What Do Certifications Certify?*

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Abstract

We study the market for certifications in the financial advisory industry, where over 200 designations compete to signal adviser quality, typically with an emphasis on ethical standards. Empirically, we find patterns consistent with a Spence signaling model: certifications that are more costly to acquire are associated with lower rates of adviser misconduct. Yet we also uncover a proliferation of low-cost, low-rigor, ethically-focused certifications that are associated with higher misconduct, raising the puzzle of why advisers invest in signals that appear to undermine their credibility. We argue that this coexistence of high- and low-quality certifications arises from free entry and limited consumer sophistication: frivolous certifications persist where consumers are less informed and competition among certifiers fuels a race to the bottom. We formalize these forces in a structural model of certification demand and supply, showing how competition among agencies and consumer naivete jointly shape equilibrium certification standards. Counterfactual simulations suggest that federally mandated certification standards, modeled on existing regulator-approved credentials that emphasize quality over membership, could increase average adviser quality by up to 20%. Our findings show how unregulated signaling and limited consumer awareness can lead to market failures in credentialing, offering insights for quality disclosure and market design in professional services.

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1 Introduction

In markets where verifying quality is difficult, third-party certifications often emerge to bridge the information gap. From organic food labels to financial adviser designations, these credentials are meant to signal trustworthiness, competence, or both. But when consumers cannot distinguish between rigorous and frivolous certifications, and when certification agencies face competitive pressures to attract paying members, the market for credentials may malfunction, undermining the very signals it is supposed to produce.

This paper examines such a breakdown in the U.S. financial advisory industry, where over 200 certifications compete to signal adviser quality and ethics. Although many advisers are certified and some high-quality certifications exist, many certifications function primarily as marketing tools; they are costly to consumers, inexpensive for advisers, and largely unregulated. We document that low-rigor certifications are both widespread and linked to higher rates of adviser misconduct, despite their claims of promoting ethical standards. This raises a puzzle: if certification is a costly signal in the Spence (1973) tradition, why do advisers adopt signals that correlate with lower quality?

We argue that this coexistence of high- and low-quality certifications arises from two forces: free entry among certifying bodies and limited consumer sophistication. In markets with unsophisticated consumers who struggle to differentiate between certifications, certifying agencies face downward pressure on standards as they compete for members. The result is a proliferation of low-quality signals that may harm rather than help consumers, a dynamic reminiscent of Shleifer's (2004) broader argument that competition, under certain frictions, can erode ethical conduct. Our paper brings these ideas to the market for professional certification, developing a structural model to unpack how informational frictions and competitive forces interact to produce signaling equilibria in which certifications lose their informational value.

We assemble new data on adviser certifications and misconduct. Approximately 20% of financial advisers hold at least one certification. These certifications are not legally required but are intended to signal higher adviser quality. For instance, the Certified Financial Planner (CFP) designation requires candidates to "meet rigorous education, examination, experience, and ethical requirements."[1] Given the prevalence of misconduct in financial advising—7.3% of advisers have a documented misconduct record—many certifications aim to signal ethical behavior and trustworthiness. Nearly all include an ethics component, and about 70% impose a fiduciary standard, requiring advisers to act in their clients' best financial interests.

Given the strong emphasis certifications place on ethics, and the fact that many focus exclusively on it, we begin by examining how adviser quality, proxied by misconduct, varies across certification holders. Misconduct rates differ markedly across certifications: in the top decile, around 5% of advisers have a misconduct record, compared to 15% in the bottom decile. While

[1] https://www.cfp.net/why-cfp-certification/the-standard-of-excellence

some certifications are indeed associated with lower misconduct, the majority are linked to above-average rates. These differences persist even after controlling for variation across firms, job roles, locations, and time by including firm-by-city-by-year-by-job fixed effects.

Anecdotal evidence from regulators reinforces the view that low-quality or frivolous certifications are widespread. FINRA refers to the "alphabet soup of professional designations" and warns that "not all financial designations are created equally... and can be used fraudulently." It further notes that such titles "often imply special training or experience of some extent, [but] can also be used as a marketing or self-promotional hook." Similar concerns are echoed by state regulators. The North American Securities Administrators Association (NASAA) cautions: "Titles may be simply purchased, or even made up by financial professionals hoping to imply that they have certain expertise or qualifications; such titles are generally marketing tools and are not granted by a regulator."

We find that certification quality is correlated with several observable characteristics. For instance, five certifications have been granted special status by state regulators that exempts holders from taking the Series 65 (Investment Adviser) exam. These "regulator-approved" certifications are associated with lower misconduct rates, suggesting that regulators can distinguish higher-quality credentials. In contrast, certifications that impose a fiduciary standard, purporting to ensure that advisers act in clients' best interests, are paradoxically associated with higher rates of misconduct, suggesting that such claims often fail in practice.

We also find that more costly certifications tend to signal higher adviser quality, consistent with standard signaling models. While most certifications require coursework and exams, the intensity of these requirements varies widely. For example, the Chartered Financial Analyst (CFA) designation requires over 900 hours of study, whereas many other certifications impose no classroom or testing requirements at all. We estimate that a 100% increase in required study hours is associated with a 3% reduction in adviser misconduct.

Why would an adviser choose to obtain a certification that signals lower quality? The proliferation of certifications, combined with limited consumer sophistication, helps sustain an equilibrium in which frivolous certifications persist. Consumers often struggle to distinguish between credentials, especially when many have similar-sounding names or acronyms. We find that low-quality certifications are more common in counties with less educated or older populations, consistent with the idea that consumer naivete supports their continued use. Additionally, in markets with greater competition among certifying bodies, adviser misconduct is more frequent – evidence of a "race to the bottom" in standards.

To interpret these findings, we build and estimate a structural model of certification demand and supply. Advisers choose whether to obtain a certification, and with which agency, based on the costs and expected returns from signaling to their clientele. Consumers, in turn, vary in their sophistication: some can discern signal quality; others treat all credentials as equal. Certification agencies compete by setting standards (study hours) to balance attracting more members

with maintaining reputational quality. The model helps explain key empirical patterns, including why consumers may select advisers with low-quality certifications and why advisers opt into them. It also provides a quantitative framework to evaluate policy counterfactuals related to certification regulation.

In the model, financial advisers differ in both their underlying ability and their propensity to engage in misconduct. Advisers choose whether to obtain a certification and, if so, which one, to maximize profits net of certification costs. The primary benefit of certification is its potential to attract more assets from households, but this benefit depends on how clients perceive the certification's value, which in turn is shaped by their level of sophistication. Certification costs reflect the effort required to meet certification's standards, with higher-ability advisers incurring lower costs. The model also allows for an adviser's ability to be correlated with her propensity to engage in misconduct.

On the supply side, certification agencies compete for members by setting standards within a Nash-Bertrand framework, balancing the dual goals of adviser quality and membership size. On the one hand, higher standards attract higher-ability advisers and enhance the agency's reputation. On the other hand, lower standards broaden the pool of potential members. As a result, agencies face a fundamental trade-off between maintaining certification quality and maximizing membership.

We estimate and calibrate the supply and demand for certifications using our data on financial advisers. On the demand side, we estimate advisers' certification choices using a mixed multinomial logit model, where demand depends on the expected profit from obtaining a certification relative to its cost. On the supply side, we recover each certification agency's preference parameters, which reflect how the agency trades off attracting more members versus maintaining certification quality. Agencies set standards, such as required study hours, to optimize this trade-off. Our estimates reveal meaningful heterogeneity across certifying bodies, captured by a single preference parameter that explains why some agencies impose higher standards than others.

We use our quantitative model to study how consumer sophistication, market competition, and regulatory interventions shape the certification market. Our empirical findings suggest that limited consumer sophistication sustains an equilibrium in which low-quality, or frivolous, certifications persist. While one might expect households to eventually learn the reputations of different certifications and adjust their behavior accordingly, our results suggest otherwise. If all households were as sophisticated as those at the top of the distribution, the average misconduct rate among certified advisers would decline by nearly 20%.

We also find that increased competition among certification agencies leads to lower certification quality. In markets where consumers struggle to differentiate between credentials, certifying bodies serve as the primary gatekeepers of quality. However, as competition for members intensifies, agencies face pressure to lower their standards to expand membership.

Consistent with the logic in Shleifer (2004), maintaining high standards in such environments requires some degree of market power or rents. In their absence, certification markets devolve into a "race to the bottom." In addition, the market for certification can also be considered as one with advantageous selection. Advisers with lower willingness to meet the standards imposed by certification agencies are potentially more likely to commit misconduct, hence more "costly". In markets with advantageous selection, perfect competition can lead to excess supply (Mahoney and Weyl, 2017).[2]

Lastly, we examine the impact of regulatory interventions that mandate certification standards. In our model, under plausible assumptions, policies that promote high-rigor certifications, such as those already endorsed by public authorities, can shift the equilibrium toward higher overall adviser quality. Indeed, our counterfactual simulations suggest that adopting uniform standards based on these regulator-approved credentials could reduce adviser misconduct by approximately 20%.

More broadly, our findings have implications beyond the financial advice industry. In any market where quality is opaque and consumers struggle to evaluate signals, unchecked competition among certifiers can degrade the value of those signals. The result is not only worse outcomes for consumers, but also a systematic misallocation of effort and investment toward low-value credentials. This underscores a central insight from Shleifer (2004), that when ethical behavior is a public good threatened by market forces, institutional design—including regulation—plays a crucial role in preserving credibility and trust in professional markets. The paper proceeds as follows: Section 2 describes the institutional setting and the data used in our analysis. In Section 3, we present some basic facts about certifications, and in Section 4, we explore why frivolous certifications survive in equilibrium. In Section 5, we develop and estimate a model of supply and demand for certifications, and we explore the quantitative implications of the model in Section 6. Section 7 concludes.

Related Literature

Our paper relates to the literature on professional licensing and certifications. The economic debate over occupational licensing and regulations dates back to Adam Smith's *Wealth of Nations* (Kleiner, 2000). On the one hand, governments can maintain minimum quality standards by implementing occupational licensing requirements. On the other hand, occupational licensing requirements inherently restrict entry. Economists have often argued that certifications may be a preferable way of signaling quality without restricting entry (See Kleiner (2000) and Kleiner (2006) for a discussion of the literature and policy); however, Berk and Van Binsbergen (2022) show certifications and disclosure requirements may not be optimal either. Berk and Van Binsbergen (2022) show that, like licensing requirements, certifications and other disclo-

[2]This result is also an illustration of the theory of the second best (Lipsey and Lancaster, 1956). In the presence of multiple frictions (market power and selection), reducing one does not necessarily lead to a more efficient outcome.

sure requirements, through their impact on equilibrium prices, can make consumers worse off while benefiting providers.

Our paper contributes to this debate by providing new insight into the link between occupational certifications and quality. Much of the existing literature has focused on the relationship between occupational licensing and quality, and in general, it has found mixed results. Evidence from the education literature finds that occupational licensing requirements have little impact on average teacher quality but potentially increase the quality of the left-tail of the distribution (Angrist and Guryan, 2004, 2008; Larsen et al., 2020). In other settings, such as certified public accountants, dentists, and home repairs, researchers have found that licensing requirements have little impact on service/product quality but lead to a decrease in competition and supply (Kleiner and Kudrle, 2000; Farronato et al., 2020; Barrios, 2022). However, evidence from Kowaleski et al. (2020) finds that the ethics training, as part of the licensing requirements in the financial advisory, leads to decreased adviser misconduct in the financial advisory industry.

In light of this previous literature, our paper focuses on occupational certifications rather than licensing requirements, which, distinct from licensing requirements, do not restrict entry. This distinction is important because professional certifications are often considered preferable to licensing. We also have the added benefit that quality, which we measure as misconduct, is relatively well-defined and measured in our setting. Lastly, we can understand how occupational certifications impact both the demand and supply of financial advice.

Our paper relates to the literature on misconduct in the financial advisory industry (Dimmock et al., 2018; Gurun et al., 2018; Charoenwong et al., 2019; Egan et al., 2019; Gurun et al., 2021) and the financial advisory literature more generally (Foerster et al., 2017; Chalmers and Reuter, 2020; Linnainmaa et al., 2021). Several important themes emerge from this literature. First, accounting for consumer sophistication is important. Egan et al. (2019) finds that misconduct is relatively common among financial advisers, especially in areas with less sophisticated households, and accounting for heterogeneous consumer sophistication is important for designing optimal financial regulations (Egan et al., 2018). Another important theme is the role of trust (Gennaioli et al., 2015; Gurun et al., 2018). Financial certifications are often considered a solution to adviser misconduct and a way of building trust in the system. Several popular financial planning websites advocate that households choose a certified financial adviser.[3] We show that certifications may exacerbate rather than alleviate information frictions in the financial advisory and lead to elevated adviser misconduct.

To this end, our results suggest that the proliferation of designations may create strategic complexity in the financial advisory industry. It is well-founded in theory that firms may increase product complexity to create obfuscation and increase market power. (Gabaix and

[3]For examples, see https://www.investopedia.com/updates/find-financial-advisor-planner/, https://www.bankrate.com/investing/how-to-choose-a-financial-advisor/, https://www.nerdwallet.com/article/investing/how-to-find-a-financial-advisor-near-you, https://www.wsj.com/buyside/personal-finance/how-to-choose-financial-advisor-01664977079.

Laibson, 2006; Carlin, 2009; Carlin and Manso, 2011). Empirical evidence from Célérier and Vallée (2017) suggests that complexity in the retail structured product market is a by-product of banks competing for yield-chasing investors. Furthermore, competition may exacerbate incentives to create strategic complexity (Carlin, 2009), and could destabilize ethical behavior in the industry overall (Shleifer, 2004).

Lastly, our paper also relates the growing literature at the intersection of industrial organization and finance. Several recent papers have used tools from the industrial organization literature to assess counterfactual financial regulations quantitatively. For example, researchers have used these types of IO frameworks to study regulatory issues in mortgage markets (Allen et al., 2014; Robles-Garcia, 2019; Agarwal et al., 2020; Benetton, 2021; Benetton et al., 2021), credit markets (Nelson, 2018; Galenianos and Gavazza, 2022; Cuesta and Sepúlveda, 2021; Allcott et al., 2022), insurance markets(Koijen and Yogo, 2016, 2018; Bhattacharya et al., 2019; Egan et al., 2022), and banking markets (Egan et al., 2017; Xiao, 2019; Wang et al., 2022) among others. Our paper is specifically related to the IO of selection markets (Einav et al., 2021), since we model how a certification agency's standard affects its misconduct rates (and also the misconduct rates of its competitors) by attracting different types of advisers.[4] A distinct feature of our setting is that misconduct rates also affect household demand for advisers, which in turn influences advisers' demand for certifications. This feedback loop can mitigate the excess supply caused by advantageous selection, since the demand for certifications among infra-marginal advisers falls as these certifications attract low-quality marginal advisers. To capture this effect, we extend traditional selection market models by introducing an additional fixed point in a Bayesian Nash Equilibrium. Our approach can also be used in other contexts, such as those with peer effects alongside selection.

2 Data and Institutional Details

2.1 Data

Our base data set comes from FINRA's BrokerCheck database. BrokerCheck contains the complete registration, employment, qualification, and disclosure history for the universe of individuals registered with FINRA (i.e., Registered Representatives). We refer to these registered representatives as "Financial Advisers" because it is typically how these individuals refer to themselves. We study the cross-section of financial advisers employed in 2020 and employed in 2016. We focus on these two cross-sections because we have certification data for these years.

Importantly, BrokerCheck contains data on each adviser's regulatory qualifications and licenses. There are 61 different regulatory licenses a financial adviser may hold. These regulatory licenses allow us to control for a financial adviser's job function. For example, an individual

[4]Other finance papers that study the interaction of market power and selection include Cuesta and Sepúlveda (2021); Crawford et al. (2018)

must hold a Series 57 License to be a NASDAQ and OTC equity trader. Conversely, a Series 11 allows an individual to work as a Sales Assistant and process unsolicited securities orders. These licenses are in sharp contrast to the professional certifications we discuss below, which are neither sufficient nor required for working in the different areas of the financial services industry.

Given that most certifications advertise that their advisers adhere to higher ethical standards, one of the key variables we examine is adviser misconduct. Following Egan et al. 2019, we define misconduct as any criminal offense, regulatory offense, customer dispute or civil case resolved in favor of the client, and any case where the adviser was fired for cause. It's crucial to note that FINRA mandates financial advisers and firms to report these types of offenses to BrokerCheck within thirty days.[5]

Table 1 displays the summary statistics corresponding to our base data set. We have 1,373,666 adviser-by-year observations for the years 2016 and 2020. The average adviser in our sample has 14 years of experience and 2 regulatory licenses. Roughly 45% of the advisers in the sample are dually registered as investment advisers.[6] Consistent with Egan et al. (2019), 7% of the advisers in our sample have a misconduct record.

2.2 What are Financial Adviser Certifications?

We collect data on certification membership from various sources, including Meridian IQ, the SEC IAPD database, and online public membership data for 71 of the most common certifications. The average adviser in our sample has 0.26 certifications. Table 2 displays the most common certifications in our sample, and Figure 1a shows a histogram of the size of each certification in terms of the number of active members. The distribution is skewed to the right. The Certified Financial Planner (CFP) designation is the most common designation; roughly 10% of the advisers in our sample are CFPs.

A natural question is, what are these financial certifications, and why do they exist? Nearly all certifications include an ethical component, aiming to certify that designees adhere to higher ethical standards. For instance, according to its website, the Certified Kingdom Adviser (CKA) certification is "the standard of excellence for biblically wise financial advice. As part of that mission, we require all Certified Kingdom Advisor designees to remain in compliance with a set of ethical principles, rules, and standards in order to use or to continue to use the Certified Kingdom Advisor designation."[7] Roughly 42% of certifications (weighted at 70% by membership) require their advisers to adhere to a fiduciary standard, meaning these advisers must act in their

[5]FINRA classifies disclosures into 23 three categories. We classify the following disclosures as adviser misconduct: Customer Dispute-Settled, Regulatory-Final, Employment Separation After Allegations, Customer Dispute - Award/Judgment, Criminal - Final Disposition, Civil-Final.

[6]We identify whether an adviser is registered as an investment adviser based on whether they have passed an investment adviser exam (i.e., Series 65 or Series 66 Licensing exam).

[7]Source: https://kingdomadvisors.com/get-certified

clients' best financial interests. Examples of designations that explicitly mention the term fiduciary in their titles include Accredited Investment Fiduciary (AIF), Board Certified Fiduciary, Certified Financial Fiduciary (CFF), Certified Plan Fiduciary Advisor (CPFA), and Registered Fiduciary (RF). According to its website, the Accredited Investment Fiduciary (AIF) Designation is "a professional certification that demonstrates an advisor or other person serving as an investment fiduciary has met certain requirements to earn and maintain the credential."[8] This distinction is important for potential clients when considering an adviser's service standard, as a fiduciary standard is significantly higher than the legal requirement for most financial advisers in the US, who are typically held to a lower suitability standard.[9]

One concern with these certifications is whether they can credibly signal that they hold their advisers to higher ethical and legal standards. To help credibly signal standards, national accreditation agencies provide accreditation for some certifications. Six designations (37% weighted by membership) in our sample are accredited by either the ANSI National Accreditation Board (ANAB) or the National Commission for Certifying Agencies (NCCA). The ANSI and NCCA are non-governmental organizations providing independent recognition and certification evaluation.

While many certifications emphasize ethical standards, some also indicate specialized training. For example, some advisers may be Certified Public Accountants (CPA), which signals skill and specialization in accounting practices. However, most states require CPA candidates to pass an ethics exam at the state level.[10] Our data includes information on advisers' regulatory licenses, allowing us to account for their job functions. Generally, certifications do not serve as substitutes for licensing requirements. However, state regulators have granted special status to five certifications that exempt certificate holders from taking the Series 65 (Investment Adviser) exam. Advisers holding the Certified Financial Planner (CFP), Chartered Financial Analyst (CFA), Chartered Financial Consultant (ChFC), Personal Financial Specialist (PFS), or Chartered Investment Counselor (CIC) designations are typically exempt from the Series 65 exam. Advisers typically need a Series 65 license to work as an investment adviser representative (e.g., work as an "investment adviser") and provide investment-related advice to their clients.

Most certifications include some form of education and testing requirements. Approximately 75% of certifications have an education requirement, while 80% require passing a test. Figure 1b displays the distribution of estimated hours required to earn each certification in our sample,

[8] Source: https://www.fi360.com/what-we-do/learning-development/aif-training/aif-designation.

[9] Under the suitability standard, advisers are obligated to recommend products that are "suitable" for their clients based on their risk tolerance and objectives (See Egan, Matvos, and Seru, 2024 for a further description of the industry). In 2010, the Securities and Exchange Commission (SEC) introduced Regulation Best Interest. This regulation mandates that broker-dealers must create and uphold "policies and procedures reasonably designed to identify and fully and fairly disclose material facts about conflicts of interest, and in instances where we have determined that disclosure is insufficient to reasonably address the conflict, to mitigate or, in certain instances, eliminate the conflict." Source: https://www.govinfo.gov/content/pkg/FR-2019-07-12/pdf/2019-12164.pdf

[10] Source: https://beatthecpa.com/ultimate-guide-to-the-aicpa-ethics-exam/

showing a right-skewed distribution. For example, completing a CFA requires over 900 hours of study and can take 4-5 years. In contrast, other certifications may only require taking an online test or course. Additionally, most certifications have an initial fee and an annual renewal fee. Figure 1c displays the distribution of annual renewal fees.

3 What do Certifications Signal?

3.1 Certifications and Adviser Quality

We examine whether advisers with certifications have higher professional and ethical standards. We focus on ethics because there have long been concerns about ethical standards in the financial industry, and they are the motivation for many of the existing regulations and certifications. Nearly all certifications include an ethical component. Moreover, 70% of certificate holders claim to act as fiduciaries, which means they must look out for their client's best financial interests.

Given the emphasis certifications place on holding their holders to higher professional and ethical standards, financial misconduct is a natural starting point for evaluating certifications. As mentioned, adviser misconduct includes regulatory violations, financial crimes, and customer disputes resulting in a settlement. We also find that our results are robust when we examine more and less stringent measures of professional standards, such as whether the adviser has ever engaged in outright fraud.

We start with several simple cuts of the data. For each certification j, we compute the $Misconduct\,Rate_j$ as the share of certification holders with a past misconduct record, pooling data in 2016 and 2020. Figure 2a displays the $Misconduct\,Rate_j$ for the certifications in our data set. The results suggest that there is substantial heterogeneity in misconduct across certifications. The red-dashed line displays the share of advisers with a record of misconduct among those who do not hold certifications. Thus, the misconduct rate for many of the certifications is higher than the misconduct rate for advisers without certifications.

To make this comparison more stark, Figure 2b displays the distribution of certification misconduct rates for those certifications that claim to hold their advisers to a higher fiduciary standard. While virtually all certifications emphasize that they hold their advisers to a higher ethical standard, it is particularly true for these fiduciary certifications. Consistent with our results for the full sample, we find substantial heterogeneity in misconduct rates among fiduciary certifications, and many have elevated (above average) rates of misconduct.

One potential concern in our analysis is that certifications may be correlated with other adviser characteristics, such as firm or job function. As documented in Egan et al. (2019) the rate of misconduct varies substantially across firms. An advantage in our setting is that we can control for the branch an adviser works in (i.e., firm-by-city fixed effects) and include license fixed effects for each of the 61 licenses an adviser might hold. These fixed effects allow us to

control for where an adviser works and what she does. Using these additional control variables, we examine the relationship between misconduct and certifications in the following regression specification:

$$Misconduct_{ijkt} = \sum_{l \in \mathcal{L}} \gamma_l Certification_{ijlkt} + \beta X_{ijkt} + \mu_{jkt} + \epsilon_{ijkt}. \quad (1)$$

Observations are at the adviser-by-year level. The dependent variable $Misconduct_{ijkt}$ is a dummy variable indicating whether adviser i at firm j in city k in year t has a record of misconduct. The vector X_{ijkt} is a vector of adviser characteristics, including their experience, regulatory licenses, and the number of states they are licensed to operate in. We include firm-by-city-by-year fixed effects in μ_{jkt}. In our most stringent specifications, we also include firm-by-city-by-year-by-licenses fixed effects. These fixed effects allow us to compare two advisers working for the same firm, in the same location, and with the same set of regulatory licenses so that we can control the adviser's job and job function.

We include a dummy variable $Certification_{ijklt}$ for each certification l, which indicates whether adviser i holds certification l in year t. The coefficients of interest in Eq. (1) are the set of fixed effects $\boldsymbol{\gamma}$ corresponding to each certification. In Figure 3, we report the distribution of misconduct rates across certifications, measured by fixed effects ($\boldsymbol{\gamma}$) plus the misconduct rates among advisers with no certifications. Among advisers without any certifications, roughly 7% have a record of misconduct (red-dashed line in Figure 3). Thus, if γ_l=2%, we would expect 9% (=2%+7%) of advisers holding certification l to have a record of misconduct. The results suggest that there is substantial heterogeneity in misconduct rates across certifications, even after accounting for differences in the job functions of certification holders, and that many certifications are associated with elevated rates of misconduct relative to the average adviser. In other words, many of the certifications are a signal of lower adviser quality (i.e., more misconduct).

3.2 Heterogeneity Across Certifications

In this section, we explore what drives the heterogeneity in certification quality and which characteristics predict it. Certifications differ on several observable dimensions, and we focus on three of the most salient features.

First, we examine whether the certification requires holders to act as fiduciaries. Advisers held to a fiduciary standard are required to act in the best financial interests of their clients, which is a much higher standard than the suitability standard that financial advisers have traditionally been held to. Even though a certification agency may require its members to act as fiduciaries, it is unclear whether and how certification agencies enforce this.

Second, advisers holding a CFA, ChFC, CFP, CIC, or PFS designation are exempt from the Investment Advisor Representative (IAR) Exam (Series 65 Exam). By definition, regulators

never require advisers to hold certifications in order to work as financial advisers; however, in this special case, states generally treat these five certifications as substitutes for the Series 65 exam. Given that regulators treat these certifications as substitutes for licensing exams, one might expect these certifications to be a signal of higher quality.

Lastly, a certification may or may not be accredited. Six of the certifications we study are accredited by private nonprofit organizations, either the American National Standards Institute (ANSI) or the National Commission for Certifying Agencies (NCCA). One might expect these accredited certifications to signal higher quality.

Building on our previous regression specification (Eq. 1), we examine which certification characteristics are associated with higher/lower professional standards in the following regression specification:

$$\begin{aligned} Misconduct_{ijkt} =& \gamma_1 Cert_{ijkt} + \gamma_2 Accredited\,Cert_{ijkt} + \gamma_3 IAR\,Cert_{ijkt} + \gamma_4 Fiduciary\,Cert_{ijkt} \\ &+ X'_{ijkt}\beta + \mu_{jkt} + \epsilon_{ijkt}. \end{aligned} \tag{2}$$

Observations are at the adviser-by-year level. The dependent variable $Misconduct_{ijkt}$ is a dummy variable indicating whether adviser i at firm j in city k in year t had a record of misconduct. The variable $Cert_{ijkt}$ indicates whether the adviser holds at least one certification. The variables $Accredited\,Cert_{ijkt}$, $IAR\,Cert_{ijkt}$, and $Fiduciary\,Cert_{ijkt}$ are dummy variables indicating whether the adviser holds a certification that is accredited, holds a certification that exempts the adviser from the IAR Exam, and holds a certification that states that the holder must act as a fiduciary. We again control for our baseline set of adviser characteristics in X_{ijkt} and include firm-by-city-by-year fixed effects in our baseline specification and firm-by-city-by-year-by-license fixed effects in our most stringent specification.

We report the estimates in Table 3. The results indicate that those five regulator "approved" certifications are correlated with lower misconduct rates. The results in column (1) suggest that advisers holding a regulator-approved certification are 1.65 pp (24%) less likely to have a misconduct record. Conversely, those advisers holding an accredited certification are 1.11 pp (16%) more likely to have a misconduct record (column 1). We also find some evidence that advisers holding a certification that requires them to act as fiduciaries are 0.26 pp (4%) more likely to have misconduct records.

The results suggest that regulator-approved certifications signal higher quality (i.e., less misconduct). This suggests that regulators are able to discern between high and low-quality certifications. In contrast, we find evidence that accredited certifications signal lower quality. Similarly, we find evidence that advisers who purportedly hold themselves to a higher standard of care (i.e., the fiduciary standard) appear to do the exact opposite and are more likely to engage in financial misconduct.

3.3 Certification Standards and Costly Signaling

We next examine the relationship between certification quality and standards. Certifications typically have an education component ranging from taking one-time online classes to years of coursework. For example, becoming a Chartered Financial Analyst (CFA), one of the oldest and most prestigious certifications, requires over 900 hours of study. In contrast, one can obtain other certifications by taking an online course that takes 10 hours to complete. Here, we examine the relationship between certification standards, measured by the estimated hours required to obtain the certification, and certification quality.

We start with a simple cut of the data. Figure 5 displays a binned scatter plot of the relationship between certification misconduct and the hours required to obtain the certification. Observations are at the certification level. The results indicate a negative relationship between hours and misconduct. Those certifications that are more costly to obtain, as measured by hours, signal higher adviser quality, as measured by lower misconduct rates. The negative relationship between the cost of obtaining the certification and misconduct is consistent with a Spence-type signaling model where the highest quality advisers acquire the most costly certifications.

More formally, we extend our previous specification (Eq. 1) where we control for an adviser's cost of obtaining certifications. We estimate the regression specification:

$$Misconduct_{ijkt} = \gamma Certification_{ijkt} + \theta \ln(1 + Hours_{ijkt}) + \beta X_{ijkt} + \mu_{jkt} + \epsilon_{ijkt} \quad (3)$$

Observations are at the adviser-by-year level, and the dependent variable indicates whether the adviser has a record of misconduct. The variable $Certification_{ijkt}$ indicates whether the adviser holds at least one certification, and the variable $Hours_{ijkt}$ measures the total estimated hours the adviser spent obtaining certifications. We again control for our baseline set of adviser characteristics in X_{ijkt} and include firm-by-city fixed effects in our baseline specification and firm-by-city-by-year-by-license fixed effects in our most stringent specification.

Table 4 displays the corresponding estimates. Consistent with Figure 5, we find a negative and significant relationship between adviser misconduct and hours in each specification. The results in column (1) indicate that a 100% increase in the time spent obtaining a certification is correlated with a 0.2pp (3%) decrease in misconduct. The results in column (1) also imply that those certifications that take less than 130 hours to complete are associated with elevated rates of misconduct relative to advisers without any certifications. In contrast, certifications that take more than 130 hours to complete are associated with less misconduct than advisers without certifications.

Overall, our results suggest that there is substantial heterogeneity in certification quality and that many certifications do the exact opposite of what they promise. Although certifications

allege that they hold their members to higher ethical standards, we find the exact opposite for many certifications in the data. Regulator-approved certifications signal positive quality, while many accredited and fiduciary-related certifications are associated with elevated adviser misconduct.

3.4 Robustness

Our baseline results indicate substantial heterogeneity in certification quality. Here, we explore several robustness checks related to our measure of certification quality.

3.4.1 Other Measures of Quality

Our baseline analysis measures certification quality based on whether the holder has a misconduct record. As a robustness check, we consider three alternative measures of quality. We measure quality based on whether the certification holder has a criminal history, whether the certification holder has a record of fraud, and whether the certification holder previously engaged in authorized activity. These three alternative measures indicate potentially more egregious behavior of the financial adviser. For example, fraud means that the adviser intentionally deceived their client for the adviser's gain. Roughly 2% of advisers in our sample have a criminal history, 0.50% have a record of fraud, and 0.97% have a record of engaging in unauthorized activity.

We re-estimate three versions of Eq. (1) where we replace the dependent variable, whether the adviser has a record of misconduct, with each of our three alternative measures of quality (i.e., criminal activity, fraud, and unauthorized activity). The regressions are of the form:

$$\begin{aligned} Criminal\,Activity_{ijkt} &= \sum_{l \in \mathcal{L}} \gamma_l^{Crime} Certification_{ijlkt} + \beta^{Crime} X_{ijkt} + \mu_{jkt}^{Crime} + \epsilon_{ijkt}^{Crime}, \\ Fraud_{ijkt} &= \sum_{l \in \mathcal{L}} \gamma_l^{Fraud} Certification_{ijlkt} + \beta^{Fraud} X_{ijkt} + \mu_{jkt}^{Fraud} + \epsilon_{ijkt}^{Fraud}, \\ Unauthorized\,Activity_{ijkt} &= \sum_{l \in \mathcal{L}} \gamma_l^{Unauth.} Certification_{ijlkt} + \beta^{Unauth.} X_{ijkt} + \mu_{jkt}^{Unauth.} + \epsilon_{ijkt}^{Unauth.}. \end{aligned} \tag{4}$$

Observations are at the adviser-by-year level. The dependent variables are whether the adviser has a criminal history, record of fraud, and record of unauthorized activity. The object of interest in these regression specifications are the certification fixed effects corresponding to criminal activity, fraud, and unauthorized activity (i.e. γ^{Crime}, γ^{Fraud}, $\gamma^{Unauth.}$). We again control for adviser characteristics in X_{ijkt} and include firm-by-city-by-year-by-licenses fixed effects.

We report the corresponding certification fixed effects for our three alternative measures of quality in Figure 4 in terms of the expected share of advisers with a criminal history, record

of fraud, and record of unauthorized activity. As before, we find substantial heterogeneity in certification quality across all three different measures of quality/misconduct.

We also replicate our analysis from Section 3.2 where we examine the relationship between the type of certification (e.g., accredited, fiduciary, SEC approved, etc.) and whether it is correlated with our other measures of quality (Eq. 2). We report the estimates in Table 5. The dependent variable in column (1) is whether the adviser has a criminal history, the dependent variable in column (2) is whether the adviser has a record of fraud, and the dependent variable in column (3) is whether the adviser has a record of engaging in unauthorized activity. The results are broadly consistent with our earlier findings. We find that SEC-approved certifications are associated with lower rates of crime and unauthorized activity, while accredited certifications are associated with elevated rates of crime and unauthorized activity. We also find that advisers holding fiduciary-related certifications are more likely to engage in unauthorized activities.

3.4.2 Misconduct Reported by Certification Agencies vs. FINRA

Four of the certifications in our sample reported the disciplinary history of their members as of 2020. As a final robustness check, we examine how the disciplinary histories reported by these certification agencies compare with the disciplinary histories reported by FINRA. Although positive and statistically significant, the correlation between FINRA-reported and certification agency-reported disciplinary histories is quite weak. The correlation between our measure of FINRA-reported misconduct and certification agency-reported discipline is 0.05. Among advisers that hold these certifications, 11% have a record of misconduct; however, only 0.13% have a disciplinary history reported by the certification agency. Furthermore, among those with a past misconduct record, as per FINRA, only 0.65% have a disciplinary history reported by the certification agency. We find similar results when we look at advisers with a history of criminal activity, fraud, and unauthorized activity. Only 0.32% of advisers with a criminal record have a disciplinary history reported by the certification agency. Similarly, only 1.25% (1.63%) of advisers with a record of fraud (unauthorized trading) have a disciplinary history reported by the certification agency. The results suggest that some certification agencies potentially dramatically underreport misconduct among their certificate holders.

3.4.3 Future Misconduct

In our baseline analysis, we examine whether certified advisers are more likely to have a record of past misconduct. We also test whether certifications predict future misconduct. Columns (4)–(5) of Table 5 report results from re-estimating eq. (1) with future misconduct as the dependent variable. In this specification, we additionally control for whether the adviser has a record of past misconduct. Even after controlling for past misconduct, holding a certification

is associated with higher rates of misconduct in the future. Hence, it appears that certification choices reflect advisers' persistent propensity to engage in misconduct.

3.4.4 Treatment vs Selection

The relationship between certification and misconduct could reflect either treatment or selection. Does obtaining certain frivolous certifications make advisers more likely to engage in misconduct (treatment), or do such certifications simply attract advisers already prone to misconduct (selection)? While everyday investors and even policymakers may not care about the distinction, it has modest quantitative implications for the counterfactuals we explore in our structural model.

We argue, and provide some evidence, that the effects we document are more likely to be driven by selection than by treatment, although disentangling these two channels is challenging. In Appendix Section C, we show that advisers with a past record of misconduct are more likely to obtain frivolous certifications and less likely to obtain reputable certifications such as the CFA in the future relative to those without such a record. This finding is consistent with the selection mechanism, although we cannot completely rule out treatment effects.

4 Motivating Evidence Why Do Frivolous Certifications Survive?

A natural question is why frivolous certifications survive in equilibrium. Why doesn't competition drive frivolous certifications out of the market? We argue that the mechanism is largely similar to why advisers persistently engage in misconduct: heterogeneity in consumer sophistication. Given these information frictions, competition can exacerbate some of these frictions. There are over 200 certifications in the marketplace, many with nearly identical names and acronyms, making it difficult for investors to discern and assess the quality of certifications. We find suggestive evidence that frivolous certifications thrive in areas with less sophisticated populations and more intense competition among certification agencies.

4.1 Consumer Sophistication and Certification Quality

We examine the relationship between adviser misconduct and certifications and how the relationship varies with consumer sophistication in the following specification:

$$Misconduct_{ijkt} = \gamma_1 Cert_{ijkt} + \gamma_2 Sophistication_{kt} \times Cert_{ijkt} + X'_{ijtk}\beta + \mu_{jkt} + \epsilon_{ijkt}. \quad (5)$$

Observations are at the adviser-by-year level, and the dependent variable indicates whether the adviser holds a misconduct record. The key independent variable of interest is the in-

teraction term between consumer sophistication and whether the adviser has a certification, $Sophistication_{kt} \times Cert_{ijkt}$. We measure consumer sophistication at the county level using census data on the share of the population with a college education, the share of the population over 65, and log income. In our baseline specification, we include firm-by-county-by-year fixed effects, which absorb the level effect that consumer sophistication has on misconduct. The interaction term then measures how the quality of certifications, as measured by the misconduct rate, varies with consumer demographics. We also include our baseline set of adviser controls X_{ijkt}.

We report the corresponding estimates in Table 6. We find that the positive relationship between certifications and misconduct is larger in areas with a greater share of people over the age of 65. The results suggest that in younger regions where share of people over 65 is one standard deviation below the mean, advisers with certifications are 2.5 bps $(0.191 - 0.216)$ less likely to have a misconduct record than advisers without certifications. In contrast, advisers in older regions where share of over 65 is one standard deviation above the mean are 41 bps $(0.191 + 0.216)$ more likely to have a misconduct record than advisers without certifications. We also find evidence that misconduct is more common among certified advisers in areas where the population is less educated, although the point estimates are statistically insignificant.

4.2 Information Frictions

Information frictions can prevent unsophisticated households from assessing the quality of certifications. There are over 200 certifications and many with similar acronyms. For example, Chartered Financial Analyst (CFA) is one of the oldest and most prestigious certifications. It requires over 900 hours of study and fewer than 5% of advisers with CFA have a misconduct record. However, many other certifications have similar acronyms as CFA, making it difficult for unsophisticated households to distinguish the quality differences. In Figure 6, we plot the average misconduct rates among certified advisers and the string differences between the certification acronyms and CFA. We show that advisers holding certifications that appear to be similar to CFA have higher misconduct rates. Advisers holding certifications whose acronyms are only 1 string different from CFA have a 3 percentage points higher probability of misconduct compared to advisers holding certifications whose acronyms are completely different from CFA with 4 string differences.

4.3 Competition among Certifications

A unique feature of certifications, as opposed to regulatory licenses, is that there is scope for competition among certification agencies. Competition for certification members could result in a race to the bottom in terms of certification standards. To explore this possibility, we estimate the following regression specification:

$$Certification\ Misconduct\ Rate_{kt} = \gamma HHI_{kt} + X'_{kt}\beta + \mu_t + \mu_{s(k)} + \epsilon_{kt}. \quad (6)$$

Observations are at the county-by-year level. The dependent variable $Certification\ Misconduct\ Rate_{kt}$ measures the share of advisers with a record of misconduct among those holding at least one certification in county k at time t. We measure competition among certification agencies at the county-by-year level using the Herfindahl–Hirschman Index (HHI_{kt}). We calculate market shares for HHI_{kt} based on the share of advisers holding each certification. A higher HHI_{kt} indicates a more concentrated (less competitive) market for certifications. We control for the share of advisers in each county and year that have any certifications, and also include time (μ_t) and state $(\mu_{s(k)})$ fixed effects.

We report the corresponding estimates in Table 7. The results indicate a negative relationship between certification concentration and the certification misconduct rate. In other words, certified advisers are more likely to have a record of misconduct when there is more competition among certification agencies (low HHI).

Overall, we find suggestive evidence that the interaction between households' limited understanding of certification differences (i.e., heterogeneity in household sophistication and information frictions) and competition among certification agencies can lead to lower certification standards and quality. Building on these findings, in the next section we develop and estimate a structural model that illustrates how these forces shape equilibrium certification standards.

5 Model

In the final portion of the paper, we develop and estimate a quantitative model of demand and supply for certifications. The model features two types of agents: financial advisers who choose certifications and certification agencies that supply these certifications.

Financial advisers' certification choices are modeled as a discrete choice problem. Each adviser decides whether to pursue certification and, if so, which certification to obtain in order to maximize their profits net of the costs involved. Certifications vary in reputation (e.g., average misconduct among members) and acquisition costs (e.g., certification standards). Advisers generally prefer certifications with a better reputation and lower acquisition costs. We allow an adviser's ability, which determines the cost of obtaining a certification, to be heterogeneous and correlated with adviser quality. Thus, our model includes a mechanism akin to a Spence signaling model, where higher quality advisers opt for certifications with higher standards.

On the supply side, certification agencies manage certifications and set the required standards. Each agency sets its standard to maximize its objective function, which balances the quality of the certification against the number of certification holders. Certification agencies compete in a Nash-Bertrand standard-setting game. By raising certification standards, an agency increases the average quality of its certified advisers but may reduce membership as advisers

substitute to other certifications that are less costly to obtain.

A key feature of our model is that it is quantitative, which allows us to analyze the underlying forces in the data and explore policy counterfactuals, discussed in Sections 6 and 7.

5.1 Advisers

Financial advisers choose certifications to maximize profits and may also commit misconduct. Their certification decisions and propensity to engage in misconduct depend on three dimensions of heterogeneity: their ability γ which determines their marginal cost of obtaining certification, their latent preference for certification η, and their propensity to engage in misconduct q. Advisers provide services to households in their local market m, and the profitability of becoming certified depends in part on how those households perceive each certification.

5.1.1 Certification Choice

Each financial adviser j decides whether to obtain a certification and which certification c to obtain from the set $\mathcal{C} \cup \{0\}$.[11] A financial adviser's payoff from certification c is given by:

$$\delta_c(\gamma_{j,}, \eta_j; m) + \epsilon_{jc} = \theta \pi_m(c) + \gamma_j \tau_c + \eta_j + \xi_c + \epsilon_{jc}, \tag{7}$$

where we normalize the payoff from not obtaining any certification to zero. The term $\pi_m(c)$ captures the incremental effect (relative to no certification) of how certification c contributes to adviser j's profit, which varies across markets m where households have different levels of sophistication. We introduce how we model $\pi_m(c)$ using an adviser production function in Section 5.1.2.

The term $\gamma_j \tau_c$ measures the adviser's cost of obtaining certification c, which depends on the standard τ_c (required study hours) set by the certification agency and adviser j's ability which determines the marginal cost of satisfying the standard $\gamma_j (< 0)$. Advisers with lower ability (more negative γ_j) face higher marginal costs of studying for certifications and are more sensitive to certification standards. The term η_j is a latent preference for holding any certification. We also incorporate unobserved certification heterogeneity ξ_c and a Type-1 Extreme Value distributed idiosyncratic shock ϵ_{jc}. We normalize the payoff from not obtaining any certification to zero.

The probability that an adviser with type (γ, η) from market m chooses certification c is:

$$s_c(\gamma, \eta; m) = \frac{\exp\left(\delta_c(\gamma, \eta; m)\right)}{1 + \sum_{l \in \mathcal{C}} \exp\left(\delta_l(\gamma, \eta; m)\right)} \tag{8}$$

[11] In the data, an adviser can have multiple certifications. If an adviser holds certifications A and B. We create two synthetic advisers each with weight 1/2, where one chooses A and the other chooses B.

The market share of certification s_c among financial advisers across types and markets is given by:

$$s_c = \sum_m \underbrace{\int_{\gamma,\eta} s_c(\gamma, \eta; m) dF(\gamma, \eta; m)}_{s_{mc}} \tag{9}$$

where we integrate over the distribution of adviser ability (γ) and preference for any certification (η).

5.1.2 Adviser Production Function

The amount of assets an adviser collects, and ultimately her total profits $\pi_m(c)$, is a function of the adviser's certification and the clientele she faces in market m. We model the asset collection process as a production function that depends on the adviser's certification, ability, and clientele. For simplicity, we use a production-function approach rather than microfounding the process in client demand; however, in the appendix we extend the model to microfound client preferences and obtain similar results.

The log of assets collected by adviser j is given by:

$$\ln aum_j = \phi_{m(j)} \bar{q}_{c(j)} + \lambda_{m(j)} Certified_j + \nu \gamma_j + \epsilon_j \tag{10}$$

The term $\phi_{m(j)} \bar{q}_{c(j)} + \lambda_{m(j)} Certified_j$ captures the contribution of certification c to adviser j's assets under management. This contribution depends on certification quality, proxied by the average misconduct rate among certification members $\bar{q}_{c(j)}$. The sensitivity $\phi_{m(j)}$ to certification quality depends on household sophistication in market m. For example, less sophisticated households may not distinguish between certifications, implying $\phi \approx 0$, whereas more sophisticated households may be more sensitive to misconduct, implying $\phi < 0$. We measure sophistication using demographics such as age and education. The term $\lambda_{m(j)}$ captures household perceptions of certification quality more broadly, which may be biased. For instance, households might incorrectly believe that all certifications have high quality, leading to a large λ. Like $\phi_{m(j)}$, $\lambda_{m(j)}$ depends on household demographics in market m. Advisers without certification have $Certified_j = 0$ and $\bar{q}_{c(j)}$ equal to the average misconduct rate among uncertified advisers.

An adviser's assets also depends on the adviser's ability γ_j. The term $\nu \gamma_j$, with $\nu \geq 0$, captures how higher-ability advisers are able to attract more assets.[12] Lastly, ϵ_j represents an idiosyncratic adviser-specific shock. This term can be interpreted as capturing an adviser's skill in attracting additional assets that is orthogonal to her ability (i.e., the cost of obtaining

[12]We assume that an adviser's latent preference for certification η_j and misconduct propensity q_j affect assets under management only through the certification dummy and certification-level average misconduct rates. We do not have sufficient variation in the data to identify the effects of multiple sources of adviser heterogeneity on assets under management. Replacing ability γ_j with η_j yields similar results.

certification) γ_j.

An adviser's choice to become certified in eq. (7) depends on the incremental profits from obtaining certification $\pi_m(c)$,which in turn depend on how certification affects the adviser's total assets. Because we observe assets rather than profits in the data, we assume that advisers charge markups μ as a constant fraction of assets. Under this assumption, the incremental profits from certification c are given by:

$$\pi_m(c) = \mu \left(\phi_{m(j)} \bar{q}_{c(j)} + \lambda_{m(j)} Certified_j \right).$$

Since how $\pi_m(c)$ affects adviser certification choice in eq. (7) depends on parameter θ, we will only identify the product of $\theta\mu$.

5.1.3 Adviser Misconduct

Each adviser has a certain propensity to commit misconduct q_j, which may correlate with ability γ_j and latent preference for certification η_j.[13] Although we do not restrict the sign of this correlation in our model, the motivating evidence presented previously suggests that advisers with higher ability are less likely to commit misconduct. This relationship could be driven by an inherent connection between ability and scruples. Alternatively, high-ability advisers who expect longer careers may perceive a greater loss from disciplinary actions following misconduct. In the context of our model, the negative correlation between ability and misconduct allows certification agencies to use certification standards to screen for advisers. By setting higher standards, certification agencies make their certifications less attractive to low-ability advisers, who are ultimately more likely to engage in misconduct.

In addition, we allow an adviser's misconduct propensity to be correlated her latent preference for certification η_j. Incorporating this heterogeneity is important to rationalize observed misconduct rates among advisers without any certification.

Specifically, we model adviser misconduct propensity $q_j = q(\gamma_j, \eta_j) + \epsilon_j$ as a function of adviser ability and latent certification preference, using the following logistic regression:

$$\ln \frac{q(\gamma_j, \eta_j)}{1 - q(\gamma_j, \eta_j)} = \rho_0 + \rho_\gamma \gamma_j + \rho_\eta \eta_j. \tag{11}$$

We do not impose any sign restrictions on parameters ρ_γ and ρ_η. In Section 6, we estimate a negative relationship between γ_j and q_j. Hence, certification agencies set higher standards to screen for advisers with higher ability who are less likely to commit misconduct.

Based on observed certification choices, we can use Bayes' rule to model theprobability that an adviser in market m with certification commits misconduct. cWe then aggregate across

[13]We do not directly model the decision to commit misconduct from a profit-maximization framework, for example, the trade-off between gains from misconduct and potential punishment.

markets to obtain the average misconduct rates $\bar{q}_c$ among advisers holding each certification.

$$\bar{q}_{mc} = \frac{\int_{\gamma,\eta} q(\gamma,\eta) \times s_c(\gamma,\eta;m) dF(\gamma,\eta;m)}{\int_{\gamma,\eta} s_c(\gamma,\eta;m) dF(\gamma,\eta;m)}$$

It is important to emphasize that, in our baseline model, the relationship between misconduct and certification standards is driven entirely by the selection of advisers (i.e., the estimated correlation parameter ρ_γ), rather than by treatment effects. In practice, however, the negative relationship between γ_j and q_j could also reflect treatment. Certifications with higher standards attract high-ability advisers (i.e. selection), and the standards themselves (e.g., training or education) may reduce an adviser's propensity to engage in misconduct (i.e. treatment).

In Appendix Section C, we discuss how we bound potential treatment effects and examine how incorporating them affects our results. In general, accounting for treatment effects does not materially change our estimates, but it can make our counterfactuals more high-powered, since raising certification standards would directly reduce the probability that a certified adviser engages in misconduct through treatment.

5.2 Certification Agencies: Supply of Certifications

5.2.1 Objective Function

On the supply side, we model how certification agencies set their standards and compete for members. A certification agency is an industry group that sponsors a certification. There is a set of certification agencies $\mathcal{C}$, and each $c \in \mathcal{C}$ issues one certification. Each certification agency c determines its standards τ_c to maximize its objective function, which is increasing in certification's market share s_c among advisers and decreasing in the misconduct generated by its members $s_c\bar{q}_c$. We write the certification agency's objective function as a simple one-parameter model:

$$\mathcal{U}_c = \underbrace{s_c\omega_c}_{\text{Membership}} - \underbrace{s_c\bar{q}_c}_{\text{Misconduct}}$$

The parameter ω_c reflects the weight that the certification agency places on membership (s_c) relative to the total misconduct from its members ($s_c\bar{q}_c$). The parameter ω_c then captures how different certification agencies trade off quality versus quantity.

Equivalently, the objective function can be written as $\mathcal{U}_c = s_c(\omega_c - \bar{q}_c)$. One interpretation of the parameter ω_c is that it reflects the minimum quality desired (or maximum allowed misconduct rates), such that $\omega_c - \bar{q}_c$ can be viewed as a "quality markup." In this context, certification agencies earn a constant marginal revenue ω_c from each member and internalize the average cost from misconduct $\bar{q}_c$.

5.2.2 Certification Agency's Problem

Being more explicit about the functions s_c and $\bar{q}_c$, the certification agency's problem is:

$$\max_{\tau_c} s_c(\tau_c, \bar{q}_c; \boldsymbol{\tau_{-c}}, \boldsymbol{\bar{q}_{-c}})\omega_c - s_c(\tau_c, \bar{q}_c; \boldsymbol{\tau_{-c}}, \boldsymbol{\bar{q}_{-c}})\bar{q}_c(\tau_c; \boldsymbol{\tau_{-c}}) \tag{12}$$

As detailed in Section 5.1, a certification's market share s_c depends on its own standard (τ_c) and misconduct rate ($\bar{q}_c$) as well as the standards and misconduct rates of competing certifications ($\boldsymbol{\tau_{-c}}, \boldsymbol{\bar{q}_{-c}}$). All else equal, if households dislike misconduct (i.e., $\phi_i < 0$) and advisers face positive costs of obtaining a certification (i.e., $\gamma_i < 0$), demand for certification c is decreasing in average misconduct rates ($\bar{q}_c$) and decreasing in standards (τ_c). Conversely, demand for certification c is increasing in the misconduct rates of other certifications ($\boldsymbol{\bar{q}_{-c}}$) and the standards of other certifications ($\boldsymbol{\tau_{-c}}$).

A certification's misconduct rate $\bar{q}_c$ depends both on its own standard and standards set by competing certifications through the selection of advisers. Under a negative relationship between advisers' ability to meet certification standards and advisers' quality, misconduct rates decrease in own standard (τ_c) and generally increase in the standard of competing certifications ($\boldsymbol{\tau_{-c}}$).[14]

The corresponding first-order condition (FOC) for the certification agency's objective function is:

$$\frac{ds_c}{d\tau_c}(\omega_c - \bar{q}_c) - s_c\frac{\partial \bar{q}_c}{\partial \tau_c} = 0 \tag{13}$$

The total derivative of market shares with respect to standards depends on both the direct effect that higher standards increase the costs of obtaining the certification ($\frac{\partial s_c}{\partial \tau_c} < 0$), and the indirect effect that higher standards reduce certification misconduct rates, which in turn attract more advisers ($\frac{\partial s_c}{\partial \bar{q}_c} < 0$). Hence, the indirect effect through certification quality dampens the direct effect of standards on the costs of obtaining the certification.

$$\frac{ds_c}{d\tau_c} = \frac{\partial s_c}{\partial \tau_c} + \sum_{l \in \mathcal{C} \cup \{0\}} \frac{\partial s_c}{\partial \bar{q}_l}\frac{\partial \bar{q}_l}{\partial \tau_c}$$

5.2.3 Implications of Household Sophistication and Competition

The first-order condition illustrates how household sophistication and competition impact certification standards. To see this, we can rewrite the FOC as follows.

[14] For an alternative certification c' that has a much higher standard, an increase in its standard $\tau_{c'}$ can also steer relatively higher ability advisers to certification c and can decrease $\bar{q}_c$.

$$\underbrace{\omega_c - \bar{q}_c}_{\text{Quality markups}} = \underbrace{-\frac{\partial \bar{q}_c}{\partial \tau_c}}_{\text{Misconduct sensitivity}} \times \underbrace{\frac{s_c}{-\frac{ds_c}{d\tau_c}}}_{1/E_c\text{:Inverse semi-elasticity}} \tag{14}$$

The "quality markup" is inversely related to the semi-elasticity E_c and the extent to which higher standards can reduce misconduct rates (misconduct sensitivity). Suppose households are unsophisticated. Setting higher standards does not make advisers more likely to obtain certifications through the indirect effect on certification quality (misconduct rate $\bar{q}_c$). With only the direct effect from the costs of obtaining certifications, the semi-elasticity E_c becomes higher, causing certification agencies to set lower standards and, consequently, to have higher rates of misconduct.

Similarly, greater competition between certifications may also reduce the quality markups. A larger number of certifications increases the elasticity, leading to lower quality markups. Under perfect competition, certification agencies set revenue equal to average cost (i.e. $\bar{q}_c = \omega_c$) such that the quality markup is zero. Therefore, competition may lead to a race to the bottom.[15]

Note that competition can also improve certification quality through misconduct sensitivity $\partial \bar{q}_c / \partial \tau_c$. Certification agencies have a greater incentive to impose higher standards if they can screen for high-quality advisers more effectively. In our model, the absolute value of misconduct sensitivity tends to increase with competition among certifications. When there are more certification agencies with heterogeneous ω_c, each agency targets advisers within a relatively narrow range of quality. In this case, the misconduct propensity of marginal advisers has a greater impact on the average misconduct rates among certification members $\bar{q}_c$. As a result, quality markups can also increase in competition, leading to lower misconduct rates.

It is worth noting that competition may lead to other benefits, such as the variety of certifications. For simplicity, we abstract away from analyzing the broader welfare implication of competition among certifications and only focus on the effect on misconduct.

6 Estimation

We jointly estimate parameters governing adviser certification choices, misconduct propensity, and the adviser production function using the Generalized Method of Moments. As we discuss further below, joint estimation is important because advisers' outcomes and decisions are interconnected. Given the estimated preference and profit parameters, we invert certification agencies' objective functions to recover their preferences over membership.

We estimate advisers' preferences for certification from revealed choices, their misconduct propensity from observed misconduct, and their production function from observed assets un-

[15] Since we only allow selection effects, certification agencies may not be able to raise misconduct rates to $\bar{q}_c = \omega_c$ by varying standards, but the perfect competition setting is useful to understand the effect of competition.

der management. The data are aggregated at the certification c by market m (county $\times$ year) level. The observed outcome variables we target are: certification choice shares in each market s_{mc} (eq. 8); misconduct propensity q_{mc} (eq. 11); and log assets $\ln aum_{mc}$ (eq. 10) among advisers in market m holding certification c.[16] To capture adviser heterogeneity, we assume that ability and latent preference for certifications (γ, η) follow independent normal distributions.

Table 8 reports the estimation results. Column (1) presents estimates of the production function. Columns (2)–(4) report certification-choice estimates. Column (5) jointly estimates certification choices and misconduct. Our preferred estimates are in column (6), where we jointly estimate parameters driving all three outcomes, since adviser heterogeneity affects all of them. In the following subsections, we discuss the moments, identification, and estimation results in detail.

6.1 Adviser Preference for Certifications

We estimate an adviser's certification choice parameters in eq. (7) by matching advisers observed certification choices with shares simulated from the model based on eq. (8). The associated moments in our GMM objective function are the score of the log-likelihood, where the likelihood is computed based on eq. (8). We integrate over adviser types numerically using Monte Carlo with 500 Sobol draws.

The adviser's parameters are identified based on the sensitivity of an adviser's certification choices with respect to certification characteristics. For example, the average disutility an adviser gets from study hours (i.e., average adviser ability γ), is identified based on how the share of advisers becoming certified changes as the associated study hours change, and the associated standard deviation of ability is identified by the variation of this sensitivity across advisers in different markets. Similarly, we identify the average and standard deviation of preference for certification η through the average and dispersion of the probability of choosing any certification.

One concern in estimating eq. (7) is that the study hours set by certifications τ_c are endogenous and correlated with unobserved certification quality ξ_c. For example, a certification with high unobserved quality may set higher study hours. To address this endogeneity, we instrument for hours using certification average misconduct rates $\bar{q}_c$. Specifically, we estimate the following control function at the certification level by regressing hours on average misconduct:

$$\tau_c = \beta \bar{q}_c + \tilde{\xi}_c$$

We use the residual of this regression $\tilde{\xi}_c$ as a proxy for the unobserved certification character-

[16] We restrict attention to advisers who either hold certifications related to managing client assets or hold no certifications. Some certifications focus on business functions unrelated to asset management, for example, the Certified Public Accountant. While such advisers may still commit misconduct, assets under management are a poor proxy for the payoff contribution of these certifications. We therefore exclude them from the analysis.

istics ξ_c. The exclusion restriction is satisfied under the assumption that advisers' certification choices do not depend on misconduct rates beyond their impact on adviser payoffs.

Table 8, column (2), presents a simple logit estimate that ignores the potential endogeneity of certification hours. In column (3), we introduce our control function; column (4) adds random coefficients for η_j and γ_j; and columns (5) and (6) report our joint estimates. Once we account for the endogeneity of study hours, we find a positive relationship between certification choice and associated profits, and a negative relationship between certification choice and study hours. We also find substantial heterogeneity in adviser ability: the cost of obtaining certification for an adviser at the 10th percentile of the ability distribution is about 35% higher than for an adviser at the 90th percentile.

6.2 Adviser Misconduct

We estimate the relationship between adviser misconduct and ability in eq. (11) by matching observed and predicted misconduct rates across advisers holding each certification, $E[q_{mc} - \bar{q}mc \mid c] = 0$. The relationship between ability (γ) and misconduct (q), ρ_γ, is identified from the correlation between study hours and certification-level misconduct rates. The relationship between latent preferences for certification and misconduct, ρ_η, is identified from the difference in misconduct rates between advisers with and without certifications.

In the middle panel of Table 8, columns (5) and (6), we report estimates of the parameters governing adviser misconduct propensity. We find that higher-ability advisers are less likely to commit misconduct ($\rho_\gamma < 0$), consistent with a Spence signaling model and the motivating evidence discussed in Section 3.3. Conceptually, this result is intuitive: higher-ability advisers may avoid misconduct because it could jeopardize future career prospects, which are better than those of lower-ability advisers. Additionally, we estimate that advisers with stronger preferences for certification are more likely to commit misconduct ($\rho_\eta > 0$). Both parameters are statistically significant.

6.3 Adviser Production Function

We estimate the parameters in the adviser production function based on eq. (10) using observed assets under management among advisers. We incorporate the standard OLS moment conditions (i.e., $E[\epsilon_{mc} Z_{mc}] = 0$) between residuals in eq. (10) and exogenous covariates $Z_{mc} = \{Certified \times X_m, \bar{q}_c \times X_m, \tau_c \times X_m\}$ into our GMM objective function. We use the same demographic variables X_m as in Section 4.1, which include a constant, the fraction of the population in market m with a college education, and the fraction of the population above 65.

The production function parameters are identified based on how an adviser's choice to become certified and the associated misconduct rate of her chosen certification affect her assets under management, and how that effect varies depending on consumer sophistication in her

market.

One challenge in directly estimating eq. (10) is that both an adviser's assets under management and her certification choice depend on latent ability, making certification choice endogenous in the adviser's production function. However, we can directly control for latent ability, thereby addressing the endogeneity problem. Specifically, we construct a control for adviser ability based on the posterior mean of ability given certification choices:

$$\gamma_{mc} = \frac{\int_{\gamma,\eta} \gamma \times s_c(\gamma, \eta; m) dF(\gamma, \eta; m)}{\int_{\gamma,\eta} s_c(\gamma, \eta; m) dF(\gamma, \eta; m)}$$

We then control for γ_{mc} in our regression. Conceptually, the idea is to use certification study hours, which are correlated with ability but otherwise uncorrelated with an adviser's assets, as a control function for adviser ability.

We report production function estimates in the bottom panel of Table 8. All demographic variables are standardized. In column (1), we estimate the production function parameters separately, without controlling for adviser ability γ_{mc}. In column (6), we estimate them jointly to account for the selection of ability among advisers holding different certifications. We find that certifications help boost an adviser's assets under management. The results in column (6) indicate that becoming certified leads to a 16% increase in assets under management.

Certifications that are associated with elevated rates of misconduct are less effective, as households appear to discount these certifications. However, for the average market, the effect of misconduct is modest. A certification with a misconduct rate up to ten percentage points higher than average (among those advisers without misconduct) would still generate weakly positive payoffs to advisers. In markets with potentially more sophisticated households (i.e., those that are younger and more educated), households appear more discerning of misconduct. Still, even in markets where educational attainment is two standard deviations above the average, a certification with 8pp higher misconduct rate than average still generates weakly positive payoffs.

For robustness, we also estimated household demand for financial advice in Appendix Section D using standard discrete-choice frameworks (Berry, 1994; Berry et al., 1995). We find similar results that households do not sufficiently discount certifications with high misconduct rates, and the sensitivity to misconduct rates is related to demographics such as education.

6.4 Certification Agencies: Supply of Certifications

Lastly, we estimate the preference parameters of the certification agencies. Certification agencies may have heterogeneous preferences, denoted by ω_c, regarding how they trade off the number of certificate holders versus the level of certification misconduct.

Having solved for advisers' demand for certifications s_c and misconduct rates $\bar{q}_c$, we invert the certification agencies' objective functions to recover ω_c according to eq. (14). All else

equal, a certification agency with a greater preference for increasing membership will set lower required study hours.

The corresponding estimates are reported in Figure 7. Certification agencies exhibit substantially different preferences when balancing certification market share against quality. Interpreting ω_c as a measure of minimum quality, we find that while the most reputable certification agencies aim to maintain a misconduct rate of less than 7 percent among their members, some agencies are willing to accept misconduct rates as high as 20 percent. Panel (a) shows that certification agencies that prioritize quality more (indicated by a lower ω_c) tend to set higher standards in terms of required study hours. Panel (b) demonstrates that certifications from agencies that value quality more (lower ω_c) have lower misconduct rates among their members, achieved by selecting high-ability advisers through higher standards.

7 Counterfactuals

We use our quantitative model to analyze how underlying economic forces influence the demand and supply of certifications. First, we examine how household sophistication affects advisers' certification choices, as well as the resulting certification standards and quality. Second, we explore the impact of regulatory mandated certification standards. This counterfactual scenario is partly inspired by the U.S. government's standardization of organic food certification through the National Organic Program in 2000. Lastly, we assess the equilibrium effects of competition among certification agencies. Unlike occupational licensing, which is typically government regulated, occupational certifications are managed by private third-party organizations. This free-entry characteristic fosters competition among certification agencies.

To solve for these counterfactuals, we simulate model outcomes under a Bayesian Nash Equilibrium, where (i) each certification agency sets study hours τ_c as a best response to the study hours set by other agencies, and (ii) households, advisers, and certification agencies have accurate perceptions of certification misconduct rates.[17] To solve for the equilibrium, we find $(\tau_c, \bar{q}_c)$ for each certification agency, such that the first-order conditions (FOCs) of agencies' objective functions in Equation 13 are set to zero and certification misconduct rates $\bar{q}_c$ in adviser production function are equal to the weighted average misconduct rates of their members.

7.1 Outcomes under the Status Quo

To evaluate different counterfactual scenarios, we compare the market shares, standards, and qualities of certifications. Column (1) of Table 9 reports the outcomes under the status quo. 16 percent of advisers hold certifications. On average, advisers spend nearly 500 hours studying for their certifications, and 8 percent of advisers commit misconduct. Since we assume no

[17] We assume households form the correct expectation of certification misconduct rates but can be insensitive to these misconduct rates.

treatment effects of certifications on misconduct, this unconditional average misconduct rate remains constant across all counterfactuals. As a comparison, the average misconduct rate for certified advisers under the status quo is 11 percent, indicating that many certifications are associated with even higher rates of misconduct than advisers without any certifications.

7.2 Household Sophistication

We examine how household sophistication affects certification quality by incentivizing advisers to obtain higher-quality certifications and prompting certification agencies to set higher standards. In this scenario, we assume that households become more sophisticated in distinguishing between certification qualities, which make the adviser production function more sensitive to certification misconduct rates.

We implement this counterfactual as follows. First, sophisticated households do not hold the biased belief that all certifications represent higher quality; they prefer a certification only if it genuinely certifies higher quality. Therefore, we set the coefficient on any certification λ in eq. (10) to be zero. Second, sophisticated households are more critical of certifications with high average misconduct rates. We set the coefficient on misconduct $\phi = -28$, corresponding to the highest level of sophistication based on our adviser production function estimates. This level is based on a hypothetical market where 100% of population have college degrees or above and 0% are over age 65.

Figure 8 plots the CDF of misconduct rates across certifications. When households become more sophisticated, misconduct rates across all certifications decrease, shifting the CDF curve in red with circle markers leftward from the gray line for the CDF under the status quo. Table 9 shows that certification agencies respond by setting higher standards, requiring advisers to study for more than one thousand hours on average. With these higher standards, 9.2 percent of advisers holding certifications commit misconduct which is down from 11 percent under the status quo. This corresponds to a 16% decline in the misconduct rates among advisers with certifications.

Overall, this counterfactual underscores the distortion caused by potentially unsophisticated household preferences. If households were sufficiently sophisticated, they could incentivize certification agencies to impose higher standards and attract high-quality advisers.

7.3 Regulatory Mandated Certification Standards

Second, we consider the impact of financial regulators, such as FINRA or the SEC, imposing standard requirements for certifications. We model this counterfactual by assuming that each certification agency balances certification quality against the number of certified members (ω_c) according to regulatory standards. One advantage of our data, as discussed in Section 3.2, is that a few certifications have been effectively granted special status by regulators, allowing

advisers to substitute these certifications for licensing requirements. We set ω_c to be greater or equal to the median value of ω_c of these "regulator-approved" certifications.

Under a regulatory certification standard, all certifications with original $\omega_c$below the regulatory standard have the same misconduct rate, which is lower than the average among certifications under the status quo, as depicted by the blue line in Figure 8. Table 9 shows that certification agencies set higher standards and achieve higher quality levels. Certifications require an average of 900 study hours. With these more stringent standards, only 4 percent of advisers obtain certifications. Thanks to higher standards, the average certification misconduct rate decreases by 3 percentage points. This counterfactual suggests that stronger regulation could potentially eliminate frivolous certifications.

7.4 Effects of Competition on Certification Standards

Lastly, we examine the effects of competition on certification standards by simulating counterfactuals with a smaller number of certification agencies. To avoid confounding the impact of certification agencies' preferences for quality, we rank certifications by their ω, and keep every other certification. Then, there are half as many certifications as the status quo, while the average preference for certification quality is roughly the same.

The black dashed line in Figure 8 shows that misconduct rates across certifications decrease, again shifting the CDF curve leftward. The last column of Table 9 shows that certification agencies set higher standards, requiring around 700 study hours. Meanwhile, the average certification misconduct rate decreases by 1.5 percentage points. With reduced competition, certification agencies face lower elasticities and set higher quality markups, imposing higher standards that results in lower misconduct rates.

Figure 9 illustrates how certification standards and quality change with the number of certifications. We reduce the number of competing certifications from 26 under the status quo to thirteen, seven, four, and lastly two. To select the subset of certifications, we again rank certifications by their preference for quality w and keep every N certification. As the number of certifications increases, certifications impose lower standards, reducing the required study hours from 850 to around 450. Concurrently, certification quality declines, with misconduct rates among certified advisers increasing by almost 40% from 8 to 11 percent. These results again suggest that competition among certifications can lead to lower standards and quality.

As discussed in Section 5.2.3, how competition affects misconduct rates is theoretically ambiguous in our model. On the one hand, reducing the number of certifications increases inverse elasticity, leading to higher quality markups. On the other hand, reducing the number of certifications can also reduce misconduct sensitivity, which measures how much incremental higher certification standards can reduce misconduct rates among certification members, resulting in lower quality markups. Our counterfactual results suggest the effect of elasticity dominates. One reason why the elasticity effect dominates is that the negative correlation between adviser

ability and misconduct propensity is not strong enough. In other words, when certification agencies impose higher standards, they risk losing many members but only achieve small gains in terms of lower misconduct rates. In Appendix Section B, we show that competition can also lead to higher certification quality (lower misconduct rates) under different parameter values.

Overall, our counterfactual results suggest that free competition among certifications can lead to a race to the bottom, where frivolous certifications do not certify higher quality.

7.5 Robustness with Treatment Effects

In our model, we rule out treatment effects when higher certification standards directly reduce advisers' misconduct propensity. While our data on adviser certification do not allow us to directly measure treatment effect, we follow the approach of Oster (2019) in Appendix Section C and find that the treatment effects of many certifications are likely small. We re-estimate the parameters governing the correlation between adviser heterogeneity and misconduct propensity, assuming treatment effects explain 10% or 20% of the variation in misconduct rates across certifications. Then, we simulate counterfactuals using these revised parameters accordingly.

When we allow some treatment effects, misconduct rates among certification members reduce further under all counterfactuals. When certification agencies set higher standards, they not only screen for high-ability advisers, but also impose stronger treatment effects on their members, further reducing their misconduct propensity. However, due to longer study hours, some advisers no longer obtain certifications and lose their treatment effects, albeit small, under the status quo. As a result, unconditional misconduct rates among all advisers tend to increase slightly. If frivolous certifications still exert some positive treatment effects on advisers, policies aimed at removing such certifications may not generate a Pareto improvement in terms of adviser misconduct.

8 Conclusion

We examine the supply and demand for certifications in the financial advisory industry and find evidence that certifications convey valuable information about the quality of financial services. Certifications that are more costly to obtain tend to signal higher quality. However, we also observe an abundance of frivolous certifications. Despite claims that these certification agencies uphold higher standards, advisers holding these certifications are more likely to have a record of fraud and misconduct than those without certifications.

A natural question arises: why doesn't competition eliminate these frivolous certifications from the industry? We argue that information frictions allow frivolous certifications to persist in equilibrium. These certifications thrive in areas with less sophisticated consumers who may struggle to differentiate between certifications. Given these frictions, we also demonstrate how, consistent with Shleifer (2004), competition can lead to a race to the bottom in certification

standards, as agencies compete for new members. Our quantitative model shows how certification agencies set standards to attract new members while attempting to maintain a certain level of quality.

Certifications have become a growing area of policy interest, with general bipartisan support. While certifications can be beneficial, we show that information frictions—often the reason certifications are needed in the first place—limit their effectiveness. We demonstrate that both limited consumer sophistication and competition lead to lower certification standards in equilibrium, potentially falling below what regulators would deem desirable. Although many support certifications, dialogue from regulators, such as FINRA and NASAA, suggests an anecdotal awareness of these shortcomings.

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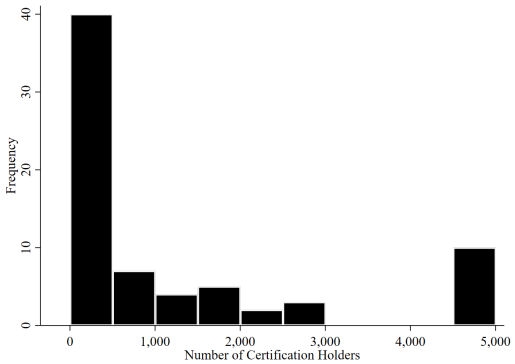
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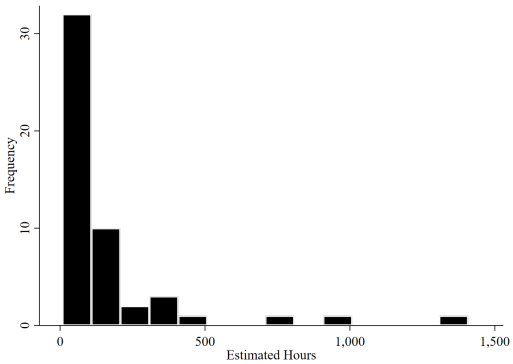
Tables and Figures

Figure 1: Certifications

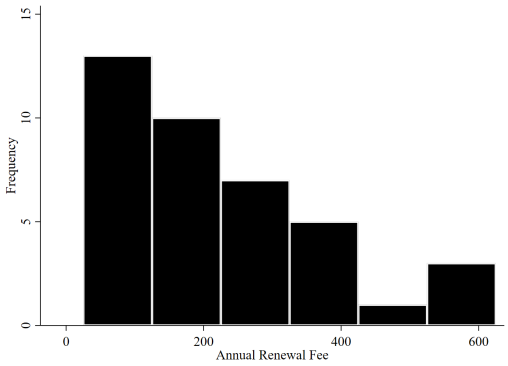
(a) Certification Membership



(b) Hours Required to Obtain Each Certification



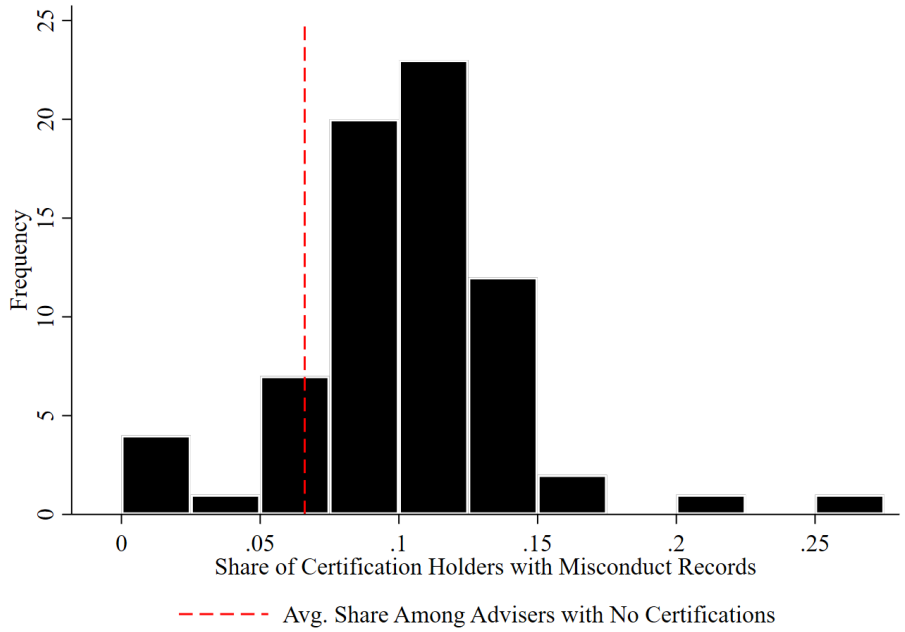
(c) Annual Renewal Fees



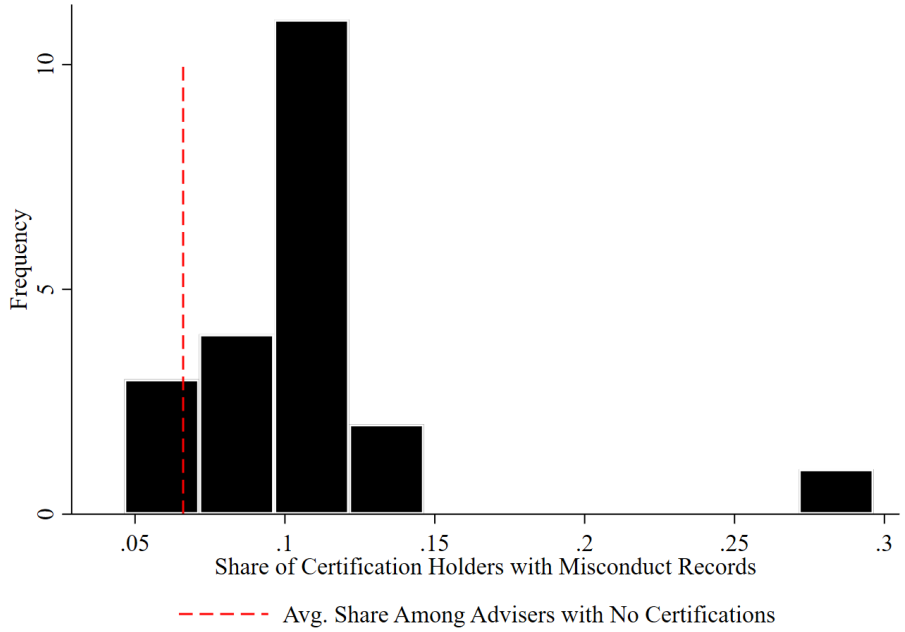
Notes: Figure 1a displays the distribution of membership size across certifications. Figure 1b displays the distribution of hours required to obtain each certification. Figure 1c displays the distribution of annual renewal fees across certifications. Observations in panels (a)-(c) are at the certification level as of 2020.

Figure 2: Misconduct by Certification

(a) Misconduct Rate

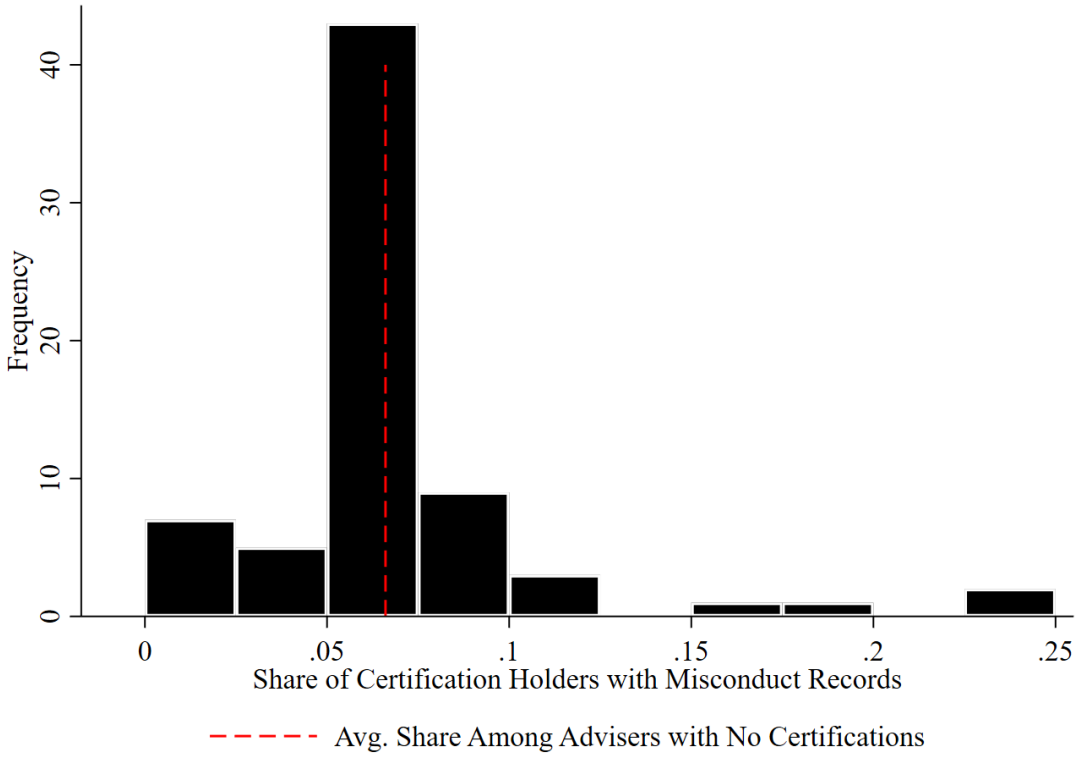


(b) Misconduct Rate - Fiduciary Certifications



Notes: Figure 2 displays the *Misconduct Rate* for each certification. The *Misconduct Rate* reflects the share of advisers holding a certification that have a past record of misconduct. Observations are at the certification level. The red-dashed line reflects the average misconduct rate among advisers without any certifications.

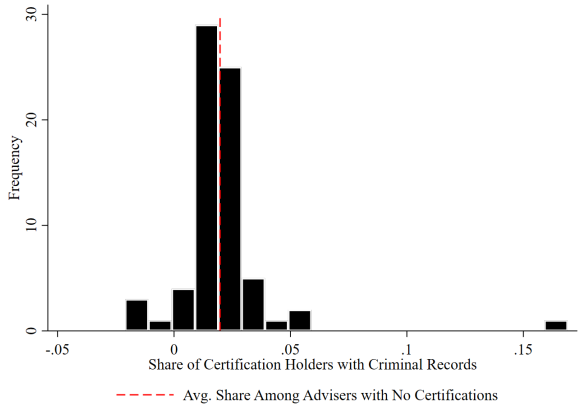
Figure 3: Certification Misconduct Fixed Effects



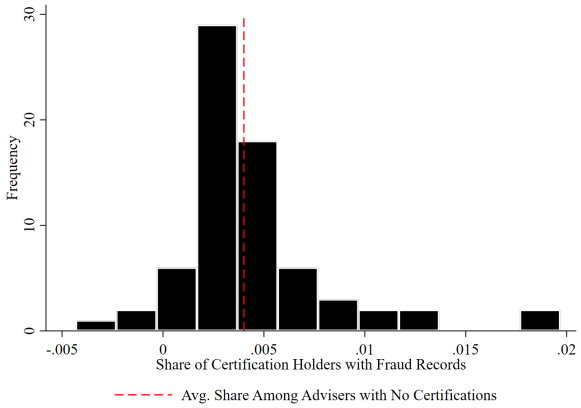
Notes: Figure 3 displays the certification fixed effects corresopnding to Eq. 1. The red-dashed line reflects the average misconduct rate among advisers without any certifications.

Figure 4: Certification Misconduct Fixed Effects - Alternative Measures of Misconduct

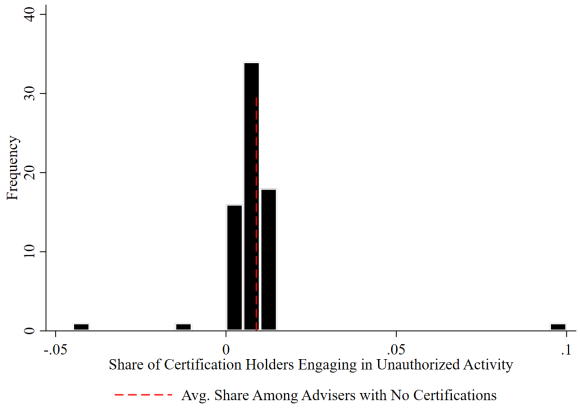
(a) Criminal Activity



(b) Fraud

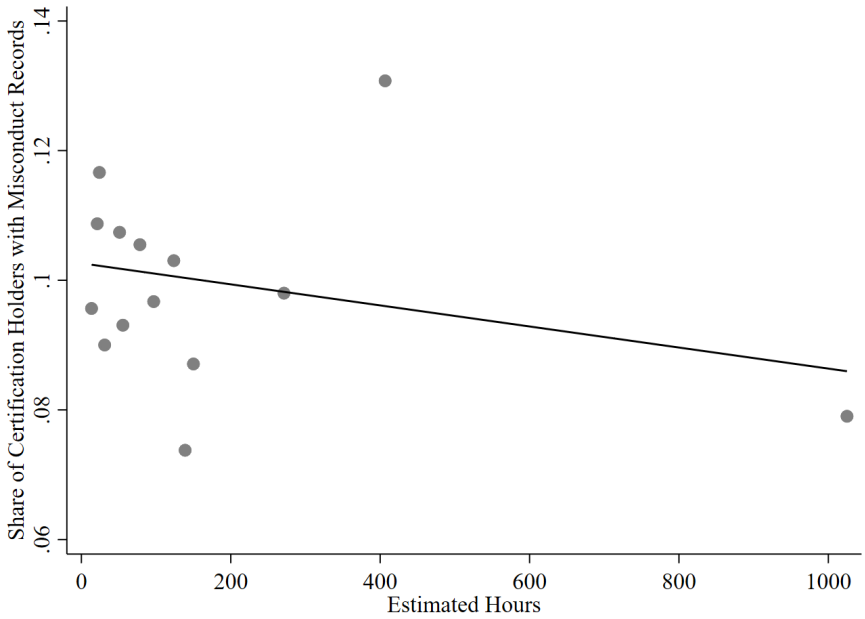


(c) Unauthorized Activity



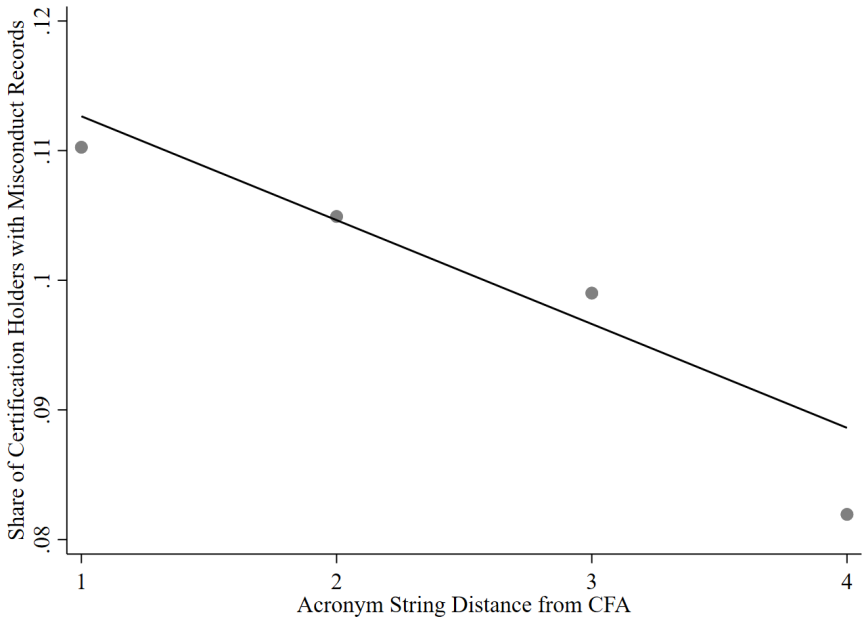
Notes: Figure 3 displays the certification fixed effects corresopnding to Eq. 4. Observations are at the certication level. The red-dashed line reflects the average misconduct rate among advisers without any certifications.

Figure 5: Misconduct by Certification vs. Hours



Notes: Figure 5 displays a binned scatter plot of the *Misconduct Rate* versus the estimated number of hours required to complete each certification. Observations are at the certification level.

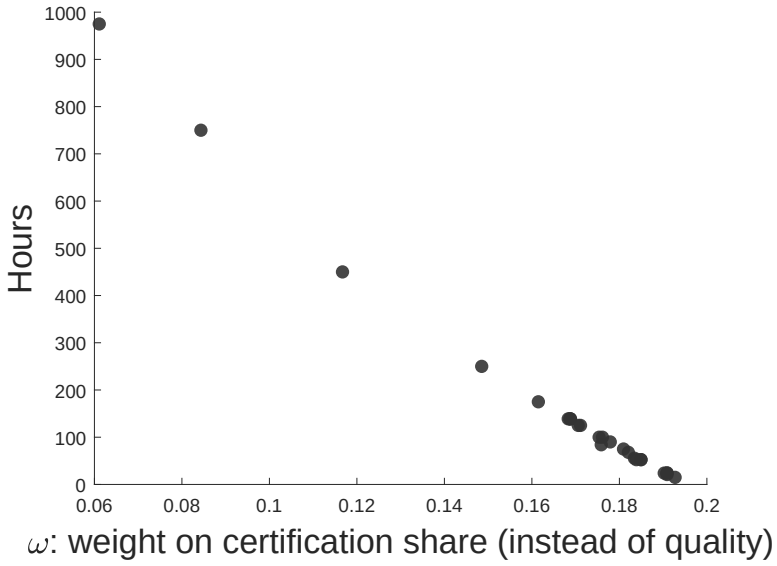
Figure 6: Misconduct by Certification vs. Acronym Differences from CFA



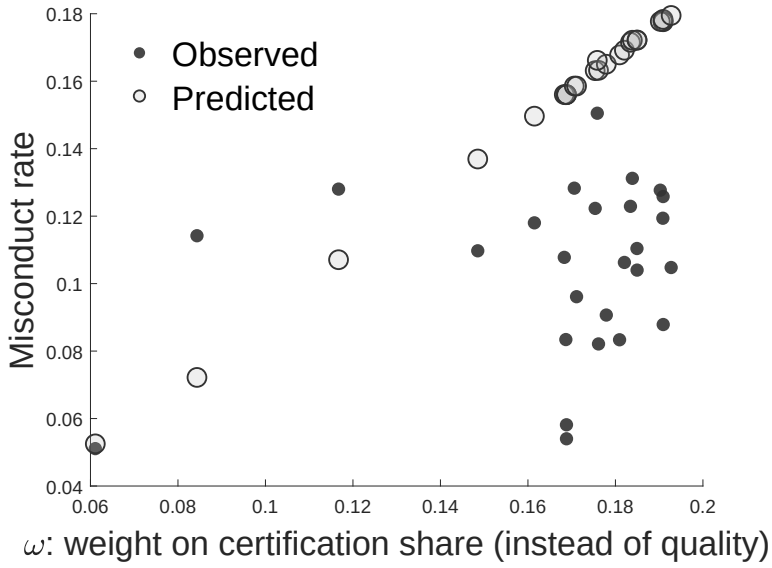
Notes: Figure 6 displays a binned scatter plot of the *Misconduct Rate* versus the string differences of certification acronym from CFA. Observations are at the certification level.

Figure 7: Calibrated ω_c of Certification Agencies

(a) ω vs hours

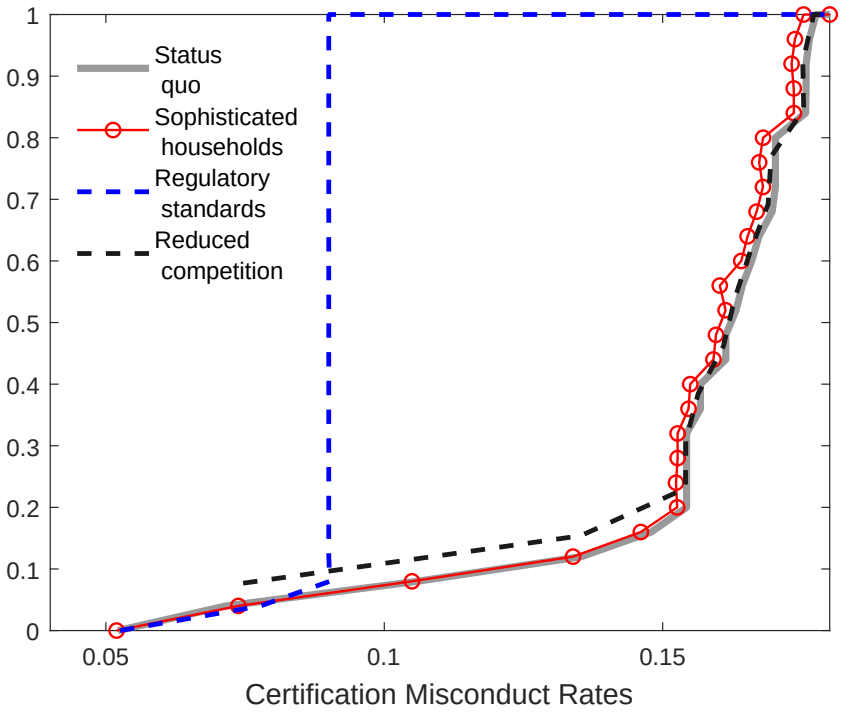


(b) ω vs misconduct



Notes: Figure 7 displays a scatter plot of study hours of each certification along the y-axis in panel (a) and misconduct rate in panel (b), versus calibrated ω_c for each certification agency. Certification agencies with higher ω_c places more weights on its market share among advisers relative to certification qualities. We proxy qualities using the negative of average misconduct rates among the certification members.

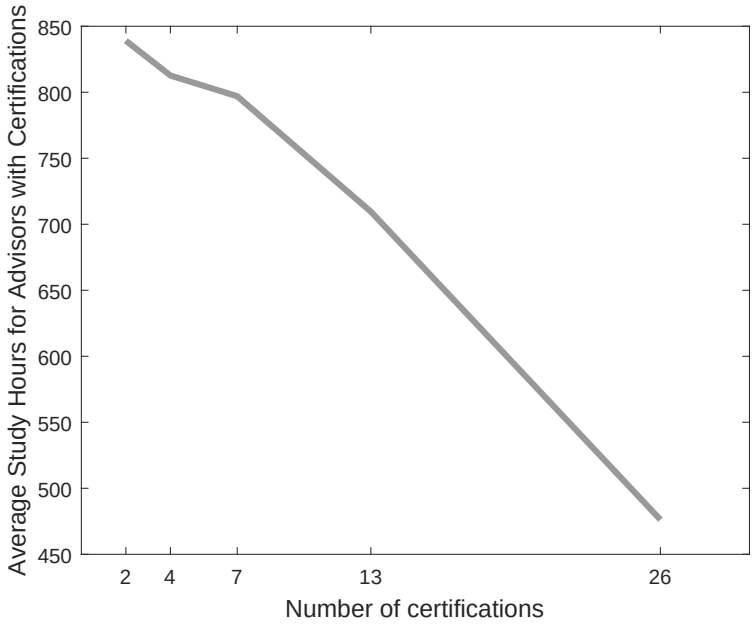
Figure 8: Counterfactuals



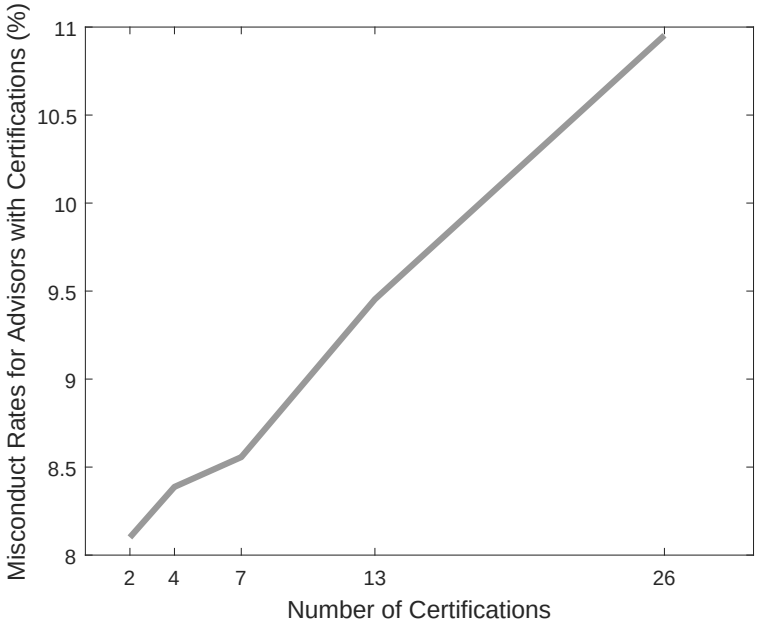
Notes: Figure 8 displays the cumulative distribution function of certification misconduct rates in the status quo and in counterfactual scenarios.

Figure 9: Counterfactuals with Different Number of Certification Agencies

(a) Hours



(b) Misconduct rates



Notes: Figure 9 displays certification standards in terms of required study hours in panel (a) and certification qualities in terms of misconduct rates among certified advisers in panel (b) across counterfactuals with different numbers of competing certification agencies.

Table 1: Summary Statistics

	(1)			
Variables	Obs	Mean	Std. Dev.	Median
Experience	1,371,423	13.96	10.93	12.00
Investment Adviser	1,373,666	0.45	0.50	0.00
Number of Licenses	1,373,666	2.19	1.14	2.00
Number of Certifications	1,373,595	0.26	0.67	0.00
Disclosure (Any)	1,373,666	0.12	0.33	0.00
Misconduct (Any)	1,373,595	0.07	0.26	0.00

Table 1 displays the adviser summmary statistics correspomding to our base data set. Observations are at the adviser-by-year level.

Table 2: Most Common Certifications

Certification	Number of Certificate Holders
CFP	57,623
CRPC	22,643
CHFC	17,691
AAMS	12,534
AIF	11,435
CLU	9,809
CIMA	9,599
CPFA	5,905
CFA	5,401
CRPS	5,088
APMA	2,913
CPWA	2,633
AWMA	2,516
CDFA	2,124
CMFC	2,055
CRC	1,994
CASL	1,855
LUTCF	1,821
CEBS	1,755
FPQP	1,639

Table 2 displays the most common certifications held by advisers as of 2020.

Table 3: Misconduct vs. Certifications

VARIABLES	(1)	(2)	(3)
Certifications	0.001	0.223	0.128
	(0.142)	(0.157)	(0.188)
SEC Approved Certifications	-1.651***	-1.391***	-0.531**
	(0.156)	(0.170)	(0.214)
Accredited Certifications	1.061***	1.049***	0.121
	(0.155)	(0.169)	(0.212)
Fiduciary Certifications	0.260*	0.243	0.293
	(0.154)	(0.170)	(0.207)
Constant	0.672***	0.926***	1.799***
	(0.108)	(0.118)	(0.055)
Observations	1,223,925	1,112,331	738,671
R-squared	0.090	0.203	0.298
Controls	X	X	X
Firm FE	X		
CityXFirmXYear FE		X	
CityXFirmXYearXLicense FE			X

Table 3 displays the regression results corresponding to a linear probability model (Eq. 2). Observations are at the adviser-by-year level. The dependent variable ($Misconduct$) is a dummy variable indicating whether an adviser has a record of misconduct. Robust standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Table 4: Misconduct vs. Certification Cost - Spense Signaling

VARIABLES	(1)	(2)	(3)
Certifications	1.084***	1.285***	0.620
	(0.294)	(0.322)	(0.391)
ln(Hours)	-0.222***	-0.194***	-0.085
	(0.050)	(0.055)	(0.068)
Constant	0.677***	0.931***	1.803***
	(0.108)	(0.118)	(0.055)
Observations	1,223,925	1,112,331	738,671
R-squared	0.090	0.203	0.298
Controls	X	X	X
Firm FE	X		
CityXFirmXYear FE		X	
CityXFirmXYearXLicense FE			X

Table 4 displays the regression results corresponding to a linear regression model (Eq. 3). Observations are at the adviser-by-year level. The dependent variable is $(\ln(1+Hours))$, where $Hours$ measures the number of hours an adviser spent obtaining certifications. Robust standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Table 5: Misconduct vs. Certifications - Alternative Measures of Misconduct

VARIABLES	(1) Criminal History	(2) Fraud	(3) Unauthorized Activity	(4) Future Misconduct	(5) Future Misconduct
Certifications	0.104	-0.088**	-0.183***	0.145***	0.128**
	(0.080)	(0.041)	(0.060)	(0.053)	(0.053)
SEC Approved Certifications	-0.430***	0.063	-0.436***		
	(0.082)	(0.045)	(0.064)		
Accredited Certifications	0.127	-0.006	0.211***		
	(0.080)	(0.045)	(0.064)		
Fiduciary Certifications	-0.050	0.027	0.119*		
	(0.084)	(0.045)	(0.065)		
Misconduct Records					2.846***
					(0.116)
Constant	1.691***	0.043	-0.108**	0.527***	0.499***
	(0.066)	(0.028)	(0.042)	(0.083)	(0.083)
Observations	1,112,331	1,112,331	1,112,331	419,817	419,817
R-squared	0.110	0.168	0.158	0.178	0.182
Controls	X	X	X	X	X
CityXFirmXYear FE	X	X	X	X	X

Table 5 displays the regression results corresponding to a linear probability model (Eq. 2). Observations are at the adviser-by-year level. The dependent variable in column (1) is whether the adviser has a criminal history, the dependent variable in column (2) is whether the adviser has a record of fraud, and the dependent variable in column (3) is whether the adviser has a record of engaging in unauthorized activity. Lastly in columns (4) and (5), we predict whether advisers engage in misconduct between 2017 and 2020 based on observables as of 2016. Robust standard errors are in parenthesis. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table 6: Misconduct vs. Demographics

VARIABLES	(1)	(2)
Certifications	0.191**	0.175*
	(0.078)	(0.096)
Certifications x Pct College	0.004	0.078
	(0.122)	(0.154)
Certifications x Pct 65 or Older	0.216***	0.166
	(0.083)	(0.108)
Certifications x ln(Income)	0.069	-0.001
	(0.121)	(0.158)
Constant	0.955***	1.740***
	(0.119)	(0.056)
Observations	1,094,048	726,519
R-squared	0.202	0.300
Controls	X	X
CityXFirmXYear FE	X	
CityXFirmXYearXLicense FE		X

Table 6 displays the regression results corresponding to a linear regression model (Eq. 5). Observations are at the adviser-by-year level. The dependent variable ($Misconduct$) is a dummy variable indicating whether an adviser has a record of misconduct. Demographic variables are at county-by-year level and are standardized. Robust standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Table 7: Misconduct vs. Certification Competition

VARIABLES	(1) Misconduct
HHI: Certifications	-53.853***
	(2.726)
Share of Advisers with Certifications	0.245***
	(0.003)
Constant	5.603***
	(0.033)
Observations	1,332,024
R-squared	0.319
Year FE	X
State FE	X

Table 7 displays the regression results corresponding to a linear regression model (Eq. 6). Observations are county-by-year level. The dependent variable measures the share of advisers with a past record of misconduct among those advisers that hold at least one certification. We measure competition among certification agencies at the county-by-year level using the Herfindahl Hirschman Index (HHI). Robust standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Table 8: Structural Estimation

	(1) Asset Production	(2) Simple Logit	(3) Mixed Logit	(4) Mixed Logit	(5) Mixed Logit & Misconduct	(6) Mixed Logit Misconduct & Asset Production
Certification Choices						
Payoff $\pi(c)$		-6.64	0.61	0.56	0.54	0.54
		(0.04)	(0.05)	(0.06)	(0.42)	(7.53)
Any Certification		-5.73	-4.59	-4.91	-4.88	-4.88
		(0.00)	(0.01)	(0.03)	(1.41)	(1.33)
Hours		0.39	-0.68	-1.12	-1.22	-1.22
		(0.00)	(0.01)	(0.01)	(0.33)	(0.55)
Control Function			1.13	1.55	1.64	1.64
			(0.01)	(0.01)	(0.18)	(0.48)
Std Any Certification				1.99	2.02	2.02
				(0.03)	(1.44)	(1.39)
Std Hours				0.12	0.17	0.17
				(0.01)	(0.17)	(0.16)
Misconduct						
Constant					-2.91	-2.91
					(0.54)	(0.48)
Preference for Certification					0.67	0.67
					(0.30)	(0.29)
Ability					-0.91	-0.91
					(1.03)	(0.94)
Production Function						
Certification	0.15					0.16
	(0.00)					(0.07)
Certification $\times$ college	-0.01					0.01
	(0.00)					(0.05)
Certification $\times$ 65+	0.02					-0.03
	(0.00)					(0.04)
Δ misconduct	-2.47					-1.60
	(0.03)					(1.91)
Δ misconduct $\times$ college	0.46					-0.33
	(0.03)					(1.26)
Δ misconduct $\times$ 65+	0.83					1.38
	(0.03)					(0.97)
Ability						0.04
						(0.03)

Notes: Table 8 displays estimates of structural parameters. Observations are at certification $\times$ market level. Column (1) shows estimates of adviser production function without considering the selection of adviser ability. We use certification payoff based on estimates in column (1) when running estimations shown in columns (2) to (5). Columns (2) and (3) estimate adviser certification choices using simple logit. From (3) to (6), we include a control function to address the endogeneity of hours. Column (4) includes random coefficients on any certification and study hours. Column (5) jointly estimates adviser certification choices and misconduct. Column (6) jointly estimates adviser certification choices, misconduct, and production function. Standard errors are shown in parentheses. We compute standard errors using the GMM asymptotic variance expression.

Table 9: Counterfactual

	Status quo	Sophisticated Households	Regulatory Standards	Reduced Competition
Fraction of Advisers with Certifications	0.16	0.06	0.04	0.05
Average Study Hours				
Unconditional	76	45	37	38
Conditional on Certifications	476	735	899	710
Misconduct Rates (%)				
Unconditional	8.20	8.20	8.20	8.20
Conditional on Certifications	10.95	9.19	7.58	9.45

Notes: Table 9 displays counterfactual outcomes.

A Solving Certification Agencies' Optimal Strategy

In this Appendix section, we discuss how we solve for certification agencies' FOC in eq. 14. The derivative of certification market shares with respect to study hours or certification misconduct rates are straightforward. When solving the derivative of misconduct rates with respect to study hours $\partial\bar{q}_c/\partial\tau_c$, we need to take into account selection across advisers with different propensity of misconduct. Going from individual adviser j's misconduct propensity $q_j$to overall misconduct rates among certification members $\bar{q}_c$:

$$\bar{q}_c = \frac{\sum_j s_{jc}(\tau_c, \bar{q}_c) q_j}{\sum_j s_{jc}(\tau_c, \bar{q}_c)} \tag{15}$$

Equation (15) has $\bar{q}_c$ on both side. At the equilibrium with rational expectation, the perceived misconduct rate of each certification at the left hand side should match the weighted average misconduct rate across members of certification c. We use Implicit Function Theorem to solve for $\partial\bar{q}_c/\partial\tau_c$. Let function $F_c = \bar{q}_c \sum_j s_{jc}(\tau_c, \bar{q}_c) - \sum_j s_{jc}(\tau_c, \bar{q}_c) q_j = 0$. We solve for $\partial q_c/\partial\tau_c$ using implicit function theorem. As the certification agency raises the required study hours τ_c, the advisers who obtain certification c will have higher ability and less likely to commit misconduct. In addition, higher certification quality will attract advisers with lower ability into studying for c, which partially offsets the immediate selection effect. In the expression below, the numerator should be positive due to the negative correlation between ability γ_j and propensity of misconduct q_j. The second term in the denominator captures how advisers may respond to increased quality of certification c. Advisers more likely to commit misconduct are more likely to live in counties where households are less sophisticated and so certification qualities drive lower profit. Hence, the denominator should be positive. Overall, higher standard τ_c results in lower misconduct rates among certification members.

$$\frac{\partial\bar{q}_c}{\partial\tau_c} = -\frac{\partial F_c/\partial\tau_c}{\partial F_c/\partial\bar{q}_c} = -\frac{\sum_j s_{jc}(1-s_{jc})\gamma_j(\bar{q}_c - q_j)}{\sum_j s_{jc} + \sum_j s_{jc}(1-s_{jc})\theta\frac{\partial \ln \pi_j(c)}{\partial\bar{q}_c}(\bar{q}_c - q_j)}$$

B Additional Results on the Effects of Competition

In this Appendix Section, we discuss additional counterfactual results on the effect of competition. In Section 7 of the main text, we display results when the number of competing certifications reduces by half. In Table 10, we further reduce the number of certifications to seven, four, and then two. We rank certifications by their preference for quality ω and keep every N certification, such that the average preference ω is similar to the status quo. As we further reduce competition, certification agencies set even higher standards and the certification misconduct rates reduce further. These additional counterfactual results reinforce our finding that competition can lead to a race to the bottom in terms of certification quality. However, we do not take a strong stance on the quantitative outcomes with four or two certifications, since these counterfactuals are too out of sample and the results depend strongly on the tail of the distribution of advisers' ability.

As discussed in Section 5.2.3, how competition affects misconduct rates is theoretically ambiguous in our model. On the one hand, reducing the number of certifications increases the inverse elasticity, leading to higher quality markups. On the other hand, reducing the number of certifications reduces misconduct sensitivity, which measures how much higher certification standards can reduce misconduct rates among certified members. Lower misconduct sensitivity can also lead to lower quality markups and higher misconduct rates. Our counterfactual results in the main text suggest the effect of elasticity dominates, suggesting that competition leads to a race to the bottom.

However, our model is flexible enough such that competition can also lead to higher quality under certain parameter values. In the bottom panel of Table 10, we simulate counterfactuals where the correlation between ability and misconduct propensity is stronger. Setting higher standards has a larger impact on the misconduct propensity of marginal advisers due to a stronger correlation, so the misconduct sensitivity is larger. In addition, we also make certifications more evenly distributed according to their ω to reduce their local market power, which further dampens the effect coming from elasticity. In this case, reducing the number of certifications can lead to higher certification misconduct rates than the status quo (except when reducing the number of certifications from four to two). The final two rows show percentage changes in average misconduct sensitivity and inverse semi-elasticity from the status quo. Compared to changes based on estimated parameters in the top panel, the reduction in misconduct sensitivity is larger and the increase in inverse elasticity is smaller. Hence the effect of misconduct sensitivity dominates and competition leads to certifications with higher quality.

Table 10: Counterfactual with Different Number of Certifications

	Status quo				
Number of Certifications	26	13	7	4	2
Baseline Estimates					
Misconduct rates (%)					
Unconditional	8.20	8.20	8.20	8.20	8.20
With Certifications	10.95	9.45	8.56	8.39	8.10
% Δ Average misconduct sensitivity		0.00	-4.79	-13.77	-33.53
% Δ Average inverse semi-elastivity		3.88	8.01	14.66	30.45
Advisor abilities more correlated with misconduct					
Misconduct rates (%)					
Unconditional	8.38	8.38	8.38	8.38	8.38
With Certifications	9.79	11.62	12.96	13.07	10.52
% Δ Average misconduct sensitivity		-5.11	-19.32	-28.41	-41.48
% Δ Average inverse semi-elastivity		2.50	5.85	9.60	17.40

Notes: Table 10 displays counterfactual outcomes with different number of certifications. The top panel is based on estimated parameters. The bottom panel is based on alternative parameters with higher correlation between adviser ability and misconduct propensity. We also set certification ω to be more evenly distributed.

C Treatment Effects of Certifications

In the model we introduced in Section 5, we rule out any treatment effects of certifications. For example, we assume longer study hours required to obtain certifications do not reduce advisers' misconduct propensity. This assumption is partially driven by the lack of time-series variation in certification data to measure misconduct propensity before and after advisers obtain certifications. This Appendix section includes three sets of analyses. First, we show that past misconduct records predict future certification choices., Combined with how certifications predict future misconduct rates in Section 3.4.3, these evidences suggest the relationship between misconduct and certification likely captures selection. Second, we perform an exercise in the spirit of Oster (2019) to bound treatment effects. Third, we impose different levels of treatment effects within our bounds and compare counterfactual outcomes. Overall, we find that treatment effects are likely to be small in our setting. With modest treatment effects, our counterfactual outcomes are qualitatively similar. In terms of misconduct rates among certification members, the effects are stronger because higher standards both select advisers who are less likely to commit misconduct and directly reduce advisers' misconduct propensity.

C.1 Misconduct and Future Certification Choice

We assume that advisers with certifications are more likely to have records of misconduct due to selection rather than treatment. Empirically, it can be difficult to rule out treatment effects using our data. We do not have random assignment of certifications. Also with two periods of data, it is also difficult to analyze how the propensity to commit misconduct differ before and after advisers obtain their certifications. In this section, we show that past misconduct records predict future certification choices among advisers without any certifications. In particular, advisers with past misconduct records are less likely to obtain the CFA and more likely to obtain frivolous certifications.

Since treatment and selection effects can be either positive or negative, in Table 11 we separately look at how misconduct rates predict whether advisers obtains the CFA, which is the most reputable, and certifications that are potentially frivolous. To determine frivolous certifications, we select certifications with $\gamma_l > 0$ and statistically significant according to eq. (1). Columns (1) and (2) of Table 11 show that advisers with past records of misconduct as of 2016 are less likely to obtain the CFA between 2016 and 2020. Columns (3) and (4) show that advisers with past records of misconduct are more likely to obtain frivolous certifications. One could argue that advisers with misconduct records may have additional incentives to obtain certifications in order to recover their reputations, but it is unlikely that they obtain certifications with low quality based on misconduct rates among members.

In Section 3.4.3, we also show that certification choices predict future misconduct. Together, these patterns suggest adviser-specific heterogeneity drives both certification choices and misconduct, which is in favor of the selection mechanism we assume in our model.

Table 11: Misconduct and Future Certification Choice

VARIABLES	(1) CFA	(2) CFA	(3) High Misconduct Certification	(4) High Misconduct Certification
Misconduct Records	-0.002***	-0.002***	0.002**	0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
Constant	0.004***	0.004***	0.006***	0.005***
	(0.000)	(0.001)	(0.001)	(0.001)
Observations	359,639	359,639	359,639	359,639
R-squared	0.028	0.156	0.013	0.284
Controls	X	X	X	X
Firm FE	X		X	
CityXFirmXYear FE		X		X

Notes: Table 11 displays results of regressing whether an adviser obtain certifications between 2016 and 2020 on whether the adviser has a record of misconduct as of 2016. We restrict to advisers without any certification as of 2016. The dependent variable in columns (1) and (2) is whether the adviser obtains the CFA. The dependent variable in columns (3) and (4) is whether the adviser obtain any certification with high misconduct rates. We consider a certification's misconduct rate to be high if the certification has $\gamma_l > 0$ and statistically significant according to eq.1. Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

C.2 Bounding Treatment Effects

Oster (2019) proposes a method to bound treatment effects based on how coefficients and R^2 change as we saturate the regression with more covariates that help control for selection. If an OLS coefficient mostly captures treatment effects, adding more covariates to control for selection will improve R^2 but not change the magnitude of the coefficient. Conversely, if the OLS coefficient mostly reflects selection, its magnitude can vary substantially as we saturate the regression with more covariates. Following this method, we use the regression from Equation 1 repeated below, where the main treatment effect of interest is the effect of certification l on misconduct γ_l. In our setting, treatment and selection likely move in the same direction. A certification that sets a higher standard will have a stronger treatment effect to reduce misconduct propensity. Similarly, advisers who choose this certification have higher ability and are less likely to commit misconduct. Without controlling for selection, the measured γ_l will be stronger than the true treatment effect. As we incorporate richer sets of fixed effects to control for selection, for example the sorting between advisers and firms documented in Egan et al. (2019), the absolute value of γ_l should become smaller.

$$Misconduct_{ijkt} = \sum_{l \in \mathcal{L}} \gamma_l Certification_{ijlkt} + \beta X_{ijkt} + \mu_{jkt} + \epsilon_{ijkt}. \tag{16}$$

We use the approximation method suggested by Oster (2019) to bound the effect between where $\dot{\gamma}, \dot{R}$ are coefficient and R^2 of a short regression and $\hat{\gamma}, \hat{R}$ are coefficient and R^2 of a long regression with more saturated covariates. The true treatment effect is bounded between the coefficient from the long regression and an extrapolation using the changes between the two coefficients $(\dot{\gamma}, \hat{\gamma})$ to a hypothetical regression with an R^2 of 1. We consider three sets of fixed effects μ_{jkt}, 1) year-by-city, 2) year-by-firm-by-city, and 3) firm-by-city-by-year-by-licenses. We extrapolate from the coefficients estimated using the first and third sets of fixed effects, and coefficients estimated using the second and third sets of fixed effects.

$$\gamma \in \left[\hat{\gamma}, \hat{\gamma} - (\dot{\gamma} - \hat{\gamma}) \frac{1 - \hat{R}}{\hat{R} - \dot{R}} \right]$$

We construct the bounds for the effect γ_l for each certification l. First, we find that around 50 percent of bounds contain zero. Hence, we cannot rule out zero treatment effects and that γ_l is entirely driven by selection. Next, for each γ_l, we pick a conservative measure of the treatment effect $\gamma^\dagger$ following a few steps. 1) if the bound contains zero, we set $\gamma^\dagger$ as zero. 2) if the bounds exclude zero, we select $\gamma^\dagger$ to be the side of the bounds closer to zero (the upper bound for negative values and the lower bound for positive values). 3) if the estimates of long and short regression have different signs, we drop this $\gamma^\dagger$. Then, we regress our measure of treatment effect $\gamma^\dagger$ on estimates from the long regression $\hat{\gamma}$. Table 12 displays the regression estimates, which indicate that approximated treatment effects are 10 to 20 percent of the estimated coefficients $\hat{\gamma}$. [18] These results all suggest that treatment effects are likely weak and most of the effect of certifications on misconduct corresponds to selection.

[18] The number of observations indicates that we have to drop many certifications, because their $(\dot{\gamma}, \hat{\gamma})$ have different signs.

Table 12: Extrapolation of Treatment Effects

	(1)	(2)	(3)	(4)
VARIABLES	Joint FE 13	Joint FE 23	Individual FE 13	Individual FE 23
$\tilde{\gamma}$	0.107*	0.012	0.198***	0.067*
	(0.055)	(0.012)	(0.067)	(0.034)
Constant	0.002	-0.000	0.001	-0.001
	(0.002)	(0.000)	(0.002)	(0.001)
Observations	26	30	27	36
R-squared	0.135	0.031	0.259	0.103

Notes: Table 12 displays regression of treatment effect approximated following the method proposed by Oster (2019), and estimated effect of coefficient on misconduct. The first two columns use jointly estimate coefficient of each certification. In the third and four columns, we estimate the effect of one certification at a time. In "Joint FE 13" we approximate treatment based on coefficients estimated using year-by-city FE and firm-by-city-by-year-by-licenses FE. In "Joint FE 23", we use coefficients estimated using year-by-firm-by-city FE and firm-by-city-by-year-by-licenses FE. Similar pairs of FEs are used when we estimate certification's effect individually. Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

C.3 Incorporating Treatment Effects

Based on the bounding exercise, we impose modest treatment effects to our estimates of adviser misconduct propensity. We start by regressing estimated certification average misconduct rates $\bar{q}_c$ on study hours

$$\bar{q}_c = \beta_0^T + \beta^T \tau_c + \epsilon_c$$

Then, we assume the treatment effect from study hours on misconduct propensity is $\beta^T \times T$ where $T = \{0.1, 0.2\}$. With treatment effects, the selection of advisers generates a smaller variation of misconduct rates across certifications. Effectively, we decompose the variation of $\bar{q}_c$ into treatment $T\beta^T\tau_c$ and selection $\bar{q}'_c$.

$$\bar{q}'_c = \beta_0^T + (1-T)\beta^T \tau_c + \epsilon_c$$

Next, we re-estimate $\rho_o, \rho_\gamma, \rho_\eta$ in Equation 11 that govern the misconduct propensity based on adviser types to minimize the squared distance between posterior misconduct probabilities conditional on certification choices and $\bar{q}'_c$. Table 13 displays revised estimates under different treatment effects. As expected, the relationship between adviser ability and misconduct becomes weaker given smaller selection effects. [19]

[19] Alternatively, we could have assumed certain fraction of the variation of observed certification average misconduct rate across study hours is driven by treatment effect and re-estimate all parameters. Across different treatment

Table 13: Misconduct Propensity Estimates with Treatment Effects

Misconduct	(1) Pure selection	(2) 10% treatment	(3) 20% treatment
Constant	-2.91	-2.79	-2.71
Preference for certification	0.67	0.67	0.67
Ability	-0.91	-0.75	-0.62

Notes: Table 13 displays estimates of misconduct propensity when we include various magnitudes of treatment effects. "Pure selection" assumes no treatment effects and is the same as column (6) in Table 8. In columns (2) to (3), we assume 10% and 20% of the estimated correlation between certification average misconduct rates and study hours in column (1) is due to the treatment effect that study hours reduces advisers' misconduct propensities.

Table 14: Counterfactual with Treatment Effects

	Status Quo		Sophisticated Households		Regulatory Standards		Reduced Competition	
Treatment effect (T)	10%	20%	10%	20%	10%	20%	10%	20%
Fraction of Advisers with Certifications	0.16	0.16	0.05	0.05	0.04	0.04	0.05	0.04
Average Study Hours								
Unconditional	76	76	42	38	36	34	35	33
Cond'l on Certifications	476	477	770	808	907	917	750	787
Misconduct Rates (%)								
Unconditional	8.21	8.20	8.26	8.30	8.26	8.31	8.26	8.32
Cond'l on Certifications	10.94	10.90	8.94	8.66	7.57	7.54	9.17	8.92

Notes: Table 14 displays counterfactual outcomes where we impose different levels of treatment effects of certification required study hours on advisers' misconduct propensity.

We then simulate counterfactual under different treatment effects T using re-estimated $\rho_o, \rho_\gamma, \rho_\eta$. Table 14 displays counterfactual results. Similar to outcomes shown in Table 9, in all three counterfactuals, certifications require longer study hours, and fewer advisers obtain certifications. The effect on misconduct rates becomes more nuanced. On one hand, misconduct rates among certification members decrease more, through both the selection (advisers with lower ability no longer obtain certifications) and treatment (longer study hours directly reduce advisers' propensity of misconduct). For example, with 20 percent treatment effects, misconduct rates among certification holders reduce by 2 percentage points in the reduced competition

effect assumptions, we may fit data differently, and so it becomes harder to compare results.

counterfactual, whereas the reduction is 1.5 percentage points without any treatment effects.

On the other hand, unconditional misconduct rates increase slightly in all counterfactual scenarios, by 10 basis points under 20 percent treatment effects and by around 5 basis points with 10 percent treatment effects. In the status quo, although some certifications require short study hours, advisers obtaining these frivolous certifications still receive some modest treatment effects. In these counterfactuals, although advisers who obtain certifications receive stronger treatments thanks to longer study hours, advisers who no longer obtain certifications lose their treatment effect, albeit modest, under the status quo. With these two opposing effects, the overall misconduct rates among all advisers become slightly higher.

Naturally, we are assuming certifications that impose short study hours still have positive treatment effects on advisers, in terms of reducing their misconduct propensity. Alternatively, advisers may be more likely to commit misconduct after realizing the standards set by certain frivolous certifications are lower than their prior, and these certifications would have negative treatment effects. We do not consider this case, because we have to introduce another parameter to capture the prior belief which can also change across different counterfactuals.

Taken together, when we allow for some modest treatment effects of certification standards on misconduct rates, our counterfactual outcomes are qualitatively similar. In terms of misconduct rates among certification holders, the effects are stronger because both selection and direct treatment effects lead to lower misconduct rates among certification members.

D Household Demand for Advisers

To compare with the adviser production function in Section 5.1.2, we model household demand for financial advisory services as a discrete choice problem. Each household i selects the financial adviser j from the set $\mathcal{J}$ that maximizes their indirect utility, which depends on adviser j's quality and fee, denoted u_{ij}. We express household i's indirect utility of working with adviser j as:

$$u_{ij} + \epsilon_{ij} = \alpha fee_j + \underbrace{\phi_i \bar{q}_{c(j)} + \lambda_i Certified_j}_{\text{Certification-specific signal of quality}} + \underbrace{\beta' X_j + \xi_j + \epsilon_{ij}}_{\text{Adviser-specific signal of quality}} \tag{17}$$

The first term, αfee_j, captures the disutility of paying the fee charged by adviser j. The second term, $\phi_i \bar{q}_{c(j)} + \lambda_i Certified_j$, represents household i's certification-specific signal of quality for an adviser holding certification c. We allow household sensitivity ϕ_i to certification quality to depend on household sophistication. The term λ_i captures any potential bias households may have regarding certifications in general. For instance, a household might incorrectly believe that all certifications are of high quality, leading to a large λ_i.

The third term is the adviser-specific signal of quality. The adviser-specific signal is given by $\beta' X_j + \xi_j + \epsilon_{ij}$.$X_j$ include observed adviser characteristics, including licenses (Series 7, 63,

65 and 66) and years of experience. ξ_j represents adviser-specific characteristics, and ϵ_{ij} is an idiosyncratic noise term. Households choose the financial adviser generating the highest utility. Following the industrial organization literature, we assume the idiosyncratic error term ϵ_{ij} is distributed as Type-1 Extreme Value. Consequently, the probability that household i chooses financial adviser j is given by:

$$p_{ij} = \frac{\exp(u_{ij})}{1 + \sum_{l \in \mathcal{J}} \exp(u_{il})} \tag{18}$$

We estimate the utility parameters following Berry (1994) by regressing the log of adviser assets under management on the right-hand side variables from Equation 17 , along with a market fixed effect $\xi_{m(i)}$ to absorb the nonlinear terms in the demand function and the total assets from households in each market. Observations are at the adviser level as of 2016.[20]

Table 15 presents the estimation results. We consistently find a negative and significant coefficient on fees across all specifications. In specifications (3) and (4), we instrument for fees using the average fees charged by advisers who entered the advisory industry in the same year and county. This instrument captures exogenous market conditions when advisers began their careers, which influenced the initial level of fees. Since fees can be sticky, these past market conditions may continue to affect current fees, but they are unlikely to be related to current household demand. Using this instrument, we find a slightly more negative coefficient on fees.

Given that the average fee is approximately 0.01, the estimates suggest a demand elasticity of -0.6, indicating that demand with respect to fees is relatively inelastic. This is consistent with the previous evidence suggesting that demand for financial products is relatively inelastic to fees (Hortaçsu and Syverson, 2004; Choi et al., 2010).

Similar to estimates shown in Table reftable:addemand, we also find that households do not significantly discount those with higher rates of misconduct. While the coefficient on certification is positive and significant, the coefficient on misconduct is statistically indistinguishable from zero. In addition, households with higher education attainment are more sensitive to misconduct rates. In a previous version of the model, we derived the contribution of certifications to assets under management using this household demand and obtained similar estimates for adviser certification choices and similar counterfactual outcomes.

[20] We estimate the model using the cross-section of advisers as of 2016 due to limited fee data.

Table 15: Household demand estimation

VARIABLES	(1) OLS	(2) OLS	(3) IV	(4) IV
Fee	-56.20***	-56.20***	-58.09***	-58.07***
	(0.36)	(0.36)	(5.43)	(5.44)
Misconduct	1.30***	1.26***	1.32***	1.30***
	(0.40)	(0.41)	(0.44)	(0.44)
Misconduct X frac college		-0.06		-0.12
		(0.41)		(0.42)
Misconduct X frac 65+		0.22		0.18
		(0.37)		(0.38)
Any certification	0.05**	0.05**	0.04**	0.05**
	(0.02)	(0.02)	(0.02)	(0.02)
Any certification X frac college		0.00		0.01
		(0.02)		(0.02)
Any certification X frac 65+		-0.01		-0.01
		(0.02)		(0.02)
TS IA (series 65 or 66)	0.07***	0.07***	0.07***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)
Series 7	0.13***	0.13***	0.12***	0.12***
	(0.01)	(0.01)	(0.02)	(0.02)
Series 63	0.31***	0.31***	0.30***	0.30***
	(0.01)	(0.01)	(0.01)	(0.01)
Ln Years of experience	0.08***	0.08***	0.08***	0.08***
	(0.00)	(0.00)	(0.01)	(0.01)
Observations	62,719	62,719	59,810	59,810
R-squared	0.32	0.32	0.30	0.30
Market FE	X	X	X	X
Fee IV			X	X

Notes: Table 15 displays household demand estimates according to Equation 17. Observations are at the adviser level as of 2016. The dependent variable is the log of asset under management of each adviser. Right hand side variables include adviser's fee, misconduct of the chosen certification interacted with county level demographics (fraction of population over 65 and/or the fraction of population with college education), dummies for any certifications, adviser characteristics including licenses obtained and experience, and market (county) fixed effects. In specifications (3) and (4), we instrument fees using the average fees in the year advisers first registered with regulatory agencies which captures to exogeneous market conditions when advisers started their careers. Standard errors clustered at the market (county) level are in parenthesis. *** $p<0.01$, ** $p<0.05$, * $p<0.10$.