those without. We show that after controlling for individualism, there is no difference in the gender performance gap between countries permitting pronoun drop and those that do not. The column labeled "High – Low" presents the t-test for the difference in the average gender performance gap between high IDV and low IDV subgroups. We show that, after controlling for the linguistic rule, the gender performance gap in high IDV countries is significantly smaller than that in low IDV countries. In other words, holding the linguistic rule constant, the gender performance gap is negatively and significantly correlated with the individualism score. The converse is not true. The gender performance gap is largely uncorrelated with the linguistic rule, holding the individualism score constant. This analysis suggests that our instrument affects the gender performance gap only through the channel of individualism.

References:

Davis, Lewis S., and Farangis Abdurazokzoda, 2016. Language, culture and institutions: Evidence from a new linguistic dataset, *Journal of Comparative Economics* 44, 541–561.

Griffin, Dale, Omrane Guedhami, Chuck C.Y. Kwok, Kai Li, and Liang Shao, 2018. National culture and the value implication of corporate governance, *Journal of Law, Finance, and Accounting* 3, 333–372.

Kashima, Emiko S. and Yoshihisa Kashima. 1998. Culture and language: The case of cultural dimensions and personal pronoun use, *Journal of Cross-Cultural Psychology* 29, 461–487.

Leary, Mark T., and Michael R. Roberts, 2014. Do peer firms affect corporate financial policy? *Journal of Finance* 69, 139–178.

Licht, Amir N., Chanan Goldschmidt, and Shalom H. Schwartz, 2007. Culture rules: The foundations of the rule of law and other norms of governance, *Journal of Comparative Economics* 35, 659–688.

Table IA2-1
Cross-country gender differences in performance under competition: identification

This table examines cross-country gender differences in performance under competition using 2SLS regressions and double sort. Panel A reports the first-stage regression results where *High IDV* is instrumented with a linguistic variable *Pronoun drop*. *High IDV* is an indicator variable that takes the value of one if a country is in the top quartile of individualism and zero otherwise. Panel B reports the second-stage regression results where the instrumented *High IDV* from the first stage are used. We use four different measures of analyst forecast performance as the dependent variables: *Average forecast error, First forecast error, Last forecast error,* and *Same week forecast error*. *Female* is an indicator variable that takes the value one if an analyst is a female, and zero otherwise. Panel C presents average gender differences in performance for four groups of firm-analyst-year observations. The groups are formed based on (1) whether a firm-analyst-year observation is from a high IDV or low IDV country; and (2) whether a firm-analyst-year observation is from a country with pronoun drop permitted or not. The row labeled "Yes – No" presents the t-test for the difference in the average gender performance gap between the countries with pronoun drop permitted and those without. The column labeled "High – Low" presents the t-test for the difference in the average gender performance gap between the high IDV and low IDV subgroups. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. First-stage regression: Instrumenting high IDV

	High IDV (1)
Pronoun drop	-0.666***
	(0.009)
Female	0.002*
	(0.001)
GGGI	-2.453***
	(0.091)
Ln(GDP per capita)	-0.021***
	(0.003)
Foreign analyst	0.116***
	(0.004)
Forecast horizon	-0.002***
	(0.000)
Forecast frequency	0.002***
	(0.000)
# firms followed	0.002***
	(0.000)
# industries followed	-0.005***
	(0.000)
Firm experience	-0.000
	(0.000)
General experience	-0.001***
	(0.000)
Ln(Brokerage size)	0.013***
	(0.000)
Firm × Year Fixed Effects	Yes
Intercept	Yes
Obs.	559,905
adj-R^2	0.831

Panel B. Second-stage regression: Cross-country gender differences in performance

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.065***	0.050*	0.076***	0.114***
	(0.024)	(0.029)	(0.028)	(0.042)
Female × High IDV (instrumented)	-0.089***	-0.109***	-0.057	-0.129***
	(0.034)	(0.040)	(0.039)	(0.050)
High IDV (instrumented)	-0.365***	-0.234***	-0.369***	-0.249**
	(0.074)	(0.088)	(0.075)	(0.116)
GGGI	1.028***	0.977**	1.837***	0.608
	(0.361)	(0.417)	(0.410)	(0.496)
Ln(GDP per capita)	-0.000	0.003	-0.003	-0.035
	(0.018)	(0.022)	(0.019)	(0.022)
Foreign analyst	0.104***	0.037	0.128***	0.041
	(0.023)	(0.027)	(0.024)	(0.026)
Forecast horizon	0.154***	0.079***	0.214***	0.011***
	(0.003)	(0.003)	(0.004)	(0.003)
Forecast frequency	-0.001	0.016***	-0.026***	-0.000
	(0.002)	(0.003)	(0.002)	(0.003)
# firms followed	0.001	0.002**	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.005**	-0.006***	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003***	-0.001	-0.006***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.002	0.001	-0.006	-0.009**
	(0.003)	(0.004)	(0.004)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV (instrumented) = 0				
F value	0.86	3.73	0.81	0.25
P-value	0.35	0.05	0.37	0.62
Obs.	559,905	559,905	559,905	302,904
adj-R^2	0.911	0.916	0.782	0.943

Panel C. Gender difference in performance sorted by pronoun drop and individualism

Panel C.1. Gender difference in average analyst forecast error

	High IDV			Low IDV			High – Low
Pronoun drop	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Female	Male	Female – Male	Female	Male	Female – Male	
Yes	-0.0628	0.011	-0.073	0.039***	-0.001	0.040***	-0.113*
No	-0.016	-0.004	-0.012	0.069**	0.015	0.054*	-0.066**
Yes – No			-0.061			-0.014	

Panel C.2. Gender difference in first analyst forecast error

	High IDV			Low IDV			High – Low
Pronoun drop	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Female	Male	Female – Male	Female	Male	Female – Male	
Yes	-0.681***	-0.677***	-0.004	-0.616***	-0.797***	0.181***	-0.185*
No	-0.764***	-0.777***	0.013	-0.653***	-0.846***	0.193***	-0.180***
Yes – No			-0.017			-0.012	

Panel C.3. Gender difference in last analyst forecast error

	High IDV			Low IDV			High – Low
Pronoun drop	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Female	Male	Female – Male	Female	Male	Female – Male	
Yes	0.575***	0.791***	-0.216**	0.882***	1.043***	-0.161***	-0.055
No	0.841***	0.856***	-0.015	0.927***	0.996***	-0.069	0.054
Yes – No			-0.201*			-0.092	

Panel C.4. Gender difference in same week analyst forecast error

	High IDV			Low IDV			High – Low
Pronoun drop	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Female	Male	Female – Male	Female	Male	Female – Male	
Yes	-0.740***	-0.537***	-0.203	-0.609***	-0.768***	0.159***	-0.362***
No	-0.710***	-0.748***	0.038*	-0.441***	-0.717***	0.276***	-0.238***
Yes – No			-0.241**			-0.117*	

Table IA1
Equity analyst pay around the world

This table provides an overview of equity analyst pay (in U.S. dollars) in our sample countries. The data for average analyst pay in a country come from the Global Salary Calculator (updated to the most recent month as of February 2023), an online database maintained by the Economic Research Institute. The data for average pay in a country come from Trading Economics (updated as of the end of 2022). The table presents average analyst pay, the ratio of average analyst pay to GDP per capita, average pay, and the ratio of average analyst pay to average pay in each country. N/A indicates pay data is unavailable. Definitions of the variables are provided in the Appendix. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Country	Average analyst pay	GDP per capita	Average analyst pay/GDP per capita	Average pay	Average analyst pay/ Average pay
Argentina	30,767.34	10,636.12	2.89	18,709.69	1.64
Australia	97,535.71	60,443.11	1.61	49,721.26	1.96
Austria	85,849.63	53,637.71	1.60	31,810.73	2.70
Belgium	90,239.75	51,247.01	1.76	N/A	N/A
Brazil	29,794.53	7,507.16	3.97	6,392.45	4.66
Canada	87,389.97	51,987.94	1.68	40,803.08	2.14
Chile	36,288.59	16,265.10	2.23	12,584.85	2.88
China	46,766.62	12,556.33	3.72	15,859.19	2.95
Denmark	99,520.61	68,007.76	1.46	74,128.02	1.34
Finland	79,864.35	53,654.75	1.49	47,873.82	1.67
France	77,176.66	43,658.98	1.77	41,905.36	1.84
Germany	88,515.25	51,203.55	1.73	51,747.63	1.71
Greece	49,279.71	20,192.60	2.44	N/A	N/A
Hong Kong	84,943.24	49,800.54	1.71	26,774.62	3.17
Hungary	27,062.16	18,728.12	1.45	17,289.00	1.57
India	18,342.14	2,256.59	8.13	N/A	N/A
Indonesia	26,570.45	4,332.71	6.13	N/A	N/A
Ireland	83,213.46	100,172.08	0.83	47,242.90	1.76
Israel	71,529.32	52,170.71	1.37	43,923.79	1.63
Italy	67,092.53	35,657.50	1.88	31,230.28	2.15
Japan	66,361.48	39,312.66	1.69	61,239.27	1.08
Malaysia	29,586.80	11,109.26	2.66	8,283.10	3.57
Mexico	25,239.68	10,045.68	2.51	6,931.37	3.64
Netherlands	86,686.65	57,767.88	1.50	38,384.86	2.26
New Zealand	81,962.86	48,781.03	1.68	43,800.56	1.87
Norway	99,380.93	89,154.28	1.11	63,081.71	1.58
Pakistan	10,016.83	1,505.01	6.66	N/A	N/A
Philippines	15,220.22	3,460.53	4.40	N/A	N/A
Poland	35,503.54	17,999.91	1.97	17,650.30	2.01
Portugal	51,048.37	24,567.51	2.08	14,990.54	3.41
Russian Federation	24,036.79	12,194.78	1.97	10,826.42	2.22
Singapore	77,367.81	72,794.00	1.06	57,636.90	1.34

South Korea	61,968.12	34,997.78	1.77	39,612.91	1.56
Spain	64,809.67	30,103.51	2.15	25,640.38	2.53
Sweden	68,148.28	61,028.74	1.12	33,521.14	2.03
Switzerland	131,337.45	91,991.60	1.43	83,602.85	1.57
Thailand	25,895.72	7,066.19	3.66	5,134.03	5.04
Turkey	14,735.75	9,661.24	1.53	2,866.90	5.14
United Arab Emirates	85,385.18	44,315.55	1.93	N/A	N/A
United Kingdom	75,617.99	46,510.28	1.63	40,369.69	1.87
United States	107,939.00	70,248.63	1.54	50,992.34	2.12
Vietnam	23,595.47	3,756.49	6.28	3,485.39	6.77
Mean	60,466.35	36,964.02	2.43	33,315.64	2.50
Median	66,727.01	37,485.08	1.76	33,521.14	2.03

Table IA2
Summary statistics for the U.S. sample

This table provides the summary statistics of analyst-level variables for the U.S. sample. The sample consists of 263,758 firm-analyst-year observations over the period 2005–2020 (the sample size for *Same week forecast error* is 179,153 because we require those forecasts are made within five days after the prior fiscal year's annual earnings announcement). Definitions of the variables are provided in the Appendix.

	Mean (1)	Median (2)	STD (3)	P25 (4)	P75 (5)
Average forecast error	2.244	0.539	6.677	0.210	1.494
First forecast error	3.054	0.714	8.563	0.243	2.142
Last forecast error	1.371	0.214	4.878	0.067	0.702
Same week forecast error	2.962	0.745	7.669	0.261	2.188
Female	0.080	0.000	0.271	0.000	0.000
GGGI	0.724	0.720	0.016	0.704	0.740
High GGGI	0.000	0.000	0.000	0.000	0.000
GDP per capita	49.934	49.596	2.351	48.467	51.052
Ln(GDP per capita)	3.910	3.904	0.047	3.881	3.933
High GDP per capita	1.000	1.000	0.000	1.000	1.000
Individualism (IDV)	0.910	0.910	0.000	0.910	0.910
High IDV	1.000	1.000	0.000	1.000	1.000
Foreign analyst	0.115	0.000	0.319	0.000	0.000
Forecast horizon	7.616	7.500	1.761	6.546	8.292
Forecast frequency	4.665	4.000	2.472	3.000	6.000
# firms followed	17.875	17.000	8.014	13.000	22.000
# industries followed	3.814	3.000	2.489	2.000	5.000
Firm experience	4.222	3.000	3.382	2.000	6.000
General experience	8.578	8.000	4.874	5.000	12.000
Brokerage size	106.813	47.000	119.367	19.000	175.000
Ln(Brokerage size)	3.914	3.850	1.345	2.944	5.165
N	263,758				

Table IA3
Correlation matrix

This table presents the correlations matrix for analyst-level variable in our sample. The sample consists of 610,847 firm-analyst-year observations over the period 2005–2020. Definitions of the variables are provided in the Appendix. Superscripts [a], [b], [c] correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Average forecast error	1.000																				
2	First forecast error	0.950 [a]	1.000																			
3	Last forecast error	0.894 [a]	0.794 [a]	1.000																		
4	Same day forecast error	0.935 [a]	0.995 [a]	0.758 [a]	1.000																	
5	Female	0.001	-0.001	0.005 [a]	0.000	1.000																
6	GGGI	-0.065 [a]	-0.061 [a]	-0.062 [a]	-0.062 [a]	-0.083 [a]	1.000															
7	High GGGI	0.026 [a]	0.021 [a]	0.032 [a]	0.013 [a]	-0.023 [a]	0.494 [a]	1.000														
8	GDP per capita	-0.033 [a]	-0.021 [a]	-0.052 [a]	-0.021 [a]	-0.127 [a]	0.542 [a]	0.112 [a]	1.000													
9	Ln(GDP per capita)	-0.027 [a]	-0.016 [a]	-0.045 [a]	-0.017 [a]	-0.093 [a]	0.498 [a]	0.097 [a]	0.928 [a]	1.000												
10	High GDP per capita	-0.067 [a]	-0.051 [a]	-0.082 [a]	-0.044 [a]	-0.114 [a]	0.410 [a]	-0.200 [a]	0.649 [a]	0.500 [a]	1.000											
11	IDV	-0.068 [a]	-0.055 [a]	-0.081 [a]	-0.059 [a]	-0.137 [a]	0.598 [a]	0.021 [a]	0.673 [a]	0.593 [a]	0.680 [a]	1.000										
12	High IDV	-0.077 [a]	-0.064 [a]	-0.089 [a]	-0.055 [a]	-0.098 [a]	0.454 [a]	-0.187 [a]	0.524 [a]	0.503 [a]	0.679 [a]	0.883 [a]	1.000									
13	Foreign analyst	0.014 [a]	0.008 [a]	0.023 [a]	0.012 [a]	0.043 [a]	0.141 [a]	0.152 [a]	0.049 [a]	0.099 [a]	-0.137 [a]	0.011 [a]	0.003[b]	1.000								
14	Forecast horizon	0.047 [a]	0.027 [a]	0.079 [a]	0.031 [a]	0.004 [a]	-0.003 [a]	-0.023 [a]	-0.017 [a]	-0.030 [a]	0.028 [a]	-0.009 [a]	0.010 [a]	-0.001	1.000							
15	Forecast frequency	0.002[c]	0.019 [a]	-0.019 [a]	0.037 [a]	-0.039 [a]	0.202 [a]	0.011 [a]	0.226 [a]	0.189 [a]	0.233 [a]	0.248 [a]	0.223 [a]	-0.001	-0.054 [a]	1.000						
16	# firms followed	-0.026 [a]	-0.021 [a]	-0.033 [a]	-0.015 [a]	-0.097 [a]	-0.038 [a]	-0.185 [a]	0.134 [a]	0.112 [a]	0.180 [a]	0.111 [a]	0.130 [a]	-0.115 [a]	0.024 [a]	0.047 [a]	1.000					
17	# industries followed	0.003 [a]	0.002 [c]	0.006 [a]	0.003	-0.006 [a]	-0.067 [a]	0.018 [a]	-0.082 [a]	-0.062 [a]	-0.125 [a]	-0.152 [a]	-0.156 [a]	-0.100 [a]	0.045 [a]	-0.109 [a]	0.403 [a]	1.000				
18	Firm experience	-0.046 [a]	-0.042 [a]	-0.051 [a]	-0.043 [a]	-0.041 [a]	0.100 [a]	-0.008 [a]	0.136 [a]	0.116 [a]	0.057 [a]	0.085 [a]	0.050 [a]	-0.071 [a]	-0.050 [a]	0.209 [a]	0.130 [a]	0.026 [a]	1.000			
19	General experience	-0.045 [a]	-0.041 [a]	-0.051 [a]	-0.039 [a]	-0.069 [a]	0.168 [a]	-0.023 [a]	0.207 [a]	0.179 [a]	0.119 [a]	0.149 [a]	0.112 [a]	-0.056 [a]	-0.025 [a]	0.121 [a]	0.269 [a]	0.108 [a]	0.608 [a]	1.000		
20	Brokerage size	-0.013 [a]	-0.013 [a]	-0.014 [a]	-0.026 [a]	0.051 [a]	-0.013 [a]	-0.043 [a]	0.043 [a]	0.067 [a]	-0.017 [a]	0.036 [a]	0.063 [a]	0.204 [a]	-0.046 [a]	0.102 [a]	0.013 [a]	-0.117 [a]	0.030 [a]	0.025 [a]	1.000	
21	Ln(Brokerage size)	-0.021 [a]	-0.020 [a]	-0.024 [a]	-0.030 [a]	0.035 [a]	-0.003 [a]	-0.044 [a]	0.060 [a]	0.080 [a]	-0.013 [a]	0.035 [a]	0.064 [a]	0.203 [a]	-0.040 [a]	0.116 [a]	0.013 [a]	-0.152 [a]	0.050 [a]	0.047 [a]	0.891 [a]	1.000

Table IA4
Cross-country gender differences in performance under competition: excluding the U.S. and the U.K.

This table examines cross-country gender differences in performance under competition using OLS regression with firm times year fixed effects excluding analysts based in the U.S. and the U.K. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.032*	0.018	0.043*	0.102***
	(0.019)	(0.024)	(0.023)	(0.037)
Female × High IDV	-0.101***	-0.139***	-0.079	-0.147***
	(0.037)	(0.047)	(0.051)	(0.052)
High IDV	0.055	0.010	0.064	0.006
	(0.045)	(0.054)	(0.055)	(0.061)
GGGI	0.725	1.293**	0.638	1.674***
	(0.465)	(0.522)	(0.549)	(0.630)
Ln(GDP per capita)	0.001	-0.014	0.013	-0.057**
	(0.019)	(0.024)	(0.021)	(0.028)
Foreign analyst	0.033	0.012	0.075**	0.040
	(0.024)	(0.028)	(0.029)	(0.035)
Forecast horizon	0.168***	0.098***	0.225***	0.012**
	(0.004)	(0.004)	(0.005)	(0.005)
Forecast frequency	0.001	0.031***	-0.039***	0.002
	(0.003)	(0.004)	(0.004)	(0.005)
# firms followed	-0.002**	-0.001	-0.003**	0.000
	(0.001)	(0.001)	(0.001)	(0.002)
# industries followed	-0.000	-0.002	0.005	-0.007
	(0.003)	(0.004)	(0.004)	(0.004)
Firm experience	-0.007***	-0.005*	-0.008***	-0.001
	(0.002)	(0.003)	(0.003)	(0.003)
General experience	0.000	0.001	-0.000	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)
Ln(Brokerage size)	-0.014***	0.000	-0.036***	-0.016**
	(0.005)	(0.006)	(0.006)	(0.007)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	4.66	8.64	0.62	1.49
P-value	0.03	0.00	0.43	0.22
Obs.	291,245	291,245	291,245	118,601
adj-R^2	0.918	0.918	0.787	0.942

Table IA5
Cross-country gender differences in performance under competition: other culture values

This table examines cross-country gender differences in performance under competition using OLS regression with firm times year fixed effects and other culture values. We sort countries by the three other cultural values of Hofstede (1980, 2001): masculinity (MAS), power distance (PDI), and uncertainty avoidance (UAI). *High MAS* is an indicator variable that takes the value of one if a country is in the top quartile of masculinity, and zero otherwise. *High PDI* is an indicator variable that takes the value of one if a country is in the top quartile of power distance, and zero otherwise. *High UAI* is an indicator variable that takes the value of one if a country is in the top quartile of uncertainty avoidance, and zero otherwise. We use four different measures of analyst forecast performance as the dependent variables: *Average forecast error, First forecast error, Last forecast error,* and *Same week forecast error*. *Female* is an indicator variable that takes the value one if an analyst is a female, and zero otherwise. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	Average forecast error			First forecast error			Last forecast error			Same week forecast error		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Female	0.056**	0.066***	0.008	0.050*	0.033	0.017	0.051**	0.078***	0.019	0.124***	0.133***	0.069**
	(0.024)	(0.025)	(0.023)	(0.029)	(0.031)	(0.028)	(0.026)	(0.029)	(0.026)	(0.041)	(0.051)	(0.034)
Female × High IDV	-0.065**	-0.086***	-0.029	-0.086***	-0.083**	-0.066**	-0.031	-0.059*	-0.001	-0.127***	-0.144***	-0.080**
	(0.027)	(0.029)	(0.028)	(0.033)	(0.036)	(0.034)	(0.029)	(0.034)	(0.031)	(0.043)	(0.055)	(0.038)
Female × High MAS	-0.048			-0.056			-0.006			-0.068		
	(0.034)			(0.041)			(0.035)			(0.061)		
Female × High PDI		-0.076*			-0.002			-0.087*			-0.057	
		(0.039)			(0.047)			(0.045)			(0.067)	
Female × High UAI			0.094**			0.036			0.086*			0.174
			(0.042)			(0.054)			(0.052)			(0.112)
High IDV	-0.085***	-0.084***	-0.051*	-0.067**	-0.076***	-0.027	-0.081***	-0.076***	-0.054*	-0.067**	-0.076***	-0.032
	(0.024)	(0.024)	(0.027)	(0.027)	(0.027)	(0.030)	(0.027)	(0.027)	(0.029)	(0.027)	(0.027)	(0.031)
High MAS	-0.017			-0.023			-0.004			-0.031		
	(0.021)			(0.026)			(0.024)			(0.026)		
High PDI		0.087**			-0.028			0.055			-0.046	
		(0.044)			(0.052)			(0.045)			(0.090)	
High UAI			0.125***			0.154***			0.087**			0.129**
			(0.037)			(0.045)			(0.042)			(0.052)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0												
F value	0.48	1.79	1.91	4.90	7.70	7.73	1.44	1.22	1.14	0.03	0.47	0.46
P-value	0.49	0.18	0.17	0.03	0.01	0.01	0.23	0.27	0.28	0.87	0.49	0.50
Obs.	610,847	610,847	610,847	610,847	610,847	610,847	610,847	610,847	610,847	318,622	318,622	318,622
adj-R^2	0.910	0.910	0.910	0.915	0.915	0.915	0.782	0.782	0.782	0.943	0.943	0.943

Table IA6
Cross-country gender differences in performance under competition: controlling transparency

This table examines cross-country gender differences in performance under competition using OLS regression with firm times year fixed effects and controlling transparency. We follow Bradshaw et al. (2019) to measure country-level transparency. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.045**	0.034	0.051**	0.092**
	(0.022)	(0.026)	(0.024)	(0.037)
Female × High IDV	-0.063**	-0.082**	-0.032	-0.105**
	(0.027)	(0.033)	(0.030)	(0.043)
High IDV	-0.090***	-0.072***	-0.085***	-0.076***
	(0.024)	(0.027)	(0.027)	(0.028)
GGGI	0.937**	1.028**	1.794***	0.916
	(0.411)	(0.493)	(0.456)	(0.565)
Ln(GDP per capita)	-0.002	0.013	-0.013	-0.049
	(0.033)	(0.043)	(0.035)	(0.039)
Transparency	-0.013	-0.020	-0.015	-0.002
	(0.023)	(0.029)	(0.024)	(0.036)
Foreign analyst	0.062***	0.011	0.087***	0.026
	(0.021)	(0.025)	(0.022)	(0.023)
Forecast horizon	0.156***	0.080***	0.216***	0.011***
	(0.003)	(0.003)	(0.004)	(0.003)
Forecast frequency	-0.001	0.016***	-0.027***	-0.001
	(0.002)	(0.003)	(0.002)	(0.002)
# firms followed	0.000	0.001*	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005**	0.000	0.000
	(0.002)	(0.002)	(0.003)	(0.002)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003***	-0.001	-0.006***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.006*	-0.001	-0.009***	-0.010***
	(0.003)	(0.004)	(0.003)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	1.48	7.37	1.22	0.56
P-value	0.22	0.01	0.27	0.46
Obs.	586,880	586,880	586,880	312,723
adj-R^2	0.912	0.916	0.783	0.944

Table IA7
Cross-country gender differences in performance under competition: using a different cutoff

This table examines cross-country gender differences in performance under competition using OLS regression with firm times year fixed effects and an alternative cutoff of individualism. *High IDV_alt* is an indicator variable that takes the value of one if a country is in the top 30th percentile of the individualism score, and zero otherwise. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.040*	0.038	0.047*	0.120***
	(0.021)	(0.026)	(0.024)	(0.039)
Female × High IDV_alt	-0.054**	-0.083***	-0.024	-0.128***
	(0.026)	(0.031)	(0.029)	(0.042)
High IDV_alt	-0.068***	-0.043	-0.058**	-0.054*
	(0.026)	(0.029)	(0.029)	(0.031)
GGGI	0.718**	0.842**	1.496***	0.870*
	(0.353)	(0.408)	(0.395)	(0.465)
Ln(GDP per capita)	-0.012	-0.007	-0.010	-0.060***
	(0.017)	(0.021)	(0.018)	(0.022)
Foreign analyst	0.053***	0.004	0.075***	0.019
	(0.019)	(0.022)	(0.019)	(0.020)
Forecast horizon	0.156***	0.081***	0.215***	0.011***
	(0.003)	(0.003)	(0.003)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.002)	(0.003)	(0.002)	(0.002)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.002	-0.005*	0.001	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003***	-0.001	-0.005***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.008***	-0.003	-0.012***	-0.011***
	(0.003)	(0.004)	(0.003)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV_alt = 0				
F value	0.93	7.72	2.06	0.28
P-value	0.34	0.01	0.15	0.60
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Table IA8
Cross-country gender differences in performance under competition: using updated individualism scores

This table examines cross-country gender differences in performance under competition using OLS regression with firm times year fixed effects and updated individualism scores. To create an updated version of Hofstede's individualism score, we follow Schwartz (1994), Triandis (1995), and Beugelsdijk et al. (2015) using survey data from the World Values Survey (WVS) and its equivalent, the European Values Study (EVS), which employs a similar set of survey questions but mostly for European countries, over the period 1981–2002. *High IDV_WVS* is an indicator variable that takes the value of one if a country is in the top quartile of updated individualism scores, and zero otherwise. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.069***	0.061*	0.074**	0.112**
	(0.026)	(0.032)	(0.031)	(0.054)
Female × High IDV_WVS	-0.088***	-0.088**	-0.064*	-0.117**
	(0.029)	(0.036)	(0.035)	(0.057)
High IDV_WVS	-0.097**	-0.173***	0.004	-0.147***
	(0.045)	(0.055)	(0.056)	(0.053)
GGGI	1.607**	1.770**	2.698***	1.349
	(0.680)	(0.794)	(0.735)	(0.923)
Ln(GDP per capita)	-0.007	-0.003	-0.045*	-0.075*
	(0.026)	(0.032)	(0.027)	(0.038)
Foreign analyst	0.018	0.006	0.028	0.026
	(0.022)	(0.027)	(0.027)	(0.028)
Forecast horizon	0.165***	0.079***	0.233***	0.008***
	(0.003)	(0.003)	(0.004)	(0.003)
Forecast frequency	-0.001	0.021***	-0.028***	0.002
	(0.002)	(0.003)	(0.003)	(0.002)
# firms followed	-0.000	-0.000	0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.001	-0.002	-0.001	0.002
	(0.002)	(0.002)	(0.003)	(0.003)
Firm experience	-0.004***	-0.004***	-0.003	-0.000
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.001	0.002	-0.006***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.002	0.000	-0.007*	-0.006*
	(0.003)	(0.004)	(0.004)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV_WVS = 0				
F value	2.37	2.83	0.37	0.07
P-value	0.12	0.09	0.54	0.79
Obs.	482,975	482,975	482,975	272,989
adj-R^2	0.931	0.931	0.801	0.949

Table IA9
Cross-country gender differences in performance under competition: clustering standard errors at different levels

This table examines cross-country gender differences in performance under competition clustering standard errors at different levels. Panel A presents the regression results when standard errors (in parentheses) are clustered at the analyst country times year level. Panel B presents the regression results when standard errors (in parentheses) are clustered at the brokerage times year level. Panel C presents the regression results when standard errors (in parentheses) are clustered at the analyst level. Panel D presents the regression results when standard errors (in parentheses) are clustered at the firm level. Definitions of the variables are provided in the Appendix. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Cross-country gender differences in performance: standard errors clustered at the analyst country times year level

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.042*	0.033	0.050*	0.111***
	(0.023)	(0.028)	(0.028)	(0.039)
Female × High IDV	-0.091***	-0.074**	-0.082***	-0.075**
	(0.027)	(0.031)	(0.031)	(0.029)
High IDV	-0.062**	-0.082**	-0.031	-0.122***
	(0.028)	(0.035)	(0.035)	(0.045)
GGGI	0.853**	0.960**	1.607***	0.897*
	(0.379)	(0.401)	(0.438)	(0.498)
Ln(GDP per capita)	-0.013	-0.008	-0.011	-0.060***
	(0.017)	(0.021)	(0.018)	(0.022)
Foreign analyst	0.059***	0.010	0.080***	0.023
	(0.021)	(0.024)	(0.023)	(0.021)
Forecast horizon	0.156***	0.081***	0.215***	0.011***
	(0.009)	(0.005)	(0.013)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.003)	(0.003)	(0.004)	(0.003)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005*	0.001	-0.000
	(0.002)	(0.003)	(0.003)	(0.003)
Firm experience	-0.003**	-0.004*	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003**	-0.001	-0.005***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.007*	-0.002	-0.011*	-0.011**
	(0.004)	(0.004)	(0.007)	(0.005)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	1.65	4.9	0.94	0.27
P-value	0.20	0.03	0.33	0.61
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Panel B. Cross-country gender differences in performance: standard errors clustered at the brokerage times year level

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.042**	0.033	0.050**	0.111***
	(0.021)	(0.024)	(0.025)	(0.037)
Female × High IDV	-0.091***	-0.074**	-0.082***	-0.075**
	(0.027)	(0.031)	(0.029)	(0.031)
High IDV	-0.062**	-0.082***	-0.031	-0.122***
	(0.026)	(0.030)	(0.031)	(0.041)
GGGI	0.853**	0.960**	1.607***	0.897*
	(0.388)	(0.430)	(0.446)	(0.502)
Ln(GDP per capita)	-0.013	-0.008	-0.011	-0.060**
	(0.018)	(0.022)	(0.020)	(0.025)
Foreign analyst	0.059***	0.010	0.080***	0.023
	(0.021)	(0.024)	(0.022)	(0.023)
Forecast horizon	0.156***	0.081***	0.215***	0.011***
	(0.003)	(0.003)	(0.005)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.002)	(0.003)	(0.003)	(0.003)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005*	0.001	-0.000
	(0.002)	(0.003)	(0.003)	(0.003)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003**	-0.001	-0.005***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.007**	-0.002	-0.011**	-0.011**
	(0.004)	(0.004)	(0.005)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	1.64	6.5	0.96	0.42
P-value	0.20	0.01	0.33	0.52
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Panel C. Cross-country gender differences in performance: standard errors clustered at the analyst level

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.042*	0.033	0.050*	0.111**
	(0.025)	(0.029)	(0.028)	(0.045)
Female × High IDV	-0.091***	-0.074**	-0.082***	-0.075**
	(0.030)	(0.032)	(0.031)	(0.033)
High IDV	-0.062**	-0.082**	-0.031	-0.122**
	(0.031)	(0.036)	(0.035)	(0.051)
GGGI	0.853*	0.960**	1.607***	0.897*
	(0.439)	(0.466)	(0.500)	(0.498)
Ln(GDP per capita)	-0.013	-0.008	-0.011	-0.060**
	(0.020)	(0.025)	(0.022)	(0.026)
Foreign analyst	0.059**	0.010	0.080***	0.023
	(0.024)	(0.027)	(0.025)	(0.025)
Forecast horizon	0.156***	0.081***	0.215***	0.011***
	(0.003)	(0.003)	(0.004)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005*	0.001	-0.000
	(0.003)	(0.003)	(0.003)	(0.003)
Firm experience	-0.003**	-0.004*	-0.003	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
General experience	-0.003**	-0.001	-0.005***	-0.002
	(0.001)	(0.001)	(0.002)	(0.001)
Ln(Brokerage size)	-0.007*	-0.002	-0.011**	-0.011**
	(0.004)	(0.005)	(0.005)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	1.23	5.22	0.78	0.29
P-value	0.27	0.02	0.38	0.59
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Panel D. Cross-country gender differences in performance: standard errors clustered at the firm level

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.042*	0.033	0.050*	0.111**
	(0.023)	(0.030)	(0.026)	(0.045)
Female × High IDV	-0.091***	-0.074**	-0.082***	-0.075***
	(0.030)	(0.030)	(0.030)	(0.027)
High IDV	-0.062**	-0.082**	-0.031	-0.122**
	(0.030)	(0.039)	(0.032)	(0.054)
GGGI	0.853**	0.960**	1.607***	0.897*
	(0.387)	(0.407)	(0.452)	(0.473)
Ln(GDP per capita)	-0.013	-0.008	-0.011	-0.060***
	(0.018)	(0.024)	(0.022)	(0.023)
Foreign analyst	0.059**	0.010	0.080***	0.023
	(0.026)	(0.023)	(0.022)	(0.021)
Forecast horizon	0.156***	0.081***	0.215***	0.011***
	(0.004)	(0.003)	(0.004)	(0.003)
Forecast frequency	-0.001	0.016***	-0.028***	-0.001
	(0.002)	(0.003)	(0.003)	(0.003)
# firms followed	0.000	0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.003	-0.005**	0.001	-0.000
	(0.002)	(0.002)	(0.003)	(0.002)
Firm experience	-0.003**	-0.004**	-0.003*	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.003**	-0.001	-0.005***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.007**	-0.002	-0.011***	-0.011***
	(0.003)	(0.004)	(0.004)	(0.004)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	1.45	6.6	1.1	0.31
P-value	0.23	0.01	0.29	0.58
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Table IA10
Cross-country gender differences in performance under competition: additional robustness checks

This table examines cross-country gender differences in performance under competition using alternative samples or model specifications to Table 4 Panel C. Panel A presents the regression results using firm-forecast-analyst-level observations. The dependent variable is *Absolute forecast error*, the absolute value of the difference between an analyst's annual EPS forecast and actual EPS normalized by the stock price at the prior fiscal year end. Column (1) presents the results with firm times year fixed effects, and column (2) presents the results with firm times year times month fixed effects. Panel B repeats the analysis in Table 4 Panel C adding brokerage times year fixed effects. Panel C repeats the analysis in Table 4 Panel C using an analyst's name to determine their country of origin. The sample consists of 11,444 equity analysts from 42 countries who are from the same high (low) IDV countries based on their last name and first name using the algorithm developed by Origins Info Ltd. as those based on their place of work. Definitions of the variables are provided in the Appendix. Heteroscedasticity-consistent standard errors (in parentheses) are clustered at the firm times year level. ***, **, * correspond to statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Cross-country gender differences in performance under competition using forecast-level observations

	Absolute forecast error	Absolute forecast error
	(1)	(2)
Female	0.063**	0.074*
	(0.031)	(0.045)
Female × High IDV	-0.078**	-0.087*
	(0.036)	(0.051)
High IDV	-0.082***	-0.102***
	(0.025)	(0.032)
GGGI	0.858***	0.713*
	(0.313)	(0.409)
Ln(GDP per capita)	-0.036**	-0.049**
	(0.017)	(0.023)
Foreign analyst	0.083***	0.073***
	(0.022)	(0.027)
Forecast horizon	0.007***	0.006***
	(0.000)	(0.000)
Forecast frequency	-0.003	-0.004
	(0.003)	(0.003)
# firms followed	0.001	0.000
	(0.001)	(0.001)
# industries followed	0.000	0.002
	(0.002)	(0.002)
Firm experience	-0.001	-0.000
	(0.001)	(0.002)
General experience	-0.005***	-0.005***
	(0.001)	(0.001)
Ln(Brokerage size)	-0.006**	-0.009***
	(0.003)	(0.003)
Firm × Year Fixed Effects	Yes	No
Firm × Year × Month Fixed Effects	No	Yes
Intercept	Yes	Yes
Test if Female + Female × High IDV = 0		
F value	0.93	0.43
P-value	0.34	0.51
Obs.	2,629,947	2,629,947
adj-R^2	0.807	0.882

Panel B. Cross-country gender differences in performance under competition including brokerage times year fixed effects

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.019	0.018	0.026	0.133***
	(0.021)	(0.025)	(0.024)	(0.039)
Female × High IDV	-0.028	-0.051	-0.006	-0.152***
	(0.026)	(0.032)	(0.030)	(0.044)
High IDV	-0.046	0.019	-0.028	0.000
	(0.031)	(0.037)	(0.036)	(0.044)
GGGI	0.636	0.374	2.007***	0.918
	(0.480)	(0.582)	(0.539)	(0.676)
Ln(GDP per capita)	-0.013	-0.003	-0.012	-0.053*
	(0.020)	(0.024)	(0.022)	(0.029)
Foreign analyst	0.073***	0.018	0.093***	0.035
	(0.022)	(0.025)	(0.023)	(0.025)
Forecast horizon	0.152***	0.080***	0.209***	0.011***
	(0.003)	(0.003)	(0.004)	(0.003)
Forecast frequency	-0.001	0.011***	-0.022***	-0.003
	(0.002)	(0.003)	(0.002)	(0.002)
# firms followed	0.001	0.002**	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.006**	-0.006**	-0.003	0.000
	(0.002)	(0.003)	(0.003)	(0.003)
Firm experience	-0.003**	-0.002	-0.002	-0.000
	(0.001)	(0.002)	(0.002)	(0.002)
General experience	-0.001	-0.000	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Brokerage size)	-0.033**	-0.046***	0.003	-0.005
	(0.014)	(0.018)	(0.014)	(0.015)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Brokerage × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	0.29	3.22	1.37	1.2
P-value	0.59	0.07	0.24	0.27
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.912	0.916	0.786	0.944

Panel C. Using an analyst's name to determine their country of origin

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.079***	0.058**	0.098***	0.149***
	(0.023)	(0.029)	(0.027)	(0.046)
Female × High IDV	-0.089***	-0.065*	-0.069*	-0.130**
	(0.034)	(0.040)	(0.037)	(0.054)
High IDV	-0.077**	-0.086**	-0.070*	-0.166***
	(0.036)	(0.041)	(0.038)	(0.044)
GGGI	0.595	0.750	1.059**	1.209**
	(0.466)	(0.563)	(0.539)	(0.604)
Ln(GDP per capita)	-0.021	-0.023	-0.008	-0.071***
	(0.018)	(0.023)	(0.021)	(0.026)
Foreign analyst	0.089***	0.072**	0.111***	0.067**
	(0.026)	(0.031)	(0.027)	(0.031)
Forecast horizon	0.157***	0.084***	0.214***	0.015***
	(0.004)	(0.004)	(0.004)	(0.004)
Forecast frequency	-0.001	0.019***	-0.031***	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)
# firms followed	-0.000	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
# industries followed	-0.001	-0.007**	0.003	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Firm experience	-0.000	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
General experience	-0.003*	-0.001	-0.007***	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)
Ln(Brokerage size)	-0.009**	-0.002	-0.016***	-0.012**
	(0.004)	(0.005)	(0.005)	(0.005)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Test if Female + Female × High IDV = 0				
F value	0.16	0.09	1.44	0.62
P-value	0.69	0.77	0.23	0.43
Obs.	389,945	389,945	389,945	195,720
adj-R^2	0.916	0.921	0.788	0.948