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Do Women Receive Worse Financial Advice?

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ABSTRACT

We arranged for trained undercover men and women to pose as potential clients and visit all 65 local financial advisory firms in Hong Kong. At financial planning firms, but not at securities firms, women were more likely than men to receive advice to buy only individual or only local securities. Female clients who signaled high confidence, high risk tolerance, or a domestic outlook were especially likely to receive this suboptimal advice. Our theoretical model explains these patterns as a result of statistical discrimination interacting with advisors' incentives. Taste-based discrimination is unlikely to explain the results.

> *"Do you have your husband's permission to buy this financial product?"*
> A question to a female finance professor from a financial advisor

IN MANY PARTS OF THE world, as women become wealthier, they are participating more in financial markets. Their investment choices can have important consequences for their financial outcomes and economic empowerment. To the extent that individuals, especially women, seek advice from finance professionals before making investment decisions (Chater, Huck, and Inderst (2010), Federal Reserve Board (2016)), it is important to evaluate the quality of this advice and to understand the factors influencing it.[1]

We conducted an audit study to examine whether financial advice varies by client gender. During 2018 to 2019, we arranged for undercover "auditors" to visit the offices of all local Hong Kong financial advisory firms that cater to retail investors. At each visit, they followed a free-flowing prepared script and engaged financial advisors in conversation, explaining that they wanted to invest toward their retirement and requesting recommendations for specific financial products. Each auditor was assigned to play a particular role (or "avatar") consisting of three attributes: high or low risk tolerance, high or low confidence, and domestic or international outlook.[2] After the visit, they answered an online exit survey questionnaire to report information about the interview, including the names of the products the advisor had recommended. Since we induced experimental variation in the assignment of auditor gender and avatars to financial advisors and randomly matched auditors to financial advisory firms, the advice that we observe is not confounded by endogenous matching or by underlying differences in these auditor characteristics.[3] This allows us to cleanly separate how advisors responded to the auditor's gender and their signaled attributes, and whether the same attribute elicited different responses depending on client gender.

A key challenge in a study such as ours is how to objectively evaluate the quality of financial advice. The optimal portfolio for any investor is a function of many attributes, both observed and unobserved by the researcher. In addition, any self-reported measure of advice quality is likely to involve subjective

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[1] About 46% of all investors at the Hong Kong Stock Exchange in 2014 were women (Hong Kong Exchange and Clearing Limited (2014)). It is possible that women in Hong Kong participate in financial markets more than women elsewhere. In a 2017 online survey, 62% of female respondents in Hong Kong, but only 5% of women respondents in the United Kingdom said, they planned to invest in stocks (IP Global (2017)). The experience of Hong Kong women may predict future patterns as women in other regions become more active investors.

[2] A large literature has found that women are more risk-averse and less confident in their ability to save and invest than men, they make more conservative financial choices, and they trade less frequently (Bajtelsmit and Bernasek (1996), Barber and Odean (2001), Bertrand (2010), Merrill Lynch (2018)).

[3] Gender discrimination in financial markets has been studied by Annan (2020), Alesina, Lotti, and Mistrulli (2013), Brock and De Haas (2019), and Egan, Matvos, and Seru (2018). Although Mullainathan, Noeth, and Schoar (2012) did not design their audit study explicitly to identify gender differences, they found that female investors were discouraged from buying actively managed or international funds, while they were encouraged to hold more liquid assets than men.

judgment.[4] Financial shocks can also prevent ex ante optimal advice from generating high returns ex post. Our approach is to classify financial advice as suboptimal if it exposes the client to uncompensated risk. Specifically, we identify as "undiversified" advice that consists only of recommendations to purchase individual risky securities, and as "home-biased" advice that consists only of recommendations to purchase local securities.[5] This is because, in both situations, the recommended financial products expose the client to idiosyncratic risk, for which there is no corresponding compensation.[6]

Our data suggest that, on average, retail clients in Hong Kong receive advice of poor quality. In 38% of the audit visits, the advisors recommended individual risky securities only. Similarly, in 39% of the visits, the advisors recommended local securities only.

The unique empirical context of Hong Kong allows us to investigate deeper. Within the same market, we observe two different business models for financial advisory firms. We find that advisors recommended the purchase of risky individual securities only in 41% of the audit visits to securities firms (SFs), where revenue is mainly earned through trading commissions. In contrast, at financial planning firms (FPs), where commissions come from a larger variety of products, advisors suggested risky individual securities only in a significantly lower 25% of visits.

Remarkably, although SFs were more likely to give suboptimal advice overall, they did not differentiate between male and female clients. In contrast, FPs, who on average gave better advice, were significantly more likely to give suboptimal (single-security or home-biased) advice to female than to male auditors. They were especially likely to give this suboptimal advice to female auditors who signaled that they were risk tolerant or confident, or if they indicated that they had a domestic outlook.

Our stylized theoretical model rationalizes this pattern as the result of advisors' incentives together with stereotypical beliefs about advisees'

[4] Wang (1994) and Borzykowski (2013) note that financial advisors spend less time with female than with male clients and offer them fewer product choices, and show that women nonetheless report greater satisfaction with their advisors than men do.

[5] As we show in Section VI.D, our results remain qualitatively similar when we instead use market-adjusted returns for the recommended securities as an ex-post measure of advice quality. Advice quality can also be measured in terms of the management fee, since regardless of advisee characteristics, the lowest fee index fund is the optimal choice for every investor (Elton, Gruber, and Busse (2004), Choi, Laibson and Madrian (2010), Mullainathan, Noeth, and Schoar (2012), Bucher-Koenen et al. (2020)). We cannot use this metric here, because only three funds in Hong Kong are linked to the broad index. The literature has also examined the aggressive sale of products by agents who receive high commissions from originating financial firms (Robles-Garcia (2020)). We do not have detailed data on the commissions that the advisors receive for selling these other financial products.

[6] It is important to note that investing in individual securities only or local securities only cannot be optimal even for clients who would like to take on high degrees of risk. For such clients, individual risky securities are dominated by a high-beta risky portfolio because the latter involves systematic (not idiosyncratic) risk and compensates for it. If the investor does not have enough leverage, they can construct such a portfolio by only buying high beta securities. This could explain why there is abnormally high demand for high-beta securities (Frazzini and Pedersen (2014)).

financial knowledge.[7] In the same spirit as a well-established literature, financial advisors in our model face a conflict between increasing the commissions generated from a client-advisor relationship and increasing the chance that the client maintains the relationship (Mehran and Stulz (2007), Stoughton, Wu, and Zechner (2011), Inderst and Ottaviani (2012a, 2012b, 2012c), Chen and Gesche (2017)). Specifically, advisors' commissions increase in the number of trades the clients carry out. This creates an incentive to recommend several individual products rather than a single diversified product, such as an exchange-traded fund (ETF) consisting of a portfolio of securities. However, clients who dislike their advice will not return. Advisors therefore have an incentive to "cater" their advice to clients' signaled preferences. For example, they may give high-risk advice to risk-tolerant and confident clients, and home-biased advice to clients with a domestic outlook. At the same time, however, financially knowledgeable clients will detect suboptimal advice and discontinue the relationship. If advisors perceive that female clients are less discerning (Lusardi and Mitchell (2008), Bucher-Koenen et al. (2016), Bertrand (2020), Klapper and Lusardi (2020)), they will be especially likely to recommend individual, risky (or local) securities to female clients who signal that they are risk tolerant, confident, or domestic oriented.

The institutional context in Hong Kong provides an ideal setting to test the importance of advisors' incentives. SFs in Hong Kong are able to conduct trades on the stock exchange and therefore keep the entire trading commission on clients' securities trades. They operate a low-fee, low-service business model, attracting clients with moderate levels of financial knowledge who seek general financial advice but are mainly looking to place trading orders, and they have a strong incentive to recommend individual risky securities, where they pocket the entire commission. FPs in contrast are not licensed to trade on the exchange and must therefore delegate clients' trading orders to other brokers. Accordingly, they keep only a fraction of clients' trading commissions. Indeed, their revenue is more diversified, since they earn commissions from selling a larger variety of financial products, many of which are bought and then held for considerable durations. Accordingly, they operate a high-fee, high-service business model and attract clients with low levels of financial knowledge who require detailed advice. It follows that SFs are more likely than FPs to give undiversified advice.

We assume there are underlying differences in the distribution of financial knowledge among men and women, such that a relatively small proportion of women are highly financially knowledgeable and a relatively large proportion have low financial knowledge. Combined with the general pattern whereby financial planners attract investors with lower financial knowledge, this implies that among the clients of FPs, women have on average lower financial knowledge than men do, whereas among the clients of SFs, the gender difference in

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[7] Alternatively, advisors themselves may lack financial knowledge (Linnainmaa, Melzer, and Previtero (2021)). However, this is unlikely to explain our results, since all advisors in our study had passed a licensing exam set by the Securities and Finance Commission (SFC) of Hong Kong.

financial knowledge is less pronounced. As a result, FPs are more likely to give suboptimal advice to women than to men, whereas SFs are relatively unlikely to distinguish their advice by client gender.

Our model suggests that while advisors' conflicts of interest contribute to low-quality advice, these conflicts of interest alone do not generate gender differences in advice. SFs, which have the strongest conflicts of interest, *do not* differentiate by client gender. Instead, it is the *interaction* between advisors' incentives and their beliefs about clients' financial knowledge that drives the gender differences that we document.

Our work contributes to the broad literature that tries to establish the underlying cause for differential treatment by client gender (Feins and Bratt (1983), Ayres and Siegelman (1995)). An alternative explanation for gender differences in advice quality is that advisors have a distaste for advising confident, risk-tolerant women, who defy their gender stereotypes.[8] However, this taste-based explanation predicts similar gender differences in advice at both securities and financial planning firms. Our finding that gender differences arise only among financial planners suggests that advisor incentives interact with stereotypes about women's lower financial knowledge to generate the patterns we observe.

This paper also contributes to a recent strand of the literature that finds that female investors receive worse financial advice than men. Baeckstrom, Marsh, and Silvester (2021) study high-wealth investors in the United Kingdom and find that female clients of female advisors hold significantly less cash (i.e., carry more risk) in their portfolios than do the male clients of female advisors. Bucher-Koenen et al.'s (2020) analysis of approximately 27,000 real advisor-client meetings at a German bank finds that advisors are more likely to advise women to purchase bank-owned high-cost funds. Our audit study approach allows us to randomize client characteristics, which enables us to rule out the possibility that advisors' recommendation of individual risky securities might be an optimal response to preferences of females that we do not observe. In the absence of such variation, Bucher-Koenen et al. (2020) argue circumstantially that the advice to purchase high-cost funds could not have been a response to greater unobserved female demand for such products, since financially knowledgeable women are more likely to reject this advice.

Since our institutional context includes two different types of advisory firms, we are also able to examine how advisor incentives affect the quality of their advice. We further model the role of investors' financial knowledge in their decisions to seek financial advice and from whom. This endogenous matching of clients to advisory firms plays a key role in our paper. As we argue below, it

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[8] Statistical discrimination refers to the phenomenon whereby the principal attributes to the individual the traits of their average group member (Phelps (1972), Arrow (1973)), whereas taste-based discrimination occurs when the principal receives disutility from interacting with an individual of a particular group (Becker (1957), Yinger (1986)).

interacts with the different incentives of the two firm types to produce different patterns of gender differences in advice quality.[9]

Since we generated the data through an audit study, we only observe how financial professionals advise walk-in prospective clients at the initial point of contact. As a result, we cannot see the trades that clients (would) ultimately end up making (if they had been real clients). Moreover, in principle, it is possible that advisors change course and improve their advice to female clients in subsequent meetings. However, that would imply that advisors change course more with their female than male clients, and even then, the central question would remain: Why do financial advisors treat female clients differently? Our paper provides novel answers to this question.

The paper is organized as follows. Section I describes the institutional context for our study. Section II develops the theoretical model that guides our empirical analysis. Section III details our study design. Section IV checks whether our audits were balanced across different auditor avatars and advisory firm branch offices, and describes our auditors' characteristics. Section V presents our main results. In Section VI, we discuss supplementary results. Section VII concludes.

I. Institutional Context

In 2019, the market capitalization of listed domestic companies in the Hong Kong Exchange (HKEX) was USD 4.9 trillion, making Hong Kong one of the world's top financial centers (World Bank (2019)). Individual retail investors are important players in this market. According to the Hong Kong Exchange and Clearing Limited (2014), 36.5% of the adult population of Hong Kong directly owned stocks and/or derivatives listed on the HKEX, and nearly one-half of these retail equity investors were women. As women's education, labor force participation, and wealth increase worldwide, and they become important clients of the retail advising industry, insights from Hong Kong's advising industry can provide insights into what to expect.

Although they are increasingly important as a market segment, women in Hong Kong continue to be less financially knowledgeable than men. In a 2018 representative sample of Hong Kong adults, men scored higher than women on a financial literacy test and self-reported higher levels of confidence in their financial knowledge (Investor Education Centre (2018)). It is likely that financial advisors take these differences into account when advising their clients.

In Hong Kong, only individuals who hold a Type 4 license issued by Hong Kong's Securities and Futures Commission are allowed to practice as financial advisors (Securities and Futures Commission (2020)).[10] They are employed by

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[9] Bucher-Koenen et al. (2020) study advisors who are employees of the same bank and are implicitly assumed to face the same incentive structure. While it is possible that the clients in their data may have matched to advisors endogenously, this matching does not play an important role in their analysis.

[10] A Type 4 license is only granted to individuals who pass several exams testing for local regulatory information and financial knowledge (Hong Kong Securities and Investment Institute (2022)).

FPs as well as by SFs. Advisors employed by banks fall outside the scope of our study since only the bank's clients can approach them for advice, and their recommendations are limited to the products that the bank sells.

SFs provide a trading platform for individual investors. Financial advisors at such firms are referred to as "account executives." SFs are full-service brokers, who advise clients upon request, but many of their investors are self-directed. In contrast, FPs provide personalized wealth management advice. The financial advisors who work at FPs are referred to as "relationship managers." They mainly work with clients looking to delegate their investment decisions.

Advisors' incentives to recommend particular products likely depend on the revenues they earn from their advice. Our focus in this paper is on the commissions they earn from trading securities for their clients. This is because we can make clear comparisons of advice quality when it comes to recommendations about traded securities. Since they are licensed to directly trade on the local stock market, SFs retain the entire commission they receive from clients. In contrast, FPs are not authorized to trade directly and hence must pass the client's order onto a broker and share the trading commission with them. Thus, within the class of individual risky local securities, SFs stand to earn a larger trading commission than FPs do. SFs therefore have a larger incentive to recommend risky local securities than FPs. However, Hong Kong–based financial advisory firms cannot directly execute trades on international stock exchanges. If a client wishes to purchase an international security, both SFs and FPs must delegate the order to an international broker and share a similar fraction of the commission with this broker. Therefore, the larger commissions from local securities incentivize advisors to recommend more local securities than international securities. However, both SFs and FPs face the same reward for selling international securities, because these securities generate the same small commissions for both advisory firm types.

In addition to trading commissions, advisory firms also receive commissions from fund houses or insurance companies for selling their (nontraded) products. They may also receive a fraction of the management fee that the client pays the mutual fund house each year. Importantly for our purposes, these commissions, and therefore the incentive to sell these products, are similar for SFs and FPs. Clients also pay the advisory firm a fee equal to a percentage of the client's assets under the firm's management (AUM). These fees tend to be significantly smaller at SFs than at FPs (in some cases, SFs may not charge fees at all).[11]

II. Model

Our theoretical model provides the framework to analyze and interpret our empirical findings. Below we first describe how men and women differ in

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[11] We do not have data on the commission rates from different fund houses or insurance companies. Also, since this is an audit study, the auditors do not have existing portfolios with these firms, and thus we cannot compute advice quality metrics based on such data.

financial knowledge, and how this influences their choice of financial advisory firm to visit. We then discuss how the different incentives that financial advisors face at these different firms affect their product recommendations, and how these incentives differ by client characteristics such as risk tolerance, confidence, geographic outlook, and gender.

A. Demand: Matching of Investors to Financial Advisors

Individual investors vary in their ability to evaluate the menu of financial products. Assume that the financial knowledge of investor i belonging to gender g is described by the random variable x_{ig}. Further assume that female investors' financial knowledge follows the distribution $G_F(\cdot)$, while men's financial knowledge follows the distribution $G_M(\cdot)$.

Financial advisors can assist investors in making their product selections. Investors incur costs when they engage an advisor, namely, a fee and a variable commission per trade. Advisors' incentives may not be aligned with those of the investor, in which case, they may give suboptimal advice.

We assume that each investor compares the benefit and cost of seeking advice and decides whether to approach an advisor. Since investors with low financial knowledge find it costly to collect and process financial information, they benefit from seeking financial advice (Willis (2011)). Highly knowledgeable investors face lower costs, and accordingly can make investment decisions without assistance. Assume that if financial knowledge x_{ig} lies above the cutoff β, the investor does not seek any advice.[12]

Investors who seek advice include (i) those with moderate financial knowledge who expect to receive a small (but positive) net benefit from advice and (ii) those with low knowledge who expect a large net benefit. Advisory firms charge a fee (fixed or percentage of AUM) and trading commissions. As we note above, the industry offers two different levels of service: In the low-service model, the firm charges a low fee; in the high-service model, it charges a high fee. Both firms charge identical per-trade commissions. In our data, we map the low-service firms to SFs and the high-service firms to FPs. We conjecture that those with moderate knowledge, that is, with $\alpha \leq x_{ig} \leq \beta$, find that their net benefit is larger if they visit SFs, while those with low knowledge, that is, $x_{ig} < \alpha$, find that the net benefit is larger if they visit FPs. SFs and FPs therefore serve two distinct market segments. In Section II.C below, we will show that this conjecture holds in equilibrium in our model.[13]

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[12] As Stolper and Walter (2017) discuss, several scholars have found that financial knowledge and financial advice are "substitutes," or that less knowledgeable individuals are more likely to seek advice (Yoong and Hung (2009), Chalmers and Reuters (2012), Disney et al. (2015)). This also rationalizes the regulatory oversight of financial advisors, aimed at preventing them from misleading susceptible investors. Note, however, that financial knowledge also tends to be correlated with wealth, income, education, and age—which also predict the likelihood that the individual has discretionary income to invest—and this could explain why some studies find that those who seek advice are more knowledgeable than those who do not (Collins (2012), Finke (2012)).

[13] The intuition is as follows. In this equilibrium, there should be no incentive for investors to deviate. Even if investors with moderate knowledge who visit SFs knew that they had received
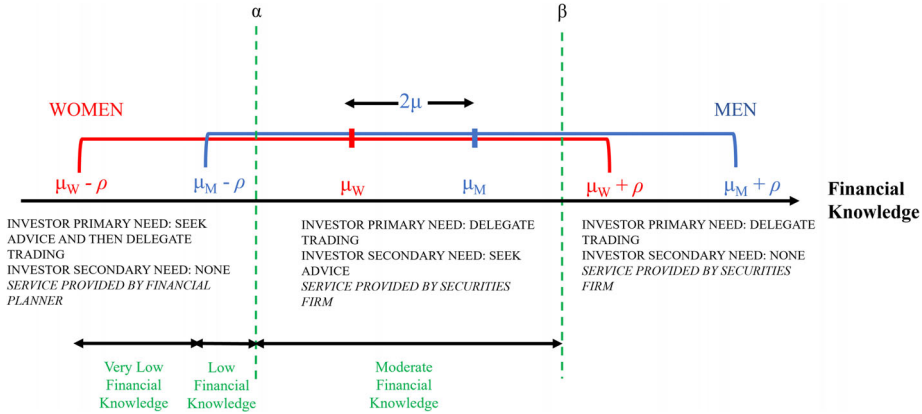
Figure 1. Matching of investors to financial advisors. The figure shows the distribution of financial knowledge for women (in red) and men (in blue). Individuals above knowledge level β do not visit any advisor, those with knowledge level between α and β visit securities firms, and those with knowledge level below α visit financial planners. (Color figure can be viewed at wileyonlinelibrary.com)

A well-established empirical literature finds that women are less financially knowledgeable than men (see, for example, Lusardi and Mitchell (2008), Bucher-Koenen et al. (2016)). Accordingly, we assume that the distribution of men's financial knowledge, $G_M(\cdot)$, has the same shape as the women's distribution, $G_F(\cdot)$, but lies everywhere to its right, shifted by a constant 2μ. This is a special case of the condition that the men's density function of financial knowledge first-order stochastically dominates that of women. For simplicity, assume that the distribution functions are uniform. In Figure 1, both men's and women's distributions have the range 2ρ, but the distribution for men is shifted to the right by 2μ. As discussed above, investors with high financial knowledge do not visit advisors, investors with medium financial knowledge visit SFs, and those with low financial knowledge visit FPs.

B. Supply: Financial Advisors' Choice of Advice Quality

By construction, advisors who give optimal advice earn a commission of zero. Building on Inderst and Ottaviani's canonical framework (2012a, 2012b, 2012c), we can formally write advisor a's payoff if they recommend that investor i purchase individual risky securities as

$$\Pi_a = \underbrace{\left[f_a + m_a(\gamma)\right]\left[\theta\left(r_i, c_i, o_i, x_{ig}\right)\right]}_{\text{benefit}} - \underbrace{C(\gamma)}_{\text{cost}}, \tag{1}$$

low quality advice, they would not deviate to FPs, because their marginal benefit from FPs' better advice is too small to cover the larger fee. Similarly, low-knowledge investors who know that they receive high-quality advice from financial planners have no incentive to deviate to SFs, because their loss from the resulting decline in the quality of advice outweighs the gain from paying a smaller fee.

where $\gamma \in [0, \infty)$ indicates the quality of advice. Specifically, optimal advice is indicated by $\gamma = 0$, and as the quality of advice worsens, γ increases. The benefit from suboptimal advice is the expected value of future revenue, which is the fee, f_a, and the commission, m_a, weighted by the probability, θ, that the client maintains the relationship.

B.1. Fee f_a and Commission m_a

The fee, f_a, does not vary with advice quality, but the commission $m_a(\cdot)$ increases in γ. Trade commissions increase in each additional risky individual security the advisor recommends. As discussed above, SFs earn the entire broker's commission, whereas FPs, unless they are licensed as brokers, must pass the client's order onto a broker and retain only a share of the commission. This allows us to write $m_{SF}(\gamma) > m_{FP}(\gamma)$ for individual risky securities. Also, as discussed in Section I, $f_{SF} < f_{FP}$.[14]

B.2 Probability of Retention θ

Clients are more likely to maintain their relationship with an advisory firm if they view its advice favorably. This depends in part on whether the advice aligns with, or in other words, the advisor "caters to," the client's exhibited preferences (Mullainathan, Noeth, and Schoar (2012)). For example, highly risk-tolerant clients and highly confident clients are more likely than those with low risk tolerance or low confidence to maintain relationships with advisors who recommend risky securities. Similarly, investors with a domestic outlook are more likely than those with an international outlook to maintain relationships with advisors who recommend domestic securities.[15]

Accordingly, we assume that for a given level of γ, the probability θ that the investor maintains the relationship is increasing in the client's risk tolerance level (r) and confidence (c). However, since knowledgeable clients likely recognize that the advice is suboptimal, the positive effect of catering is tempered. In other words, more knowledgeable clients are less responsive to catering. Formally, θ increases with r and c by less if the client is more knowledgeable.

As discussed above, Figure 1 shows that clients with financial knowledge between α and β —defined as "moderate" knowledge—visit SFs. Given the truncated distributions of financial knowledge between α and β, when an

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[14] Chalmers and Reuter (2020) find a broadly similar pattern among investment providers in the Oregon University System's Optional Retirement Plan: "HIGH" brokers who provide personalized, face-to-face service charge a higher fee while "LOW" brokers provide less personalized advice and charge lower fees.

[15] Advice that caters to clients' risk tolerance or confidence need not be suboptimal. As discussed in footnote 6, advisors could suggest that highly-risk tolerant or confident clients buy high-beta portfolios instead of individual risky securities. However, to cater to clients who have a domestic outlook or who prefer famous or interesting securities, the advisor would have to suggest domestic or individual risky securities, which would be suboptimal advice.

SF observes both a male and a female client, they expect both of them to have the same moderate financial knowledge level.[16] In contrast, FPs only receive clients whose knowledge is below the level α, and a greater percentage of women fall in this segment than do men. Therefore, as we can see in Figure 1, FPs expect their female clients to be less knowledgeable than their male clients.[17]

In Table I, we show the net effect of these different forces on the probability θ that an advisor who gives suboptimal advice retains the client.

For example, consider an advisor at an SF who receives a male client. If the client signals that he is highly risk tolerant or highly confident, then suboptimal advice caters to this preference and increases the likelihood that he returns. However, since he has moderate financial knowledge as discussed above, he is moderately likely to detect that the advice is suboptimal, which can deter him from returning. In Table I, the net effect of these two opposing forces is captured by $\theta = a + d$. If, instead, the client had signaled that he had low risk tolerance or low confidence, then suboptimal advice would not even match his preferences. Accordingly, the likelihood that he returns is lower ($\theta = a$). Since the SF expects both male and female clients to have the same moderate level of financial knowledge, the same reasoning applies when the advisor is approached by a female client. Thus, in our model, SFs do not vary the quality of advice by client gender.

At an FP firm, an advisor that receives a male client expects him to have low financial knowledge. If, in addition, the client signals that he has low risk tolerance or low confidence, then advice to purchase individual securities does not generate any additional benefit in retention probabilities, but it is also relatively unlikely that the client detects that the advice is suboptimal. Therefore, compared to a male client with the same low risk tolerance and confidence who visited an SF, FPs have greater incentive to advise this client to purchase an undiversified or home-biased product. Accordingly, we set $\theta = a + b$.[18] If instead the client was female, the advisor would expect her to have very low financial knowledge, in which case, it would be extremely unlikely

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[16] If financial knowledge follows a uniform distribution and α and β lie in the range ($\mu_M - \rho$, $\mu_W + \rho$), men and women who visit SFs will have the same financial knowledge in expectation. Section I of the Internet Appendix shows that if financial knowledge follows a normal distribution, then a different range condition will ensure that the expected gender difference in the financial knowledge will be smaller for SF than for FP clients. The Internet Appendix is available in the online version of this article on *The Journal of Finance* website.

[17] Our audit study does not allow us to test whether this assumption holds in practice in our empirical context. However, our calculations using data from the nationally representative Health and Retirement Study (wave 2016) in the United States suggest that among respondents who seek paid professional financial advice, women have less financial literacy than men. Among those who obtain such advice for free, there is no appreciable gender difference in financial literacy. Details about our tests and the empirical findings are provided in Internet Appendix Table IA.XII. The Internet Appendix is available in the online version of this article on who *The Journal of Finance* website.

[18] All the parameters—*a, b, c, d, e*, and *f*—are positive. No other conditions are needed. However, to avoid cluttering the figures, we assume in Figures 2, 3, and 4 that $d > a + b$.

Table I

Probability of Retaining Clients after Giving Suboptimal Advice.

This table shows how the probability that a financial planner firm (FP) or securities firm (SF) retains a client varies with different combinations of attributes: high or low risk tolerance or confidence, domestic or international outlook, and gender.

Client Attributes	Gender	If client visits ...	...then advisor infers client's financial knowledge is	...implying	Probability that client is retained: θ	
Risk Tolerance/Confidence/ Geographic Outlook					FPs	SFs
(1)	(2)	(3)	(4)	(5)	(6)	(7)
High/High/Domestic	Female	FP	Very low	High catering; Very low detection	$a+b+c+d+e+f$	—
	Male	FP	Low	High catering; Low detection	$a+b+d+e$	—
	Female	SF	Moderate	High catering; Moderate detection	—	$a+d$
	Male	SF	Moderate	High catering; Moderate detection	—	$a+d$
Low/Low/International	Female	FP	Very low	Low catering; Very low detection	$a+b+c$	—
	Male	FP	Low	Low catering; Low detection	$a+b$	—
	Female	SF	Moderate	Low catering; Moderate detection	—	a
	Male	SF	Moderate	Low catering; Moderate detection	—	a

Figure 2. Probability of retaining client. This figure shows the probability that an advisor, either financial planner firm (FP) or securities firm (SF), retains clients with different combinations of characteristics (high or low risk tolerance; high or low confidence; domestic or international outlook; very low, low, or moderate financial knowledge). (Color figure can be viewed at wileyonlinelibrary.com)

that she detects that the advice was suboptimal and extremely likely that she maintains the relationship. This generates an even larger benefit from giving her suboptimal advice, which we capture by $\theta = a + b + c$.

If, instead, the male client visiting the FP signals that he has high risk tolerance or high confidence, then suboptimal advice caters to his preferences. Further, as before, he is relatively unlikely to detect that the advice is low quality. Accordingly, we write $\theta = a + b + d + e$, which is larger than the probability for low risk tolerance/low-confidence male clients by the amount $d + e$. If the female client visiting the FP signals high risk tolerance or high confidence, then her lower financial knowledge means that her retention probability is even larger; $\theta = a + b + c + d + e + f$. Note that when a female client switches from low risk tolerance/confidence to a high level, the likelihood that an advisor retains her after giving suboptimal advice increases by the amount $d + e + f$, whereas the same change for a male client increases the retention probability by only $d + e$. This is in line with our assumption that an advisor benefits more from catering to a client's preferences when the client has less financial knowledge.

Figure 2 provides a graphical representation of these assumptions.

B.3. Cost $C(\gamma)$

We assume that the advisor's cost of giving suboptimal advice $C(\gamma)$ is a convex, increasing function of γ. We can think of this as either the fiduciary penalty or the psychic cost of violating a code of conduct.[19]

C. Equilibrium

Advisors maximize the payoff in expression (1) above by selecting advice quality (γ) such that

$$m'(\gamma)\left[\theta\left(r_i, c_i, x_{ig}\right)\right] = C'(\gamma). \tag{2}$$

In Panel A of Figure 3, we graphically analyze the advisor's choice to recommend risky individual securities. For simplicity, we assume that commission $m(\cdot)$ is linear in advice quality and, as discussed above, for all values of γ, $m_{SF}(\gamma) > m_{FP}(\gamma)$. Specifically, assume that $m_{SF}(\gamma) = K \cdot m_{FP}(\gamma)$, where K is sufficiently large.[20] Since the values of θ in Table I are independent of γ for $\gamma > 0$, the marginal benefit curves on the left-hand side of (2) are horizontal lines. Therefore, in Panel A of Figure 3, for any given level of risk tolerance or confidence, the marginal benefit curve for SFs lies everywhere above the marginal benefit curve for FPs.

Given that the cost function $C(\cdot)$ is increasing and convex in advice quality, the marginal cost function $C'(\cdot)$ slopes upward. For simplicity, we assume that it is a straight line.

Consider first the case of SFs. Since, as discussed above, the expected financial knowledge of men and women who visit these firms is similar, advisors at these firms have no reason to distinguish between male and female clients. However, they stand to earn large commissions from suboptimal advice, and so they will cater to the client's preferences. It follows that these advisors will give worse advice to highly risk-tolerant/highly confident clients than to less risk-tolerant/less confident clients. This is true whether the client is male or female.

There are two differences when we consider FPs. First, their considerably lower commissions from selling individual securities generate a weaker incentive to offer suboptimal advice, as depicted by the smaller vertical intercepts of the marginal benefit curves for FPs in Panel A of Figure 3. Second, FPs expect female clients to be less knowledgeable than male clients, and hence they gain more in expectation from giving suboptimal advice to women than to men (depicted by the higher marginal benefit curves for women, shown in red, than for men, shown in blue) for all preferences. The net result is that in equilibrium, FPs give higher quality advice than do SFs, but they

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[19] Advisors who have a personal bias against female investors may face a smaller psychic cost when they give suboptimal advice to women than to men. In Section II.E, this will allow us to incorporate the possibility of taste-based discrimination against female clients.

[20] Specifically, we require that $K > \frac{a+b+c+d+e+f}{a}$.
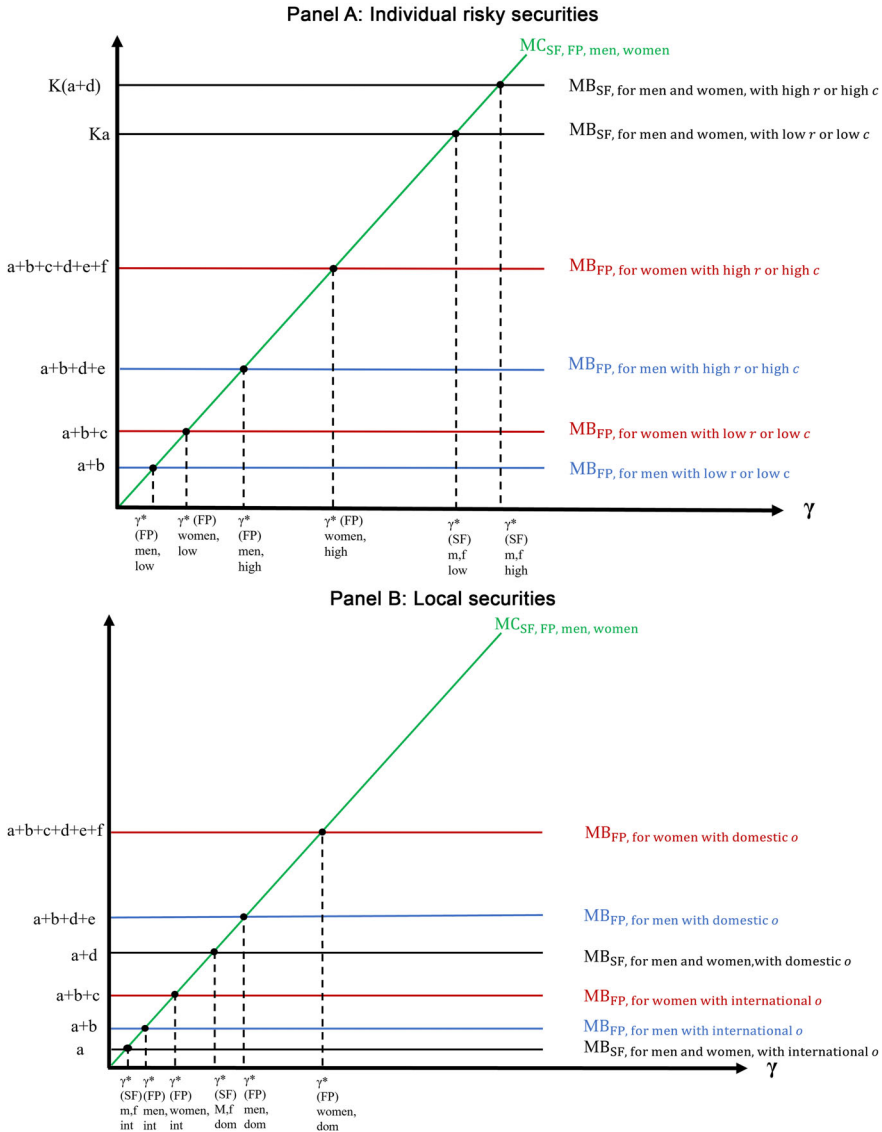
Figure 3. Trade-offs in determining advice quality, no taste-based discrimination. For the advice to buy individual risky securities (Panel A) or for the advice to buy local securities (Panel B), the panels show the marginal benefit (MB) and marginal cost (MC) curves for financial planner firms (FPs) and securities firms (SFs) in the absence of taste-based discrimination. Their points of intersection are the equilibrium points. The MB curves for securities firms (MB_{SF}) are in black; the MB curves for financial planners (MB_{FP}) are in red for women and in blue for men; and the MC curves for both types of firms ($MC_{SF, FP}$) are in green. "r" refers to risk tolerance, "c" to confidence, and "o" to geographic outlook. (Color figure can be viewed at wileyonlinelibrary.com)

distinguish between male and female clients—specifically, they give worse advice to female than to male clients.

The assumption that more knowledgeable investors are less responsive to catering delivers an additional result: As discussed above, the gender difference in marginal benefits of suboptimal advice is larger when the clients are highly risk tolerant or highly confident. In Panel A of Figure 3, this can be seen as the larger distance between the vertical intercepts of male and female clients' marginal benefit curves, when the clients have high risk tolerance or high confidence—$c + f$—compared to when they have low risk tolerance or low confidence—c. It follows that financial planners are more likely to distinguish by gender when clients signal high confidence or risk tolerance.

For these results to obtain in equilibrium, investors must have no incentive to deviate from the sorting that we conjectured earlier: Those with moderate knowledge visit SFs, while those with low knowledge visit FPs. Consider investors who visit SFs and receive low-quality advice. If they deviated to FPs, they would receive better advice, but at a higher fee. Since they have moderate knowledge, their marginal benefit from the better advice is too small to cover the additional cost. Similarly, the low-knowledge investors who visit FPs have no reason to deviate to SFs, because their loss from the decline in advice quality outweighs the gain from switching and paying a lower fixed fee. We assume that at an earlier date, these two types of financial advisors set their fees to target different market segments, and that these fees are profit-maximizing given the size of the market segments. This assumption ensures that there is no deviation by advisors.[21]

In summary, we obtain the following implications.

IMPLICATION 1 (Difference in Propensity to Recommend Individual Risky Securities by Firm Type): *Advisors at SFs are more likely than advisors at FPs to recommend that clients purchase individual risky securities*.

IMPLICATION 2 (Difference in Propensity to Recommend Individual Risky Securities by Firm Type and Gender): *FPs are more likely to recommend individual risky securities when advising female clients than male clients, while advisors at SFs are equally likely to recommend individual risky securities to both genders*.

IMPLICATION 3 (Difference in Propensity to Recommend Individual Risky Securities by Client Attributes and Gender—Financial Planners): *FPs are more likely to distinguish their advice quality by gender when clients signal they are highly confident or highly risk tolerant*.

D. Extension: Home-Biased Advice

We now extend the model to analyze the advisor's choice to recommend local securities. Investors may vary in their geographic outlook. Denote by

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[21] This equilibrium sorting can be formally modeled as an early-stage game, although it would not provide relevant novel insights relevant to the empirical tests of this paper.

o the extent to which the investor prefers to own stock in domestic firms. By recommending that domestic-outlook investors purchase local securities, the advisor can increase the chance that the client returns. Accordingly, in equation (1), we assume that for a given level of γ, the probability that the investor maintains the relationship (θ) is increasing in the client's domestic outlook (*o*). Table I shows that, all else equal, we do indeed see a larger θ when the client has a domestic outlook.

However, local securities expose the investor to idiosyncratic domestic risks that could be diversified away through the purchase of international securities. Therefore, any advice that caters to a domestic-outlook client's preference is necessarily suboptimal. Financially knowledgeable clients are likely to detect that they have received suboptimal advice, which reduces the chance that they will return. Accordingly, in Table I, advisors who recommend local securities expect female clients to return more often than similar male clients.

Recall the previous assumption that more knowledgeable investors are less responsive to catering. In the case of the client's geographic outlook, this assumption implies that the gender difference in the marginal benefits of suboptimal advice is larger when the client has a domestic rather than an international outlook. As before, we see this in Table I, where the gap between the probability of retaining male and female clients is larger ($c + f$) when the clients have a domestic outlook than when they have an international outlook (c).

An important difference from our previous analysis is that advisors at both SFs and FPs earn smaller commissions from selling global securities than local securities. This is because neither type of firm can directly execute trades on international stock exchanges and so must delegate to an international broker, who takes an identical share of the trading commission from both. Therefore, $m_{SF}(\gamma) = m_{FP}(\gamma)$, and the two advisor types have an equal incentive to recommend local rather than global securities.

Accordingly, Panel B of Figure 3 below can be viewed as a special case of Panel A of Figure 3, where $K = 1$. Whereas in Panel A the marginal benefit curve for SFs is always higher than the curve for FPs, in Panel B this is no longer the case.[22] Therefore, we do not obtain a clear rank-ordering of the different firms' propensity to recommend local securities over global securities.

As before, SFs expect their male and female clients to have similar financial knowledge, and, hence expect that they can earn the same marginal benefits from giving suboptimal advice (local securities) to both genders. Clients respond positively to catering, and thus an SF's marginal benefit curve for domestic-outlook clients is higher than that for international-outlook clients.

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[22] In the previous case, our assumption that $K > \frac{a+b+c+d+e+f}{a} > 1$ delivered the result that the vertical intercept of the lowest marginal benefit curve for SFs was higher than the intercept of the highest marginal benefit curve for FPs. Accordingly, irrespective of client characteristics, SFs always have a stronger incentive to recommend individual risky securities than do FPs. Here, since we assume $K = 1$, this ordering no longer obtains.

Therefore, in equilibrium, these advisors will give lower quality advice to domestic-outlook clients, both male and female.

As before, FPs expect their female clients to be less knowledgeable than male clients and also more responsive to catering. Therefore, analogous to our previous results, they are more likely to recommend local securities to women than men, especially if clients exhibit a domestic outlook.

In summary, we obtain the following implications.

IMPLICATION 4 (Difference in Propensity to Recommend Local Securities by Firm Type): *We cannot rank order the propensity of advisors at SFs or FPs to recommend local securities.*[23]

IMPLICATION 5 (Difference in Propensity to Recommend Local Securities by Firm Type and Gender): *FPs are more likely to recommend local securities when advising female clients than male clients. Advisors at SFs are equally likely to recommend local securities to both genders.*

IMPLICATION 6 (Difference in Propensity to Recommend Local Securities by Client Attributes and Gender—Financial Planners): *FPs are more likely to distinguish by gender when clients signal that they have a domestic outlook.*

E. Extension: Taste-Based Discrimination

We can extend this model to allow for the possibility that advisors may have a distaste for delivering good advice to female clients. We do so by allowing the advisor's cost function to also depend on the client's gender $C(\gamma, g)$. Advisors who have a personal prejudice against female clients may face a smaller psychic cost when giving suboptimal advice to women than to men. Accordingly, in Panels A and B of Figure 4, the advisor's marginal cost curve for advising women is flatter than for men. As before, advisors choose the quality that sets marginal benefit equal to marginal cost. Our previous result continues to hold: FPs give worse advice to women than to men. However, unlike before, we now see that even SFs distinguish between the genders in the same way. This leads to our final implication.

IMPLICATION 7 (Difference in Propensity to Recommend Individual Securities or Local Securities by Firm Type and Gender—Taste-Based Discrimination): *Under taste-based discrimination, both SFs and FPs give worse financial advice to women than to men.*

III. Study Design

Our sampling frame consists of all local firms in Hong Kong that advise retail investors. In February 2017, we obtained from the Hong Kong SFC

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[23] One alternative explanation for our previous results could be that SFs employ less-competent advisors. If this explanation were to hold, these advisors would recommend both more individual risky securities and more local securities than FPs. Instead, we find that SFs recommend more individual risky securities than FPs, but advisors at the two firms are equally likely to recommend local securities.
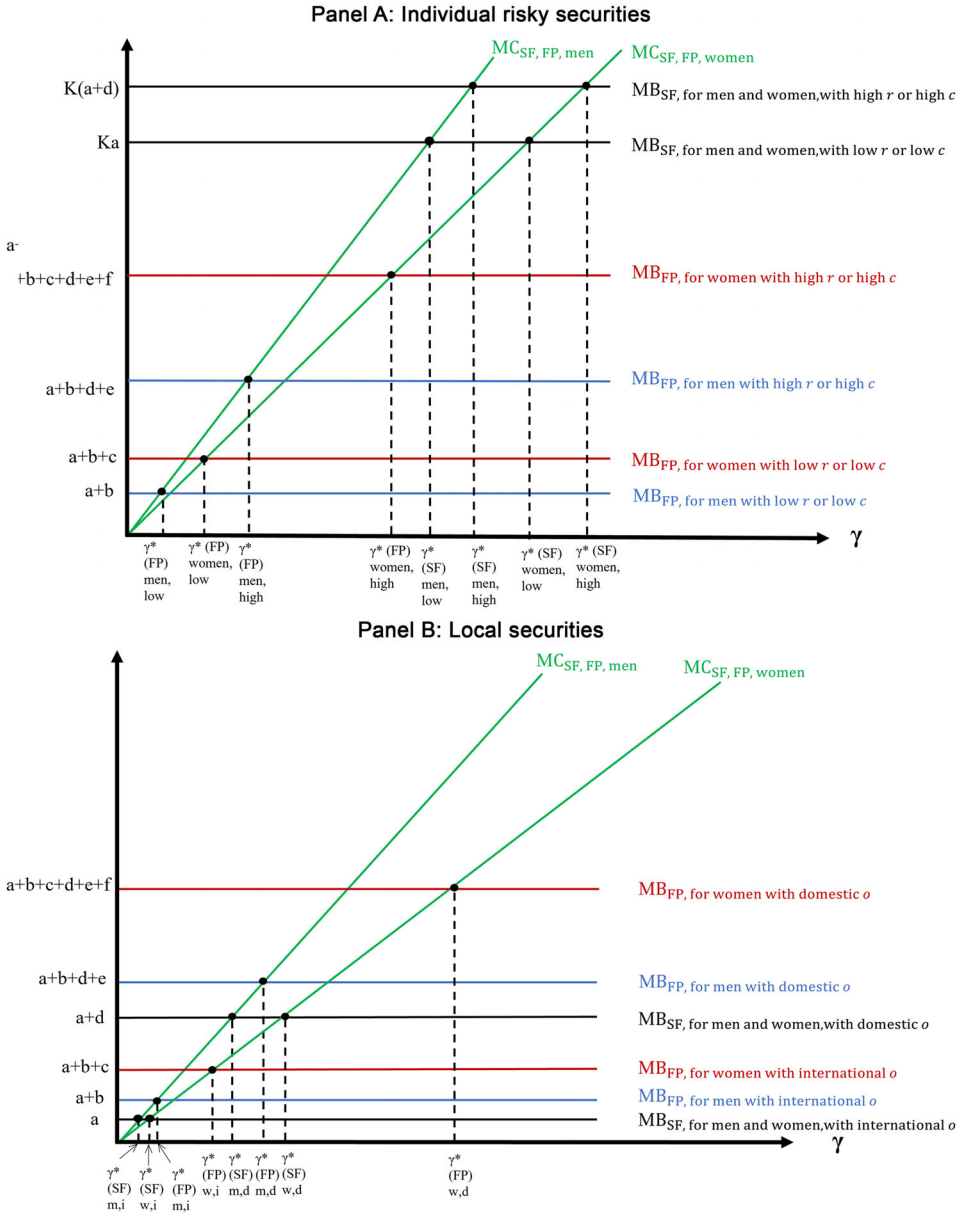
Figure 4. Trade-offs in determining advice quality, taste-based discrimination. For the advice to buy individual risky securities (Panel A) or for the advice to buy local securities (Panel B), the panels show the marginal benefit (MB) and the marginal cost (MC) curves for financial planners (FP) and securities firms (SF) in the presence of taste-based discrimination. Their points of intersection are the equilibrium points. The MB curves for securities firms (MB_{SF}) are in black; the MB curves for financial planners (MB_{FP}) are in red for women and in blue for men; and the MC curves for both types of firms ($MC_{SF, FP}$) are in green. "r" refers to risk tolerance, "c" to confidence, and "o" to geographic outlook. (Color figure can be viewed at wileyonlinelibrary.com)

website a list of all individuals who held an active Type 4 license allowing them to practice as a financial advisor in Hong Kong. For each such individual, the website also reports the firm where the person is employed, which allows us to compile a list of all firms where advising services were potentially available.[24] We removed multinational firms since their operating procedure is determined globally, potentially constraining their advisors' conduct in Hong Kong. All firms that belonged to the same parent company were treated as a single firm, and all firms that did not publicly provide contact information were removed.[25]

In summer 2018, our bilingual research assistant contacted each firm individually, via telephone or email. She pretended to be a potential retail customer, and using a free-flowing script in Cantonese, inquired if the firm would give her personalized financial advice. This allowed us to screen out firms unsuitable for our study, such as banks that only advised their depositors and firms that only advised corporate clients, only accepted referred clients, required an initial deposit before giving advice, only provided a trading platform, or only sold gold, insurance, or futures. After eliminating such firms, our sampling frame consisted of 90 individual advisory firms, which comprise 75 SFs and 15 FPs. We included all 191 branch offices corresponding to these 90 firms in our study.[26]

We designed our experiment so that each auditor embodied an "avatar" comprising three attributes: risk tolerance, confidence, and geographic outlook. We created eight avatars that included all possible combinations when we allowed each attribute to take one of two values: high or low risk tolerance, high or low confidence, and domestic or international outlook. A market research firm hired 32 auditors (16 men and 16 women) and we assigned each avatar to four auditors (two men and two women). We then randomly assigned each auditor to conduct 18 to 20 audit visits.

Every branch office received multiple visits, each from a different auditor. To maximize the precision of our estimates, we balanced the gender × avatar assignment across the different visits at the same branch office. Since the advisor could have asked to see the auditor's Hong Kong identity card, we instructed each auditor to truthfully provide their name when making the appointment. Auditors only visited firms with prior appointments.[27] An individual auditor was assigned to visit only one branch of any given firm; this helped avoid detection if firms had centralized appointment scheduling platforms. We assigned

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[24] Employers apply for Type 4 licenses on behalf of the employee and thus each Type 4 license corresponds to an employer-employee pair. If the employee leaves the given firm's employment, the license becomes inactive. This reassures us that we are correctly identifying the universe of all firms that provided financial advising services.

[25] If a firm did not post its contact information publicly, a prospective client was unlikely to be able to schedule an appointment without a referral. Such firms did not qualify for our study.

[26] We initially assigned 111 of the 191 branch offices to auditors and held 80 branch offices in reserve as replacements for contingencies. We created 594 branch × auditor random assignments, linking 32 auditors to 111 firm-branches from 74 firms. Based on an initial pilot study, our power calculations suggested that this sample size would be sufficiently powered. Details of the random assignment are in Section III.B of the Internet Appendix.

[27] The auditors scheduled and attended their appointments independent of each other.

more visits to firms with more branches. However, to avoid creating suspicion, no branch received more than six visits.

Despite our elaborate groundwork, some of our visits failed—either because the staff at the advisory firm told the auditors that the firm did not offer recommendations, or because they insisted on prior referrals or that the auditor open an account.[28] In such cases, we assigned the auditor to a visit at another branch office. The distributions of the originally assigned visits and the actual visits, and information about the failed visits, are in Table IA.XVI and Section III.E, respectively, in the Internet Appendix. Importantly, the reasons for visit failures appear to be unrelated to our outcome of interest. Our final sample consists of 463 visits conducted at 102 branch offices across 65 individual firms.

A Hong Kong–based market research firm organized the audit visits.[29] They hired and trained the auditors to pose as potential clients visiting a financial advisor for the first time. All auditors were given the same investment objective, investment amount, and investment horizon, and were asked to state these and seek appropriate product recommendations. We provided them with scripts that they could incorporate naturally into their conversation to signal their avatar. Each auditor role-played the same avatar in all of their visits. This helped ensure they could embody their avatars successfully and avoid mistakes.[30]

To signal high risk tolerance, we provided the script (in Cantonese): "I don't mind if I lose money sometimes in bad times, but I want to make good money when the times are good. So, I can afford to lose some money." In contrast, an auditor signaling low tolerance for risk was instructed to say, "I want to buy something that is safe. I worry that if I make a mistake, I will lose my money. I can tolerate a little loss, but not much." An auditor who was pretending to be very confident was asked to say, "I usually make financial decisions myself. I don't usually take the help of advisors. I am only here because my good friend insisted that I meet you before I make any decisions." Someone signaling low confidence was asked to say "I have never made important financial decisions on my own before. In my household, my parents / spouse have always done this. That is why I need your advice."[31] Finally, an auditor with an international

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[28] Of our originally planned 594 visits, 187 (or 31.5%) failed for these reasons. We replaced 108 of these visits with new visits from our reserve list, giving us a total of 515 visits. However, even among these 515 visits, 52 did not result in usable data, as we explain in Section III.E of the Internet Appendix. As a result, our analysis is run on data from 463 visits.

[29] We did not reveal our research question to either the market research firm or the auditors.

[30] In six visits, auditors reported that advisors appeared to remember having met another auditor previously. To avoid any biases caused by contamination, we did not include these six visits in our estimation sample. In addition, we dropped the visit immediately prior to this one at this branch.

[31] Our theoretical model assumes that confidence and financial knowledge are orthogonal, and that advisors interpret these two signals independently of each other. If, however, advisors interpreted the high-confidence script as signaling self-belief about high financial literacy instead, and if self-belief about financial literacy is positively correlated with actual financial literacy (Allgood and Walstad (2015)), then they would have advised financially knowledgeable clients in the

outlook would say, "My cousin lives in Canada and I am thinking of moving to Canada. I am not sure that I want to retire here." Someone with a domestic outlook was asked to say, "I was born here and intend to retire here," and was also instructed to avoid mentioning any relatives that lived abroad.

It is common for financial advisors to administer a risk profile questionnaire to first-time clients. To ensure that auditors' responses to the questionnaire would align with their avatar, we created model answers for three risk profile questionnaires that we had obtained from different financial advisory firms before the visits began, and the market research firm trained the auditors to answer accordingly. Audits and training took place in Cantonese. Our bilingual research assistant attended the training sessions to ensure consistent last-mile delivery of our instructions.

We collaborated with the market research firm to choose the criteria for hiring auditors. Auditors needed to be able to credibly signal that they were Hong Kong retail investors seeking financial advice. At the same time, to ensure that the experimentally varied attributes and gender of the auditors, not their other characteristics, generated the majority of the variation in advisors' perceptions of the auditors, they needed to be relatively homogeneous in other aspects. Accordingly, all auditors were Hong Kong residents between 30 and 45 years old and earned incomes similar to the mean salary level in Hong Kong (Quarterly Report of Wage and Payroll Statistics, Hong Kong SAR (2018)). All spoke Cantonese. Section III.C in the Internet Appendix provides more details.

If education is correlated with financial knowledge, highly educated retail investors might be less likely to visit financial advisors. Accordingly, we chose to hire auditors who had not received a university education.[32] Similarly, we required that they had either no or limited experience trading on the stock exchange.[33] The market research firm confirmed that auditors met these criteria before hiring them. We obtained data about these and other characteristics from an online questionnaire they filled in after they were employed. Five individuals quit during the study and were replaced.[34] Table II presents descriptive statistics for all 37 individuals who were auditors. Note, however, that at any point in time, only 32 auditors were involved, with two men and two women playing each of the eight avatars.

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same way as clients who signaled high confidence, and both men and women who signaled high confidence would have received high-quality advice. Instead, we find that high-confidence women (but not men) were more likely than low-confidence women to receive *suboptimal* advice.

[32] Despite this, one male auditor did have a bachelor's degree in journalism. However, he fulfilled all of the other criteria about age, monthly income and net worth, and limited investment experience.

[33] Rather than advertising any nonverifiable hiring criteria in the job posting, we asked the market research firm to use these criteria to screen out job applicants.

[34] One female auditor quit because of an accident, and one male auditor left Hong Kong on a month-long business trip. The market research company fired one male and one female auditor about one-third of the way into the study because of unsatisfactory performance, specifically, because they did not probe sufficiently to ascertain the advisors' product recommendations. We do not know the reason why the fifth auditor quit.

Table II
Characteristics of the Auditors.

This table shows summary statistics for the characteristics of the auditors. The study started with 32 auditors, but during the study five new auditors were hired to replace five auditors who left. The summary statistics correspond to all 37 individual auditors.

	All	Male $N = 19$	Female $N = 18$
	(1)	(2)	(3)
Age (Mean)	40.43	39.00	41.94
Married (Fraction)	0.84	0.68	1.00
Number of children (Mean)	0.97	0.74	1.22
Currently employed (Fraction)	0.84	0.95	0.72
Lives in own house (Fraction)	0.54	0.63	0.44
Has a mandatory provident fund plan (Fraction)	0.81	0.95	0.67
Never traded stocks before (Fraction)	0.43	0.32	0.56
Number of times traded stocks in last year (Fraction)			
Zero	0.49	0.42	0.56
1 to 2 times	0.30	0.37	0.22
3 to 4 times	0.22	0.21	0.22
Education (Fraction)			
Less than senior secondary school	0.05	0.00	0.11
Senior secondary school	0.59	0.53	0.67
Two-year degree / Sub-degree	0.32	0.42	0.22
Bachelor's degree	0.03	0.05	0.00
Net worth (Fraction)			
Less than $100,000	0.16	0.11	0.22
$100,000–$499,999	0.38	0.32	0.44
$500,000–$999,999	0.24	0.37	0.11
$1,000,000–$4,999,999	0.22	0.21	0.22

Unsurprisingly, male and female auditors differed along a number of characteristics. On average, the women were three years older than the men. All of the women, but only about two-thirds of the men, were married. Accordingly, the average woman auditor had more children. This likely reflects gender differences in labor force participation: Married women with children are more likely to work part-time, whereas for men, the likelihood of engaging in part-time work is less correlated with marital status and parenthood. This is borne out further by the fact that only three-quarters of the female auditors were employed at the time that they were recruited into our study, whereas nearly all the men were. Accordingly, women were also less likely to have a mandatory provident fund.[35] Men were more educated than women: 47% (22%) of men (women) had studied beyond senior secondary school. Men also reported having more wealth than women: 58% (33%) of men (women) reported a net worth above HK$500,000. In line with our intention to use auditors with little to no trading experience, none of the auditors had traded stocks more than

[35] In Hong Kong, employers are required to contribute to the mandatory provident fund for all employees who have a contract longer than 60 days, whether full-time or part-time.

four times in the previous year. In fact, 56% of the women auditors and 32% of the male auditors reported that they had never traded stocks previously.

Within 24 hours of each visit, auditors filled in an online questionnaire where they reported various details of the visit. The market research firm followed its internal quality control procedures to verify these details. The data from the questionnaire form the basis of our empirical analysis. Section III.D of the Internet Appendix provides details on the visit protocol, and Sections IV and V of the Internet Appendix provide the Cantonese script as well as an English translation of the visit protocol.

IV. Randomization Balance and Summary Statistics

We planned our audits so that each avatar was role-played by an equal number of men and women auditors. As can be seen from the green (darker) bars in Panel A of Figure 5, our original schedule included 149 visits by men and 149 visits by women playing a low risk-tolerance avatar and 148 visits by men and 148 visits by women playing a high risk-tolerance avatar. As described above, unsuccessful visits were replaced with visits to the branch offices on the reserve list. The brown (lighter) bars show that this did not create an imbalance in terms of gender and the three other attributes that we were randomly varying (see Figure 5, Panels B and C, respectively).

The quality of advice that our auditors received could also have varied by the gender of the advisor they met. Our study randomly assigned auditors to particular branches, but we could not select the specific advisor whom the auditor met. If firms simply assign the first available advisor to each prospective client, then the advisor match was plausibly exogenous. However, firms could also selectively assign advisors according to clients' characteristics, specifically, those that were easily observed when the appointment was made or when the auditor walked in. As we see in Table III, likely because financial advising is a male-dominated profession, auditors met female advisors in only 25.7% of the visits. Importantly, there is no evidence that firms match prospective clients to advisors of their own gender or of the opposite gender: When women conducted the audits, they were about as likely (24.3%) to meet a female advisor as when men conducted the visits (27.2%). This pattern is similar across both SFs and FPs.[36]

V. Empirical Results

We now analyze the quality of advice that auditors received. As we see in Table IV, in line with their commission incentives, SFs often recommended products that trade on the stock exchange. This includes stocks, which were recommended in 60% of visits, ETFs recommended in 21% of visits, and real estate investment trusts (REITs) recommended in 7% of visits. FPs recommended a larger variety of products overall, although even they recommended traded products in 56% of the visits.

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[36] After this research was concluded, an acquaintance who works at a SF told us that at their firm, "walk-in" clients are assigned to the first available advisor.
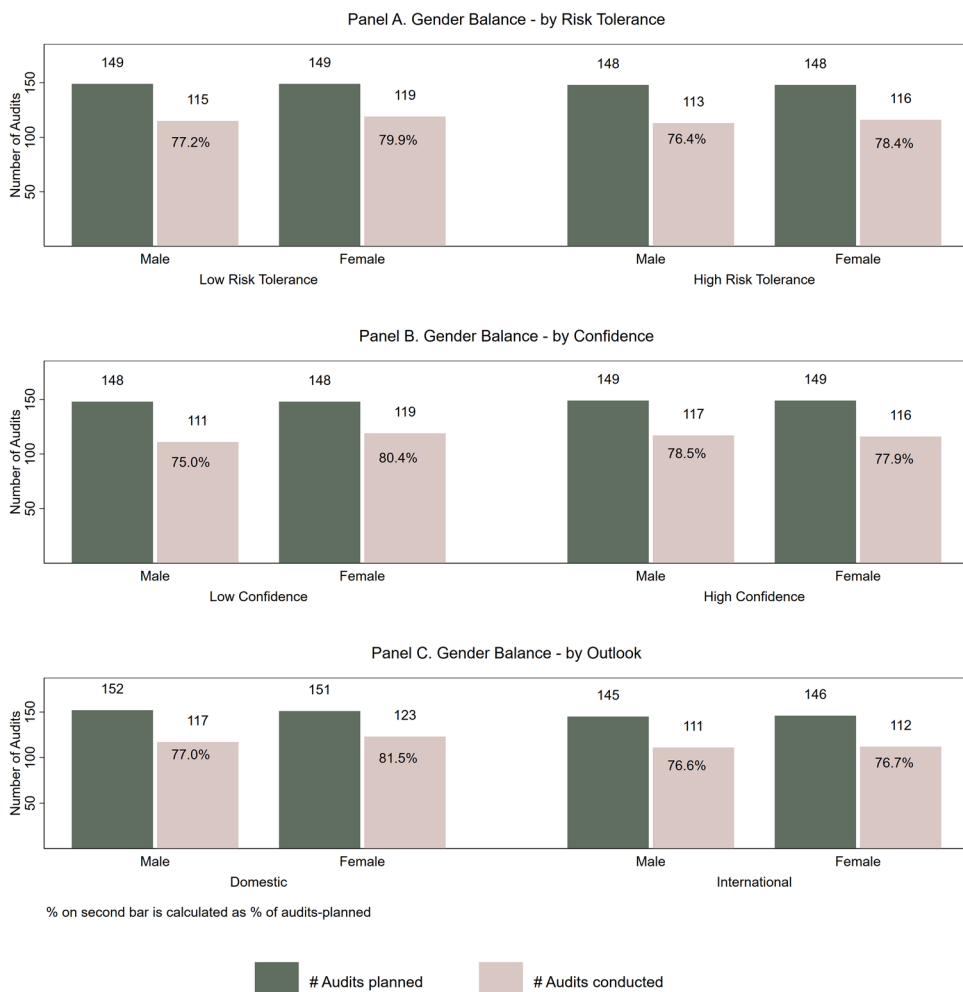
Figure 5. Gender balance across auditor attributes. The panels show gender balance by risk tolerance (Panel A), confidence (Panel B), and geographic outlook (Panel C). The green bars depict the number of audits that were planned, whereas the brown bars depict the number of audits that were successfully conducted. (Color figure can be viewed at wileyonlinelibrary.com)

In 30% of the visits, advisors did not recommend any specific product. In Table V, we examine the content discussed in these visits. Note first that no-advice visits occurred predominantly at SFs. In 56 (= 53 + 3)% of the 120 no-advice visits at SFs, the advisor claimed that their firm facilitated trades but did not give customized advice to retail investors. In 23 (= 17 + 6)% of no-advice visits at SFs, the advisor only administered a risk profile questionnaire or discussed risk diversification strategies. In 23% of no-advice visits at SFs, the advisor asked the auditor to open an account before advice would be

Table III

Number of Visits by Gender of Financial Advisor and Auditor, and by Advisor Type.

This table reports the fraction of the total number of audit visits made by the auditors of a given gender to the advisors of a given gender for securities firms (SFs) and financial planners (FPs) both combined and separately. The fractions without (with) parentheses sum to 100 across columns (rows).

	Male Advisor (1)	Female Advisor (2)	Total Number (3)
All Firms			
Male auditor	0.73	0.27	228
	(0.48)	(0.52)	
Female auditor	0.76	0.24	235
	(0.52)	(0.48)	
Total	344	119	463
	(0.74)	(0.26)	
Financial Planning Firms			
Male auditor	0.81	0.19	37
	(0.49)	(0.5)	
Female auditor	0.82	0.18	38
	(0.51)	(0.5)	
Total	61	14	75
	(0.81)	(0.19)	
Securities Firms			
Male auditor	0.71	0.29	191
	(0.48)	(0.52)	
Female auditor	0.75	0.25	197
	(0.52)	(0.48)	
Total	283	105	388
	(0.73)	(0.27)	

offered. In no-advice visits at FPs, the advisor was less likely to say that they did not advise clients or require them to open an account first.

Importantly, in our empirical analysis, all visits where the auditor did not receive specific product recommendations are coded as "undominated advice," that is, not undiversified or not home-biased advice. This implies that our results are not driven by systematic selection of visits where advisors choose to give advice. Instead, our estimates of the incidence of suboptimal advice are lower than they would have been if we had chosen to remove these visits from our estimation sample.[37]

As we argued above, the purchase of any single risky security is dominated by the purchase of a basket of securities or a government bond. This is because any investor who purchases individual risky securities only is exposed to idiosyncratic risk that could be diversified away at no loss of expected return.

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[37] As we discuss in Section VI.E, our main conclusions are unaffected if we implement a multinomial logit estimation explicitly including advisors' choice not to give advice.

Table IV
Distribution of Recommendations across Product Classes.

This table shows the fraction of visits to financial planners (FPs) and securities firms (SFs) in which a given class of financial product was recommended. Column (1) ((4)) shows the fraction of visits where FPs ((SFs)) recommended at least one product in that class. Columns (2) and (5) show the mean and columns (3) and (6) show the median number of products recommended within that class. Because advisors may recommend products belonging to different classes in one visit, the fractions in columns (1) and (4) sum to more than one.

	Visits to Financial Planners			Visits to Securities Firms		
	Fraction	Number of Products Recommended		Fraction	Number of Products Recommended	
		Mean	Median		Mean	Median
Product description	(1)	(2)	(3)	(4)	(5)	(6)
Stocks	0.51	2.1	2	0.60	2.3	2
ETFs	0.13	1.0	1	0.21	1.2	1
REITs	0.09	1.0	1	0.07	1.0	1
Traded on exchange	0.56	1.0	1	0.67	1.0	1
Government bonds	0.04	1.7	1	0.02	1.0	1
Insurance	0.03	1.5	2	0.02	1.0	1
Not traded on exchange	0.07	1.0	1	0.04	1.0	1
Mutual fund	0.37	2.0	2	0.06	1.1	1
Others	0.04	–	–	0.02	–	–
No recommendation	0.25	–	–	0.31	–	–

Table V
Explanations for Visits Where Advisor Did Not Recommend a Specific Product.

This table summarizes the content of conversations at visits where the advisor did not recommend a specific product. Multiple categories may apply simultaneously to any given visit. X: avoid excessive risk; invest in provident fund; diversify geographically; buy blue-chip stocks, insurance, bonds, mature stocks. Others: reason is unclear.

Content of Conversation or Other Explanations	Financial Planners (N = 19) (1)	Securities Firms (N = 120) (2)
"We do not provide specific recommendations"	0.21	0.53
"You must open an account first"	0.11	0.23
"You must undergo a risk assessment first"	0.21	0.17
"Our company provides industry research findings"	0.05	0.20
Did not meet a licensed financial advisor	0.11	0.14
Advisor provided information but did not advise	0.11	0.10
"We do not take walk-in clients"	0.16	0.05
"We only work with professional investors"	0.26	0.03
Advisor gave nonspecific advice to do X	0.05	0.06
"This is not a good time for financial investments"	0.00	0.03
Others	0.11	0.01

Accordingly, we define the advice given in an audit visit as "undiversified" if the advisor recommended only individual risky securities to the auditor. The complement of this set, labelled "diversified," includes advice that mentioned a basket of securities, as well as visits in which no advice was given. This allows us to circumvent the usual problems that arise in evaluating the quality of financial advice. Ex post measures of advice quality such as the raw (or risk-adjusted) rate of return on the portfolio are not appropriate in our context because, in an initial visit, the advisor is unlikely to discuss the exact weight of each product they recommend.[38] Ex ante measures, such as the distance from an efficient portfolio, are also inherently problematic because they require that we observe the client's true risk appetite and the feasible opportunity set. Our definition provides a simple and conservative measure of the extent to which advisors give prospective clients suboptimal advice. Importantly, advisors at both SFs and FPs can recommend diversified products if they choose to. For example, SFs could recommend baskets such as ETFs, and FPs could recommend baskets such as mutual funds.

Similarly, we construct a measure in which advice is classified as "home-biased" if the advisor only mentioned products domiciled in Hong Kong, that is, stocks of firms headquartered in Hong Kong, or mutual funds or ETFs that are invested in the stocks of firms headquartered in Hong Kong. The complement of this set includes advice to buy securities from other jurisdictions, as well as visits in which no advice was given.[39]

Table VI presents summary statistics for the variables described above. In column (1) of Panel A, we see that overall, in 38.4% of the visits, advisors recommended single risky securities only. Consistent with Implication 1, this propensity is significantly more pronounced among advisors employed by SFs (41%) than those employed by FPs (25%). The difference is statistically significant ($p = 0.01$). Column (2) shows that in 38.9% of the visits, advisors recommended local securities only. However, the propensity to give home-biased advice is equally prevalent among advisors at SFs and FPs. This is in line with Implication 4 that there is no clear rank ordering of the likelihood that advisors at SFs or FPs recommend local securities.

In columns (1) and (2) of Panel B, we see that a male auditor and a female auditor visiting an SF were offered undiversified (home-biased) advice 39.3% (36.1%) and 42.6% (43.1%) of the time, respectively. In contrast, columns (3) and (4) show that a male auditor visiting an FP was offered undiversified (home-biased) advice 13.5% (24.3%) of the time, whereas a female auditor was offered undiversified (home-biased) advice much more often (36.8% [44.7%] of the time). The differences are 23.3% ($p < 0.05$) and 20.4% ($p < 0.10$). Thus, FPs appear to be more likely to give suboptimal advice to female than to male

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[38] Our main conclusions are unaffected when we analyze the ex-post returns of recommended products. See Section VI.D.

[39] Note that this definition is independent of whether the advice consisted of single securities or a basket of securities. If the advisor recommends a fund, we classify the advice as home-biased or not based on the location of the underlying securities, not the headquarters of the fund manager.

Table VI

Advice Quality by Firm Type and Auditor Gender.

This table shows the difference in advice quality by financial-advisory firm type and by auditor gender. Panel A shows the difference by type of firm, while Panel B shows the difference by auditor gender within each type of firm. [**] and [*] denote statistical significance at the 5% and 10% level.

Panel A: Advice quality by firm type		
	Undiversified Advice (UA) (1)	Home-Biased Advice (HB) (2)
All firms	0.384	0.389
Securities firms (SFs)	0.410	0.397
Financial planners (FPs)	0.253	0.347
Diff (SFs − FPs)	0.156**	0.050
p-value	0.01	0.41

Panel B: Advice quality by firm type and auditor gender				
	Securities Firms		Financial Planners	
	UA (1)	HB (2)	UA (3)	HB (4)
Male	0.393	0.361	0.135	0.243
Female	0.426	0.431	0.368	0.447
Diff (M − F)	−0.034	−0.070	−0.233**	−0.204*
p-value	0.50	0.16	0.02	0.06

clients, whereas SFs are less likely to vary their advice quality according to the client's gender. This is in line with Implications 2 and 5.

Multivariate regressions allow for more rigorous tests of the model implications. We use the following specification:

$$y_{ai} = \alpha + \beta \text{ Financial Planner}_a + \gamma \text{ High Risk Tolerance}_i$$
$$+ \delta \text{ High Confidence}_i + \mu \text{ Domestic Outlook}_i + \boldsymbol{X_i} + \varepsilon_{ai}. \quad (3)$$

Here, y_{ai} is a binary variable indicating the quality of the advice that auditor i received when they visited advisor a. Recall that we classify the advice as "undiversified" ("home-biased") if the advisor recommended individual risky securities (securities domiciled in Hong Kong) only. The binary variable *Financial Planner$_a$* takes a value of one if the firm is an FP and 0 if it is an SF. We also include three binary variables indicating the risk tolerance, confidence level, and geographic outlook of the avatar of the auditor who conducted the visit. Vector $\boldsymbol{X_i}$ includes controls for the age, education level, net worth, and trading experience of the auditor. In all regressions, standard errors are clustered at the auditor level.[40]

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[40] As we discuss in Section VI.F, our results are robust to clustering standard errors at the level of the branch of the advisory firm or at the auditor level, as well as to including advisory firm fixed effects.

In columns (1) to (3) of Table VII, the dependent variable takes a value of one if the advisor recommended single risky securities only, and zero otherwise. Column (1) essentially replicates the result from column (1) of Table VI, Panel A. In column (2), we include as controls the three binary variables that indicate the randomly assigned attributes of the auditor. The coefficient on the *Financial Planner* variable is unaffected by these controls. Similarly, when we additionally control for the auditor's personal characteristics in column (3), we continue to find that FPs were 15.5 percentage points (pp) less likely than SFs to give undiversified advice. This is in line with Implication 1.

In columns (4) to (6), the dependent variable takes a value of one if the advisor recommended local securities only. We do not find a statistically significant coefficient on the FP variable. Again, this result remains unchanged when we control for both randomly assigned and naturally varying auditor characteristics in columns (5) and (6), respectively. These results are consistent with the results in column (2) of Table VI, Panel A, and in line with Implication 4.

To summarize, we find that SFs are more likely than FPs to recommend individual risky securities (undiversified advice) only, but both firm types are roughly equally likely to recommend local securities (home-biased advice).

To formally test Implications 2 and 5, we run the following regression separately for FPs and SFs:

$$y_{ai} = \alpha + \beta \text{ Female Auditor}_i + \gamma \text{ High Risk Tolerance}_i + \delta \text{ High Confidence}_i$$
$$+ \mu \text{ Domestic Outlook}_i + \boldsymbol{X_i} + \varepsilon_{ai},$$

(4)

where *Female Auditor* is an indicator for whether a female auditor conducted the visit.

In columns (1) to (6) of Table VIII, advice quality is measured using the dependent variable *Undiversified Advice*. As column (1) shows, in their visits to FPs, female auditors were 23.3 pp more likely than male auditors to receive advice to buy single risky securities only. The estimate is very similar and highly significant when we control for the randomly varying avatar attributes in column (2), and even increases in magnitude when we further control for auditor characteristics in column (3).

In contrast, when we run the same specification using the sample of visits to SFs in columns (4) to (6), we find no evidence that advisors varied their recommendation quality by auditor gender. The point estimates on the *Female Auditor* indicator variable range from 0.021 to 0.037, and none is statistically significant. In columns (7) to (12), we run the same specifications as in columns (1) to (6), but the dependent variable is *Home-biased Advice*. We again find that FPs were more likely to recommend local securities only to female clients than to male clients. Thus, once again, SFs do not appear to vary their advice by client gender.

To summarize, we find strong evidence that FPs are more likely to give suboptimal advice to female clients than to male clients, but no evidence that SFs vary advice quality by gender. This result supports Implications 2 and 5. The finding that SFs do not vary their advice by gender suggests that our results

Table VII
Advice Quality and Type of Firm.

This table shows estimation results of regressing *Undiversified Advice* and *Home-Biased Advice* on the advisor type. *Financial Planner* is a dummy variable taking the value of one (zero) when the advisor is from a financial planner firm (securities firm). *High Risk Tolerance, High Confidence,* and *Domestic Outlook* take the value of one (zero) when the auditor plays an avatar of high (low) risk tolerance, high (low) confidence, and domestic (international) outlook in the audit visit, respectively. *Educated Beyond Sr. Secondary School, Net Worth above HK\$500,000,* and *Traded Stocks* take the value of one if the auditor's education is higher than senior secondary school, if the net worth of the auditor is more than HK\$500,000, and if the auditor has traded stocks before, respectively. *Age* is the age of the auditor in years. Standard errors are clustered at the auditor level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

	Undiversified Advice			Home-Biased Advice		
	(1)	(2)	(3)	(4)	(5)	(6)
Financial Planner	-0.156***	-0.151***	-0.155***	-0.050	-0.072	-0.068
	(0.053)	(0.052)	(0.054)	(0.058)	(0.057)	(0.058)
High Risk Tolerance		-0.007	-0.023		-0.202***	-0.230***
		(0.045)	(0.046)		(0.052)	(0.048)
High Confidence		0.110**	0.117***		0.091*	0.079*
		(0.046)	(0.042)		(0.052)	(0.042)
Domestic Outlook		-0.050	-0.065*		0.029	0.014
		(0.044)	(0.038)		(0.053)	(0.049)
Educated Beyond Sr. Secondary School			-0.032			-0.018
			(0.061)			(0.052)
Net Worth above HK\$500,000			-0.098			-0.066
			(0.059)			(0.072)
Age			0.003			0.002
			(0.005)			(0.005)
Traded Stocks			0.076			-0.079
			(0.055)			(0.066)
Constant	0.410***	0.383***	0.269	0.397***	0.440***	0.467**
	(0.027)	(0.046)	(0.194)	(0.034)	(0.074)	(0.221)
Observations	463	463	463	463	463	463
R^2	0.014	0.030	0.038	0.001	0.053	0.071

Table VIII

Gender Difference in Advice Quality and Type of Firm.

This table shows estimation results of regressing *Undiversified Advice* and *Home-Biased Advice* on auditor gender. Columns (1) to (6) show the results of regressing *Undiversified Advice*, while columns (7) to (12) show the results of regressing *Home-Biased Advice* on auditor gender, estimated separately for audit visits to financial planners and securities firms (SFs). *Female Auditor* is an indicator taking the value of one (zero) for female (male) auditors. *High Risk Tolerance, High Confidence,* and *Domestic Outlook* take the value one (zero) when the auditor plays an avatar of high (low) risk tolerance, high (low) confidence, and domestic (international) outlook in the audit visit, respectively. *Educated Beyond Sr. Secondary School, Net Worth above HK$500,000,* and *Traded Stocks* are indicator variables. *Age* is the age of the auditor in years. Standard errors are clustered at the auditor level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

| | Undiversified Advice | | | | | | Home-biased Advice | | | | | |
| | Financial Planner Firms | | | SFs | | | Financial Planner Firms | | | SFs | | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Female Auditor	0.233**	0.243***	0.290***	0.034	0.037	0.021	0.204*	0.202	0.253**	0.070	0.072	0.044
	(0.098)	(0.095)	(0.100)	(0.053)	(0.050)	(0.062)	(0.120)	(0.120)	(0.118)	(0.067)	(0.052)	(0.046)
High Risk Tolerance		0.119	0.125		-0.028	-0.043		-0.160	-0.161		-0.209***	-0.234***
		(0.095)	(0.096)		(0.049)	(0.049)		(0.130)	(0.125)		(0.053)	(0.052)
High Confidence		0.137	0.206**		0.106**	0.120**		0.164	0.261**		0.079	0.069
		(0.099)	(0.097)		(0.050)	(0.047)		(0.123)	(0.108)		(0.053)	(0.047)
Domestic Outlook		-0.047	0.008		-0.051	-0.063		0.026	0.083		0.031	0.023
		(0.093)	(0.092)		(0.049)	(0.040)		(0.127)	(0.119)		(0.053)	(0.053)
Educated Beyond Sr. Secondary School			0.186			-0.052			0.224*			-0.038
			(0.113)			(0.067)			(0.129)			(0.051)
Net Worth above HK$500,000			-0.107			-0.106*			-0.234**			-0.039
			(0.131)			(0.061)			(0.110)			(0.073)

(Continued)

Table VIII—*Continued*

	Undiversified Advice						Home-biased Advice					
	Financial Planner Firms			SFs			Financial Planner Firms			SFs		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Age			-0.006			0.001			-0.002			-0.002
			(0.009)			(0.006)			(0.016)			(0.006)
Traded Stocks			-0.081			0.125*			-0.015			-0.077
			(0.136)			(0.063)			(0.131)			(0.066)
Constant	0.135**	0.048	0.252	0.393***	0.378***	0.352	0.243**	0.220	0.240	0.361***	0.413***	0.610***
	(0.059)	(0.128)	(0.316)	(0.039)	(0.053)	(0.235)	(0.096)	(0.158)	(0.598)	(0.052)	(0.085)	(0.203)
Observations	75	75	75	388	388	388	75	75	75	388	388	388
R^2	0.072	0.120	0.155	0.001	0.016	0.027	0.046	0.095	0.152	0.005	0.058	0.074

cannot be explained simply as the result of advisors' distaste for advising female investors. This addresses Implication 7.[41]

The experimental variation in the auditor's avatar attributes allows us to examine more deeply the factors behind gender differences in financial advice. We use the following empirical specification:

$$
\begin{aligned}
y_{ai} = &\ \alpha + \beta\ \text{Female Auditor}_i + \gamma\ \ \text{Attribute X}_i + \omega \\
&\ \big(\ \text{Female Auditor}_i \times\ \text{Attribute X}_i\big) + \boldsymbol{X_i} + \varepsilon_{ai},
\end{aligned}
\tag{5}
$$

where y_{ai} is an indicator variable representing *Undiversified Advice*.

In columns (1) and (2) of Table IX, *Attribute* X_i is set to one if the auditor was playing a high risk-tolerance avatar, and zero otherwise. We use this specification to estimate the predicted probability that the auditor receives suboptimal advice, and then compute the difference in predicted probability due to the auditor's gender within a risk tolerance level. For brevity, in the top half of Table IX, we report the predicted probabilities for the four gender × risk tolerance subgroups, and in the bottom half, we report the difference in predicted probabilities by gender (keeping risk tolerance constant) and by risk tolerance (keeping gender constant).

In column (2), we see that highly risk-tolerant female auditors were more likely to receive undiversified advice than highly risk-tolerant male auditors (difference = 36 pp, significant at the 10% level). However, among auditors who signaled low risk tolerance, the likelihood of receiving undiversified advice did not vary by gender (difference = 16.3 pp, not significant). The results are depicted in Figure 6, Panel A.

In columns (3) and (4) of Table IX, we examine how advice quality varies with the client's confidence level. As we see in column (4), highly confident female auditors were significantly more likely to receive undiversified advice than highly confident male auditors (difference = 35.2 pp, significant at the 1% level). However, among auditors who signaled low confidence, the likelihood of receiving undiversified advice did not vary by gender (difference = 17.7 pp, not significant). The results are depicted in Figure 6, Panel B.

Finally, we see that domestic-outlook female auditors were significantly more likely to receive home-biased advice than were domestic-outlook males (column (6), difference = 33 pp, significant at the 10% level). However, among auditors who signaled an international outlook, the likelihood of receiving

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[41] Although our model assumes that advisors view gender as an indicator of the investor's financial knowledge, advisors could instead (or additionally) infer clients' financial knowledge from other characteristics such as age, education, wealth, or trading experience. As noted above, by design, these characteristics varied little among our auditors, limiting our ability to examine whether they influence advice quality. Nevertheless, in Table IA.XIII in the Internet Appendix we show simple tests of differences in the likelihood of dominated advice between younger and older auditors, those with less versus more education, those with less versus more net worth, and those with less versus more trading experience. In line with our main results, FPs appear to be more responsive than SFs to proxies of financial knowledge. Although the differences are never significant, FPs are consistently less likely to give undiversified advice to younger, more educated, higher net worth, and more experienced auditors. We thank an anonymous referee for raising this point.

Table IX
Gender Difference and Auditor Attributes in Financial Planner Visits.

The top half of the table reports the predicted probabilities that auditors of each gender and attribute combination receive *Undiversified Advice* in columns (1) through (4) and Home-Biased Advice in columns (5) and (6), when they visit financial planners. The probabilities are obtained from regression equation (5). The key independent variable/attribute (X) is an indicator variable taking the value of one (zero) for *High (Low) Risk Tolerance* in columns (1) and (2), *High (Low) Confidence* in columns (3) and (4), and *Domestic (International) Outlook* in columns (5) and (6). The bottom half of the table reports the difference in the predicted probability and *t*-tests for the difference in the respective dependent variable across auditors' gender with a particular attribute, and across a particular auditor attribute for a given gender. *Demographic Controls* include a dummy for the auditor's education (= 1 if educated beyond sr. secondary school), a dummy for the auditor's net worth (= 1 if net worth above HK$500,000*)*, a dummy for the auditor's trading experience (= 1 if have traded stocks before), and the auditor's age (in years). Standard errors reported in parentheses are clustered at the auditor level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

Dependent Variable (Y)	Undiversified Advice		Undiversified Advice		Home-biased Advice	
Independent Variable/Attribute (X)	X = Risk Tolerance		X = Confidence		X = Outlook	
	(1)	(2)	(3)	(4)	(5)	(6)
Predicted Probability						
Male, Low X	0.136	0.125	0.100	0.080	0.278**	0.291**
	(0.085)	(0.080)	(0.090)	(0.077)	(0.133)	(0.117)
Male, High X	0.133	0.156*	0.176**	0.186**	0.211	0.193
	(0.085)	(0.089)	(0.074)	(0.079)	(0.139)	(0.147)
Female, Low X	0.280***	0.288***	0.273***	0.257***	0.429***	0.390***
	(0.082)	(0.091)	(0.088)	(0.099)	(0.114)	(0.115)
Female, High X	0.538***	0.516***	0.500***	0.537***	0.471***	0.524***
	(0.120)	(0.147)	(0.121)	(0.112)	(0.078)	(0.090)
Within High X: Female – Male	0.405***	0.360*	0.324**	0.352***	0.260	0.330*
	(0.147)	(0.178)	(0.142)	(0.115)	(0.159)	(0.187)
Within Low X: Female – Male	0.144	0.163	0.173	0.177	0.151	0.099
	(0.118)	(0.126)	(0.126)	(0.136)	(0.175)	(0.161)
Within Females: High X – Low X	0.258*	0.228	0.227	0.280*	0.042	0.133
	(0.145)	(0.170)	(0.150)	(0.138)	(0.138)	(0.154)
Within Males: High X – Low X	−0.003	0.031	0.076	0.106	−0.067	−0.098
	(0.122)	(0.131)	(0.117)	(0.121)	(0.193)	(0.185)
Demographic Controls	No	Yes	No	Yes	No	Yes
Observations	75	75	75	75	75	75
R^2	0.112	0.123	0.109	0.146	0.049	0.089

home-biased advice did not vary by gender (column (6), difference = 9.9 pp, not significant). The results are depicted in Figure 6, Panel C.

Taken together, our results are consistent with the idea that advisors at FPs attempt to "cater" to clients' characteristics—risk preferences, confidence, and geographic outlook—but they respond to these attributes more sharply when the client is female than when the client is male. Our model interprets this pattern as a result of differential financial knowledge: Advisors are more likely
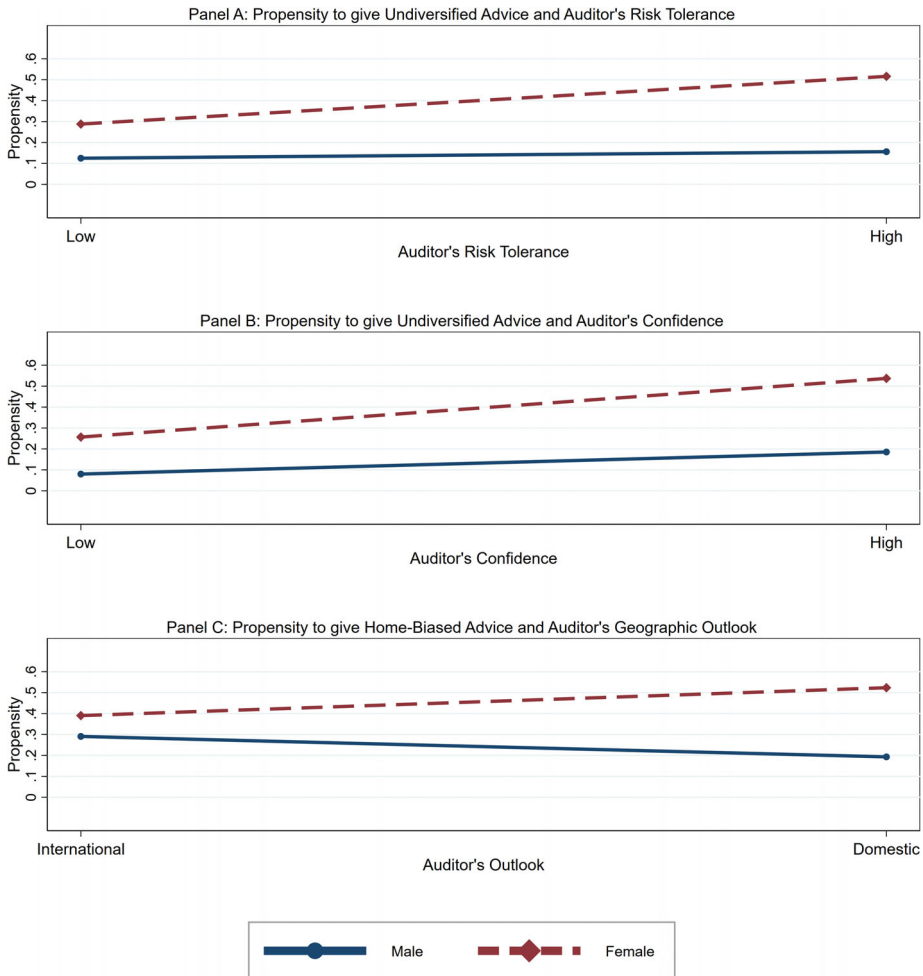
Figure 6. Propensity to give suboptimal advice by auditor attributes. Panel A plots the propensity of financial planners to give undiversified advice against different levels of risk tolerance of men and women auditors; Panel B plots the same against different levels of confidence of men and women auditors; and Panel C plots the propensity of financial planners to give home-biased advice against different levels of geographic outlook of men and women auditors. The numbers on the *y*-axis in the three panels are from columns (2), (4), and (6) of Table IX, respectively. (Color figure can be viewed at wileyonlinelibrary.com)

to cater to the preferences of women by offering suboptimal advice because they perceive female clients as having less financial knowledge. Thus, women who exhibit that they are risk tolerant, confident, or have a domestic outlook are more likely to receive suboptimal advice than men who display the same attributes. These findings lend support to Implications 3 and 6.[42]

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[42] An anonymous referee suggested that since the auditors had limited trading experience, the advisors could have recommended familiar or interesting securities to motivate them to invest.

VI. Supplementary Findings

We next examine our data to answer several additional questions of interest.

A. *Which Firm Type Gives Female Investors Better Financial Advice?*

Table VII shows that FPs provide better financial advice than SFs. However, Table VIII shows that FPs provide worse advice to women than to men, whereas SFs do not differentiate on the basis of clients' gender. A priori then, it is unclear which type of firm would, on average, provide better financial advice to female clients. To answer this question, in Table X, we report results from equation (3) run separately for male and female auditors. As we can see in columns (4) to (6) and (10) to (12), the average female auditor was equally likely to receive suboptimal advice from FPs and SFs. In contrast, columns (1) to (3) and (7) to (9) indicate that the average male auditor received better advice from an FP than an SF. In particular, the average male auditor was 28 pp (significant at the 1% level in column (3)) less likely to receive undiversified advice, and 16 pp (significant at the 10% level in column (9)) less likely to receive home-biased advice, if he visited an FP rather than an SF.

B. *How Does Advice Quality Vary by the Gender of the Advisor?*

Are clients equally likely to receive suboptimal advice from male and female advisors, or does one gender offer worse advice on average?[43] To correctly answer this question, one would need to design an experiment in which auditors were randomly matched to advisors of different genders. Note, however, that Table III shows no evidence that firms systematically match clients to advisors of the same or opposite gender, and thus it is plausible that the specification below gives accurate estimates:

$$y_{ai} = \alpha + \beta \; Female \; Auditor_i + \sigma \; Female \; Advisor_a$$
$$+ \omega \; (Female \; Auditor_i \times Female \; Advisor_a) + \boldsymbol{X_i} + \epsilon_{ai}. \tag{6}$$

However, as we show in Internet Appendix Table IA.XIV, auditors who had never traded stocks before, and those who had traded at least once, received undiversified advice in an identical 38% of audit visits. It has also been suggested that auditors who played the high risk-tolerance avatar were signaling that they were either risk-loving or positive-skewness-loving, and auditors may have catered to that preference. To address this possibility, in Internet Appendix Table IA.XV, we compare the stocks recommended to such auditors with the constituent stocks in the Hang Seng Index. We find no evidence that recommended stocks had higher variance (as would be predicted if the auditors were risk-loving) or higher skewness (as would be predicted if the auditors had gambler-like preferences).

[43] Using data from a survey conducted on Swedish financial advisors and their clients, Soderberg (2012) finds that advisors of different genders have systematically different assessments of their customers' risk tolerance and financial literacy, as well as different expectations about their clients' satisfaction with and trust in them.

Table X

Which Firm Type Should a Female Investor Seek Advice From?

This table shows estimation results from a regression of the *Undiversified Advice* and *Home-Biased Advice* dummy variables on the type of financial advisory firm. *Financial Planner* takes the value of one (zero) when the financial advisory firm is a financial planner (securities firm). *High Risk Tolerance, High Confidence,* and *Domestic Outlook* take the value one (zero) when an auditor plays the avatar of high (low) risk tolerance, high (low) confidence, and domestic (international) outlook in the audit visit, respectively. *Educated Beyond Sr. Secondary School, Net Worth above HK\$500,000,* and *Traded Stocks* are indicator variables. *Age* is the age of the auditor in years. Standard errors are clustered at the auditor level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

| | Undiversified Advice | | | | | | Home-Biased Advice | | | | | |
| | Male Auditors | | | Female Auditors | | | Male Auditors | | | Female Auditors | | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Financial Planner	−0.258***	−0.254***	−0.281***	−0.058	−0.047	−0.050	−0.118	−0.137	−0.156*	0.016	−0.004	−0.001
	(0.063)	(0.056)	(0.060)	(0.082)	(0.084)	(0.084)	(0.086)	(0.080)	(0.084)	(0.082)	(0.086)	(0.083)
High Risk Tolerance		0.005	−0.002		−0.016	−0.021		−0.238***	−0.266***		−0.163**	−0.187**
		(0.069)	(0.058)		(0.053)	(0.057)		(0.079)	(0.092)		(0.064)	(0.071)
High Confidence		0.041	0.140**		0.180***	0.164**		0.120	0.163		0.065	0.064
		(0.073)	(0.060)		(0.050)	(0.062)		(0.082)	(0.101)		(0.064)	(0.054)
Domestic Outlook		−0.088	−0.152***		−0.014	−0.047		0.012	−0.068		0.048	0.042
		(0.070)	(0.044)		(0.049)	(0.057)		(0.083)	(0.101)		(0.064)	(0.067)
Educated Beyond Sr.			0.017			−0.150			−0.064			−0.034
Secondary School			(0.055)			(0.087)			(0.099)			(0.072)

(Continued)

Table X—*Continued*

| | Undiversified Advice | | | | | | Home-Biased Advice | | | | | |
| | Male Auditors | | | Female Auditors | | | Male Auditors | | | Female Auditors | | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Net Worth above HK$500,000			−0.254***			0.057			−0.215*			0.042
			(0.054)			(0.088)			(0.120)			(0.064)
Age			0.004			−0.002			−0.000			0.007
			(0.006)			(0.011)			(0.009)			(0.012)
Traded Stocks			0.212**			−0.009			0.083			−0.129*
			(0.084)			(0.055)			(0.126)			(0.073)
Constant	0.393***	0.413***	0.245	0.426***	0.351***	0.466	0.361***	0.416***	0.559**	0.431***	0.458***	0.235
	(0.040)	(0.074)	(0.236)	(0.036)	(0.053)	(0.455)	(0.052)	(0.132)	(0.257)	(0.043)	(0.086)	(0.492)
Observations	228	228	228	235	235	235	228	228	228	235	235	235
R^2	0.040	0.050	0.093	0.002	0.035	0.045	0.008	0.086	0.120	0.000	0.033	0.047

In column (2) in the bottom half of Table XI, we see that female and male auditors were equally likely to receive undiversified advice if they met female advisors (difference = 13.3 pp, not significant). However, female auditors were 23.8% more likely than male auditors (statistically significant at the 10% level) to receive undiversified advice if they met male advisors. Similarly, column (4) shows that women clients were also more likely to receive home-biased advice if they met male advisors (difference = 25.6 pp, not statistically significant) than if they met female advisors (difference = 6.3 pp, not significant). Thus, these findings provide suggestive evidence that it is mainly male advisors who offer suboptimal advice to female clients.[44]

C. Other Audit Visit Outcomes

In Table XII, we examine differences in other elements of the conversations between auditors and advisors. In column (7), we see that advisors at SFs were on average less willing to make a recommendation than advisors at FPs (row 1). They also spent less time speaking with the auditors (row 2) and asked fewer questions (rows 3, 4, 5). Further, SFs treated male and female auditors similarly along all but two dimensions column (10). They asked female auditors fewer questions about their financial situation than they asked male auditors, and remarkably, they were more willing to advise female auditors (as auditors reported to us). Also, FPs asked female auditors fewer questions about their demographic characteristics (row 3, column (11)).

D. Ex Post Performance of the Advised Portfolio

Thus far, we have defined advice as suboptimal if the advisor recommended single risky securities only (undiversified advice) or if they recommended local securities only (home-biased advice). However, advisors may have selectively recommended particular securities that beat the market ex post. Indeed, some argue that retail investors request advisors for tips about "hot stocks," in which case, advice quality should be evaluated only by the metric of whether advised products outperform the market. Accordingly, we define an alternative measure of advice quality based on the ex post market performance of the recommended products.

Note, however, that in the context of our study, this approach has limitations. In many visits, the advisor suggested multiple products without specifying portfolio weights, or they mentioned a particular mutual fund family but did not specify exactly which mutual fund to purchase. This hampers our ability to compute the actual return the client could have earned. Nevertheless, for each visit, we assume that all recommended products (in so far as we can identify them) had equal weight and compute the market-adjusted return (return in excess of the Hang Seng Index, the broad stock market index in Hong Kong)

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[44] This is consistent with Wang's (1994) finding that male financial advisors spend less time and offer a narrower range of financial products when advising female (compared to male) clients.

Table XI

Do Male or Female Financial Planners Advise Differentially by Gender of the Advisee?

The top of the table shows the predicted probabilities of receiving *Undiversified Advice* (*Home-Biased Advice*) by auditor and advisor gender for the audit visits to financial planners. The probabilities are obtained from regression equation (8). The bottom of the table reports the difference in the predicted probabilities (and *t*-test for the difference) that an advisor of a given gender provides *Undiversified Advice* (*Home-Biased Advice*) to female and male auditors, and that auditors of a given gender receive from female and male advisors. *Demographic Controls* include a dummy for the auditor's education (= 1 if educated beyond sr. secondary school), a dummy for the auditor's net worth (= 1 if net worth above HK$500,000), a dummy for the auditor's trading experience (= 1 if have traded stocks before), and the auditor's age (in years). Standard errors are clustered at the auditor level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

	Undiversified Advice		Home-biased Advice	
	(1)	(2)	(3)	(4)
Predicted Probability				
Male Auditor, Male FA	0.167**	0.171**	0.267**	0.264**
	(0.077)	(0.076)	(0.126)	(0.134)
Male Auditor, Female FA	0.000	0.019	0.143	0.106
	(0.000)	(0.065)	(0.140)	(0.161)
Female Auditor, Male FA	0.419***	0.409***	0.516***	0.521***
	(0.086)	(0.095)	(0.069)	(0.083)
Female Auditor, Female FA	0.143	0.152	0.143	0.169
	(0.144)	(0.142)	(0.144)	(0.151)
Within Female FA: Female Auditor - Male Auditor	0.143	0.133	0.000	0.063
	(0.144)	(0.155)	(0.201)	(0.224)
Within Male FA: Female Auditor - Male Auditor	0.253**	0.238*	0.249*	0.256
	(0.115)	(0.126)	(0.144)	(0.172)
Within Female Auditors: Female FA - Male FA	−0.276*	−0.257*	−0.373**	−0.351**
	(0.151)	(0.145)	(0.142)	(0.142)
Within Male Auditors: Female FA - Male FA	−0.167**	−0.152	−0.124	−0.158
	(0.077)	(0.114)	(0.211)	(0.251)
Demographic Controls	No	Yes	No	Yes
Observations	75	75	75	75
R^2	0.114	0.131	0.098	0.125

Table XII

Gender Differences in Other Audit Characteristics: Securities Firms (SFs) Versus Financial Planners (FPs).

This table reports the difference in various audit characteristics by auditor gender estimated separately for SFs and FPs. *Willing to Give Advice* is a binary variable taking the value of one if an auditor assigns a top-two rating to the advisor on a five-point scale, and zero otherwise. *Duration* of the meeting is measured in minutes. *Number of Demographic Questions* is the number of demographic-related questions (e.g., age, marital status) the advisor asked the auditor in a visit. *Number of Financial Condition Questions* is the number of questions related to the financial condition of the auditor (monthly income, employment situation, etc.) the advisor asked in a visit. *Asked about Financial Knowledge* is a binary indicator taking the value of one if the financial advisor asked any question related to financial knowledge or investment experience of the auditor in a visit, and zero otherwise. *Did not Inquire about Any Item* is a binary indicator taking the value of one if a financial advisor did not ask the auditor about any of the 19 items we had listed, about their demographics, financial condition, or financial knowledge. *p*-values for *t*-tests for the differences in means are reported in alternate rows in columns (7) to (11). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

	Securities Firms			Financial Planners			Difference				
	All	F	M	All	F	M	(1 − 4)	(2 − 5)	(3 − 6)	(2 − 3)	(5 − 6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Willing to Give Advice	0.54	0.60	0.48	0.65	0.68	0.62	−0.11*	−0.08	−0.15	0.13**	0.06
							0.07	0.35	0.11	0.01	0.58
Duration (min)	21.75	21.45	22.07	30.33	27.63	33.11	−8.58***	−6.18***	−11.04***	−0.62	−5.48
							0.00	0.01	0.00	0.62	0.25
Number of Demographic Questions	0.50	0.40	0.60	1.71	1.16	2.27	−1.21***	−0.76***	−1.67***	−0.2	−1.11**
							0.00	0.00	0.00	0.12	0.04
Number of Financial Condition Questions	0.75	0.62	0.88	2.03	1.82	2.24	−1.28***	−1.20***	−1.36***	−0.26**	−0.43
							0.00	0.00	0.00	0.05	0.29
Asked about Financial Knowledge	0.31	0.33	0.29	0.61	0.61	0.62	−0.30***	−0.28***	−0.33***	0.04	−0.02
							0.00	0.00	0.00	0.44	0.89
Did not Inquire about Any Item	0.45	0.42	0.48	0.13	0.13	0.14	0.32***	0.29***	0.35***	−0.06	0.00
							0.00	0.00	0.00	0.23	0.96

of the portfolio over the three-month period starting from the date of the audit visit. We can compute this return for only 221 of 463 visits: 27 visits to FPs and 194 visits to SFs.

In Panel A of Table IA.I in the Internet Appendix, we note first that across all firms, the estimated three-month market-adjusted return was 0.25% and not statistically different from zero. When we disaggregate observations by firm type, there is no evidence that the advice from either SFs or FPs significantly outperformed the market. The returns on FPs' recommendations were 1.36 pp higher than those on SFs' recommendations but the difference is not statistically significant.

In Panel B of Table IA.I, we examine how these results vary by gender and firm type. Although the three-month market-adjusted return of SFs' advice to male auditors (0.28%) was higher than that for female auditors (-0.07%), the gender difference is a small 0.35 pp and not statistically significant. Among FPs, the market-adjusted return is 2.97% for male auditors and 0.04% for female auditors. This generates a larger gender difference of 2.93 pp, although this result is not statistically different from zero either.

In Tables IA.II and IA.III in the Internet Appendix, we repeat the exercises from Tables VII and VIII using this measure of ex post advice quality as the dependent variable. Although not statistically significant, the point estimates in Table IA.II suggest that FPs provide better advice than SFs. Similarly, although not statistically significant, the point estimates in Table IA.III suggest that FPs provide worse advice to women than to men, whereas the gender differences are smaller for SFs. Thus, although the tests are underpowered, we find suggestive evidence that FPs' recommendations to women generate lower market returns.

E. The Case of No Advice

In 30% of the audits, the advisor did not recommend a specific product. Recall that in our main analysis, we construct our binary dependent variables so that when the audit resulted in no advice, we code the observation as undominated advice. As a result, our previous analysis provides conservative estimates of the true incidence of dominated advice.

It is possible that given a choice between giving no advice, dominated advice, or undominated advice, some advisors would prefer not to advise at all, but if required to do so, may offer dominated advice. These propensities may (or may not) vary by the type of firm advisors work for or by the gender of the client. Our previous analysis does not allow us to detect such patterns. To circumvent this issue, we employ multinomial regressions to reexamine our key findings. In columns (1) and (2) of Table IA.IV in the Internet Appendix, we present results from multinomial regressions in which the dependent variable is coded to take one of three values: *No Advice*, *Undiversified Advice (UA)*, or *Not Undiversified Advice* (reference category). Similarly, in columns (3) and (4), the dependent variable is *No Advice*, *Home-Biased Advice (HB)*, or *Not Home-Biased Advice* (reference category). As column (1) shows, relative

to the reference category, FPs were more likely than SFs to advise the auditor and were less likely to give undiversified advice. Columns (3) and (4) show that relative to *Not Home-biased Advice*, FPs were just as likely as SFs to advise auditors, but significantly less likely to give home-biased advice. Thus, our main results from the binary dependent variable specifications hold in multinomial regressions as well: FPs were less likely to give poor-quality advice overall and were less likely to avoid advising the auditor.

Our previous results in Table VIII on firm type and gender differences are also confirmed in multinomial regressions in Table IA.V in the Internet Appendix. There is no evidence that advisors at either SFs or FPs were more hesitant to advise women than men. However, compared to undominated advice, FPs were more likely to give dominated advice to women than to men. This difference does not exist in SFs. Similarly, our results in Table IX on differences across the three auditor attributes—risk tolerance, confidence, and geographic outlook—continue to hold in the multinomial specifications, as shown in Table IA.VI in the Internet Appendix. These specifications confirm that among the risk-tolerant, confident, and domestic outlook-bearing auditors, women were significantly more likely to receive dominated advice over undominated advice in their visits to FPs.

F. Robustness to Alternative Clustering of Standard Errors and Firm Fixed Effects

Advisors working at the same firm branch might share common characteristics, and so the measurement error in their advice quality may be correlated. To account for this, in Tables IA.VII to IA.IX in the Internet Appendix, we rerun all of the tests from Tables VII to IX by clustering the standard errors at the branch level. Our conclusions remain qualitatively unchanged.

Finally, note that our data set consists of audits at 65 distinct advisory firms. Firm fixed effects can account for firm-specific inputs that affect advice quality, for example, advisor training, incentives, or firm culture. In Tables IA.X and IA.XI in the Internet Appendix, we repeat the analysis from Tables VIII and IX with firm fixed effects and standard errors clustered at the auditor level. Our results remain broadly similar.

G. External Validation of Model

We draw on the raw data from the nationally representative Health and Retirement Study (wave 2016) to test a key assumption of our paper. Using financial literacy questions similar to Lusardi and Mitchell (2014), a questionnaire was designed by Kim, Maurer, and Mitchell (2021) to measure the financial literacy of different demographic segments. Another question tried to gauge the use of free versus paid financial advice. We link the responses to all of these questions to test whether there is a gender difference in financial knowledge between those who seek free financial advice and those who pay for their advice.

The results are reported in Table IA.XII in the Internet Appendix. In column (1), we find that among the clients who pay for financial advice (roughly equivalent to clients visiting FPs in our model), financial literacy scores of women are lower than those of men, whereas in column (2), there is no difference in literacy scores of the two genders for the clients who obtain free financial advice (roughly equivalent to clients visiting SFs in our model). This corroborates a key assumption of our model. As the financial literacy scores of clients who pay for financial advice and those that do not are statistically indistinguishable (difference = 0.13, not significant), we find no evidence for or against another assumption of our model—less (more) financially knowledgeable clients visit FPs (SFs).

VII. Conclusion

Although some prior works suggest that finance professionals give different advice to men and women, it has been difficult to pin down the reasons why they do so. If advisors use the client's gender as a proxy for their risk preferences or for other characteristics that determine their optimal financial portfolio, then this is a benign explanation for the differences in advice. To the extent that these preferences are difficult to measure objectively, researchers are unable to control for them. To our knowledge, ours is the first paper to use a natural field experiment to randomly vary three such attributes—risk tolerance, confidence, and geographic outlook. This allows us to not only establish that there is a difference in the quality of financial advice that men and women receive, but to also shed light on the mechanisms that lead to these gender differences.

Our study provides evidence indicating that women are more likely to receive low-quality financial advice than men at some, but not all, types of advisory firms. We explain this as the result of different firm incentives and beliefs of advisors about gender differences in financial knowledge. When their revenues derive from trade commissions, advisors are more likely to recommend individual local stocks that investors trade frequently. At firms that specialize in customized service, advisors are likely to cater advice to their clients' attributes. Critically, however, this tendency is more pronounced when the client is female. We argue that this is because of advisors' belief that women are less financially knowledgeable and hence less likely to detect that the advice is of low quality.

A caveat is that we are unable to directly identify the effect of clients' financial knowledge. It is understandably difficult to conduct an audit study where auditors credibly signal that they are highly knowledgeable, since knowledgeable clients would typically not seek financial advice. Instead, we argue that advisors were most likely aware of the well-established empirical pattern that men tend to be more financially knowledgeable than women. Thus, our findings accord with the idea that advisors engage in statistical discrimination against women. Further, since we do not find gender differences

in the advice that SFs provide, it seems unlikely that the differences in the quality of advice are driven by taste-based discrimination.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1: Internet Appendix.
Replication Code.