Gender, Competition, and Performance: International Evidence

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Motivation

- Much of our understanding of gender differences in preference for competition and performance under competition is based on laboratory studies (Niederle and Vesterlund 2011):
  - Women are generally less keen on being exposed to competition (Niederle and Vesterlund 2007).
  - Men's performance increases in competition whereas women's do not (Gneezy, Niederle, and Rustichini 2003).

- The majority of those studies rely on participants and samples largely from western industrialized countries (see, for example, Booth 2009; Croson and Gneezy 2009; Reuben, Sapienza, and Zingales 2021).

This paper

- 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 information on gender.
  - Equity analysts are known to be a highly competitive profession and their performance is precisely measured (Clement 1999; Hong, Kubik, and Solomon 2000).

- We address two research questions:
  1) Does competition hurt women's on-the-job performance?
  2) Are there cross-country differences in the relation between competition and women's on-the-job performance?

Contributions

- We offer new insights into the important relationship between gender, competition, and performance by taking an international lens.
  - In highly individualistic countries, there is no significant difference in performance under competition between the genders.

- 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 by Niederle and Vesterlund 2011).
  - Using a global sample of professionals with the same occupation allows us to delineate the channels through which country-level factors help mitigate the negative association between competition and women's on-the-job performance.

Contributions

- Our paper contributes to the ongoing debate on whether nature, nurture, and/or the interaction between the two are responsible for gender differences in preferences and performance (see, for example, Croson and Gneezy 2009; Gneezy, Leonard, and List 2009).
  - We show that exposure to different cultures, social norms, or ideologies significantly changes individuals' behavior including their entry to competition and performance under competition, even among the most sophisticated labor market participants.

National culture

- National cultural values define what constitutes appropriate decisions and behaviors in a society (North 1990).

- Our main measure of country-level differences is the individualism dimension in Hofstede's (1980, 2001) national cultural framework—the most important driver of cultural differences across countries (Triandis 1995).
  - Individualistic societies emphasize independence, equality, and the importance of "speaking one's mind" (Hofstede 2011, p. 11), whereas collectivistic societies emphasize in-groups' interests and harmony (Trompenaars 1993; Hofstede 2001, 2011).

Our conceptual framework

- Individualistic societies encourage independent opinions; collectivistic societies encourage conformity based on in-groups' perspectives.

- Women in individualistic societies are given more latitude to make decisions according to their own preferences than women in collectivistic societies (Hofstede 2011, p. 11; Griffin et al. 2017).

- Given women's aversion to competition, and that beliefs about one's relative performance affect entry to competition (Niederle and Vesterlund 2011), we expect that in individualistic societies, only women with beliefs that they can excel in competition choose to enter competition, such as becoming equity analysts.

Our conceptual framework

- Collectivistic societies emphasize in-groups' interests and harmony and may view employer-employee relationship like a family link (Hofstede 1997).

- Clement, Rees, and Swanson (2003) posit that poorly-performing analysts are more likely to be fired in individualistic societies compared to those in collectivistic societies.

- Kumar (2010) argues that due to workplace discrimination, there is a higher hurdle for women to enter and stay in the analyst profession compared to men.

Our conceptual framework

- On the one hand, if only capable women choose to becoming equity analysts in individualistic countries, it is not clear that female analysts are more likely to be fired due to poor performance in individualistic countries compared to that in collectivistic countries.

- On the other hand, workplace discrimination may accentuate female analyst turnover-to-performance sensitivity than their male counterparts in individualistic countries.

➢ On balance, we expect that *ceteris paribus*, the greater female analyst turnover-to-performance sensitivity in individualistic societies will help narrow the performance gap between the genders.

Our conceptual framework

- Individualistic societies emphasize speaking one's mind over preserving relationships and in-groups' harmony (Hofstede 2011, p. 11).

- In individualistic societies, managers value accountability and transparency (Gray 1988; Hofstede 2011).
  - Firms' information environments are more transparent in individualistic countries than those in collectivistic countries Eun, Wang, and Xiao (2015), Griffin, Guedhami, Li, and Lu (2021)

Our conceptual framework

- Using U.S. data, Fang and Huang (2017) show that male analysts benefit more than female analysts from alumni ties with corporate boards.

- Li, Wong, and Yu (2020) find that in a highly collectivistic country, China, in which relational contracting is prevalent and disclosure is poor, only connected analysts have information advantage.

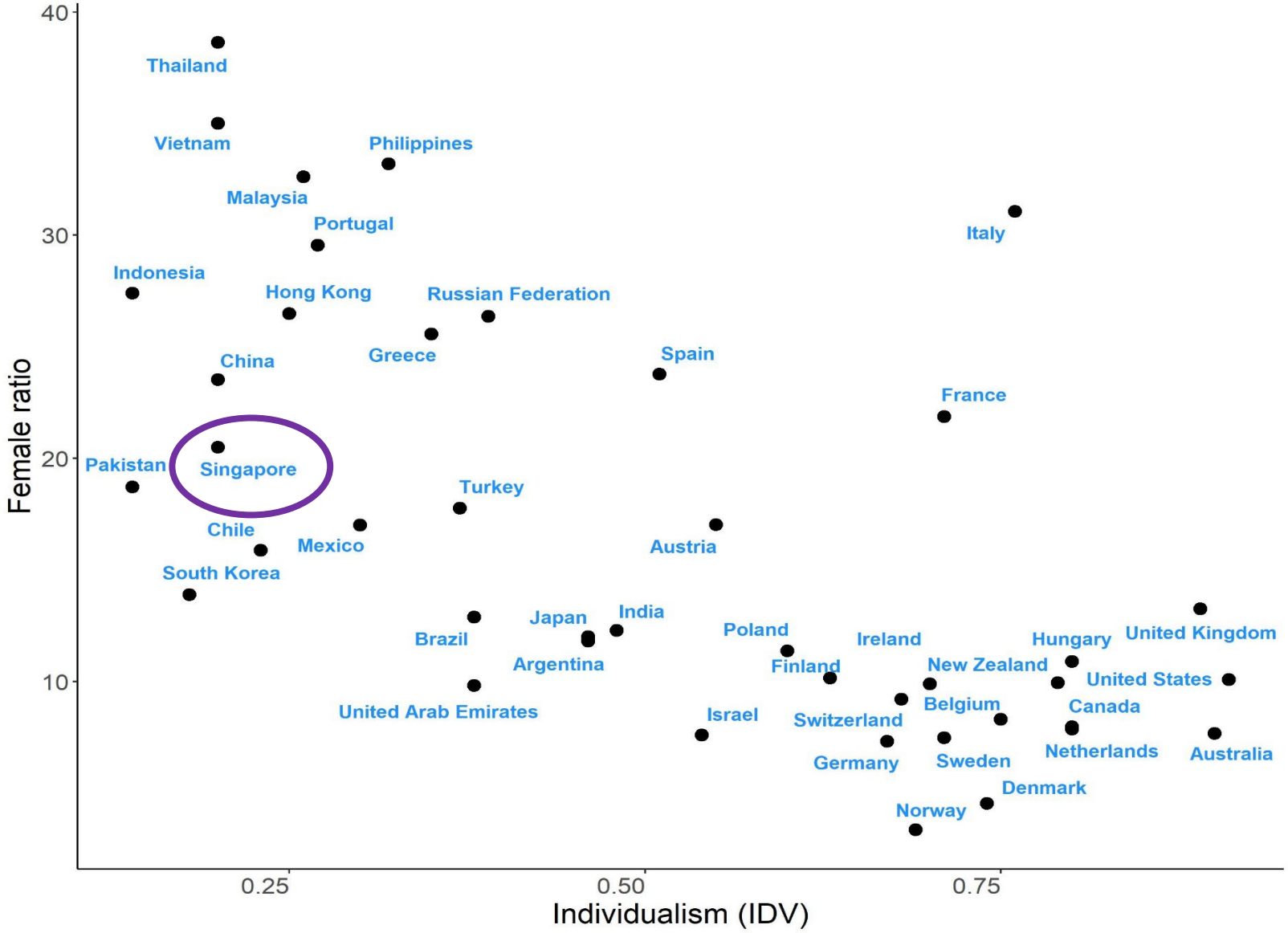
- We expect that *ceteris paribus*, more transparent disclosure in individualistic countries helps reduce information asymmetry and hence levels the playing field when comparing analyst performance in general, and potentially narrowing the gender gap in performance in particular.

Our conceptual framework

- In summary, we identify two analyst-level variables –
  - only women with beliefs that they can excel in competition choosing to enter competition and
  - differential turnover-to-performance sensitivities between the genders
- and one country-level variable
  - transparency
- that may serve as channels linking the individualism dimension of culture to a smaller gender gap in performance under competition.

➢ Our main hypothesis: The negative effect of competition on performance is attenuated for female analysts in highly individualistic countries.

Sample overview



Regression specification

$$Forecast\ performance_{c,i,j,t} = \alpha + \beta_1 Female_j + \beta_2 Female_j \times High\ IDV_c + \beta_3 Country\ characteristics_{c,t} + \beta_4 Analyst\ characteristics_{j,t} + \beta_5 Brokerage\ characteristics_{j,t} + Firm \times Year\ FE + e_{c,i,j,t},$$

- Our control variables largely follow prior literature. Clement (1999), Bae, Stulz, and Tan (2008), Hong and Kacperczyk (2010), Kumar (2010), and Bradshaw, Huang, and Tan (2019).
- Firm times year fixed effects are included to control for time-varying unobservables that might drive an analyst' coverage decision as well as her performance (Clement 1999; Hong and Kacperczyk 2010; Hilary and Shen 2013).
- The sample consists of firm-analyst-year observations.

Gender, competition, and performance

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.043**	0.040	0.051**	0.114***
	(0.021)	(0.025)	(0.024)	(0.038)
Female × High IDV	-0.059**	-0.089***	-0.030	-0.122***
	(0.026)	(0.030)	(0.029)	(0.041)
High IDV	-0.073***	-0.045	-0.058**	-0.061**
	(0.026)	(0.029)	(0.028)	(0.030)
GGGI	0.770**	0.882**	1.537***	0.891*
	(0.352)	(0.408)	(0.396)	(0.461)
Ln(GDP per capita)	-0.012	-0.008	-0.011	-0.060***
	(0.017)	(0.021)	(0.018)	(0.022)
Foreign analyst	0.054***	0.005	0.076***	0.020
	(0.019)	(0.022)	(0.019)	(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	-0.002	-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
Tests if Female + Female × High IDV = 0				
F value	1.25	8.6	1.59	0.22
P-value	0.26	0.00	0.21	0.64
Obs.	610,847	610,847	610,847	318,622
adj-R²	0.910	0.915	0.782	0.943

Robustness checks

- Remove U.S. analysts.
- Control for other Hofstede's national cultural values.
- Use an updated measure of individualism.
- Use Schwartz's affective autonomy.
- Use forecast-level observations controlling for firm*year*month fixed effects.
- Control for brokerage fixed effects.
- Remove analysts if the individualism ranking of her country of origin as determined by her name differs from that of her place of work.

Channel analysis - Univariate DID

	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
Adjusted forecast error2yr	-0.005	0.000	-0.003	0.000	-0.002***	0.000	-0.002	0.000	-0.003	-0.001	0.001	0.000	-0.003***
Adjusted forecast error	-0.003	0.000	-0.002	0.000	-0.001	0.000	0.000	0.000	-0.001	0.000	0.001	0.000	-0.002**
# firms followed	9.920	9.000	12.115	11.000	-2.194***	-2.000***	8.976	8.000	10.046	9.000	-1.071***	-1.000***	-1.124***
# industries followed	3.261	3.000	3.572	3.000	-0.311***	0.000***	3.870	3.000	3.934	3.000	-0.064*	0.000***	-0.247***
Firm experience	3.208	2.500	3.598	3.000	-0.389***	-0.500***	2.871	2.091	3.208	2.500	-0.337***	-0.409***	-0.052
General experience	5.977	5.000	7.103	6.000	-1.126***	-1.000***	5.266	4.000	6.046	5.000	-0.781***	-1.000***	-0.345***
ln(Brokerage size)	4.133	4.174	3.863	3.761	0.270***	0.413***	3.752	3.526	3.660	3.434	0.093***	0.092***	0.178***
Top10 brokerage	0.367	0.000	0.254	0.000	0.113***	0.000***	0.253	0.000	0.201	0.000	0.052***	0.000***	0.061***
Top20 brokerage	0.439	0.000	0.351	0.000	0.088***	0.000***	0.331	0.000	0.283	0.000	0.047***	0.000***	0.041***
Ln(Market capitalization)	8.436	8.624	8.438	8.619	-0.001	0.005	8.293	8.390	8.365	8.503	-0.072***	-0.113***	0.071**
Ln(Total assets)	8.632	8.708	8.644	8.711	-0.012	-0.003	8.535	8.442	8.735	8.762	-0.200***	-0.320***	0.188***
Tobin's Q	1.663	1.363	1.647	1.388	0.015	-0.025	1.624	1.263	1.497	1.152	0.127***	0.112***	-0.112***
Net income	0.030	0.043	0.020	0.037	0.010***	0.006***	0.060	0.054	0.051	0.048	0.009***	0.006***	0.001
Sales growth	0.112	0.072	0.130	0.084	-0.018***	-0.011***	0.125	0.094	0.112	0.083	0.013***	0.011***	-0.031***

Channel analysis – skills

	Deviation from consensus	Ln(# alternative forecasts)	Forecast frequency
	(1)	(2)	(3)
Female	-0.024	-0.009***	0.051***
	(0.015)	(0.003)	(0.014)
Female × High IDV	0.010	0.031***	0.044**
	(0.017)	(0.004)	(0.020)
Forecast frequency	-0.001	0.010***	
	(0.001)	(0.000)	
High IDV	-0.071***	-0.158***	0.229***
	(0.016)	(0.003)	(0.018)
Firm × Year Fixed Effects	Yes	Yes	Yes
Intercept	Yes	Yes	Yes
Tests if Female + Female × High IDV = 0			
F value	2.19	59.13	50.20
P-value	0.14	0.00	0.00
Obs.	577,270	610,847	610,847
adj-R^2	0.789	0.369	0.350

- Only more capable women and hard-working women become equity analysts.

Channel analysis – turnover-to-performance sensitivity

	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)
Using adjusted forecast error2yr	Obs.	Mean	Obs.	Mean	Mean	Obs.	Mean	Obs.	Mean	Mean	Mean
Bottom quartile forecast performance	1,184	0.104	10,786	0.071	0.033***	1,268	0.121	6,412	0.122	-0.001	0.035***
Using adjusted forecast error											
Bottom quartile forecast performance	1,412	0.100	11,996	0.071	0.030***	1,490	0.130	7,414	0.126	0.004	0.026**

- Underperforming female analysts are more likely to be turned over than their male counterparts in high IDV countries compared to those in low IDV countries.

Channel analysis – demotion-to-performance sensitivity

	High IDV	Low IDV	High IDV	Low IDV
	Demotion	Demotion	Demotion	Demotion
	(1)	(2)	(3)	(4)
Female	0.005	-0.014**	0.005	-0.014**
	(0.006)	(0.006)	(0.006)	(0.006)
Female × Adjusted forecast error2yr	-0.003	0.049		
	(0.038)	(0.044)		
Female × Adjusted forecast error			0.294**	0.139
			(0.121)	(0.118)
Adjusted forecast error2yr	0.146	0.083		
	(0.117)	(0.111)		
Adjusted forecast error			-0.021	0.050
			(0.043)	(0.051)
GGGI	-0.283***	-0.222***	-0.279***	-0.214***
	(0.093)	(0.051)	(0.093)	(0.051)

- Underperforming female analysts are more likely to experience demotion than their male counterparts in high IDV countries compared to those in low IDV countries.

Channel analysis - transparency

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.018	-0.005	0.035**	0.049**
	(0.016)	(0.019)	(0.018)	(0.021)
Female × High Transparency	-0.031	-0.013	-0.013	-0.066**
	(0.023)	(0.028)	(0.028)	(0.030)
GGGI	0.478	0.656	1.149***	1.002**
	(0.371)	(0.427)	(0.409)	(0.477)
Ln(GDP per capita)	-0.007	-0.007	-0.006	-0.059***
	(0.017)	(0.021)	(0.017)	(0.021)
Foreign analyst	0.035*	-0.004	0.060***	0.014
	(0.018)	(0.021)	(0.020)	(0.020)

- The gender gap in performance is smaller in countries with high transparency.

Conclusions

- Using a hand-collected sample of 18,000+ equity analysts from 42 countries over the period 2003-2019, we show that
  - Female analysts exhibit worse forecast accuracy than their male counterparts.
  - However, in highly individualistic countries, we show that there is no significant difference in forecast accuracy between the genders.
  - There are three possible mechanisms underlying our findings – in high IDV countries,
    - more capable females choose to become equity analysts;
    - there is greater turnover-to-performance sensitivity for female analysts; and
    - there is greater transparency.

❖ Gender differences in performance under competition are attenuated by national culture and social norms.

Robustness checks (back)

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.043**	0.038	0.054**	0.106***
	(0.021)	(0.026)	(0.024)	(0.039)
Female × High IDV	-0.086**	-0.139***	-0.051	-0.140***
	(0.039)	(0.044)	(0.041)	(0.052)
High IDV	-0.034	-0.018	0.021	-0.028
	(0.033)	(0.036)	(0.035)	(0.041)
…				
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Tests if Female + Female × High IDV = 0				
F value	1.77	8.36	0.01	1.00
P-value	0.18	0.00	0.93	0.32
Obs.	347,089	347,089	347,089	139,469
adj-R^2	0.897	0.902	0.772	0.934

Robustness checks (back)

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.061*	0.047	0.069*	0.125**
	(0.033)	(0.040)	(0.037)	(0.057)
Female × High IDV	-0.071**	-0.086**	-0.049	-0.129**
	(0.034)	(0.041)	(0.039)	(0.058)
Female × High MAS	-0.068*	-0.069	-0.026	-0.093
	(0.036)	(0.043)	(0.036)	(0.063)
Female × High PDI	-0.056	0.002	-0.076	-0.037
	(0.044)	(0.055)	(0.050)	(0.075)
Female × High UAI	0.094**	0.062	0.067	0.212*
	(0.044)	(0.057)	(0.052)	(0.114)
High IDV	-0.051*	-0.028	-0.039	-0.053*
	(0.026)	(0.029)	(0.029)	(0.032)
High MAS	0.006	0.007	0.016	-0.008
	(0.023)	(0.028)	(0.026)	(0.028)
High PDI	0.095**	-0.013	0.068	-0.035
	(0.045)	(0.053)	(0.046)	(0.091)
High UAI	0.149***	0.165***	0.124***	0.136***
	(0.035)	(0.044)	(0.041)	(0.046)
…				
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Tests if Female + Female × High IDV = 0				
F value	0.55	6.46	1.52	0.08
P-value	0.46	0.01	0.22	0.78
Obs.	610,847	610,847	610,847	318,622
adj-R^2	0.910	0.915	0.782	0.943

Updating Hofstede's individualism

- To create an updated version of Hofstede's individualism score, we follow Schwartz (1992,1994), 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.

- Based on questions in the WVS/EVS, 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;
  4) justifiability; abortion: 1. never justifiable... 10. always justifiable.

Robustness checks (back)

	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)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Tests 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

Robustness checks (back)

- Affective autonomy is the independent pursuit of pleasure, seeking enjoyment by any means without censure.

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.019	0.009	0.036**	0.040**
	(0.013)	(0.015)	(0.015)	(0.017)
Female × High affective autonomy	-0.050	-0.091**	-0.018	-0.088**
	(0.035)	(0.040)	(0.035)	(0.041)
High affective autonomy	0.026	0.045	0.045*	0.037
	(0.024)	(0.027)	(0.026)	(0.028)
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Tests if Female + Female × High affective autonomy = 0				
F value	0.93	5.25	0.35	1.77
P-value	0.34	0.02	0.55	0.18
Obs.	608,748	608,748	608,748	318,440
adj-R^2	0.911	0.915	0.782	0.943

Robustness checks (back)

- Remove analysts if the individualism ranking of her country of origin as determined by her name differs from that of her place of work.

	Average forecast error (1)	First forecast error (2)	Last forecast error (3)	Same week forecast error (4)
Female	0.074***	0.055*	0.097***	0.140***
	(0.023)	(0.029)	(0.028)	(0.046)
Female × High IDV	-0.085**	-0.073*	-0.065*	-0.123**
	(0.034)	(0.039)	(0.037)	(0.053)
High IDV	-0.049	-0.057	-0.037	-0.124***
	(0.036)	(0.041)	(0.039)	(0.041)
…				
Firm × Year Fixed Effects	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Tests if Female + Female × High IDV = 0				
F value	0.21	0.47	1.81	0.48
P-value	0.65	0.49	0.18	0.49
Obs.	384,739	384,739	384,739	190,805
adj-R^2	0.916	0.921	0.788	0.947