Finance Research Letters 55 (2023) 103914

Contents lists available at ScienceDirect

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

The role of gender in sales behaviour: Evidence from institutional financial brokerage

Raul Riefler [a], Onur Kemal Tosun [b,*], Ylva Baeckström [a]

[a] King's Business School, King's College London, Bush House, 30 Aldwych, London WC2B 4BG, United Kingdom
[b] Cardiff Business School, Cardiff University, Aberconway Building, Colum Dr, Cardiff, CF10 3EU, United Kingdom

ARTICLE INFO

JEL classification:
G23
G41
J16

Keywords:
Gender differences
Financial brokers
Sales performance
Sales behaviour

ABSTRACT

We study the role of gender in sales behaviour using 336,401 daily institutional broker transactions over two years. Female brokers appear more efficient at generating revenue than males. Their more cautious sales behaviour sees them execute fewer transactions and sell lower risk financial products to more conservative clients. Directionally supportive of literature that records higher confidence levels, trading frequency and risk taking among males, we show how female brokers contribute to more diversified and successful sales behaviour. Our findings are relevant to gender unequal financial services industry and other quantitative domains that tend to overvalue male relative to female skills.

1. Introduction and theoretical background

Does the sales behaviour of male and female financial brokers differ? The financial services industry has the largest gender pay gap[1] (Healy and Ahamed, 2019) and employs only 10–20% women in fund management, financial advising and financial brokerage roles (Bellstrom and Hinchliffe, 2019; Niessen-Ruenzi and Ruenzi, 2019). This female underrepresentation persists despite wide acceptance that gender balance is good for business. Diversity is especially important in financial services where homogeneous decision making, overconfidence and concentrated risk taking are linked to malpractice and poor performance (Benabou, 2013; Song and Thakor, 2019). Women can make vital contributions because their complementary skills reduce both overconfidence (Girardone et al., 2021) and risk taking behaviours (Yang et al., 2019). Despite this, there is little information about gender differences in the *performance* of finance professionals and it therefore remains unknown whether male over representation and pay are justified by male outperformance. This lacuna extends to financial brokerage, an acutely gender unequal area of financial services.

Against this backdrop, we investigate gender differences in the sales performance of financial brokers employed by a large European bank, selling financial products to institutional clients. Regression analyses comprising 336,401 daily transactions, executed between 4 January 2016 to 31 December 2018, identify how broker sales behaviour varies by gender. Brokers appear to follow gender stereotypical patterns in both the types of clients they sell to, and the types of products they sell. Overall, our results suggest that female brokers are more efficient than their male peers at generating sales revenues (fees). Female brokers conduct fewer transactions, they broker less risky products (e.g., fixed income) and they sell to more "conservative" clients, e.g., sovereign and public sector organisations. Conversely male brokers are more successful at selling higher risk products (e.g., foreign exchange) to clients such as banks

* Corresponding author.
E-mail address: tosuno@cardiff.ac.uk (O.K. Tosun).

[1] Women in banking earn between 25.4% (UK) to 53% (US) less than men and receive up to 59% lower bonuses (DataUSA, 2021).

https://doi.org/10.1016/j.frl.2023.103914
Received 17 March 2023; Received in revised form 10 April 2023; Accepted 17 April 2023
Available online 18 April 2023
1544-6123/© 2023 The Author(s). Published by Elsevier Inc. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

who favour riskier investments.

Our findings are consistent with the view that women have lower tolerance for investment risk (Brooks et al., 2019) and are less financially overconfident compared to men (Aristei and Gallo, 2022; Tosun et al., 2022). Our results corroborate studies that show male overconfidence contributing to more frequent (Deaves et al., 2010), but less successful trading strategies (Barber and Odean, 2001). Our findings also validate research that shows how overconfident (male) brokers generate higher trading volume (Jackson, 2005) and how high broker turnover is linked to analyst recommendations and higher analyst income (Karmaziene, 2023). The gender gap is sometimes explained as women self-selecting to avoid competitive finance roles (Niederle and Vesterlund, 2007), but female brokers do not necessarily compete on a gender equal basis which challenges their ability to perform (Madden, 2012).

Given the persistence of gender inequality in this industry and the dearth of research into the role of gender in quantitative sales roles, our paper makes an important and timely contribution to the literature. Specifically, we add to the evidence base for the benefits of having women in client-facing finance roles. For example, using more stable and less risky investment strategies, female fund managers generate equally high returns for their clients as male managers. This underscores the importance of female trading skills, yet women fund managers are less successful at attracting client investments (Niessen-Ruenzi and Ruenzi, 2019). However, Baeckström et al. (2021), find that female individual clients actually allocate more of their savings to higher risk investments when they have female, instead of male, financial advisors. This demonstrates how female financial advisors can outperform their male peers in terms of revenue generation and client portfolio return potential. Research also shows that gender differences in sales between male and female brokers are explained by sales support rather than capacity, and that this support is not readily available to women brokers (Madden, 2012). Therefore, firms often miss out on the financial benefits of women leaders because they do not have the support structures or influential power enjoyed by their male counterparts (Martínez-García, Terjesen and Gómez-Ansón, 2022).

Our results suggest that combining the skills of male and female brokers has the potential to improve sales diversification and performance. It seems that a diverse team of brokers can sell a broader product range to a wider set of clients - across the risk spectrum. This extends previous experimental research that shows that mixed gender teams contribute to more stable financial markets (Cueva and Rustichini, 2015). Highlighting the importance of female trading skills, our paper adds to the argument for more gender equality in financial services. Understanding gender differences in sales behaviour and financial revenue generation increases awareness about the contributions made by all employees which can assist institutions struggling to recruit and retain female talent (Hospido et al., 2019). Our study informs the academic discussion and offers impactful insights for the industry whose managers need to evaluate women's contributions appropriately and consider how women's contributions and skills could decrease gender inequality, improve sales diversity and attract more women to quantitative sales domains.

2. Data and methodology

Our unique, hand-collected data set is from one of the 50 largest banks in Europe. It contains 336,401 daily financial broker transactions between 4 January 2016 to 31 December 2018. Their clients include asset management companies (*AMC*), banks, corporates, insurance companies and pension funds (*Ins/Pens),* sovereign and public sector organisations (*Sov/Publ)*. The brokers sell derivatives, fixed income (*FI)*, foreign exchange (*FX*) and money market (*MM*) products. They trade on an "execution only" basis and therefore do not provide financial advice or give trade recommendations to their clients. The data set also contains information about broker gender and fees, i.e., revenue generated per transaction.[2]

Fig. 1 shows that the majority of transactions are fixed income (44%), followed by derivatives, FX, and MM, respectively. Over half (53%) of the brokers' transactions are with AMC clients and 36% are with investment banks. The remaining transactions are with corporates, insurance companies, pension funds, sovereign, public sector and an unspecified client category 'other'.

Descriptive statistics in Table 1 show that only 6.5% of the transactions are conducted by female brokers. Although a data limitation means that the proportion of women brokers is not revealed, this 6.5% figure suggests that female representation may be similar to the industry average of around 10% female brokers. While the average fee per transaction is about €148.170, its right-skewed distribution indicates that there are few transactions with very high fees. On average, brokers execute 533 transactions per day. Interestingly, female brokers generate higher revenues per transaction (€352.308) compared to their male peers (€133.974). Women execute considerably fewer transactions than men. Nevertheless, the number of monthly transactions by both female and male brokers suggests that all brokers behave consistently across the months (i.e., their monthly sales figures remain constant). Corporates and banks purchase more of the risky products, i.e., derivatives and FX, whereas sovereign and public sector organisations focus on the safer products, i.e., FI and MM. This is perhaps unsurprising given the lower investment risk taking required by public sector organisations (Stalebrink and Sacco, 2006).

We examine the sales behaviour of male and female brokers across different products in the following difference-in-difference panel regression model:

$$LnFee_{i,t} = \alpha + \beta_1 (Female \times Product)_{i,t} + \beta_2 Female_{i,t} + \beta_3 Product_{i,t} + \beta_4 Transaction_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $LnFee_{i,t}$ is the natural logarithm of transaction fee. The $Female_{i,t}$ dummy represents transactions by female brokers. $Product_{i,t}$ denotes financial products i.e., *FI, FX,* and *MM* equal to one for each particular product individually, and zero otherwise. The control

[2] To protect its clients, the institution requests anonymity but consents to the material being published for research purposes. Confidentiality limits any further information being disclosed.

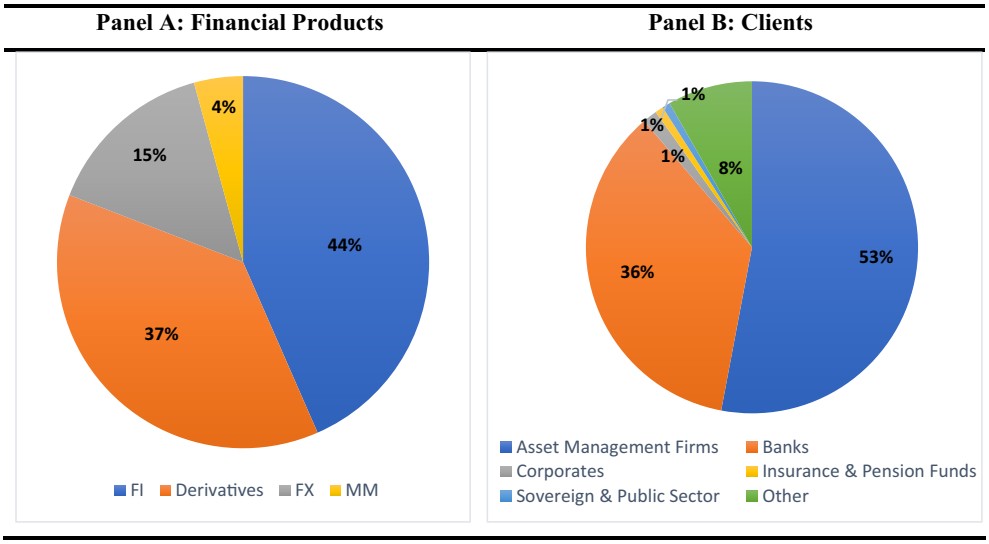


Fig. 1. Financial products and clients.
These figures display details of financial products and clients. Panel A presents the distribution of financial products executed by brokers while Panel B shows the distribution of clients of brokers. The sample includes 336,401 daily broker transactions between 2016 and 2018.

variable $Transaction_{i,t}$ is the total number of daily transactions in thousands. i represents the broker, t the day, and $\varepsilon_{i,t}$ denotes the error term. We investigate whether gender and product type are linked to brokers' product sales behaviour, denoted by the interaction of *Female* and *Product.* We include time and client fixed effects in the model. Standard errors are robust in the analysis.

For client analyses, we replace $Product_{i,t}$ with $Client_{i,t}$ representing different clients by brokers i.e., *AMC, Bank, Ins/Pens, Sov/Publ,* and *Other.* $Client_{i,t}$ equals one for each client individually, and zero otherwise. We replace client fixed effects with product fixed effects and include time fixed effects in the model with robust standard errors. 'Corporates' and 'derivatives' are excluded from the main analyses because these highest risk interactions are exclusively managed by male brokers.

We also investigate the distribution of clients between male and female brokers and to what extent they sell certain types of financial products through the following panel logistic regression model:

$$Product/Client_{i,t} = \alpha + \beta_1 Female_{i,t} + \beta_2 Fee_{i,t} + \beta_3 Transaction_{i,t} + \varepsilon_{i,t} \quad (2)$$

where $Product/Client_{i,t}$ dummy represents financial products and clients as described before. $Fee_{i,t}$ is the fee per transaction in EURO for broker i in day t. We include time, client, and product fixed effects in the model where necessary. Standard errors are robust in the analysis.

3. Results

We compare male and female broker sales success across different financial products and client type by analysing their fees. Although statistically significant and positive estimates for *Female* in Panel A of Table 2 indicate that female brokers generate more sales revenues overall through higher fees than male brokers, this success in sales revenues starts to decline (rise) as females (males) execute more daily transactions, implied by the negative result for *Female* × *Transaction*. Moreover, the lower risk sales behaviour of female brokers appears more successful. The positive coefficient for *Female* × *FI* indicates that female brokers generate more in fees when trading less risky products, i.e., *FI.* On the other hand, the negative coefficient for *Female* × *FX* implies that male brokers excel with riskier products such as, *FX.* These findings are consistent with gender-oriented risk preference and confidence levels (Bauer et al., 2009; Charness and Gneezy, 2012) which we now show also extends to professional brokers. The results for stand-alone variables *FI, FX,* and *MM* reveal that these are well-paying financial products, considering their positive estimates.

Female broker conservatism is also reflected in the types of clients they deal with. In Panel B of Table 2, we show that male brokers earn higher fees from transactions sold to banks, insurance companies and pension funds. Their female peers, however, are more successful with sovereign and public sector organisations and 'other' clients. These are indicated by the statistically significant and negative results for *Female* × *Bank, Female* × *Ins/Pens* and the positive results for *Female* × *Sov/Publ* and *Female* × *Other.* These findings suggest that male and female brokers behave differently, and that gender differences in skill and risk preferences extend to their client coverage. Focusing on the stand-alone variables *AMC, Bank, Ins/Pens, Sov/Publ,* and *Other,* we show that asset management companies, insurance companies and pension funds are lucrative clients for brokers.

Next, we study which clients get allocated to male or female brokers and whether specific financial products are more frequently sold by men or women. Odds ratio estimates for *Female* in Table 3 show that female brokers are 2.9, 7.8, and 5.7 times more likely to sell to banks, insurance companies and pension funds, and sovereign and public sector organisations, respectively, compared to other

Table 1
Variable characteristics.

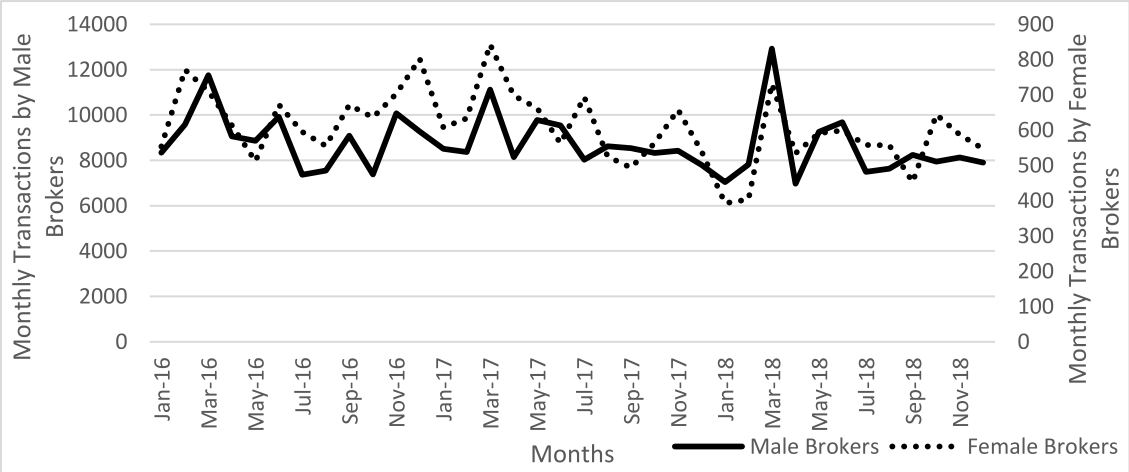
Panel A: Descriptive Statistics

	Mean	StDev	p25	Median	p75
Female	0.065	0.247	0	0	0
Fee (€/transaction)	148.17	350.912	9.92	39.23	116.16
LnFee	3.552	1.839	2.316	3.686	4.782
Transactions (per day)	533	435	364	449	586
For Female Brokers:					
Fee (€/transaction)	352.308	634.335	15.75	68.855	319.711
LnFee	4.303	2.064	2.964	4.317	5.852
Transactions (per day)	36	26	25	31	37
For Male Brokers:					
Fee (€/transaction)	133.974	317.211	9.701	37.591	108.67
LnFee	3.501	1.811	2.303	3.67	4.709
Transactions (per day)	509	447	338	420	555

Panel B: Client Transactions per Product

	Corporates	Banks	AMC	Ins / Pens	Sov / Publ	Other
Derivatives	100%	52%	33%	3%	0%	0%
FX	0%	11%	10%	3%	45%	69%
FI	0%	27%	57%	89%	15%	30%
MM	0%	10%	0%	5%	40%	1%

Panel C: Time Trend of Transactions by Female and Male Brokers



This table provides descriptive statistics for the main variables (Panel A) and the portfolios of investors (Panel B), as well as, the time trend of transactions by female and male brokers (Panel C). The sample contains 336,401 daily transactions by brokers from 4 January 2016 to 31 December 2018. Female is a dummy variable equal to one for transactions by female brokers, and zero otherwise. Fee is the fee per transaction in EURO. LnFee is the natural logarithm of transaction fee. Transaction is the total amount of daily transactions by brokers. Each of FX, FI, MM, Corporates, Banks, AMC, Ins/Pens, Sov/Publ, and Other represent a financial product or a client i.e., foreign exchange, fixed income, money market, corporate, bank, asset management company, insurance company and pension fund, sovereign and public sector or, other, respectively.

clients. However, AMCs and 'other' clients are more likely to be handled by male brokers as the odds of women representing these clients drop by 0.37 and 0.81 times, respectively. These results imply a mismatch between certain clients and brokers that has not yet been documented in the literature. Recall how males are more successful with banks and insurance companies and pension funds, yet those clients are usually allocated to female brokers. Similarly, 'other' clients seemingly favour male brokers, however it is women brokers who in fact engage in more successful transactions with this client segment.

In Table 3, we show how female brokers tend to execute less risky financial products, i.e., FI, for which they are also more successful than males as revenue generators. This is consistent with our conjecture, and our findings in Table 2. In particular, FI transactions are 55.9 times more likely to be executed by female brokers, while the odds of FX and MM transactions being traded by women decrease by 0.01 and 0.001 times respectively. This finding supports the argument that overconfident male brokers prefer selling riskier financial products.

4. Conclusion

Our analysis of 336,401 daily transactions by financial brokers at a large European bank reveals how sales behaviour varies by gender. Female brokers focus on selling lower risk products less frequently and for higher fees to more conservative clients. Male

Table 2
Analyses of broker behaviour.

Panel A: Broker Product Sales					Panel B: Clients of Brokers					
	LnFee					LnFee				
	I	II	III	IV		I	II	III	IV	V
Female × Transaction	-0.155**				Female × AMC	-0.035				
	(0.007)					(0.030)				
Female × FX		-3.171***			AMC	0.969***				
		(0.296)				(0.006)				
FX		1.131***			Female × Bank		-0.428***			
		(0.008)					(0.028)			
Female × FI			1.515***		Bank		-0.845***			
			(0.295)				(0.006)			
FI			0.200***		Female × Ins/Pens			-0.802***		
			(0.006)					(0.065)		
Female × MM				-0.587	Ins/Pens			1.668***		
				(0.475)				(0.036)		
MM				2.661***	Female × Sov/Publ				2.771***	
				(0.012)					(0.073)	
					Sov/Publ				0.016	
									(0.024)	
					Female × Other					1.205***
										(0.055)
					Other					-0.627***
										(0.011)
Transaction	0.189	0.388	0.001	0.005	Transaction	0.006	0.307	0.157	0.160	-0.002
	(1.733)	(1.671)	(1.201)	(0.750)		(4.176)	(1.956)	(1.256)	(1.412)	(6.123)
Female	0.563***	1.097***	0.688**	1.105***	Female	0.562***	0.815***	0.324***	0.312***	0.232***
	(0.036)	(0.014)	(0.295)	(0.014)		(0.018)	(0.020)	(0.016)	(0.015)	(0.016)
Time, Client FE	YES	YES	YES	YES	Time, Product FE	YES	YES	YES	YES	YES
Adj. R^2	0.116	0.186	0.110	0.116	Adj. R^2	0.284	0.273	0.228	0.226	0.231
Observations	330,896	330,896	330,896	330,896	Observations	330,896	330,896	330,896	330,896	330,896

This table presents the difference-in-difference analysis estimates for *Female, Transaction, FX, FI, MM, AMC, Bank, Ins/Pens, Sov/Publ, Other* and their interaction terms as the main explanatory variables. An intercept is included in the regression, but not reported in this table for brevity. Dependent variable is Ln*Fee*, as the natural logarithm of transaction fee. Control variables are *Transaction*, as the total amount of daily transactions by brokers in thousands; *Female,* as a dummy variable equal to one for transactions by female brokers, and zero otherwise; *FX, FI, MM, AMC, Bank, Ins/Pens, Sov/Publ,* and *Other*, as dummy variables equal to one if the financial product or the client is foreign exchange, fixed income, money market, asset management company, bank, insurance company and pension fund, sovereign and public sector or, other, respectively, and zero otherwise. Main explanatory variables are the interaction between *Female* and *FX, FI, MM* in Panel A; and *AMC, Bank, Ins/Pens, Sov/Publ, Other* in Panel B. Day, product, and client fixed effects are included. Robust standard errors are reported. The *** indicates statistical significance at the 1% level.

Table 3
Analysis of financial products and clients.

	FX I	FI II	MM III	AMC IV	Bank V	Ins/Pens VI	Sov/Publ VII	Other VIII
Female	0.009***	55.948***	0.001***	0.365***	2.907***	7.818***	5.748***	0.810***
	-0.001	-6.207	0	-0.006	-0.043	-0.344	-0.329	-0.024
Fee	1.001***	0.999***	1.002***	1.001***	0.999***	1.001***	1.001***	0.998***
	0	0	-0.001	0	0	-0.001	-0.001	0
Transaction	1.001***	0.998***	0.998***	0.999***	0.993***	0.999***	1.001***	1.000***
	-0.001	-0.001	-0.001	0	-0.003	-0.001	-0.001	0
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Product FE	NO	NO	NO	NO	YES	YES	YES	YES
Client FE	YES	YES	YES	YES	NO	NO	NO	NO
Pseudo R^2	0.167	0.118	0.211	0.046	0.013	0.119	0.248	0.246
Observations	330,896	330,896	330,896	330,896	330,896	330,896	330,896	330,896

This table reports logistic regression analysis estimates for average *Female* along *Fee* and *Transaction* as control variables. An intercept is included in the regression, but not reported in this table for brevity. Dependent variables are *FX, FI, MM, AMC, Bank, Ins/Pens, Sov/Publ,* and *Other*. Each of them is a dummy variable equal to one if the financial product or the client is foreign exchange, fixed income, money market, asset management company, bank, insurance company and pension fund, sovereign and public sector or, other, respectively, and zero otherwise. *Female* is a dummy variable equal to one for transactions by female brokers, and zero otherwise. *Fee* is the fee per transaction in EURO. *Transaction* is the total amount of daily transactions by brokers in thousands. Day, product, and investor fixed effects are included. Standard errors are robust. Odds Ratios (exponential of betas) and standard errors of betas are reported. The *** indicates statistical significance at the 1% level.

brokers sell higher risk products to more risk loving clients more frequently, but for lower fees. Our contribution to the debate on the benefits of women in quantitative sales roles is to show that combining female and male brokers can lead to a less homogeneous and more successful sales culture. Gender diversity can help the institution sell a wider range of products to a broader range of clients, more profitably.

Future research is needed to expand our understanding of the benefits of brokerage teams with better gender diversity and equality. We need to investigate the barriers to women self-selecting into these roles and the support structures that surround brokers of all genders. Our findings also offer profitability, product and client diversification as further motivations for institutions to increase the proportion of women in brokerage. Managers and policy makers need to increase their efforts to encourage women into quantitative sales roles, advertise the value of female skills and reward them appropriately.

CRediT authorship contribution statement

Raul Riefler: Data curation. **Onur Kemal Tosun:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Ylva Baeckström:** Conceptualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

None.

Data availability

Data will be made available on request.

References

Aristei, D., Gallo, M., 2022. Assessing gender gaps in financial knowledge and self-confidence: evidence from international data. Financ. Res. Lett. 46, 102200.

Baeckström, Y., Marsh, I.W., Silvester, J., 2021. Variations in investment advice provision: a study of financial advisors of millionaire investors. J. Econ. Behav. Organ. 188, 716–735.

Barber, B.M., Odean, T., 2001. Boys will be boys: gender, overconfidence, and common stock investment. Q. J. Econ. 116, 261–292.

Bauer, R., Cosemans, M., Eichholtz, P., 2009. Option trading and individual investor performance. J. Bank. Financ. 33, 731–746.

Bellstrom, K. and Hinchliffe, E. (2019). What we've learned from 5 years of big tech diversity reports: the broadsheet. Fortune. [Online]. Available at: https://fortune.com/2019/10/11/what-weve-learned-from-5-years-of-big-tech-diversity-reports-the-broadsheet/ [Accessed 08 February 2023].

Benabou, R., 2013. Groupthink: Collective delusions in organizations and markets. Rev. Econ. Stud. 80, 429–462.

Brooks, C., Sangiorgi, I., Hillenbrand, C., Money, K., 2019. Experience wears the trousers: exploring gender and attitude to financial risk. J. Econ. Behav. Organ. 163, 483–515.

Charness, G., Gneezy, U., 2012. Strong evidence for gender differences in risk taking. J. Econ. Behav. Organ. 83, 50–58.

Cueva, C., Rustichini, A., 2015. Is financial instability male-driven? Gender and cognitive skills in experimental asset markets. J. Econ. Behav. Organ. 119, 330–344.

DataUSA, 2021. Covid-19 in numbers: finance and insurance. [Online]. Available at: https://datausa.io/prole/naics/nance-insurance [Accessed 17 February 2023].

Deaves, R., Lüders, E., Schröder, M., 2010. The dynamics of overconfidence: evidence from stock market forecasters. J.Econ. Behav. Organ. 75, 402–412.

Girardone, C., Kokas, S., Wood, G., 2021. Diversity and women in finance: challenges and future perspectives. J. Corporate Financ. 71, 101906.

Healy, G., Ahamed, M.M., 2019. Gender pay gap, voluntary interventions and recession: the case of the British financial services sector. Br. J. Ind. Relations 57, 302–327.

Hospido, L., Laeven, L., Lamo, A., 2019. The gender promotion gap: evidence from central banking. Rev. Econ. Statistics 1–45.
Jackson, A.R., 2005. Trade generation, reputation, and sell-side analysts. J. Financ. 60, 673–717.
Karmaziene, E., 2023. The greater the volume, the greater the analyst. Financ. Res. Lett. 51, 103377.
Madden, J.F., 2012. Performance-support bias and the gender pay gap among stockbrokers. Gender & Soc. 26 (3), 488–518.
Martínez-García, I., Terjesen, S., Gómez-Ansón, S., 2022. Board gender diversity codes, quotas and threats of supranational legislation: impact on director characteristics and corporate outcomes. Br. J.Manag. 33 (2), 753–783.
Niederle, M., Vesterlund, L., 2007. Do women shy away from competition? Do men compete too much? Q. J. Econ. 122, 1067–1101.
Niessen-Ruenzi, A., Ruenzi, S., 2019. Sex matters: gender bias in the mutual fund industry. Manag. Sci. 65, 3001–3025.
Song, F., Thakor, A.V., 2019. Bank culture. Journal of Financial Intermediation 39, 59–79.
Stalebrink, O.J., Sacco, J.F., 2006. Public sector investment failures: theoretical contributions from new institutional and Austrian economic theory. J. Public Budgeting, Accounting & Financ. Manag. 18, 337–351.
Tosun, O.K., El Kalak, I., Hudson, R., 2022. How female directors help firms to attain optimal cash holdings. Int. Rev. Financ. Anal. 80 (1–20), 102034.
Yang, P., Riepe, J., Moser, K., Pull, K., Terjesen, S., 2019. Women directors, firm performance, and firm risk: a causal perspective. The Leadership Q. 30, 101297.