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FIDUCIARY DUTY AND THE MARKET FOR FINANCIAL ADVICE

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ABSTRACT

Fiduciary duty aims to solve principal-agent problems, and the United States is in the middle of a protracted debate surrounding the merits of extending it to all financial advisers. Leveraging a transaction-level dataset of deferred annuities and state-level variation in common law fiduciary duty, we find that it raises risk-adjusted returns by 25 bp and leads to a 16% decline in the entry of affected firms. Through the lens of a model of entry and advice provision, we argue that this effect can be due to both an increase in fixed costs and an increase in the cost of providing low-quality advice. We show how to disentangle these two effects. Model estimates indicate that both channels are important, and counterfactual simulations suggest that further increases in the stringency of fiduciary duty, such as a federal fiduciary standard, can further improve advice at the cost of reducing the number of firms.

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1. Introduction

Informed agents working on behalf of uninformed principals are subject to fundamental conflicts of interest. The primary legal mechanism for bridging this principal-agent problem has historically been fiduciary duty. Agents subject to fiduciary duty must act in the best interest of their principals: agents have a duty of care to exert effort on behalf of principals and a duty of loyalty to put aside any opportunities for private benefit. If agents fail to satisfy their fiduciary duty, they can be liable for any losses the principals incur.

This paper sheds light on the effect and mechanisms of fiduciary duty in a setting currently undergoing significant policy upheaval in the United States: the regulation of financial advisers. Americans save almost $30 trillion for retirement, much of which is in complex financial products sold through advisers. A patchwork of state and federal law has resulted in many advisers not being classified as fiduciaries, and the past 10–15 years have seen various regulators—including the Department of Labor, the Securities and Exchange Commission, and many state legislatures—propose to bridge this gap. This debate is ongoing: in 2023, the Department of Labor proposed new guidelines for fiduciary duty. Consumer and industry groups have spent millions lobbying on this issue, with the former alleging serious financial losses in vulnerable older populations and the latter arguing that fiduciary duties place undue burden on advisers without affecting outcomes.

Supporters of expanding fiduciary duty to all advisers argue that it directly alleviates conflicts of interest and thus makes it more costly to offer low-quality advice. We call this mechanism the advice channel. Opponents argue for a second mechanism: fiduciary duty does not have an impact on product choice directly, perhaps because investors already know which product to buy or because conflicts of interest are minimal. Instead, it raises the cost of doing business for firms that employ financial advisers, regardless of advice quality. This may lead to fewer firms in the market and perhaps even to worse advice in equilibrium through a compositional shift in entrants. We call this mechanism the fixed cost channel.

We develop a model of entry and advice provision that captures these two forces: fiduciary duty may increase both the cost of providing low-quality advice and the fixed costs of firm entry. Each mechanism will change observed advice, directly in the case of the advice channel and indirectly through entry for both. The model allows us to unpack the relative contributions of both channels and simulate the impact of alternative regulatory regimes taking into account entry and exit responses. The potential for the entry margin to undo the direct effect of a regulation is a concern in any intervention that affects the profitability of advice quality. A contribution of this paper is to take into account both changes in advice and changes in entry decisions when evaluating policy interventions in this market.

We leverage a new dataset of transaction-level data for deferred annuity sales from an anonymous financial services provider ("FSP"). FSP is among the top-five companies by market share in the annuity market and is representative of other large companies in this industry. This dataset contains information about every contract sold by FSP from 2013–2015, detailed data about the product and adviser, and some limited data on the client. For each transaction we observe the fiduciary status of the adviser and geographic information about the parties. We value each transaction using a dynamic model of contract execution.

The key variation we exploit is differences in fiduciary duty across types of advisers and across state borders. Advisers that are dually registered (DRs) as investment advisers must comply with standardized federal fiduciary law, while those licensed just as broker-dealers (BDs) face state variation in their legal duties. BDs are excluded from federal fiduciary duty because they historically have been considered order takers without a significant advisory function. Today, however, they do similar work with respect to retail investors (SEC, 2011, 2013a,b) and offer many of the same annuities with the same contract characteristics. Crucially, however, state courts in several states have ruled that BDs are fiduciaries within their borders, creating common law variation in fiduciary duty. We compare behavior of BDs in states in which they have fiduciary duty to states in which they do not, using the difference in behavior of DRs as a control. To control for differences across states, we restrict to counties along state borders with a change in common law fiduciary duty.

We find that fiduciary duty improves the quality of transacted products in equilibrium: BDs with fiduciary duty sell products with risk-adjusted returns that are 25 basis points higher. The increase in returns arises from a change in the set of transacted products. We find a shift towards fixed indexed annuities and away from variable annuities. Within variable annuities, sales shift towards those with more and better-rated investment options. Further, we find that fiduciary duty leads to a 16% reduction in the number of BD firms.

The previous results can be rationalized by either the advice channel or the fixed cost channel: the former by increasing the cost of each adviser providing low quality advice and the latter by increasing fixed costs of entry, regardless of advice quality, if the firms that offer low quality advice are less profitable to begin with. In reality, both channels could be empirically relevant. Their relative importance determines the equilibrium effects of counterfactual regulation.

To show how to disentangle these mechanisms, we develop a model of firm entry into the provision of financial advice with heterogenous adviser and firm qualities (or types). To capture the advice channel, the model is flexible regarding the extent to which advisers vary their advice due to fiduciary duty. To capture the fixed cost channel, the model does not restrict the relationship between profitability and firm type, so that changes in fixed costs can drive high or low quality firms out of the market. We show that one can identify the presence of an advice channel by examining how the distribution of advice changes with the imposition of fiduciary duty. If fiduciary duty only increases fixed costs, firms exit the market and the support of observed advice contracts. However, if the advice channel is substantial we might observe the emergence of higher-quality advice—both because existing advisers adjust and because high quality firms who were formerly crowded out enter. We test this implication of the model and find evidence for the presence of an advice channel. We also directly estimate this model, which allows us to unpack the relative contributions of both channels and to simulate the effects of counterfactual policies.

We find that common-law fiduciary duty operates both by increasing the cost of offering distorted advice and by increasing fixed costs: both channels are quantitatively important. Notably, though, when facing only the advice channel of fiduciary duty, firms typically find it more profitable to change their advice than to exit the market. Thus, most observed exit effects come from the fixed cost channel. Moreover, we estimate that the fixed cost channel does not lead to a substantial shift in the composition of firms.

To study the effects of alternative regulation, we evaluate policies that amplify both channels proportionally, taking the effect of common-law fiduciary duty as a starting point. We find that stronger standards improve advice quality at the cost of additional exit. This result is not a given: it is possible for stronger standards to lead to worse advice through a compositional shift in firms. Given that several approaches have been proposed for federal fiduciary standards, it is critical to build predictions that are robust to different scalings of each channel. The worst-case outcome corresponds to scaling the fixed cost channel but not the advice channel. Nevertheless, such an outcome still dominates an alternative policy of directly preventing entry of firms known to offer low-quality advice. The main driver of this result is that eliminating poor performers does not change behavior of inframarginal players, while fiduciary duty does. These results inform the current debate on fiduciary standards.

Related Literature. This paper contributes to a growing literature on the industrial organization of financial markets, studying market structure and consumer behavior in settings such as car loans (Einav et al., 2012; Grunewald et al., 2023), credit cards (Nelson, 2023; Gavazza and Galenianos, 2020), insurance (Koijen and Yogo, 2015, 2016, 2022), mortgages (Allen et al., 2014, 2019; Benetton, 2019; Robles-Garcia, 2020; Grigsby et al., 2023), municipal bonds (Brancaccio et al., 2020), pensions (Hastings et al., 2017; Illanes, 2017; Illanes and Padi, 2021), personal loans (Cuesta and Sepúlveda, 2021; Liberman et al., 2019; Xin, 2023), small business lending (Cox et al., 2022), and student loans (Bachas, 2019).

More narrowly, this paper relates to the literature on expert advice in financial decision-making. Theoretical work on financial advice has a long tradition (Inderst and Ottaviani, 2012a,b). Empirically, a number of papers have documented advisers responding to commissions and other incentives rather than offering clients appropriate advice (Anagol et al., 2017; Bergstresser et al., 2009; Christoffersen et al., 2013; del Guercio and Reuter, 2014; Guiso et al., 2022; Mullainathan et al., 2012; Robles-Garcia, 2020; Garrett, 2019). Focusing on financial advisers, Egan et al. (2019) study the prevalence of misconduct and discuss demand-side explanations for why advisers and firms with misconduct records survive in equilibrium. Charoenwong et al. (2019) show that the agency in charge of enforcement affects quality. Our contribution to this literature is to study how fiduciary duty, the main policy lever to constrain poor advice, affects adviser behavior.

A few papers have studied empirical implications of fiduciary duty. Finke and Langdon (2012) identify cross-state common law variation and show that advisers report that fiduciary duty constrains their advice. Kozora (2013) shows that an increase in stringency of fiduciary duty in the municipal bond market led to more sales of investment-grade bonds. Egan (2019) finds that extending fiduciary duty would increase risk-adjusted returns by 5–21 bp in the reverse convertible bond market, a setting with sales of dominated products. Finally, Egan et al. (2022) and Barbu (2022) use variation induced by either the proposal of the DOL Rule or state law in New York to study product design and exchanges. We contribute to this literature both by identifying the effect of fiduciary duty in the reduced form and by taking into account the entry margin. This allows us to simulate the impact of different levels of stringency on returns without assuming that the set of advisers is held fixed.

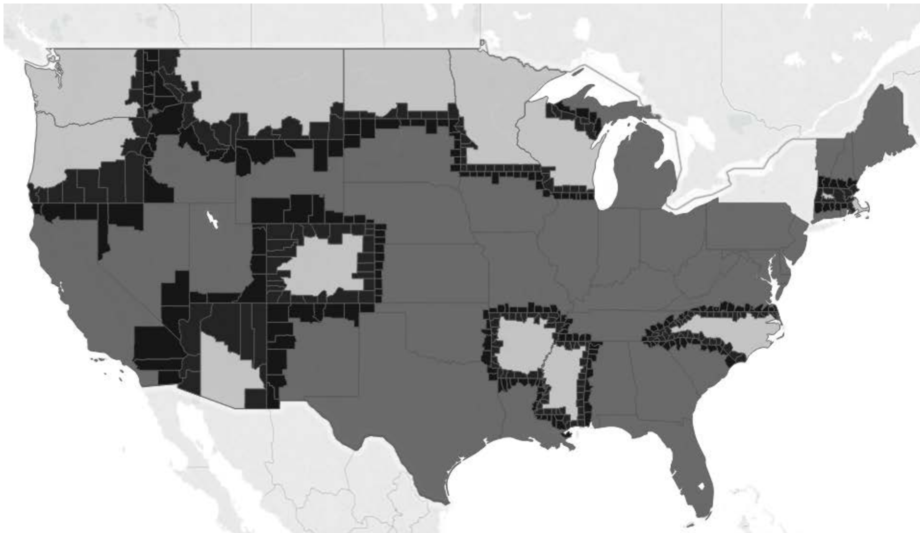
2. Institutional Details

We provide information on financial advisers and fiduciary duty in Section 2.1. Section 2.2 discusses variable and fixed indexed annuities, the products we study in this paper.

2.1. Financial Advisers and Fiduciary Duty

The US has two registration types for financial advisers: registered investment advisers (RIAs) and broker-dealers (BDs). These types evolved separately for historical reasons but now serve similar functions. RIAs are regulated at the federal level by the SEC under

Figure 1: Common law fiduciary duty on broker-dealers by state



States with some degree of fiduciary duty (dark grey) and none (light grey), per Finke and Langdon (2012). Counties in black are ones at borders between states with different fiduciary duties and constitute our main sample. New York and its surrounding counties are omitted, as New York has different suites of products.

the Investment Advisers Act of 1940. Broker-dealers (BDs) are subject to the Securities Exchange Act of 1934 and regulated by state law and by FINRA, a private industry regulator. BDs are not regulated under the Investment Advisers Act as they were initially conceived as mere order takers. Since then, they have grown into the role of providing financial advice to retail investors. Advisers can be dually registered (DRs) as both an RIA and a BD; they must do so to sell deferred annuities. All advisers in our sample are DRs or BDs.

DRs must satisfy their fiduciary duty when recommending products and may not pick and choose when it applies (Hughes v. SEC, 1949): DRs have a “duty of loyalty” to their client under the Investment Advisers Act, and must recommend the best product to their customer regardless of the benefit they receive. BDs nationwide have a “duty of care” that requires them to treat their customers fairly and must recommend products that are “suitable” to their client under FINRA’s rules (FINRA, 2022). As long as those requirements are satisfied, BDs can recommend products that give themselves higher commissions.

In practice, both types of advisers face conflicts of interest, as they are compensated on commission and through revenue sharing agreements with providers. Studies by the SEC (SEC, 2011, 2013a,b) have suggested that consumers often do not realize that advisers have an incentive to sell high commission products. They also are unable to tell whether their financial adviser is a BD or a DR, and many assume that all advisers are fiduciaries.

This project estimates the impact of fiduciary duties on BDs by leveraging cross-state variation in state common law. In some states, court rulings have imposed a common law duty on BDs that rises to the level of a fiduciary duty. Finke and Langdon (2012) classify states into those with no common law fiduciary duty on advisers and those with some. Figure 1 plots this classification.[1] These duties are designed to give clients recourse for low-quality advice, even when advisers meet disclosure requirements (OCIE SEC, 2004).

Legal recourse from fiduciary duty materializes *ex post* through complaints, arbitration, and lawsuits. Investors can file complaints about BDs and DRs with FINRA, state securities regulators, and the SEC. Arbitrators, through FINRA or other forums, must typically follow applicable state and federal laws (Egan et al., 2018). If investors have not signed a mandatory arbitration agreement, they can sue advisors in state or federal court. Regardless of the forum, this process can be costly for advisers even if unsuccessful. These channels for legal recourse are relevant even if clients are unaware of the fiduciary status or registration status of their adviser. Clients can attempt to sue or request arbitration and learn through the process about the limits to recourse stemming from the duty their adviser had. This legal structure implies that fiduciary duty may change the profitability of offering distorted financial advice. It may also impose costs regardless of advice quality. Our research question tackles whether this framework actually changes the advice clients receive or not, and through which mechanisms.

Advisers are employed by firms that are themselves registered as BDs or DRs. Most firms share the registration type of the majority of their advisers, but firms can employ a mix of BDs and DRs. An individual adviser's duty is determined by their own status regardless of their employer's, and advisers are the ones who make product recommendations. Consequently, when we study the impact of fiduciary duty on advice, we use the registration status of the adviser. Entry decisions, however, are made by firms, as are compliance, training, and insurance choices. Firms also sign revenue sharing agreements with upstream suppliers. As a result, when we study entry and exit effects of fiduciary duty, the correct level of analysis is the firm. In our model, we allow for adviser and firm level heterogeneity in advice quality, for advisers employed by different firms to respond differently to fiduciary duty, and for the fixed cost effect of fiduciary duty to vary with the firm's registration status.

[1] Finke and Langdon (2012) develop this classification based on their legal research. In Appendix B.7, we outline a procedure to validate this research. We also discuss two alternate decisions pertaining to treatment of federal cases and case law for insurance providers that yield a modified classification. We show the main results of this paper are stronger under this alternate classification.

2.2. Fixed and Variable Annuities

We restrict attention to deferred annuities, one of the most common investment vehicles for retirement, with over $3 trillion in reserves. Most annuity contracts sold in the US are deferred annuities: fixed immediate annuities, in which investors turn over a lump sum in exchange for fixed periodic payments until death, are a very small fraction of the US annuity market. The DOL directly mentioned concerns about deferred annuities as the impetus for their 2016 rule (Employee Benefits Security Administration, 2016). These products involve an accumulation phase, during which money is contributed to an account and invested, and a payout phase, during which payments are made from the account to the annuitant. Fixed indexed (FIA) and variable annuities (VA) are the most popular deferred annuity products. They share the structure of an accumulation and a payout phase, but differ in how the account grows during accumulation, in the ways money can be withdrawn during both phases, in fee structure, and in the riders, or options, that can be added to the contract.

Investors in FIAs distribute their funds during the accumulation phase between a series of crediting strategies. Crediting strategies include fixed rates of return and the performance of the S&P 500, with a cap and a floor. All crediting strategies fully protect the investor from downside risk. In most cases, fees are not directly charged, so the client need not understand any further features of the product: the margin comes from the realized return of the index less the amount accrued. The main exception to this statement are surrender charges, which tax withdrawals taken in the first years of the accumulation period. At a certain age, FIAs can be converted into a fixed annuity, transitioning the contract into the payout phase; alternatively, they can be withdrawn. In the case of death during the accumulation period, beneficiaries receive the contract amount.

Variable annuities replace the small set of crediting strategies in FIAs with a pool of investment funds, with a range of asset allocations, risk profiles, and fees. The most basic VA contract resembles an FIA, with contract values accruing interest according to the performance of the set of funds chosen, and investors receiving the option of an annuity upon entering the payout phase. For this contract, investors pay an annual percentage fee, the expense ratios of the funds they invest in, and potentially surrender charges. Often, VAs are sold with living benefit riders, which establish a separate account called an income base, which for a fixed period of time grows by the maximum of the realizations of the fund return and a fixed rate. During the payout phase, clients choose between drawing down the account value, annuitizing it, or receiving a percentage of the income base in perpetuity. These riders essentially convert the VA into an option (Koijen and Yogo, 2022), which incentivizes risk-taking in fund selection. Optimal execution of VAs requires choosing appropriately from the pool of investment options, and if the contract is coupled with a living benefits rider, it further requires making correct decisions about when to take withdrawals. As a result, these contracts are more complex and difficult to value than FIAs.

For annuities sold by FSP, there is no difference between BDs and DRs in terms of the characteristics of the products they can recommend, including investment options and fees. A client choosing a particular product would have the same decisions to make and the same payout streams conditional on these decisions, regardless of the adviser. What differs is how advisers and firms are compensated by FSP.

3. Data

In Section 3.1, we describe the data provided to us by FSP about its transactions and the advisers in the market. Section 3.2 discusses data for product characteristics. Section 3.3 presents our calculations for returns.

3.1. Transactions, Advisers, and Clients

FSP is a major financial services provider that sells insurance products in all fifty states, has household name recognition, and is publicly traded. Our main dataset consists all FSP deferred annuity transactions in the United States between 2013 and 2015. For each transaction, we observe the product, date, adviser selling the product, and dollar amount. If a contract involves multiple transactions, they can be linked together. The only client-level information we have is the client's zipcode and age. Clients can also be linked across contracts, although multiple purchases are infrequent.

Additionally, FSP has provided us data from Discovery Data for all advisers who could sell annuities or life insurance in 2015, regardless of whether they transact with the company. This dataset allows us to observe basic demographics of the adviser as well as regulatory information such as licensing and registration (BD or DR). While advisers cannot be matched externally, we can match them to FSP transactions. Discovery also includes information about firms, including firm footprint (e.g., local or national). Additional sample selection decisions are reported in the data appendix.

Table 1 provides summary statistics for FSP contracts sold in the border counties and for the advisers associated with them. About 21% of advisers are BDs. BDs and DRs each sell about 5.7 FSP contracts on average, with some advisers selling significantly more.

Table 1: Summary statistics for border counties

				Percentiles				
	N	Mean	Std.	10%	25%	50%	75%	90%
A. Adviser-Level Quantities								
Is Broker-Dealer	3,936	0.207						
Contracts per Adviser								
BD	814	5.7	9.2	1	1	2	6	14
DR	3,122	5.7	9.0	1	1	3	6	14
B. Contract-Level Quantities								
Is Variable Annuity								
BD	4,678	0.793						
DR	17,794	0.900						
Contract Amounts ($K, 2015)								
BD	4,678	119.4	139.8	24.2	42.6	79.9	148.6	251.5
DR	17,794	153.0	179.7	34.3	54.4	100.9	188.2	304.1
Client Age								
BD	4,678	61.3	10.3	49	55	62	68	74
DR	17,794	64.5	9.5	54	59	65	71	77
C. Market-Level Quantities								
Number of Firms	411	10.9	19.7	0	1	4	10	29
Number of BD Firms	411	3.18	6.08	0	0	1	3	8
Number of DR Firms	411	7.72	13.8	0	1	3	8	20
Number of BD Advisors	411	18.2	64.6	0	0	1	6	30
Number of DR Advisors	411	42.9	153	0	0	4	15	71

Conditional on selling an FSP annuity, BDs and DRs sell VAs 79% and 90% of the time, respectively. Contract amounts are about $34,000 larger for DRs. Finally, the average client is around retirement age, with a difference of about 3 years between BD and DR clients. Summary statistics for the entire nation are broadly similar and are available upon request.

Panel C provides summary statistics for the number of firms and advisers serving the border counties. There is considerable heterogeneity across counties, with many served by a small number of firms. The average number of firms serving these counties is smaller than the nationwide average, but the median number of firms is identical.

3.2. Product Characteristics

We match the transaction dataset to external data sources containing information about products. Beacon Research provided data about the fees and investment options available to annuitants; this data is sourced from quarterly prospectuses that VAs are required to file with the SEC. We also collect information about restrictions on investments and rider rules from prospectuses stored in SEC's EDGAR. We match investment options to the Morningstar

Investment Research Center to collect information about fund ratings and investment styles, and we match them to the CRSP US Mutual Fund database for historical returns. See Table B.1 for summary statistics of the VAs in our sample.

While FIAs do not have to file product characteristics with the SEC, we collected archived rate sheets through a series of open records requests to state insurance agencies. Beacon Research provides further information about them. Rates depend on the crediting strategies available in an FIA, so we do not have simple summary characteristics for them. However, we fold these rates into return calculations.

3.3. Calculating Net Returns

We aggregate contract characteristics into returns using two methods. Our preferred metric is expected risk-adjusted returns, using a stochastic discount factor corresponding to a three-factor model (Cochrane, 2009). We also compute unadjusted returns, as they may align more closely with the information given to clients; del Guercio and Reuter (2014) shows that unsophisticated investors are sensitive to unadjusted returns of mutual funds.

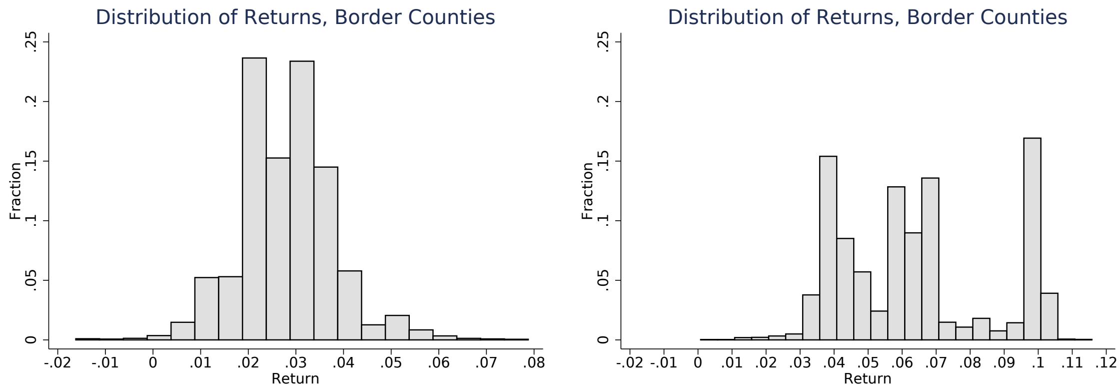
We compute returns of each annuity in an environment where the annual risk-free rate is 3%, for an individual who values money left to heirs equally as their own consumption. Computing the expected net present value of these products requires (i) information about the fees of the basic contract and all riders, (ii) expectations over the distribution of returns for all underlying funds in which the annuitant can invest, (iii) a stance on the discount rates, and (iv) an understanding of portfolio allocations (for a VA) or crediting strategies (for an FIA) and how the annuitant chooses whether and when to take the rider. This information, together with age and contract amount, generates an NPV for each transaction.

As discussed above, we have fees and rate sheets, which directly deals with (i). We proxy (ii) using a Fama-French three-factor model for the underlying mutual funds, estimated using the historical distribution of returns from CRSP. We deal with (iii) by discounting in two ways: for adjusted returns, we compute the stochastic discount factor that prices the factors and use this quantity to discount various states of the world. Alternatively, we compute returns for an individual who discounts all states of the future at 3%. Finally, given that we do not see portfolio allocations of clients or execution of the riders, we tackle (iv) by solving the dynamic programming problem induced by each contract's rules to find the optimal execution. Details of the factor model and discounting are in Appendix C, and an exposition of the dynamic program is in Appendix D.

Figure 2 shows the full distribution of returns. We present values as the annualized returns

Figure 2: Distribution of returns, border counties

(a) Risk-adjusted (b) Unadjusted



necessary in a fixed account to achieve the same NPV by the terminal age of the contract. More precisely, if A is age, β is the discount rate, and T is the contract's terminal age, we find the return R such that $(1+\beta)^{T-A} \cdot (\text{Net Present Value}) = (1+R)^{T-A} \cdot (\text{Transaction Amount})$. Risk-adjusted returns for VAs and DRs range largely between 0 and 6%, with long tails in either direction. Products in the mean of the distribution have risk-adjusted returns of about 2.5%. Similar observations apply to the distribution of unadjusted returns.[2]

In what follows, we will work with these returns as a metric of advice quality. Previous literature (Brown, 2007) has documented that consumers exhibit behavioral biases in the market for annuities. Nevertheless, we believe that the correct metric for evaluating the quality of a contract for our research question is the value of the contract without these biases. We do not expect an adviser to be able to skirt their duty by arguing that a "poor" contract is perceived as high-quality when valued with a behavioral bias. Moreover, part of the role of an adviser is to help clients understand products. We see selling under-performing products to consumers who think that they are good as a manifestation of distorted advice.

4. Does Fiduciary Duty Affect Outcomes?

We consider two main questions in this section. First, do broker-dealers with fiduciary duty sell higher quality products? Using several measures of quality, we establish that this is

[2] About 40% of transactions in our dataset exceed a 3% return (i.e., the assumed risk-free rate) in risk-adjusted terms. This does not imply that the products themselves are negative NPV to the insurer: the NPV a product brings an insurer involves averaging across all transactions for that product. We find over 80% of the products an insurer offers give it positive NPV. Suboptimal execution would further increase the insurer's NPV; in Section 4.1 we show our estimates are robust to one important form of suboptimal execution.

the case. Second, does fiduciary duty lead to different market structures? Again, we find evidence that this is the case. Since these findings are consistent with both the fixed cost and the advice channels, in Section 5 we develop an approach to disentangling them.

4.1. Effects on Product Quality

The comparison of product sales across legal regimes can be tainted by the fact that fiduciary duties are not randomly assigned. For example, if preferences for financial instruments have influenced the adoption of fiduciary duties, then differences in product sales across states confound the effect of fiduciary duties with differences in preferences. We address this issue in two steps. First, we restrict analysis to counties on either side of a border between states that differ in fiduciary status, since we expect that—and subsequently provide corroborating evidence for the fact that—border counties are similar to each other. Second, we compare the difference across the border for BDs to that for DRs, leading to a difference-in-differences strategy. In particular, for a variety of outcomes Y_{ist}, we estimate

$$\begin{aligned} Y_{ist} = \alpha_0 + \alpha_1 \cdot \mathbb{1}[\text{State has FD for BDs}]_s \cdot \mathbb{1}[\text{Adviser is BD}]_i \\ + \alpha_2 \cdot \mathbb{1}[\text{State has FD for BDs}]_s \cdot \mathbb{1}[\text{Adviser is DR}]_i \\ + \alpha_3 \cdot \mathbb{1}[\text{Adviser is BD}]_i + \text{Border FE} + \text{Month FE} + \text{Age FE} + \epsilon_{ist}, \quad (1) \end{aligned}$$

where i represents an adviser, s a state, and t a transaction. We include border fixed effects to use only within-border variation, month-of-contract fixed effects to address any changes in product offerings and rates over time, and client age fixed effects.

Within (1), there are three objects of interest. First is the straightforward difference-in-differences estimator, $\alpha_1 - \alpha_2$. Under the null hypothesis that fiduciary duty has no equilibrium impact on market outcomes, $\alpha_1 - \alpha_2$ should be zero. Counties on either side of a state border may differ from each other, either in the underlying demand for financial products, the supply of financial advice, or other state laws and regulations.[3] However, the difference-in-differences estimator should alleviate this concern: as long as market differences across state borders are equal for BDs and DRs, we would still expect $\alpha_1 - \alpha_2$ to be 0. Under the assumption that there are no spillover effects onto DRs, one can interpret

[3]Nevertheless, we have conducted legal research to look for differences in other state laws and regulation. We have found no significant correlation between fiduciary duty and the regulations we have studied: variable annuity licensing or exams, whether the state has adopted the Interstate Insurance Compact of 2013, and whether the state's Unfair and Deceptive Acts and Practices regulation covers insurance products.

this difference-in-difference estimate as the causal effect of fiduciary duty on BDs.

We also interpret α_1 and α_2 separately. If market conditions do not change sharply across the state border, α_1 is the causal impact of fiduciary duty on BDs, and α_2 is the spillover effect of BDs fiduciary duty onto DRs. That is, interpreting both α_1 and α_2 as separate causal effects requires no shift in underlying market characteristics at the border.

We provide four arguments in favor of the assumption that underlying market characteristics do not change sharply at the state border. First, demographic characteristics are balanced (Appendix B.2). Second, even with covariate balance, one may be worried about differential selection of consumers to advisers as a function of fiduciary status. However, there is extensive evidence (SEC, 2011, 2013a,b; Hung et al., 2008) suggesting that consumers have very little information about which type of adviser they visit. There can still be selection on observables—certain consumers may choose to visit large companies, which are more likely to have DRs—but the extent of this selection would have to vary across borders for this to be a legitimate concern. Third, one can test for differential selection by using client and contract characteristics as outcomes in (1). Table B.3 in Appendix B.2 shows no significant effects on transaction amount, client age, or incidence of cross-state shopping (i.e., whether the adviser and client are from the same state). Fourth, in most specifications (for returns or contract characteristics), we find that α_2 is much smaller than α_1 and usually close to zero. There may be spillover effects onto DRs, and the model we develop in Section 5 allows for them, but it is unlikely that spillovers and demand changes in the border are such that they net out to a small α_2 across many outcome measures.

Effects on Returns. Table 2 reports estimates of (1). We find a statistically and economically significant effect of fiduciary status on returns. In Column (1), we show that risk-adjusted returns increase by about 25 bp, which corresponds to approximately 9% of the base mean. This difference is due almost entirely to the effect on BDs, as the effect on DRs is negligible. Column (3) repeats this analysis controlling for firm-type fixed effects, to control for differences between BD and DR firms. Results are almost identical. Columns (2) and (4) repeat the analysis for unadjusted returns, where we find the same takeaway.

Moving beyond means, Figure 3 shows the distribution of returns of products sold by advisers in border counties, conditional on adviser type and fiduciary status. The distribution of returns for BDs in states with fiduciary duty is shifted rightward relative to states without it, for both risk-adjusted and unadjusted returns. The distributions for DRs are almost identical for states with and without fiduciary duty.

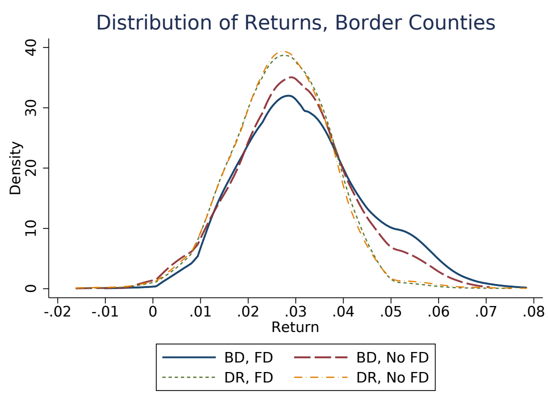
Table 2: Returns of annuity products

	(1) Risk Adjusted	(2) Unadjusted	(3) Risk Adjusted	(4) Unadjusted
DID ($\alpha_1 - \alpha_2$)	0.0025**	0.0047*	0.0024**	0.0048**
	(0.0011)	(0.0023)	(0.0011)	(0.0023)
FD on BD (α_1)	0.0020**	0.0034	0.0019*	0.0035
	(0.0009)	(0.0021)	(0.0009)	(0.0021)
FD on DR (α_2)	-0.0006	-0.0013*	-0.0006	-0.0013*
	(0.0010)	(0.0007)	(0.0010)	(0.0007)
BD (α_3)	0.0019**	-0.0032**	0.0020**	-0.0033**
	(0.0007)	(0.0014)	(0.0007)	(0.0013)
Firm Type FE	No	No	Yes	Yes
Mean of Dep. Var	0.028	0.064	0.028	0.064
N	22,472	22,472	22,472	22,472

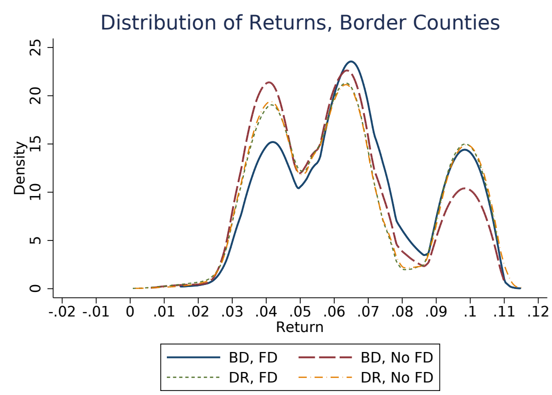
Annualized returns for annuities sold in border counties. Specifications include border, contract month, and age fixed effects. Standard errors are clustered by state. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 3: Returns for border counties, by adviser type and fiduciary status

(a) Risk-adjusted returns



(b) Unadjusted returns



The behavior of BDs with fiduciary duty does not mimic that of DRs. We do not expect it to: BDs and DRs may work at firms that negotiate different contracts with FSP, may attract different clienteles, or may have different business models. Moreover, other research has shown that DR registation is not necessarily associated with better returns (Boyson, 2019). Our identification strategy allows for heterogeneity across advisers, as long as it is independent of the fiduciary status of the state. The key difference between BDs and DRs, for the purposes of this paper, is that the former are regulated differently across the border while the latter are not.

Discussion. We work with risk-adjusted returns as our preferred metric for product quality as they are a well-established, consistent yardstick by which to measure products. However, there are two main concerns with this approach. The first is that clients have heterogeneous preferences over products and thus using a single measure of returns might not be appropriate. The second is that clients may execute products suboptimally, reducing returns.

Regarding the first point, note that our return metric considers heterogeneity in returns as a function of age and contract amount. Thus, products do not have uniformly higher returns for all clients. Nevertheless, there will be measurement error in the outcome if consumers value products differently than our return metric. We would still obtain consistent estimates of the effect of fiduciary duty on risk-adjusted returns of transacted products if consumers do not select advisers as a function of these unobserved preferences. For this to also be the effect of fiduciary duty on individual-specific perceived returns, however, one needs to also assume that advisers do not differentially match consumers to the products that maximize their individual-specific returns as a function of fiduciary status. To the extent that fiduciary duty induces advisers to be more responsive to consumers' individual needs, however, our estimates would be a lower bound on the effect of fiduciary duty on perceived returns, as the correlation between the difference in risk-adjusted and individual-specific returns and the fiduciary status of the adviser would be negative. In Appendix B.4 we explore the robustness of our results to heterogeneity in risk aversion across the population and differential selection into buying VAs and FIAs as a function of fiduciary duty and risk aversion. We find our result that fiduciary duty improves advice is robust.

As for the second point, behavioral biases can lead clients to value and execute contracts suboptimally. A particularly costly mistake is early surrender, where clients give up the contract and receive back the contract value minus a surrender charge. This can happen when optimistic clients fail to anticipate their future liquidity needs; it can also happen to rational clients who face large shocks. Under optimal execution, contracts are never surrendered early. If high-return contracts also have high surrender charges, early surrender could affect our conclusions. To assess its impact on our findings, we assume that all clients have a 1% per year probability of surrendering the annuity during the period in which there is a surrender charge. This lowers average returns by 30 bp. However, it does not quantitatively impact the estimate of the impact of fiduciary duty: the difference-in-difference estimate is 23 bp (s.e. 11 bp). To the extent that fiduciary duty improves execution, our results are a lower bound. There is evidence that is a reasonable assumption: Barbu (2022) documents that clients advised by fiduciaries are less likely to exchange their VAs for worse ones.

Effects on Product Characteristics. What are the changes in the characteristics of transacted products that lead to this change in returns? Since product characteristics do not change across states, these changes are a function of shifts in the probabilities that particular products are sold. Answering this question not only helps unpack the return effect, but also yields evidence on the behavior of financial advisers. Moreover, characteristics are salient in prospectuses and brochures and may be the avenue through which steering towards higher-quality products happens. Advisers may be more upfront about fees and expenses, or highlight that certain products have more restrictive investment options. Additionally, characteristics may be related to recourse. Litigation about fiduciary duty in other settings, including ERISA, has cited higher numbers of investment options, higher quality funds, lower expense ratios, higher returns, and lower fees as supporting the conclusion that fiduciaries are performing their function. FINRA arbitration sometimes also cites similar characteristics as complaints against advisers.

We estimate (1) with the raw properties of annuities mentioned in Section 3 on the left-hand side. We find significant shifts in salient product characteristics, such as whether the product is a variable or a fixed indexed annuity, on variable annuity fees, on expense ratios for the investment vehicles embedded within a variable annuity, and on the diversity of these vehicles. See Appendix B.3 for more detailed results and a discussion.

4.2. Effects on Market Structure

Critics of fiduciary duties claim these duties decrease the number of firms in the market, limiting access to financial products. To study this hypothesis, we shift the unit of analysis to the market and study whether market structure changes.

We regress the (log of one plus the) total number of firms in a county on fiduciary status, controlling for border fixed effects and county covariates. We find evidence of both a level and a compositional effect of fiduciary duty on market structure. Column (1) of Table 3 shows that imposing fiduciary duty reduces the total number of firms in the market by about 9%, although we cannot rule out a zero effect at the 10% level. Columns (2) and (3) suggest that this effect comes primarily from a 16% drop in the number of BD firms. We do not estimate a statistically (or economically) significant effect on the number of DR firms; this also allays concerns that the shift in BD firms is due to changes in other financial regulation at the border, as we would have likely expected other regulation to impact both BD and DR firms. Appendix B.5 shows that local BD firms are most influenced by fiduciary duty.

Since the entry decision is made at the firm-level, our preferred measure of market

Table 3: Effects on market structure

	Firms			Advisers		
	Total Firms (1)	BD Firms (2)	DR Firms (3)	Total Adv (4)	Adv in BD Firms (5)	Adv in DR Firms (6)
$\mathbb{1}$[FD]	-0.086	-0.158**	-0.020	-0.128	-0.209*	-0.048
	(0.067)	(0.074)	(0.062)	(0.081)	(0.113)	(0.075)
Mean	10.91	3.19	7.72	61.1	10.3	50.8
N	411	411	411	411	411	411

Regression of log of (one plus the) number of firms or advisers on the fiduciary status of the county, controlling for log population, log median household income, and median age. Results are robust to specifying the model as a Poisson regression or using the inverse hyperbolic sine transformation. These specifications are available upon request. Specifications include border fixed effects, and standard errors are clustered at the border level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

structure is the number of firms operating in the market. Nevertheless, in Columns (4)–(6), we report the effect on the total number of advisers in the market, split out by the type of firm at which they are employed. The results in these columns are quantitatively similar to the ones in Columns (1)–(3). This consistency provides us some confidence that the model we develop below, which does not explicitly include a strategic choice of the number of advisers in a firm, is not missing an important margin in this setting.

These results suggest that concerns about fiduciary duty inducing exit of BDs have merit. While the effect on the absolute number of firms is small, there nevertheless seems to be a trade-off between advice provision and the number of firms in the market.

5. A Model of Fiduciary Duty

The previous sections estimated the effect of extending common law fiduciary duty to BDs but do not speak to the mechanisms through which it operates. We provide an approach to unpack these mechanisms by building a model of entry and advice provision. In Section 5.1, we outline two channels through which fiduciary duty can operate: a "fixed cost channel" through which fiduciary duty only affects the cost of doing business but does not directly impact provided advice except through entry and exit, and an "advice channel" through which fiduciary duty direct impacts advice and potentially profits. We derive testable implications of the presence of the advice channel. In Section 5.2, we outline how these results extend to more general settings and discuss the key assumptions of the framework. In Section 5.3, we describe how to take the model to the data to quantify the relative impact of each channel.

5.1. Elements of the Model

We first consider competition solely between BD firms. Each firm f has a *type* θ_f and can choose advice a; for the purposes of illustrating the forces graphically here, we take θ_f to be one-dimensional. We adopt the convention that higher values of a correspond to worse, or more distorted, advice.[4] The distribution of types is $H(\cdot)$, and we abuse notation by letting $H(S)$ denote the mass of types in a set S. A firm of type θ has a *base profit function* $\pi(a;\theta)$. We assume this function is single-peaked and as a normalization say the maximum is attained at $a = \theta$. The actual profit of a firm of type θ who enters and gives advice a when the equilibrium mass of entrants is μ is

$$f(\mu) \cdot \pi\left(a;\theta\right) - K, \tag{2}$$

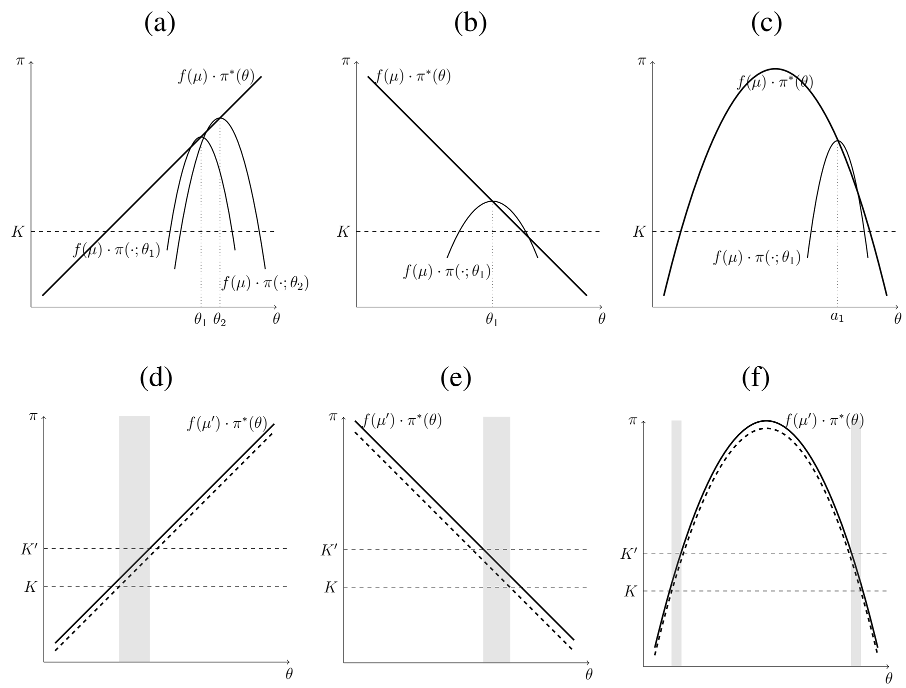
where $f(\cdot)$ is decreasing and independent of θ. We conceptualize $f(\cdot)$ as the number of clients a firm receives if there are μ entrants and K as the fixed cost of entry. In equilibrium, firms enter if and only if they make positive profits. Denote by $\mathcal{E}(\mu, K)$ the set of types θ who would enter if they believe that a mass μ of firms would enter and the fixed cost of entry is K. Then, an equilibrium consists of a mass $\mu^*(K)$ such that $H\left(\mathcal{E}(\mu^*(K), K)\right) = \mu^*(K)$.

In our model, θ_f captures the latent propensity to offer distorted advice. We remain agnostic about the sources of differences in θ. Firms may have negotiated different commission schedules with wholesalers and may also provide different splits of the commissions to individual advisers. They may also place different levels of emphasis on reputational considerations, or have different beliefs about the probability or cost of litigation.

Define $\pi^*(\theta) \equiv \max_a \pi(a;\theta)$. Given that we do not take a stance on the source of heterogeneity in θ, we also cannot take a stance on the behavior of $\pi(\cdot;\theta)$, and thus $\pi^*(\theta)$, with θ. Figure 4(a)–(c) illustrates three possibilities for $\pi^*(\cdot)$ and sample graphs of $\pi(\cdot;\cdot)$. Panel (a) illustrates the case where worse advice corresponds to highest profits. However, higher-θ firms may in fact have lower profits so that cases such as (b) and (c) are also possible: the shape of this function is not capturing the causal impact of distortion on profits, but rather the correlation between the types of firm that have a distortion governed by θ and their profits. Below, we develop predictions that hold over any shape of $\pi^*(\cdot)$.

[4] For the purposes of this paper, one should think of advice as (negative of) a metric of returns. In more general settings, one could think of "advice" a as the (negative of) utility a customer receives from a firm. This metric could come from a demand system for differentiated products, for instance.

Figure 4: Illustration of $\pi(\cdot;\cdot)$ and $\pi^*(\cdot)$, and the effects of a pure fixed cost channel



Different $\pi^*(\cdot)$ and underlying $\pi(\cdot;a)$ that generate them. Panels (d)–(f) depict increases in fixed costs from K to K'. The shaded types exit the market. Note that we do not show the underlying density $H(\cdot)$ of types.

The Fixed Cost Channel. We say fiduciary duty operates solely through a fixed cost channel if imposing it increases fixed costs of entry from K to $K' \geq K$ for all θ but does not alter $\pi(\cdot;\cdot)$ or the underlying distribution $H(\cdot)$ of types. [5] If this is the case, then the set of firms in a market with fiduciary duty is a subset of the set of firms in an otherwise identical market without it. A direct implication is that set of observed advice also weakly contracts. In particular, if $\underline{a}(K)$ and $\bar{a}(K)$ are the least and most distorted advice observed for a fixed cost K, then $\underline{a}(K') \geq \underline{a}(K)$ and $\bar{a}(K') \leq \bar{a}(K)$ if $K' \geq K$. This leads to the following prediction.

Observation 1. *Suppose A and B are identical markets other than the fact that B has fiduciary duty. Suppose that fiduciary duty operates only through a fixed cost channel. Then, the worst advice observed in B is weakly better than the worst advice observed in A, and*

[5] We write the change in costs as a change to the fixed costs of entry. We can instead have a constant fixed cost of entry and say that the effect of the fixed cost channel is to change the base profit function from $\pi(\cdot;\cdot)$ to $\pi(\cdot;\cdot) - c$. This would correspond to an increased per-transaction cost due to fiduciary duty. The key similarity is that c is independent of advice and the ordering of profitability of types does not change with the imposition of fiduciary duty. One should think of the "fixed" cost as fixed across types.

the best advice observed in B is weakly worse than the best advice observed in A.

For intuition, observe that if fiduciary duty only increases the fixed cost of operation, then it cannot change the ordering of profitability of types and thus cannot induce new types, who found it unprofitable to operate even without fiduciary duty, to enter. Since types map to advice, the set of advice must contract. Analogous results apply in more general cases, and Propositions 1 and 2 in Appendix A.2 provide them.

Because we are not taking any stance on the shape of $\pi^*(\cdot)$ or $H(\cdot)$, there are no predictions for how fiduciary duty affects moments such as the mean of the advice distribution, even if it operates purely through a fixed cost channel. Panels (d)–(f) of Figure 4 illustrate the effects of increasing the fixed cost in panels (a) through (c). In each situation, K increases to K', but the effective profit function $f(\mu) \cdot \pi^*(\cdot)$ also increases slightly due to exit of firms, from the dashed to the solid lines. On net, however, firms exit, as denoted by the shaded areas. In Panel (d), fiduciary duty operating through a fixed cost channel increases the mean a since $\pi^*(\cdot)$ increases in θ and increasing the fixed cost simply excludes low-θ firms from the market. In Panel (e), the argument is reversed. In Panel (f), the effect on the mean depends on $H(\cdot)$. In all three panels, however, the extremes of advice weakly contract.

A second prediction relates to how a particular firm changes the advice it provides.

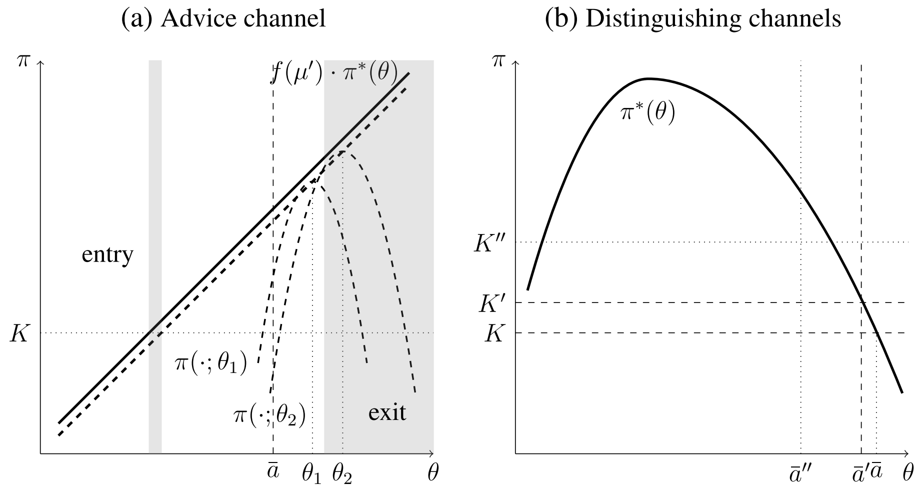
Observation 2. *Suppose A and B are identical markets other than the fact that B has fiduciary duty, and suppose fiduciary duty operates only through a fixed cost channel. If the same firm enters both markets, then it provides the same advice in both markets.*

The assumption underlying this observation is that a firm will have the same type θ in all markets it enters. Since the fixed cost channel of fiduciary duty does not change the base profit function, the advice the firm gives does not change either.

The Advice Channel. Alternatively, fiduciary duty could make it more costly to offer low-quality advice. We call this effect the advice channel and model it through a cost function $c(a)$, with $c'(a) > 0$. The profit to type θ from giving advice a under fiduciary duty is $\pi(a; \theta) - c(a)$. In this section, we show that Observations 1 and 2 need not hold under an advice channel.

As an example, suppose $c(\cdot)$ is such that fiduciary duty places a cap on advice: $c(a) = 0$ for $a \leq \bar{a}$ and $c(a)$ is infinite for $a > \bar{a}$. This leads to two effects not present in a fixed cost channel. First, Figure 5(a) illustrates that firms with especially high values of θ, such as θ_2, cannot profitably offer any level of advice and will be forced to exit. If there is exit of high

Figure 5: Further illustration of the model



(a) Moving from the baseline (thick, dashed lines) to a fiduciary duty in which advice can be no larger than $\bar{a}$. The shaded area to the right illustrates types who exit since they cannot profitably adjust their advice. The shaded area to the left illustrates entrants offering previously unprofitably good advice. (b) An illustrative $\pi^*(\cdot)$ under which strengthening fiduciary duties will lead to different results under a pure fixed cost channel and an advice channel (proxied by a cap). We assume $f(\cdot)$ is flat in (b).

θ firms, this makes it profitable for very low-θ firms to enter, leading to the appearance of previously unprofitable high-quality advice. That is, the lowest type $\underline{\theta}$ that enters decreases. Second, a firm that remains in the market can improve its advice. Firms with moderately high values of θ, such as θ_1, will still profitably operate but will adjust their advice to $\bar{a} < \theta_1$. Neither of these observations could be rationalized through a pure fixed cost channel.

These observations apply with any increasing $c(\cdot)$: such a cost function $c(\cdot)$ effectively acts as a handicap for higher-θ firms and can induce them to exit the market, leading to entry of lower-θ firms.[6] Further, all firms will have an incentive to (weakly) improve their advice (see Proposition 3 in Appendix A.4). In general, the emergence of high quality advice upon imposing fiduciary duty can come both from firms who only enter under fiduciary duty and from firms who enter in both regulatory regimes improving their advice.

Mapping Policies to these Channels. What policies map to an advice or a fixed cost channel? Some firm responses that would fall under the advice channel include changing

[6]In principle, this model allows for $c(\cdot)$ to be decreasing, in which case fiduciary duty would lead to more distorted advice. This is a plausible outcome of the advice channel: advisers could be reluctant to offer any clear advice at all and instead steer to, for instance, simpler but worse products. While we do not discuss this here for expositional simplicity, the empirical implementation of this model allows for this possibility.

incentive structures to make it less profitable to provide distorted advice, or training advisers to offer different products. Also, if fiduciary duty increases expected damages for more distorted advice, the firm will find it more profitable to lower distortion. Responses that fall under the fixed cost channel include retaining lawyers for litigation, training advisers on disclosure measures and bookkeeping practices to mitigate exposure, or investing in relationship management with clients so as to reduce the likelihood of being sued in the first place. Safe harbor disclosure requirements would also fall into a fixed cost channel.

However, not all policies neatly map to exactly one of these channels. For instance, if fiduciary duty induces firms to invest in training or software that provides information to advisers about products, firms would incur a fixed cost. However, such software may also induce advisers to change the advice they give due to this new information.

The Importance of Distinguishing These Channels. Consider the illustration in Figure 5(b). Suppose that in the baseline without fiduciary duty, the worst observed advice is $\bar{a}$, and imposing fiduciary duty reduces the mean distortion and moves the worst advice to $\bar{a}'$. This could be due to fiduciary duty operating through a fixed cost channel and increasing costs from K to K', or by the advice channel imposing a cap of $\bar{a}'$.

Whether stricter fiduciary standards continue to improve advice depends on the underlying channel. Under an advice channel (e.g., moving $\bar{a}'$ to $\bar{a}''$), more strict fiduciary duty would continue to improve advice. Under a fixed cost channel, however, a stricter law might increase the cost to K'', at which point average advice can improve or worsen depending on whether more low-θ or high-θ firms are displaced. Predicting the effects of counterfactual regulation requires understanding the mechanism through with fiduciary duty operates.

5.2. Discussion

The observations presented in Section 5.1 apply to a more general version of the model discussed in Appendix A. We can allow the type θ_f to be multidimensional: firms could have heterogeneous profitability even conditional on the advice they optimally provide, or firms could have different types of advisers within them. We can allow $f(\cdot)$, K, and $\pi(\cdot)$ to differ on observable characteristics as well, capturing differences stemming from geographic footprint or registration status of the firm (e.g., BD or DR). When taking the model to the data in Section 5.3, we extend it on similar dimensions, and the arguments in Appendix A show that the intuition outlined in Section 5.1 continues to apply.

A maintained assumption is that $f(\cdot)$ is not directly a function of θ: we rule out that the mass of consumers received by a firm, after controlling for firm observables, is a function of their advice quality. We find this assumption realistic for a number of reasons. First, given the previous evidence on the lack of consumer information in this market (SEC, 2011, 2013a,b; Egan et al., 2019), it seems unlikely that consumers are sorting to advisers based on advice quality. Second, this assumption is analogous to assuming that θ enters into $f(\cdot)$ in a multiplicatively separable fashion, so that we can envelope the effect of θ on $f(\cdot)$ into π, which does depend flexibly on θ. Thus, the restriction that $f(\cdot)$ is independent of θ is saying that the effect of the type on profits does not *differentially* change with competition.

Moreover, we do not let $f(\cdot)$ depend directly on whether the market has fiduciary duty. For $f(\cdot)$ to depend directly on fiduciary duty, it must be that imposing it changes how many clients go to various firms or what type of firms they go to. Given the substantial survey evidence cited above that clients are not even aware of the fiduciary status of their advisers, we find it implausible that consumers are making decisions about which advisers to talk to based on the common law fiduciary status of the state.

We assume that competition does not directly impact advice: each adviser's optimal advice is independent of μ. One could imagine a more general model: for instance, we could assume that a firm chooses advice a to maximize $\pi(a + g(\mu); \theta_f)$; here, $g(\cdot)$ shifts the location of optimal advice without directly affecting profits. We believe that assuming $g(\cdot) = 0$ is justified in our setting, as we have found no empirical evidence in favor of a direct effect of competition on advice. We find no within-firm changes in advice due to competition: regressing risk-adjusted return on the log of the number of firms in the market, controlling for border fixed effects, firm fixed effects, and fiduciary status, returns a coefficient of -1.2 bp (s.e. 0.9 bp), which is both statistically insignificant and economically small relative to the effect of fiduciary duty. For completeness, Appendix A discusses analogues of Observation 1 for settings where competition directly affects advice. Observation 2 still holds as long as the within-firm comparison is made conditional on the number of entrants.

More broadly, we adopt the approach of defining a reduced-form profit function rather than explicitly modeling the primitives that lead to it. This follows a long tradition in the entry literature, starting from Bresnahan and Reiss (1991) and Berry (1992), which recognizes that entry itself is indicative of profits. It is also appropriate for the our policy questions of interest: it allows for fiduciary duty to both directly affect advice and affect the composition of firms in the market, and it also allows us to study counterfactual regulation that affects either channel. Thus, we do not need to pursue a microfoundation of the profit function from demand and costs. Moreover, such a microfoundation would be difficult to take to our data. The firms in our setting sell many products, and we only observe FSP annuity sales. We also do not have information about "costs": we do not observe the contract between the advisory firm and the upstream firms supplying the financial products, nor would we have any pricing decisions at the advisory level to back this out.

5.3. Empirical Model

To take the model to the data, we add some elements to capture institutional features. In particular, we allow for BD and DR firms to compete against each other and for each firm to have BD and DR advisers. We also allow for systematic differences across BD and DR advisers within a firm, adviser-level heterogeneity within BD/DR advisers within a firm, and for heterogeneity across markets and firms.

Each firm f has a registration status $R \in \{BD, DR\}$, a geographic footprint W_f (local/regional/national as defined by Discovery Data), and a two-dimensional type $(\theta_f^{BD}, \theta_f^{DR})$ that dictates the advice given by their advisers. Types are drawn from a distribution H^R that we parameterize as $N(\mu_\theta^R(W_f), \Sigma^R)$. This allows for advice given by BDs and DRs to be different within a firm. It also allows for this advice to be correlated, due to firm-level hiring practices, training, or compensation policies.

The profit function for firm f in market m, when there are N_{BD} BD firms and N_{DR} DR firms in the market, is given by

$$M_m \cdot f^R(N_{BD}, N_{DR}) \cdot \pi^{R*}(\theta_f^{BD}, \theta_f^{DR}; FD_m) - K_{mf}. \tag{3}$$

The elements of (3) mirror those of (2). The first term is the size of the market, the second the share of customers a type R firm captures, the third the profit derived from the optimal advice given to consumers, and the fourth the fixed cost of entry.

We model $M_m = \exp(X_m \cdot \gamma)$ as a function of market covariates X_m. Shares are nested logit with nests for BD firms, DR firms, and the outside option, so that

$$f^{BD}(N_{BD}, N_{DR}) \equiv \frac{\exp(u_{BD}) \cdot N_{BD}^{\nu_{BD}-1}}{1 + \exp(u_{BD}) \cdot N_{BD}^{\nu_{BD}} + \exp(u_{DR}) \cdot N_{DR}^{\nu_{DR}}}$$

is the share of customers going to BD firms ($f^{DR}(\cdot)$ is analogous). The nesting parameters ν_R govern the substitution between firm types.

The third term $\pi^{R*}(\theta_f^{BD}, \theta_f^{DR}; FD_m)$ captures the profit DR and BD advisers provide the firm given their optimal advice decisions. We parameterize

$$\pi^{R*}(\theta_f^{BD}, \theta_f^{DR}; FD_m) = \exp\left(\beta_0^{R,DR} + \beta_1^{R,DR}(\theta_f^{DR} - \bar{\theta}^{R,DR})^2\right) + \exp\left(\beta_0^{R,BD} + \beta_1^{R,BD}(\theta_f^{BD} - \bar{\theta}^{R,BD})^2 - \lambda^R \cdot (\theta_f^{BD})^2 \cdot FD_m\right). \quad (4)$$

The first term in (4) is the profit contribution from DR advisers in a firm, and the second is that of BD advisers. BD advisers in markets with fiduciary duty face an additional cost of fiduciary duty λ^R: the cost is higher for firms with higher BD types. This cost governs how fiduciary duty shifts the profits of offering distorted advice. This parameterization is parsimonious but flexible: profits could be increasing, decreasing, or non-monotone in θ.

Appendix E.1 derives this firm profit function from a base profit function at the adviser level that depends on an adviser type η, the advice they give, and their fiduciary status. Adviser profit functions are such that a BD adviser with fiduciary duty offers advice centered at $\eta/(1+c^R)$, and all other advisers offer advice centered at η. Here, c^R governs the extent to which fiduciary duty shifts advice, and thus (c^R, λ^R) govern the advice channel. Both these parameters are functions of primitives in the base profit function.

A firm of type θ_f has advisers of status $S \in \{BD, DR\}$ drawn from $N(\theta_f^S, (\sigma_\eta^S)^2)$, and thus the maximized profit function π^{R*}, which integrates out over the distribution of advisers in a firm, is a function of firm types θ_f. In this sense, the model is a generalization of the one in Section 5.1, with multidimensional types and heterogeneity across categories of firms.

The final term K_{mf} of (3) is the fixed cost of entry, which we parameterize as

$$K_{mf} = \kappa_0 \cdot \mathbb{1}[FD]_m + \kappa_1 \cdot \mathbb{1}[BD]_f + \cdot \mathbb{1}[FD]_m \cdot \mathbb{1}[BD]_f \cdot \big(\kappa_{2L} \cdot \mathbb{1}[\text{Local}]_f + \kappa_{2R} \cdot \mathbb{1}[\text{Regional}]_f + \kappa_{2N} \cdot \mathbb{1}[\text{National}]_f\big) + X_{mf}\beta + \xi_{b(m)} + \epsilon_{mf}. \quad (5)$$

The first three terms allow for fixed cost differences across markets with and without fiduciary duty, differences between BDs and DRs, and an additional cost for BD firms in markets with fiduciary duty. The coefficients $\kappa_{2\times}$ parameterize the magnitude of the fixed cost channel for local, regional, and national firms. We also control for firm- and county-level covariates: log population, log median household income, and log median home price. Interactions of these county covariates with BD status and footprint are all encapsulated in X_{mf}. Importantly, we include a full set of border fixed effects $\xi_{b(m)}$, allowing for the possibility that fixed costs vary arbitrarily at the border level. Finally, we include an unobserved firm-market-specific profit shifter $\epsilon_{mf} \sim N(0,1)$, which also provides the scale normalization.

When making its entry decision, the firm knows its own θ_f and ϵ_{fm} draw but not the realizations of θ_f of other potential entrants. A firm enters if and only if it expects to make positive profits conditional on entry, given its beliefs over the entry probabilities of all other potential entrants in the market. An equilibrium is such that beliefs are consistent with true entry probabilities. For instance, in an equilibrium where each firm f has a probability p_f^* of entry when integrating out over the realizations θ_f and ϵ_f, it must be for a BD firm f that

$$\int \Pr\left(\mathbb{E}_{p^*_{-f}}\left[M_m \cdot f(N_{BD}+1, N_{DR})\right] \cdot \pi^{BD*}(\theta_f; FD_m) - K_{mf} \geq 0\right)\, dH^{BD}(\theta_f) = p_f^*, \tag{6}$$

where the $\Pr(\cdot)$ is taken over realizations of ϵ_{mf} and the inner expectation is taken over realizations of N_{BD} and N_{DR} given the equilibrium entry probabilities p^*_{-f} of all other firms. The system specified by (6) and analogous equations for DRs define an equilibrium.[7]

A key feature of this model is that we allow advice decisions to happen at the level of the adviser while entry decisions happen at the level of the firm. This is consistent with the institutions and with the levels at which we have conducted the reduced-form analysis in Section 4. A limitation is that we do not microfound how a particular firm chooses its expected mix of BD and DR advisers and do not allow this to change with policy.

Moreover, modelling decisions closely mirror the ones made in the reduced-form analysis. We estimate this model on the sample of border counties, and counties at the same border share a fixed effect. We allow the entry cost to depend on a full interaction of BD status and fiduciary duty, which mirrors the difference-in-difference specification and allows the entry pattern of DRs to serve as a control for BDs. The distribution of types of potential entrants is common on both sides of the border, allowing the model to exploit an implicit comparison between counties. We will use the entire distribution of advice to estimate the model, leveraging the finding from Observation 1 that emergence of high-quality advice informs the advice channel. Finally, θ_f is fixed within firm, which causes the model to also use within-firm comparisons to inform the advice channel, mirroring intuition in Observation 2. These decisions aid in identification of the structural primitives.

Finally, to contextualize the empirical model in the entry literature, note that it is

[7] Example 1 in Appendix A.2 shows that in a simpler case with two types (BD and DR, say), and no unobserved shocks, the equilibrium is unique as long as cross-type competitive effects are not too strong. We do not have a proof that equilibria are unique in our richer empirical model. This is not an issue for estimation of the model, as we follow a two-step approach and recover beliefs regarding entry probabilities before estimating the model. For counterfactuals, we follow one common approach in the literature (e.g., Seim (2006)) and look for multiplicity by testing different starting points. Across the board, starting our solver from different initial guesses results in the same fixed point.

reminiscent of entry models with heterogeneous competitors. Unlike these models, we do not allow the type of a competitor (quality in Mazzeo (2002), location in Seim (2006), and θ with BD/DR status in this paper) to be a choice. We believe this is a realistic assumption in this setting: a firm will likely not change its licensing status or any internal policies that cause it to distort advice more or less than competitors for every market that it enters. However, we still allow for the types that choose to enter to be a selected subset of the latent distribution. Our model also incorporates firm-level unobserved heterogeneity in ϵ_{mf} and market-level unobserved heterogeneity in ξ_m, like Berry (1992) or Seim (2006). A difference is that other papers incorporate market-level heterogeneity as a random effect; instead, we continue with the reduced-form strategy of comparing similar markets along a border and incorporate a fixed effect common to a subset of markets.

6. Quantifying the Channels of Fiduciary Duty

We use the framework from Section 5 to understand how fiduciary duty operates. In Section 6.1, we test for the presence of the advice channel using the observations in Section 5.1, without imposing the full structure of the empirical model. In the remaining sections, we discuss how to take the empirical model to the data to quantify the relative impact of each channel.

6.1. Does an Advice Channel Exist?

Observation 1 leads to a market-level test for whether an advice channel exists, without placing any further structure on the model. If the highest quality advice offered by any BD firm in a market with fiduciary duty is higher than the advice in an otherwise similar market without, then this must be due to the advice channel.We operationalize this test using our preferred metric of risk-adjusted returns as the measure of the quality of advice. We partial out border, contract month, and age fixed effects, to arrive at a "normalized" risk-adjusted return that is comparable across all transactions and controls for differences across markets. The test is based on the support of the distribution of this advice across adviser types, and we proxy for the support with the mass in the tails, i.e., the proportion of normalized returns that are above x for large values of x.[8]

[8]Suppose we have two distributions A and B with continuous and strictly increasing cdfs on their support, with the maximum M_A of the support of A strictly less than the maximum M_B of the support of B. We know that $F_A(M_A) = 1$ and $F_B(M_A) < F_B(M_B) = 1$, where $F_T(\cdot)$ is the cdf of T. Thus, $F_A(M_A) > F_B(M_A)$, so for x sufficiently close to M_A, $1 - F_A(x) < 1 - F_B(x)$ as well. For similar reasons, we could look at the

Table 4: Effects on tails of risk-adjusted return distribution

	(1)	(2)	(3)	(4)	(5)
Cutoff	0.010	0.015	0.020	0.025	0.030
BD Proportion	0.013	0.008	0.006	0.005	0.005
BD Difference	0.020***	0.010**	0.010***	0.009***	0.006**
	(0.006)	(0.005)	(0.003)	(0.003)	(0.003)
DR Proportion	0.068	0.051	0.032	0.017	0.010
DR Difference	0.005*	0.000	0.000	-0.003	-0.003
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)

Proportion of normalized risk-adjusted returns above various cutoffs as a function of adviser type and fiduciary duty. "BD Proportion" refers to the mass of advice above each cutoff for BDs in states without fiduciary duty. "BD Difference" is the difference in this quantity for BDs with and without fiduciary duty. The rows for DRs are analogous. Standard errors are computed through the bootstrap. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The row marked "BD Proportion" of Table 4 shows the proportion of normalized returns above various cutoffs for BDs without fiduciary duty; "BD Difference" shows the change in this proportion when moving to border counties with fiduciary duty. For extreme cases, we find an economically and statistically significant increase in this proportion, consistent with an expansion of high-quality advice when imposing fiduciary duty. For DRs, we find that changes in the shares in the tails are economically and statistically zero, which lends further credence to the fact that the changes in the distribution for BDs are not spurious. The expansion in high-quality advice cannot be explained by a pure fixed cost channel but is consistent with the presence of an advice channel.

Observation 2 leads to a firm-level test: do firms that enter multiple markets offer better advice in markets with fiduciary duty than in markets without? We estimate (1) for all outcomes considered in this paper but also add firm fixed effects. Table B.6 in Appendix B.6 shows results of this analysis. We do not find a within-firm effect on risk-adjusted returns; this is not inconsistent with an advice channel and could also reflect noise in the set of firms that happen to enter multiple markets in reality. Moreover, for most other characteristics we find within-firm improvements, which would not happen under a fixed cost channel.

6.2. Identification and Estimation of the Empirical Model

Because we observe advice, firm types θ_f for firms that enter are directly identified, as are adviser types. Thus, σ_η and σ_a are identified from the extent of variation in adviser types within a firm and the extent of variation in advice within an adviser, respectively.

effect on extreme quantiles; results are similar and available upon request.

The observed distribution of firm types θ_f is selected through entry, but markets with high probabilities of entry provide information about the unconditional distribution.

While the tests in Section 6.1 are implemented only to test for the presence of an advice channel, the magnitudes of these effects are informative of the magnitude of c. A stronger advice channel reduces profits and thus reduces entry in markets with fiduciary duty, but the magnitude of the fixed cost channel $\kappa_{2\times}$ can move to match the entry rate by footprints in these markets. How the distribution of entrants is affected informs the channels: if the reduction in the probability of entry induced by fiduciary duty is concentrated among firms with high distortion, the model is more likely to interpret that as due to a profit effect of an advice channel (high λ).

As in canonical entry models, variation in the number of potential entrants informs the competitive effect. In our setting, however, we also have quasi-exogenous policy variation that helps pin down cross-type competitive effects: since fiduciary duty differentially affects the profits of BD and DR firms, the responsiveness of DR entry to fiduciary duty informs how strongly the two types of advisers compete with each other.[9] Finally, cost shifters (such as fiduciary duty and market characteristics) change the distribution of advice in the market differently depending on the shape of the profit function. For instance, if changes in market covariates that increase costs lead to a more contracted distribution of advice, this is evidence that the profit function may be an inverted-U (like in Panel (c) of Figure 4).

To take the model to the data, we need to take a stance on the set of potential entrants. We follow a common approach in this literature of using "nearby" firms as potential entrants. In particular, we assume that (i) national firms are potential entrants in all markets, (ii) any regional firm operating at a border is a potential entrant everywhere at that border, and (iii) the number of local potential entrants in every county equals one more than the maximum number of local entrants in any county within that border. We also estimate the model with variations of (iii) as robustness checks. When we generate local potential entrants, we assume their types θ_f are independent of other firms, but national and regional potential entrants retain their identity and thus their θ_f across all markets.

For simplicity in choosing functional forms, the parameterization is written with larger a corresponding to more distorted advice (and with $a \geq 0$). We use our preferred metric—risk-adjusted returns—as the backbone of our measure of a. For a transaction t, we say that

[9] In one specification, we also use data on which firm types customers choose to purchase from (conditional on purchasing an FSP product). The functional form $f^R(\cdot)$ can be interpreted as providing a probability of purchasing from a BD firm, which can be added to the likelihood. This provides another source of identification of the competitive effects.

$a_T = \bar{r} - r_t$, where r_t is the residualized risk-adjusted return after partialling out border, contract-month, and age fixed effects, and $\bar{r}$ is the 99.5$^{\text{th}}$ percentile of this distribution. Moreover, we introduce a source of "measurement error" into the model and say that we observe $\tilde{a}_t = a_t + \epsilon_t^a$, where $\epsilon_t^a \sim N(0, \sigma_a^2)$ for each transaction t.[10]

The intuition behind identification suggests that the entire distribution of advice provides information about the parameters. As such, we employ a likelihood approach to leverage the full distribution we observe. The probability a particular firm enters a market depends on (i) its θ_f and (ii) the equilibrium entry decisions of all other firms in the market. To address (i), we integrate out over θ_f using Gaussian quadrature for each firm. To address (ii), we use a two-step approach, as in Sweeting (2009). In the first stage, we use the observed probabilities of entry across markets to predict an empirical probability of entry.[11] At the market-potential entrant level, we estimate a linear probability model of whether a firm enters on the same set of covariates as in our fixed cost parameterization in (5). From this regression, we arrive at an estimated probability of entry $\hat{p}_{fm}$ for each potential entrant, from which we derive beliefs that a firm has over the distribution of competitor BDs and DRs conditional on entry. This allows us to compute $\mathbb{E}[f^R(\cdot)]$ for each firm, conditional on entry and given candidate parameters in $f^R(\cdot)$. This approach frees us from having to compute an equilibrium for each candidate set of parameters and is robust to multiplicity of equilibria.

We use information about firm entry decisions and observed advice to construct the likelihood. We run an additional specification where we also include the likelihood from adviser choice. To account for estimation error from the first stage, we compute standard errors by bootstrapping the entire procedure, redrawing firms from the set of potential entrants at the market level, and redrawing advice within firm.

6.3. Parameter Estimates

Panel A in Table 5 shows estimates of the means of the type distribution for various types of firms. Distortion is in percentage points and higher values of distortion correspond to lower risk-adjusted returns. Thus, BD advisors in national BD firms, on average, give advice that leads to 58 bp higher risk-adjusted returns than the average BD advisor in a local BD firm. National firms typically have lower average distortions than local and regional ones,

[10]We can alternatively interpret ϵ_t^a as the result of tailoring advice to different clients, as long as this tailoring is not relevant for the cost of distortion.

[11]While Sweeting (2009) uses multiple observations of entry into the same market, we use observations of entry into similar markets. We can use this procedure since we omit market-level random effects from the model in favor of fixed effects at the border level, which groups together multiple markets.

although there are some exceptions.

Moving from the 5[th] to the 95[th] percentile of types for θ_f^{BD} for BD firms corresponds to a shift of 43 bp, and the analogous shift of θ_f^{DR} for DR firms is about 70 bp. Moreover, the two dimensions of firm types are significantly positively correlated within-firm: we estimate that θ_f^{BD} and θ_f^{DR} have a correlation of about 0.6 for both BD and DR firms. This positive correlation is consistent with firm types originating from firm-wide practices, hiring or compensation policies, or contracts which may apply to all advisers within a firm.

The last two rows of Panel B report the standard deviation of adviser types σ_η within a firm as well as the standard deviation of advice within an adviser σ_a. In this specification, the values are constrained to be identical for BD firms and DR firms. We estimate both these quantities to be large, although they are smaller for DR advisers. From the perspective of the model or of understanding the channels of interest, these parameters are not material: the economics outlined in Section 5.1 relate to heterogeneity across firms. However, they provide some interpretation for the source of variation in advice within firms.

Panel C shows the slope of profits as a function of θ. The profit function is decreasing in θ at the mean type for each of the adviser/firm-type pair; this is also true for most of the relevant region of θ. The interpretation is that firms that set optimal distortion higher also have lower profits; this is not the causal impact of increasing distortion on profit. An implication is that increases in fixed costs would lead to exit of higher-distortion firms.

Table 6 shows parameter estimates related to competitive forces and market size. First, note that ν is estimated to be close to 1: within firm-type substitution is close to cross-firm-type substitution. Removing a BD firm would not lead to significantly more diversion to other BD firms than to DR firms. This is consistent with survey evidence cited in Section 5.2 that customers are unaware of the registration status of firms or advisers. The parameters also indicate a strong market expansion effect: $f^{BD}(\cdot)$ decreases by about 4% when moving from the median market (1 BD firm and 3 DR firms) to a market in the third quartile of BD firms (4 BD firms and 3 DR firms). Overall, firms do not compete strongly.

The final three columns report how market size M_m depends on county covariates. Larger counties with higher incomes have larger M_m: a 10% increase in the population of a county corresponds to a 1% increase in M_m, and the elasticity is about three times as large for income. We find that counties with larger house prices have smaller M_m, at least conditional on income; this could reflect lower demand for non-housing investment assets.

Panel D of Table 5 reports estimates for the parameters governing the advice channel. We find that BD advisers reduce distortion by 12% upon imposition of fiduciary duty if they

Table 5: Parameter Estimates

	BD Firms		DR Firms	
	BD	DR	BD	DR
A. Means of Distribution of Advice (μ_θ)				
Local	4.395	3.542	2.961	4.153
	(0.108)	(0.046)	(0.064)	(0.042)
Regional	4.177	3.803	4.020	3.906
	(0.078)	(0.046)	(0.120)	(0.044)
National	3.819	3.733	3.343	3.743
	(0.078)	(0.045)	(0.031)	(0.021)
B. Variance of Distribution of Advice				
Standard Deviation of Firm Types (σ)	0.131	0.032	0.073	0.212
	(0.053)	(0.003)	(0.011)	(0.014)
Correlation Between BD and DR Types (ρ)	0.636		0.615	
	(0.013)		(0.025)	
Standard Deviation of Adviser Types (σ_η)	0.844	0.414	0.844	0.414
	(0.039)	(0.033)	(0.039)	(0.033)
Standard Deviation of Advice Within-Adviser (σ_a)	0.796	0.627	0.796	0.627
	(0.027)	(0.016)	(0.027)	(0.016)
C. Profit Function				
Slope of Profit Function at Average θ (per bp)	-0.000	-0.625	-0.117	-0.042
	(0.000)	(0.039)	(0.022)	(0.003)
D. Advice Channel				
Effect on Advice (c)	0.117	–	0.056	–
	(0.019)		(0.009)	
Effect on Profits (Governed by λ)	-0.000	–	-0.037	–
	(0.000)		(0.016)	
E. Fixed Cost Channel				
Effect for Local Firms (κ_{2L})	2.770		–	
	(0.305)			
Effect for Regional Firms (κ_{2R})	0.037		–	
	(0.084)			
Effect for National Firms (κ_{2N})	0.084		–	
	(0.044)			

are in employed BD firms and by 6% if they are employed in DR firms. Since λ is difficult to interpret by itself (estimates are in Appendix E.2), we instead report the average change in profits across types due to imposition of the advice channel. The values presented in the table are relative to the ϵ_{mf} shock, which has a standard deviation of 1. For both firm types, we find very small impacts. This finding is directly consistent with the entry behavior of DR firms: large negative profit effects would be inconsistent with the finding that DR firms' entry behavior is not affected on average by fiduciary duty. For BD firms, this finding teaches us that the entry effect is primarily coming from the fixed cost channel. Panel E

Table 6: Market size

BD Firms		DR Firms		Market Size (in Logs)		
u	ν	u	ν	Pop.	Inc.	House
-8.02	0.97	-6.40	0.99	0.10	0.32	-0.09
(0.55)	(0.01)	(0.52)	(0.00)	(0.01)	(0.02)	(0.01)

shows the parameters relevant for the fixed cost channel. We find that the fixed cost channel does increase costs for firms, but the effect is much larger for local firms.

Appendix E.2 discusses a number of other robustness checks. We add information about firm choice by individual clients who purchase FSP products to the likelihood to provide more information about competitive effects embedded in $f(\cdot)$. This has minimal quantitative impact on our estimates. We also vary how we define local potential entrants, which we believe is the most arbitrary part of our definition of potential entrants. While doing so does impact our estimates of fixed costs (to match the probability of entry), it does not affect the estimates of the differential fixed costs due to fiduciary duty, which is the relevant parameter. Finally, we have assumed that competition occurs at the county level. In the appendix, we take the alternative stance that counties on the same side of the border are all one market. We find some effects on the correlates of market size and estimate a larger κ for regional firms, but estimates are otherwise similar. Appendix E.2 also discusses model fit.

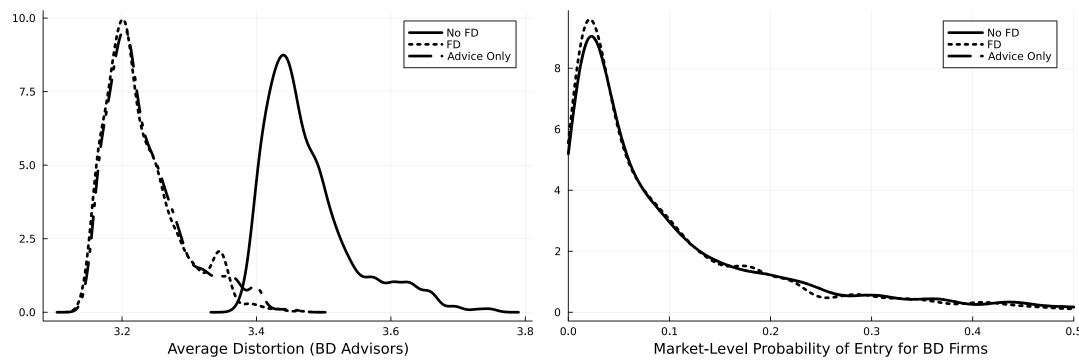
6.4. How Large Are the Advice and Fixed Cost Channels?

We solve our model under three scenarios: no fiduciary duty, full fiduciary duty, and fiduciary duty operating only through the advice channel. In each case, we loop through all markets and compute the expected distortion provided by a BD adviser conditional on entry—using that market's covariates, potential entrant distribution, and relative share of BD advisers by type of firm. For the first case, we set $\lambda = c = 0$ and $\kappa_{2\times} = 0$ but keep all other parameters at their estimated values. For the second, we set λ, c, and $\kappa_{2\times}$ to their estimated parameters and apply them to all markets. Finally, to allow fiduciary duty to operate only through the advice channel, we set λ and c to their estimated values but keep $\kappa_{2\times} = 0$.

Figure 6(a) shows the distribution, across markets, of average distortion conditional on entry for BD advisors. Fiduciary duty improves advice: the distribution with fiduciary duty is a leftward shift of the distribution without fiduciary duty. The difference in the means of this distribution corresponds to 25 bp, identical to the impact we estimate in Section 4.1.

Figure 6: Decomposition of the total effect of fiduciary duty

(a) Decomposition of distortion (b) Decomposition of entry



Notably, however, the distribution induced by only the advice channel (dashed line) is very close to the distribution with full fiduciary duty: the advice effect of fiduciary duty comes entirely from the advice channel. This need not have been the case: the fixed cost channel could have differentially induced exit of firms that systematically offered lower- or higher-quality advice. In fact, parameter estimates indicate that higher-distortion firms typically have lower profits conditional on footprint, so adding in the fixed cost channel leads to an additional decrease in distortion. However, this effect is very small since we estimate profit functions to be relatively flat over the relevant region: it accounts for only 2% of the total effect of fiduciary duty on advice.

Panel (b) repeats this exercise but focuses on the market-level probability of entry of a BD firm, averaging across potential BD firm entrants within a market. Imposing fiduciary duty leads to a decrease in entry probabilities: the average entry probability decreases by 0.6 pp. Here, the distribution of entry probabilities when just looking at the advice channel is very similar to the distribution without fiduciary duty: the entry effect of fiduciary duty comes from the fixed cost channel, as the profit effect of the advice channel is very small. This could happen if the threat of increased damages from litigation induces firms to reduce their distortion such that the drop in profit from sales is similar to the reduction in expected damages, or if fiduciary duty induces investment in software (a fixed cost) that helps advisers identify higher-quality products.

In summary, both proponents and detractors of expanding fiduciary duty have identified empirically relevant mechanisms through which fiduciary duty affects the market for advice. Like proponents argue, fiduciary duty improves advice quality by increasing the cost of offering distorted advice. However, like detractors argue, fiduciary duty also leads to firm exit by increasing the fixed cost of offering advice.

7. The Effects of Counterfactual Stringency

Stringency of fiduciary duty is a matter of ongoing debate. Commentators on the SEC's Regulation Best Interest argue that it imposes fewer liability costs on advisers than the DOL's 2015 proposal. Proposed state legislation is also anecdotally of different stringencies, especially since enforcement methods will be different. In 2023, the DOL proposed a new rule that is expected to shift the stringency of fiduciary duty as it applies to retirees.

How would alternate stringencies affect advice and entry? One way to conceptualize alternate stringencies is that they keep the relative strength of the two channels fixed. A federal law, for instance, could both increase the advice channel and the fixed cost channel: firms would have to not only adopt more compliance technology but may also face larger enforcement probabilities or penalties for giving especially low-quality advice. We argued in Section 5.1 that even though we found that common law fiduciary duty improves advice, it is not clear that scaling these channels would continue to do so. In this section, we use our model to compute the equilibrium effects of increased stringency.

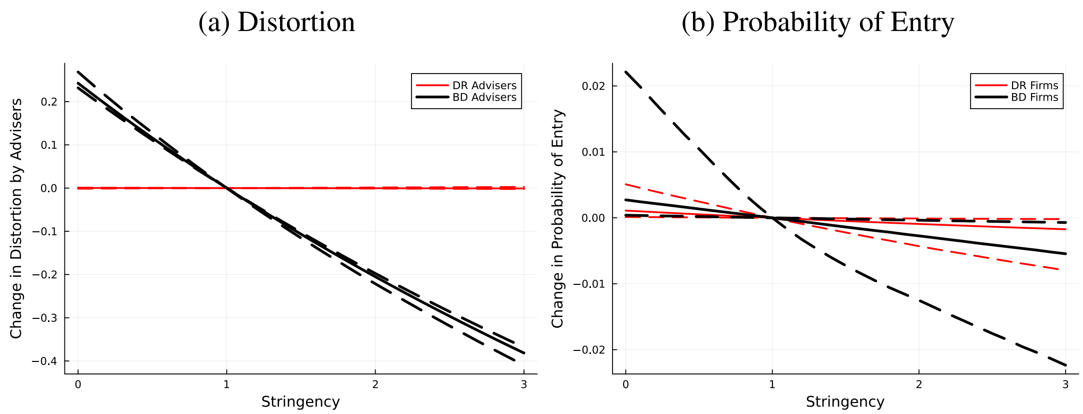
Figure 7 shows the results of increasing stringency proportionally: we scale both c and $\kappa_{2\times}$ by the same k.[12] Note that $k = 0$ corresponds to no fiduciary duty and $k = 1$ corresponds to common-law fiduciary duty. One might expect that a federal standard corresponds to $k > 1$. Panel (a) reports results on distortion and Panel (b) on entry probabilities. Solid lines illustrate outcomes for the median county relative to common-law fiduciary duty at $k = 1$, and the dashed lines illustrate the 5^{th} and 95^{th} percentiles across counties. The black lines show outcomes for BDs while the red lines show outcomes for DRs.

Panel (a) shows that as fiduciary duty becomes more stringent, advice provided by BD advisors keeps improving. Recall that this result is not mechanical, as the set of entrants changes with stringency. However, since the additional increase in fixed costs induced by a stronger fixed cost channel typically crowds out higher-distortion firms, increases in the fixed cost channel also improve advice slightly. The dashed lines show there is limited dispersion in the effect across markets.

Panel (b) shows that increasing stringency continues to decrease the probability of entry of BD firms: the probability decreases by about 0.8 pp for the average market when moving from the common law duty to one that triples stringency. This is relative to a baseline

[12] We also scale λ by an appropriate amount. Our experiment involves scaling $\tilde{c}$, using notation in Appendix E.1. Thus, a stronger advice channel leads to a larger change in advice but also potentially more exit.

Figure 7: Effects of changing stringency proportionally



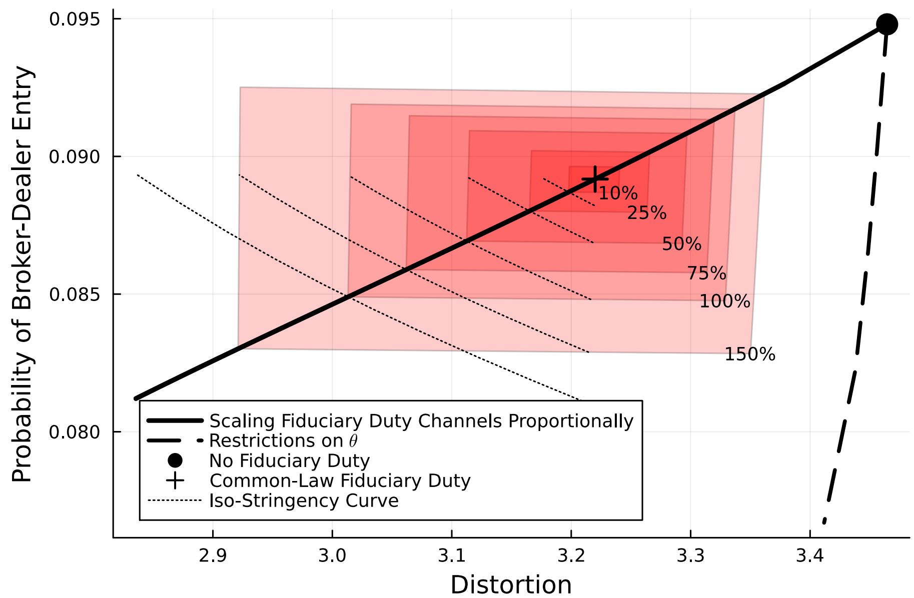
A stringency of 1 corresponds to common-law fiduciary standards. The solid line plots the median effect (relative to common-law) across all markets, and the dashed lines plot the 5th and 95th percentiles.

probability of entry of 9 pp at the common law duty. For this outcome, we find more heterogeneity in the effects on the probability of entry across markets. This heterogeneity is correlated with the size of the market, and the top quartile of markets by number of entrants has a median change in the probability of entry of 2.1 pp when moving from no duty to common law fiduciary duty; the effect for the bottom quartile is close to zero. Across all markets, moving from the current law to one that is three times as strong leads to a further drop in entry probabilities of about 7–17% of the baseline entry probability in that market.

In principle, these policies could have had additional spillovers onto agents not directly impacted. For instance, advice provided by DR advisers might have changed due to entry and exit of firms that employ them. Moreover, DR firms might change their entry behavior, both due to change in competition from BD firms and any additional costs of fiduciary duty that BD advisers in DR firms face. The figures show these spillover effects in red. We find almost no impact of fiduciary duty on advice provided by DR advisers. We find a small negative impact of the entry on DR firms (baseline entry probability of 11 pp), coming from the fact that in some markets we estimate the impact of the advice channel on BD advisers in DR firms to be nontrivial.

While scaling channels proportionally is a natural benchmark for investigating the effects of alternate stringencies, doing so may be difficult in practice. Regulators might not be able to predict exactly how the language of a stronger standard would translate to actions taken by the firm. For instance, increasing the legal liability for breach of fiduciary duty likely would lead to an increase in the advice channel, but it could also induce firms to retain lawyers,

Figure 8: Outcomes from scaling channels separately



translating to a higher fixed cost as well. The SEC's Regulation Best Interest was widely criticized for not providing guidance that could directly impact advice (Melkonyan, 2020), suggesting that this policy operated through a fixed cost channel while the intended effect may have been different. What are the set of outcomes that could be obtained if channels could not be targeted as precisely?

One way to use our model to answer this question is to scale channels separately. A regulator wishing to adopt a nationwide standard along the lines of common law fiduciary duty could adopt language very similar to the state court opinions. We could interpret this as scaling the advice channel and fixed cost channels by values k_A and k_{FC}, respectively, both in some interval $[1/(1+\delta), 1+\delta]$ for some small δ. A regulator wishing to adopt a significantly different standard than common-law fiduciary duty may be interested in the potential impacts of policies in the space defined by a larger δ.

Figure 8 asks the question of what the worse-case outcome is from not being able to target channels precisely. The solid black line shows the outcomes attainable by scaling both channels equally, averaging outcomes over all markets; this illustrates the trade-off between entry and advice quality identified in Figure 7. The darkest region (labeled "10%") corresponds to outcomes in the region defined by $\delta = 0.10$; the next region corresponds to $\delta = 0.25$, and so forth. We include iso-stringency curves as dotted lines for reference: these correspond to outcomes of points where $k_A + k_{FC}$ is a constant. Moving to the bottom right on the curves corresponds to a higher k_{FC}.

Points in the bottom right of the shaded region illustrate the "worst-case" outcomes from scaling the channels of fiduciary duty: these outcomes come from policies that increase the fixed cost channel but reduce the advice channel. In general, policies that end up targeting the fixed cost channel more strongly worsen the advice-entry trade-off: moving down the iso-stringency curves can lead to situations where the impact on advice is about the same as that of common-law fiduciary duty but with significantly larger entry impacts.

Note that the shaded regions in Figure 8 extend to the top left of the solid line. This indicates that it is in principle possible to mute the advice-entry trade-off: a regulator could scale channels to improve advice without having as large an impact on entry. The shape of this region is an empirical result: these points correspond to a large k_A and a small k_{FC}, and had we estimated a larger profit effect of the advice channel, this region would have been closer to the solid line. We caution against interpreting these points as evidence that a regulator could practically avoid this advice-entry trade-off entirely: it may be difficult to design rules to achieve the requisite scaling.

To benchmark these outcomes, we consider an alternate policy that directly targets firms by screening out problematic ones. This could approximate a situation where regulators shut down firms that receive too many complaints or are found to have systematically sold particularly low-quality products, or it could be an approximation to a (currently non-existent) market-based quality system that assigns a "rating" to each firm and effectively eliminates business going to low-quality firms. To implement such a policy, we exclude firms with $\theta^{BD} > \theta^*$ from entering the market, for different values of θ^*. Doing so directly improves average advice in the market but would come at a cost of reducing entry. Of course, the fact that firms with lower θ^{BD} might now find it profitable to enter the market could both counteract the entry effect and reinforce the direct effect. The magnitude of these effects, especially in comparison to the broader fiduciary duties, is an empirical question.

The dashed line in Figure 8 plots outcomes in the advice-entry plane for this policy, for a range of θ^*. We find that these policies have somewhat limited effects on advice but large effects on entry. In fact, even the worst-case outcomes from fiduciary duty dominate policies in this class. The reasons can be traced back to three points. First, Table 5 shows that the distribution of θ^{BD} across firms is fairly narrow, so preventing bad actors from entering does not do much to change the average advice provided by other firms. Second, we estimated competition to be somewhat muted across firms: accordingly, the presence of these higher-θ firms was not strongly preventing lower-θ firms from entering. Finally, unlike in the advice channel of fiduciary duty, the policy does not cause changes in the behavior of inframarginal firms. Indeed, the effect on these firms, as illustrated by the emergence of high-quality advice and confirmed in the structural model as well, is an important aspect of fiduciary duty. Overall, this provides further justification for using fiduciary duty standards, even if a regulator cannot perfectly target them to individual channels.

8. Conclusion

Motivated by recent regulatory discussion, this paper evaluates the effects of extending fiduciary duty to broker-dealers. We find that in the market for deferred annuities, fiduciary duty increases risk-adjusted returns by 25 bp and induces an reduction of 16% in the number of BD firms. Unpacking this change in risk-adjusted returns, we find that BDs with fiduciary duty are less likely to sell variable annuities. When selling a variable annuity, they are more likely to steer clients to products with more and higher-quality investment options.

We develop a model of entry and advice provision to disentangle the mechanisms through which fiduciary duty operates and simulate equilibrium effects of counterfactual policies. The model highlights that separately identifying the effects of fiduciary duty on fixed costs and on advice quality is crucial for understanding the effects of alternative policy designs.

We find that fiduciary duty operates both as a constraint on low-quality advice and as an increase in fixed costs. Further, we find that strengthening both mechanisms would continue to improve equilibrium advice. This is not a given, as firm exit could have led to a compositional shift that worsened advice. Finally, we compare the effects of fiduciary duty to the equilibrium impacts of policies designed to weed out "bad players." We find that fiduciary duty dominates these policies, even if regulators are unsure of how regulation will map to the fixed cost and advice channels. The main driver of this result is the fact that the advice channel of fiduciary duty changes the behavior of marginal and inframarginal firms, while inframarginal firms do not respond strongly to policies that eradicate the worst ones. Overall, these results offer a extensive picture of the effects and mechanisms of fiduciary duty in the market for financial advice.

The framework developed in this paper is not limited to understanding the impact of fiduciary duty. It can be used to evaluate any regulation that affects the provision of financial advice so long as one has a map from this regulation to the fixed cost and advice channels. We focus on fiduciary duty because our data allows us to identify this map. Future work may be able to leverage other variation to evaluate other policies, such as commissions caps or specific disclosure requirements.

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A. Further Analysis of the Model

In this appendix we provide a more general and formal treatment of the model in Section 5.

A.1. Setup

There are M *categories* of firms indexed by m. Each firm j has a type θ_j and can choose advice a_j. The distribution of types for category m is $H_m(\cdot)$, and it has compact support; abuse notation by letting $H_m(S)$ be the mass of firms in a set S. A firm of type θ and category m has a *base profit* function $\pi_m(a + g_m(\boldsymbol{\mu}); \theta)$ that we assume has a unique maximizer. The actual profit of a firm of category m and type θ that enters and gives advice a when the equilibrium mass of entrants is $\boldsymbol{\mu} = (\mu_1, \dots, \mu_M)$ is $f_m(\boldsymbol{\mu}) \cdot \pi_m(a + g_m(\boldsymbol{\mu}); \theta) - K_m$. We assume that $f_m(\cdot)$ is decreasing in every component.

Define $\pi^*_m(\theta) \equiv \max_a \pi_m(a + g_m(\boldsymbol{\mu}); \theta)$. Note that since the effect of competition $g_m(\cdot)$ is modeled as shifting the optimal advice, $\pi^*_m(\cdot)$ does not depend on μ. Suppose that $H(\cdot)$ and $\pi(\cdot)$ are jointly such that the distribution of $\pi^*(\theta)$ does not have any mass points.

A.2. Equilibrium Effects of Increasing Fixed Costs

In equilibrium, firms enter if and only if they make positive profits. Denote by $\mathcal{E}_m(\boldsymbol{\mu}, K_m)$ the set of types θ_j of category m who would enter if they believe that a mass $\boldsymbol{\mu}$ of firms of each category would enter and the fixed cost of entry is K_m. Then, for a fixed cost vector $\boldsymbol{K} = (K_1, \dots, K_m)$, an equilbrium is a mass $\boldsymbol{\mu}^*(\boldsymbol{K})$ such that $H_m(\mathcal{E}_m(\boldsymbol{\mu}, K_m)) = \mu^*_m(\boldsymbol{K})$.

Proposition 1. *Suppose that $K'_m \geq K_m$ and that $\mu^*_m(\boldsymbol{K}') \leq \mu^*_m(\boldsymbol{K})$. Then, $\mathcal{E}_m(\boldsymbol{\mu}(\boldsymbol{K}'), K'_m) \subseteq \mathcal{E}_m(\boldsymbol{\mu}(\boldsymbol{K}), K_m)$.*

Proof. A category m firm with type θ enters at K'_m if $f_m(\boldsymbol{\mu}') \cdot \pi^*_m(\theta) \geq K'_m$, or $\pi^*_m(\theta) \geq K'_m / f_m(\boldsymbol{\mu}')$. Similarly, (θ, m) enters with costs K_m if $\pi^*_m(\theta) \geq K_m / f_m(\boldsymbol{\mu})$. Since $\mu'_m < \mu_m$, it must be that $K'_m / f_m(\boldsymbol{\mu}') > K_m / f_m(\boldsymbol{\mu})$, meaning if a type θ firm enters at an entry cost of $\boldsymbol{K}'$, it must enter at an entry cost of $\boldsymbol{K}$ as well. □

Note that entry decreasing is a non-primitive assumption that need not be satisfied in general. Suppose that K'_1 is very large compared to K_1 and K'_2 is close to K_2. In this case, it could be that the number of firms of category 1 decreases considerably, and this decrease allows a larger set of category 2 firms to enter. However, the decrease can be verified empirically (see Appendix B.5), and it is also consistent with various formulations of the model. For instance, with $M = 1$ category, one can show that the equilibrium is unique and an increase in K_1 leads to a decrease in the number of entrants. Second, entry also decreases with $M = 2$ categories when fiduciary duty affects the fixed costs of only one category but competition between the categories is not too strong. We codify this in the following example.[13]

Example 1. *Define $\hat{\pi} \equiv f(\cdot) \cdot \pi^*(\cdot)$. Assume*

$$\frac{\partial \hat{\pi}_1}{\partial \mu_1} \cdot \frac{\partial \hat{\pi}_2}{\partial \mu_2} > \frac{\partial \hat{\pi}_1}{\partial \mu_2} \cdot \frac{\partial \hat{\pi}_2}{\partial \mu_1}. \tag{A.1}$$

That is, the product of the effects of the categories' own share on profits is less than the product of the effects of the categories' share on the other category's profits. Then, (i) there is a unique equilibrium in the entry game. If $K_1' > K_1$ and $K_2' = K_2$, then (ii) the set of Category 1 firms who enter under at K_1 is a superset of those who enter at K_1', and (iii) holding K_2 fixed, the set of Category 2 firms who enter under at K_1 is a subset of those who enter at $K_1' > K_1$.

Proof. For simplicity of notation, reorder and rescale types so that they are uniform on $[0, 1]$ and $\pi_m^*(\cdot)$ is decreasing in its argument. The equilibrium (μ_1^*, μ_2^*) solves $\hat{\pi}_i(\mu_1^*, \mu_2^*) = K_i$. According to the Gale-Nikaido Theorem, the solution to this system is unique if the matrix M with $M_{ij} = -\partial \hat{\pi}_i / \partial \mu_j$ is a P-matrix. This condition means all principal minors must be positive. Both diagonal elements are positive since the effective profit is decreasing in the number of entrants of either type. Under Equation A.1, the determinant is positive as well.

To prove (ii) and (iii), take the total derivative of the equilibrium conditions with respect to K_1. Then,

$$\begin{pmatrix} \frac{\partial \hat{\pi}_1}{\partial \mu_1} & \frac{\partial \hat{\pi}_1}{\partial \mu_2} \\ \frac{\partial \hat{\pi}_2}{\partial \mu_1} & \frac{\partial \hat{\pi}_2}{\partial \mu_2} \end{pmatrix} \begin{pmatrix} \frac{d\mu_1}{dK_1} \\ \frac{d\mu_2}{dK_1} \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}. \tag{A.2}$$

Solving (A.2) for the derivatives gives

$$\begin{pmatrix} \frac{d\mu_1}{dK_1} \\ \frac{d\mu_2}{dK_1} \end{pmatrix} = \left(\frac{\partial \hat{\pi}_1}{\partial \mu_1} \cdot \frac{\partial \hat{\pi}_2}{\partial \mu_2} - \frac{\partial \hat{\pi}_1}{\partial \mu_2} \cdot \frac{\partial \hat{\pi}_2}{\partial \mu_1} \right)^{-1} \begin{pmatrix} \frac{\partial \hat{\pi}_2}{\partial \mu_2} & -\frac{\partial \hat{\pi}_1}{\partial \mu_2} \\ -\frac{\partial \hat{\pi}_2}{\partial \mu_1} & \frac{\partial \hat{\pi}_1}{\partial \mu_1} \end{pmatrix} \begin{pmatrix} 1 \\ 0 \end{pmatrix}. \tag{A.3}$$

Assumption A.1 ensures the first term in (A.3) is positive. The elements of the first column are negative and positive, respectively, which completes the argument. □

[13] Bulow et al. (1985) uses similar conditions to impose stability of equilibria in a pricing game.

We are unable to show general (interpretable) conditions under which the model possesses a unique equilibrium.

A.3. Equilibrium Effects on Advice

To connect Proposition 1 to the data, we need to make it a prediction on advice (which is observed) rather than types (which are not). The following result makes this connection.

Proposition 2. *Suppose that $K'_m > K_m$ and $\mu^*_m(\boldsymbol{K}') \leq \mu^*_m(\boldsymbol{K})$ for each m in some subset $\mathcal{M}$ of categories. Let $\overline{a}_{\mathcal{M}}(\boldsymbol{K})$ and $\underline{a}_{\mathcal{M}}(\boldsymbol{K})$ be the most and least distortive advice observed from a firm in any category $m \in \mathcal{M}$ when the entry cost vector is $\boldsymbol{K}$. Then, if $g_m(\boldsymbol{\mu}) = 0$ for all m, $\underline{a}_{\mathcal{M}}(\boldsymbol{K}') \geq \underline{a}_{\mathcal{M}}(\boldsymbol{K})$ and $\overline{a}_{\mathcal{M}}(\boldsymbol{K}') \leq \overline{a}_{\mathcal{M}}(\boldsymbol{K})$. If $g_m(\boldsymbol{\mu}(\boldsymbol{K}')) \leq g_m(\boldsymbol{\mu}(\boldsymbol{K}))$ for all $m \in \mathcal{M}$, $\underline{a}_{\mathcal{M}}(\boldsymbol{K'}) \geq \underline{a}_{\mathcal{M}}(\boldsymbol{K})$. If $g_m(\boldsymbol{\mu}(\boldsymbol{K}')) \geq g_m(\boldsymbol{\mu}(\boldsymbol{K}))$ for all $m \in \mathcal{M}$, $\overline{a}(\boldsymbol{K}') \leq \overline{a}(\boldsymbol{K})$*

Proof. Proposition 1 shows $\mu_m(\boldsymbol{K}') < \mu_m(\boldsymbol{K})$ implies that the set of firms of category m who enter contracts. If $g(\boldsymbol{\mu}) = 0$, then each types maps uniquely to an advice value independent of μ. Thus, the set of advice offered by these entrants must shrink as well. This means the highest a observed in the market decreases, and the lowest a increases.

Let $\tilde{\underline{a}}_{\mathcal{M}}(\boldsymbol{K}'; \boldsymbol{K})$ denote the least distorted advice among firms in $\mathcal{M}$ if $g_m(\cdot)$ were kept at the same level as $g_m(\boldsymbol{\mu}(\boldsymbol{K}))$. Arguments above indicate that $\tilde{\underline{a}}_{\mathcal{M}}(\boldsymbol{K}'; \boldsymbol{K}) \geq \underline{a}(\boldsymbol{K})$. Since $g_m(\boldsymbol{\mu}(\boldsymbol{K}')) \leq g_m(\boldsymbol{\mu}(\boldsymbol{K}))$, there is a direct impact of reduced competition on worsening advice, so $\underline{a}_{\mathcal{M}}(\boldsymbol{K}') \geq \tilde{\underline{a}}_{\mathcal{M}}(\boldsymbol{K}'; \boldsymbol{K})$. The reverse condition is analogous. □

The implication of Proposition 2 is that under the maintained assumption of competition not directly impacting advice, the best advice observed at BD firms would worsen and the worst would improve. While we have presented the argument in the case of a single type θ_j, this proposition still holds when the type is multidimensional. Examples follow.

- *Heterogeneous Profitability*. The type consists of (θ_j, ϵ_j), where θ_j maps to a single optimal advice but the base profit function is $\pi_m(\theta_j; a) + \epsilon_j$. Then, firms that offer the same advice can be heterogeneously profitable.

- *Heterogenous Consumers*. A firm of type θ_j could offer advice from a (compact) set that depends on θ_j at its optimum. This could be because the base profit function has multiple maxima or because (in a more general model) the base profit function depends on a set of advice offered. This could capture a situation where the firm tailors advice to different customers who come to the firm, and θ_j captures the level of distortion in the tailoring.

- *BD and DR Advisers Within a Firm.* The type can be written as $(\theta_j^{BD}, \theta_j^{DR})$. Advice can take one of two values (e.g., the advice offered by BDs at a firm and that offered by DRs at a firm), or it can be multi-valued like above.

In all these situations, it is still the case that if moving to $\boldsymbol{K}'$ reduces entry, then the set of types contracts. Thus, the range of advice seen in firms in categories in $\mathcal{M}$ must also contract. This justifies why Observation 1 suggests studying the set of advice offered by any BD firm, regardless of whether it is given by BD or DR advisers.

A.4. A "Smooth" Advice Channel

We relax the assumption on $c(\cdot)$ in Section 5.1 that advice above a level is infinitely costly.

Proposition 3. *Suppose the cost $c(\cdot)$ of advice is weakly increasing. Then, holding the entry rate $\boldsymbol{\mu}$ fixed, advice of a firm weakly improves when moving from a market with fiduciary duty to a market without.*

Proof. Fix a type θ and a entry rate $\boldsymbol{\mu}$; suppress the dependence on $\boldsymbol{\mu}$. Let $a^*_{NFD}(\theta) \equiv \arg\max_a \pi(a;\theta)$ be the advice given by this type without fiduciary duty. θ is the advice given by this type in the absence of fiduciary duty. Advice with fiduciary duty is

$$a^*_{FD}(\theta) \equiv \arg\max_a \pi(a;\theta) - c(a).$$

Consider the function $s(a,\lambda) \equiv \pi(a;\theta) - c(a)$, and let $a^*(\lambda)$ be the maximizer of this function. Note that $s(a,\lambda)$ has weakly decreasing differences in (a,λ) since $c(\cdot)$ is weakly increasing. Then it must be that $a^*(\lambda)$ is weakly decreasing in λ. Since $a^*_{FD}(\theta) = a^*(1)$ and $a^*_{NFD}(\theta) = a^*(0)$, it must be that $a^*_{NFD}(\theta) \geq a^*_{FD}(\theta)$. Thus, advice weakly improves upon imposition of fiduciary duty, as long as the cost $c(\cdot)$ is increasing in its argument. $\square$

B. Additional Empirical Results

B.1. Summary Statistics for Product Characteristics

Contract characteristics for transacted annuities are summarized in Table B.1, separated by whether the adviser is a BD or an DR. Panel A shows historical undiscounted returns (net of expense ratios) of the underlying investment options, assuming either the return-maximizing allocation (subject to investment restrictions) or an equal allocation across funds (Benartzi and Thaler, 2001). Panel B shows the minimum and average expense ratio of all potential investments. Panel C shows the mortality and expense fee, an annual percentage fee that must be paid on all products, along with the average surrender charge over the surrender schedule—which must be paid only if money is withdrawn early.[14]

Panels D–F measure the potential for diversification together with Morningstar's quality metrics for the underlying funds. Morningstar rates each fund on a scale of 1–5 stars based on its historical risk-adjusted return (net of expenses) relative to a peer group of funds. A fund is labeled *high-quality* if it receives at least 4 stars and *low-quality* if it receives 2 or fewer. Second, Morningstar categorizes the *style* of both the equity and fixed-income investment of each fund into nine potential styles. Panel D counts the number of distinct investment options available per product, unconditionally and across quality levels. Panels E and F report the number of equity and fixed-income styles that are covered by at least one high-quality fund, as well as the number only covered by low-quality funds.

Table B.1 shows that the variation across BDs and DRs is small relative to the variation within adviser category. Given this heterogeneity, there is scope for advice to affect client outcomes and thus for regulation that shifts advice to have an impact. These characteristics affect the return of the annuity, which we report in Panel G.

B.2. Covariate Balance

Our identifying assumption rests on the argument that even though common law fiduciary status of a state may be correlated with average demand in the state, there are no demand discontinuities at the border. For corroborating evidence on this point, we run covariate balance checks for a variety of demographic and economic characteristics. To run these checks, we estimate regressions at the county level of the demographic quantity on a dummy for whether the border county has fiduciary duty.

Table B.2 shows the results of these regressions. Each row corresponds to an outcome. Columns (1) and (2) restrict to counties with at least one transaction from FSP; column (3) represents the mean of the outcome variable on this sample. Columns (4)–(6) repeat this for all border counties in the Discovery data. On almost all covariates, we estimate fairly tight zeros on the difference between means for counties with and without fiduciary duty.

Table B.3 shows evidence that there is no differential selection at the border over client observables. We estimate the same regression as in (1), excluding client age fixed effects.

[14]The surrender charge varies by year since the purchase of the contract, and it declines to zero within ten years. We average the surrender charges over this period (averaging in zeros if needed).

Table B.1: Summary statistics for annuities sold by BDs and DRs, border counties

Characteristic		BD Mean	BD Std.	DR Mean	DR Std.
A. Fund Return (%)	Return-Maximizing	4.77	2.70	5.00	2.67
	Equal	0.35	0.35	0.39	0.34
B. Fund Expense Ratios (%)	Minimum	00.50	0.02	0.50	0.02
	Average	1.27	0.21	1.26	0.20
C. Fees (%)	M&E Fee	1.19	0.22	1.06	0.30
	Avg. Surrender Charge	3.74	1.20	2.96	1.44
D. # Funds	All	97.51	37.58	96.64	33.49
	High Quality	27.39	12.63	33.12	14.10
	Low Quality	34.74	17.24	30.56	19.05
E. # Equity Styles	Some High Quality	6.85	2.05	7.30	1.94
	Only Low Quality	1.03	1.75	0.83	1.62
F. # FI Styles	Some High Quality	4.05	1.05	4.49	1.57
	Only Low Quality	3.05	0.30	3.02	0.25
G. Contract Return (%)	Risk-adjusted	3.10	1.23	2.72	0.96
	Unadjusted	6.40	2.12	6.40	2.27

Panels (A)–(F) summarize characteristics of transacted VAs. Panel (G) summarizes returns of all transacted annuities. In Panels (E) and (F), "Some High Quality" refers to styles covered at least by one high quality fund, and "Only Low Quality" refers to styles convered only by low quality funds.

We find no evidence that there is differential selection by age. We also find no difference in cross-border shopping, or whether the client state is different from the adviser's state of business. Purchasing an annuity out of state is restricted by law. It is only allowed if the customer works in the state where they are purchasing, if they own a second home in that state, if they are a former resident who returns frequently, or if they have another significant connection, such as regular business dealings in that state. Moreover, it is illegal to redirect an investor to a broker in another state if the broker is not registered in the client's home state. Finally, advising a client to purchase a security from a broker would not shield the adviser from fiduciary duty: the duty is defined by the relationship, not just the transaction. We also find statistically insignificant differences in transaction amount, although these estimates are less precise. To the extent that transaction amount is a proxy for consumer income or wealth, this would indicate a lack of selection on these characteristics. We interpret this result with caution, as one might worry that transaction amount is manipulable.

Table B.2: Covariate balance

	Transactions			Discovery		
	No Border FE (1)	Border FE (2)	Mean (3)	No Border FE (4)	Border FE (5)	Mean (6)
Population (K)	168.61	-126.18	134.03	36.36	7.24	85.72
	(230.00)	(135.16)		(42.55)	(21.84)	
Median Age	-0.33	0.45	40.69	-0.50	-0.39	41.54
	(0.80)	(0.66)		(.87)	(0.52)	
Pop Black (K)	27.37	-28.43	16.17	7.81	4.93	10.65
	(38.16)	(41.00)		(5.05)	(3.84)	
Pop Hispanic (K)	130.82	-16.43	21.96	16.00	4.41	13.63
	(97.45)	(18.18)		(14.64)	(7.54)	
Median HH Income (K)	0.06	2.56	45.74	2.07	1.03	43.48
	(6.11)	(3.88)		(2.62)	(0.93)	
Mean HH Income (K)	-1.36	1.01	59.97	2.30	0.97	57.17
	(7.65)	(5.85)		(3.05)	(1.13)	
Pct. Unemployment	0.61	-0.70***	9.32	-0.27	-0.14	9.32
	(0.81)	(0.20)		(1.09)	(0.42)	
Pct. Poverty	-0.17	-1.64	17.34	-0.84	-0.09	18.13
	(1.81)	(1.34)		(1.68)	(0.68)	
Pct. HH with less than $25k	-0.89	-1.86	28.38	-1.07	-0.55	29.87
	(2.09)	(2.32)		(1.97)	(0.73)	
Pct. HH with less than $50k	-0.94	-2.50	54.86	-1.90	-0.89	57.08
	(4.10)	(3.13)		(2.41)	(0.87)	
Pct. HH with less than $75k	-0.28	-1.81	73.15	-1.59	-0.65	75.19
	(4.66)	(2.97)		(2.10)	(0.76)	
Pct. HH with less than $100k	0.29	-1.17	84.46	-1.29	-0.58	86.12
	(4.26)	(2.58)		(1.57)	(0.58)	
Pct. Pop less than HS	1.53	-1.20	14.50	-0.07	0.41	15.55
	(1.45)	(1.31)		(1.62)	(0.60)	
Pct. Pop HS	2.31***	1.65	32.85	1.66	1.73***	34.02
	(0.87)	(1.78)		(1.39)	(0.73)	
Pct. Pop BA or Higher	-4.19	-0.93	19.75	-0.31	-0.64	17.87
	(3.07)	(3.00)		(1.65)	(0.67)	

Covariate balance for various economic and demographic characteristics. Each pair of columns, for each row, corresponds to the results of one regression. The first column in each pair gives the coefficient on the fiduciary duty dummy. All specifications cluster at the state level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B.3. Effects on Product Characteristics

This subsection discusses the effects of imposing fiduciary duty on broker dealers on product characteristics. A salient characteristic that the adviser can influence is the type of annuity: variable or fixed indexed. Column (1) of Table B.4 uses a dummy for whether the annuity is a VA as the outcome, and we find a difference-in-differences estimate of a drop in the probability that the annuity is a variable annuity of 11 pp, or 12.4% of the base mean.

An adviser with fiduciary duty may be drawn to FIAs for a variety of reasons. First, FSP's FIAs tend to have higher risk-adjusted returns for the population of clients we observe during our sample period. Second, FIAs are simpler to explain: they do not include income and contract bases, or complex riders. A shift to simpler products may limit the likelihood

Table B.3: Client covariates

	Age of Contract Holder		Cross-Border Shopper		Trans. Amount ($K)	
	(1)	(2)	(3)	(4)	(5)	(6)
DID	-0.197	0.680	-0.013	0.003	4.20	9.23
	(0.833)	(0.521)	(0.028)	(0.029)	(16.71)	(9.95)
FD on BD	-0.200	0.519	0.005	0.021	0.81	4.40
	(0.762)	(0.499)	(0.034)	(0.035)	(15.19)	(9.37)
FD on DR	-0.003	-0.161	0.018	0.018	-3.39	-4.83
	(0.299)	(0.166)	(0.025)	(0.017)	(5.48)	(3.37)
BD	-2.948***	-0.874***	-0.104***	-0.008	-40.81***	-25.58***
	(0.471)	(0.302)	(0.018)	(0.016)	(7.33)	(2.38)
Firm FE	No	Yes	No	Yes	No	Yes
Mean of Dep. Var	63.8	63.8	0.320	0.320	146.0	146.0
N	22,472	22,451	22,472	22,451	22,472	22,451

Contract-level regression using (1), with age of the contract holder, whether the contract is due to cross-border shopping (client state is different from adviser state), and transaction amount on the left-hand side. All specifications include border fixed effects and contract-month fixed effects but exclude age fixed effects, and Columns (2), (4), and (6) also include firm fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

of the adviser being brought to the courtroom or arbitration by a client who claims terms had not been properly explained. It would also be consistent with advisers using complexity as a proxy for worse quality, as in Célérier and Vallée (2017). Finally, given that FIAs cannot generate negative unadjusted returns while VAs can, this effect could reflect advisers better informing clients of the potential realizations of an investment vehicle. Consistent with this argument, column (2) shows a shift towards products with lower downside risk: BDs with fiduciary duty sell products with higher 10^{th} percentile returns.[15] This is not to argue that ex-post returns are what matters for recourse. Rather, we see this outcome as an informative measure of the ex-ante distribution of returns.

The remainder of Table B.4 studies shifts within VAs. Column (3) shows that the minimum expense ratio decreases by about 0.6 bp, showing that clients have access to a slightly lower fee option. However, Column (4) shows that the average expense ratio increases by about 5.4 bp, which is relevant if one is concerned about naive allocation methods. Column (5) documents a shift towards VAs that have funds with higher mean returns, net of expense ratio, assuming a return-maximizing allocation; the effect is substantial, amounting to 12% of the base mean. Column (6) shows a similar result assuming a naive equal allocation rule,

[15]This outcome equals K if at the terminal age, the client can withdraw K times the initial principal of the contract. We compute this using forward simulation of the policy functions computed in Appendix D.

Table B.4: Characteristics of transacted products

			Expense Ratio		Fund Returns		Fees	
	$\mathbb{1}$[VA]	10^{th} Perc.	Minimum	Average	Optimal	Equal	M&E	Surr. Chg.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DID	-0.109***	0.967**	-0.006*	0.052**	0.006*	0.001**	-0.055	0.185
	(0.038)	(0.448)	(0.003)	(0.022)	(0.003)	(0.000)	(0.038)	(0.141)
FD on BD	-0.088**	0.779	-0.007**	0.061***	0.006*	0.001**	-0.046	0.094
	(0.035)	(0.474)	(0.003)	(0.020)	(0.003)	(0.000)	(0.034)	(0.114)
FD on DR	0.021	-0.188	-0.001	0.009	-0.000	0.000	0.009	-0.091
	(0.027)	(0.250)	(0.002)	(0.010)	(0.001)	(0.000)	(0.020)	(0.071)
BD	-0.041*	-0.150	0.006***	-0.035**	-0.006***	-0.001***	0.111***	0.336***
	(0.024)	(0.219)	(0.002)	(0.015)	(0.002)	(0.000)	(0.029)	(0.088)
Base Mean	0.878	2.771	0.501	1.263	0.05	0.004	1.088	3.049
N	22,472	22,472	19,730	19,730	19,730	19,730	19,730	22,472

	# Funds			# Equity Styles		# FI Styles	
	All	$\geq$ 4 Stars	$\leq$ 2 Stars	High Q.	Only Low Q.	High Q.	Only Low Q.
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
DID	8.263*	3.798**	1.806	0.739**	-0.493*	0.277	-0.078**
	(4.270)	(1.861)	(2.059)	(0.328)	(0.250)	(0.185)	(0.034)
FD on BD	10.725***	3.532**	3.470	0.754***	-0.556**	0.167	-0.091***
	(3.896)	(1.562)	(2.136)	(0.261)	(0.214)	(0.169)	(0.030)
FD on DR	2.463	-0.266	1.663	0.015	-0.063	-0.110	-0.013
	(2.181)	(0.853)	(1.303)	(0.148)	(0.127)	(0.091)	(0.008)
BD	-6.063**	-6.554***	0.816	-0.767***	0.504***	-0.401***	0.068**
	(2.972)	(1.493)	(1.376)	(0.246)	(0.184)	(0.124)	(0.031)
Base Mean	96.807	32.04	31.348	7.215	0.865	4.407	3.028
N	19,730	19,730	19,730	19,730	19,730	19,730	19,730

Estimates of (1) for various product characteristics. Columns (1) and (2) use the set of all annuities transacted in the border, while the other columns restrict to variable annuities. Standard errors are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

which allays concerns about the increase in the average expense ratio.

Columns (7) and (8) document noisy effects on the two most salient fees associated with the product: the M&E fee and the surrender charge. We find a small and statistically insignificant decrease of 5.5 bp in the M&E fee and a noisy increase of 19 bp in the surrender charge. We should highlight that unlike M&E ratios and expense ratios, the surrender charge is not necessarily paid. Additionally, lower fee FSP products always come with higher surrender charges, so advisers who are unconcerned about their clients needing to withdraw early should steer them towards higher surrender charge products.

Another characteristic of interest is the number of funds available to investors. Column (9) estimates that fiduciary duty leads BDs to sell products with about 8.3 more funds. Column (10) shows an increase of about 12% in the number of "high-quality" funds, as measured by Morningstar ratings of 4 or 5 stars. However, Column (11) reports a positive but less precisely estimated increase of about 6% in low-quality funds as well—as proxied by 2 or fewer stars. The increase in high-quality (or low-quality) funds is not a mechanical consequence of having a larger set of funds, as when FSP chooses to offer a product with more options it could add only high or low-quality funds.

A second relevant metric is the diversity of funds available. Using the categorization into equity and fixed income styles discussed in Appendix B.1, Columns (12) and (13) document a significant increase in the number of equity styles covered by at least one high-quality fund and a decrease in the number of equity styles covered by only low-quality funds. The effects are noisier and smaller for fixed income styles (Columns (14) and (15)).

Many of these characteristics feed into the returns. More importantly, they are salient to clients and advisers, and responsiveness of such observable dimensions provides further evidence that fiduciary duty is having an effect. Moreover, these characteristics are interesting since they are tied, at least heuristically, to higher quality. Historical returns of investment options are publicized in prospectuses and marketing brochures, and advisers with fiduciary duty may be hesitant to recommend products with low investment returns—even if risk-adjusted returns are aligned with the market. An adviser and a client who have a more-choice-is-better mindset may find products with a large number and variety of investment options more attractive. In the process of following these quality heuristics, advisers may well steer clients to products that indeed have higher returns on net.

B.4. Heterogeneity in Risk Aversion

One concern is that individuals may have heterogeneous risk aversion, and fiduciary duty may induce advisers to steer individuals differently based on it. We address this concern with the following exercise: suppose that individuals can be either risk-averse or not. In areas with fiduciary duty, a share $\eta_T \in [0, 1]$ of individuals who buy a product $T \in \{\text{VA, FIA}\}$ are risk-averse. In areas without fiduciary duty, the share is η_T'. We choose η_T' so that the share of risk-averse individuals buying products is the same across the border but the distance between η_T' and η_T is minimized. Risk-averse individuals value products following the SDF of the economy. Risk-neutral individuals do not engage in risk adjustment. We then value a product of type T in an area with fiduciary duty as η_T times its risk-adjusted return plus $1 - \eta_T$ times its risk-neutral return. This allows for (i) homogeneity of the underlying population across the border in terms of risk aversion, (ii) sorting of individuals into products by risk aversion, and (iii) differential sorting induced by fiduciary duty.

Table B.5: Number of firms, by footprint

	Local			Regional			National		
	All	BD	DR	All	BD	DR	All	BD	DR
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FD	-0.161**	-0.123	-0.0578	0.0177	-0.0193	0.0355	-0.0357	-0.0654	-0.0170
	(0.0768)	(0.0768)	(0.0483)	(0.0517)	(0.0464)	(0.0433)	(0.0555)	(0.0628)	(0.0589)

Regressions of the number of each type of firm (using the $\log(x+1)$ transformation) on fiduciary status, log population, log median household income, and median age, border fixed effects, and standard errors clustered at the border. All regressions have $N = 411$ observations. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

We vary $\eta_T \in [0, 1]$ for both T and compute the DID estimate from (1). There is no guarantee that this estimate lies between the risk-adjusted and unadjusted estimates presented in Table 2. Weighing points uniformly on this grid, we find that the 10^{th} percentile of all results is is 14 bp and the first quartile is 24 bp, the latter of which is significant at the 5% level. The minimum estimated coefficient is -3 bp. This requires extreme sorting across product types in the share of customers who are risk-averse: all customers who buy VAs must be risk-averse and all customers who buy FIAs must be risk-neutral, which is the opposite of the selection we would expect. Within a reasonable range of parameters ($\eta_T \in [1/3, 2/3]$), the minimum coefficient is 24 bp and 99% of coefficients are significant at the 10% level. This exercise provides credence that our main results are robust to heterogeneity in valuation methodologies.

B.5. Entry Rates by Firm Categories

Table B.5 computes entry effects by firm type, using the same specification as Columns (4)–(6) of Table 3 but restricting to firms of a given footprint in each column. We use footprint categorizations from Discovery, but group local and multistate firms. The decrease in firms is primarily driven by changes in the number of local firms. We find no evidence of expansions of any type of firm. This justifies the conditions of the test run in Section 6.1 for the presence of an advice channel (see Appendix A.2), and it also explains the larger estimate for the effect of FD on the fixed costs of local firms estimated in the structural model in Section 6.3.

Table B.6: Characteristics of transacted products, with firm fixed effects

	Returns				Expense Ratio		Fund Returns		Fees	
	Risk-Adj. (2.1)	Unadj. (2.2)	$\mathbb{1}$[VA] (1)	10$^{\text{th}}$ Perc. (2)	Minimum (3)	Average (4)	Optimal (5)	Equal (6)	M&E (7)	Surr. Chg. (8)
DID	0.0005	0.0029	-0.042	0.582	-0.004	0.041**	0.004	0.000*	-0.022**	-0.116
	(0.0010)	(0.0019)	(0.031)	(0.436)	(0.003)	(0.019)	(0.003)	(0.000)	(0.009)	(0.158)
FD on BD	0.0004	0.0022	-0.027	0.405	-0.004	0.043**	0.004*	0.000	-0.015*	0.062
	(0.0009)	(0.0017)	(0.033)	(0.409)	(0.002)	(0.018)	(0.002)	(0.000)	(0.007)	(0.122)
FD on DR	-0.0001	-0.0006	0.015	-0.177	-0.000	0.002	-0.000	-0.000	0.007	-0.055
	(0.001)	(0.001)	(0.001)	(0.009)	(0.001)	(0.000)	(0.008)	(0.054)		
BD	-0.0000	-0.0046***	0.002	-0.457*	0.008***	-0.069***	-0.007***	-0.001***	0.017*	0.076
	(0.0006)	(0.0012)	(0.015)	(0.227)	(0.002)	(0.012)	(0.002)	(0.000)	(0.009)	(0.095)
Base Mean	0.028	0.064	0.878	2.771	0.501	1.263	0.05	0.004	1.088	3.049
N	22,450	22,450	22,450	22,450	19,707	19,707	19,707	19,707	19,707	22,450

	# Funds			# Equity Styles		# FI Styles	
	All (9)	$\geq$ 4 Stars (10)	$\leq$ 2 Stars (11)	High Q. (12)	Only Low Q. (13)	High Q. (14)	Only Low Q. (15)
DID	5.734	2.466*	1.720	0.396*	-0.322	0.053	-0.065***
	(3.466)	(1.358)	(1.432)	(0.224)	(0.215)	(0.090)	(0.017)
FD on BD	6.751**	2.131	2.568*	0.366*	-0.328*	-0.006	-0.067***
	(3.263)	(1.272)	(1.337)	(0.206)	(0.194)	(0.060)	(0.017)
FD on DR	1.017	-0.335	0.848	-0.030	-0.006	-0.059	-0.001
	(1.600)	(0.404)	(0.918)	(0.082)	(0.099)	(0.054)	(0.009)
BD	-11.897***	-3.711***	-4.747***	-0.672***	0.644***	0.042	0.065***
	(2.407)	(1.021)	(0.877)	(0.166)	(0.143)	(0.067)	(0.014)
Base Mean	96.807	32.04	31.348	7.215	0.865	4.407	3.028
N	19,707	19,707	19,707	19,707	19,707	19,707	19,707

Estimates of (1) for various product characteristics. Columns (2.1), (2.2), (1), and (2) use the set of all annuities transacted in the border, while the other columns restrict to VAs. All specifications include firm fixed effects. Columns (2.1) and (2.2) should be compared to Columns (1) and (2) of Table 2. All other columns should be compared to Table B.4. Standard errors are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B.6. Estimates with Firm Fixed Effects

Table B.6 reports estimates of (1), but with firm fixed effects, for all outcomes in this paper. A prediction of the fixed cost channel is that within-firm behavior should not change as a function of fiduciary duty. We broadly find that point estimates of within-BD changes are 1/2 to 2/3 of the change within firm fixed effects. They are (almost) uniformly in the same direction as the total effect. These results provide suggestive evidence in favor of an advice channel.

B.7. Robustness to Fiduciary Duty Classification

Breach of FD is a common law claim brought in state court. A party must claim that their adviser was a fiduciary, meaning the adviser owes the customer a duty of loyalty beyond the ordinary duty of care, and that the adviser breached the duty causing harm to the party. In general, states agree that the fiduciary relationship must be assessed on a case by case basis.

States differ in whether they recognize that broker-dealers have an FD towards their client.

Some states, such as Massachusetts, have repeatedly stated that brokers in general owe no duty of loyalty to customers. Others, including Texas, have been willing to find a fiduciary relationship in special circumstances, such as when the broker repeatedly recommends particular products or the broker's behavior would cause a reasonable person to believe they had an advisory role. Finally, some states, like Missouri, have held that stockbrokers generally do have an FD towards their clients. Some states have specified the components of fiduciary duty to include "to manage the account as dictated by the client's needs and objectives, to inform of risks in particular investments, to refrain from self-dealing, to follow order instructions, to disclose any self-interest, to stay abreast of market changes, and to explain strategies." *State ex rel. PaineWebber, Inc. v. Voorhees*, 891 S.W.2d 126, 129 (1995).

In light of these cases, individual firms and their legal counsel can design training materials, purchase liability insurance, and implement other compliance procedures to minimize their liability risk. Since a breach of FD claim is fact based, meaning a wide range of evidence is admissible in court, firms can choose to take assets under management fees, rather than commissions, or supplement the requirements of FINRA suitability with additional disclosures to create a record of compliance in case a dispute arises.

There are only a handful of opinions in each state that evaluate the specifics of the fiduciary relationship, and even fewer of these result in a monetary disposition of the case. Finke and Langdon (2012) classified states according to their common law cases into three categories: those with fiduciary standards on BDs, those with quasi-fiduciary standards, and those without a fiduciary standard for BDs. We validate this categorization as follows.

First, we restrict our attention to state appellate court opinions that mention fiduciary relationships. Within that case law, we search for cases discussing the application of fiduciary duty to broker-dealers handling non-discretionary accounts. If there is a case with unequivocal language, either extending fiduciary duty to most such transactions or denying the possibility of a fiduciary relationship being found in an arms-length transaction, we categorize the state as in the first or third group. If there is equivocal language or no case addressing the application of fiduciary principles to brokers, we move to the second stage.

In these states, we read through any cases that describe the requirements needed for a finding of a fiduciary relationship, focusing on cases involving clients and brokers in arms length relationships. We exclude cases where there is a statutory fiduciary duty or with an unusually close relationship such as family or business partners. If a case exists that shows that the state's court is willing to expand the reach of fiduciary duty when clients face losses due to seller's poor guidance, the state is coded as a quasi-fiduciary state. If no cases exist in a state or if the cases define fiduciary duty very narrowly, the state is classified as having no fiduciary duty on broker-dealers.

Following this procedure, we largely replicate Finke and Langdon (2012)'s classification but find it missing two features. First, it ignores federal cases where state law is applied to the FD question. Since federal court opinions on state law are not binding, this exclusion is not necessarily problematic. A brief look at these excluded cases shows that federal courts tend to heighten the duties placed on broker dealers. Second, the classification does not account for the fact that advisors in our sample are often registered insurance producers, subject to heightened duties under state insurance law. Since both of these omissions would underestimate the strength of the duty placed on brokers, we assume that any evidence of fiduciary duty placed on broker dealers qualifies a state as imposing a fiduciary duty, pooling the fiduciary and quasi-fiduciary states under our fiduciary classification.

For robustness, we take an alternate stance on the decisions above and generate a "modified" classification of states by common law fiduciary duty. This classification accounts for the challenges laid out above and codes states as imposing a fiduciary duty anytime a state or federal case mentions that brokers have a fiduciary duty placed on them, excluding fiduciary duties placed on analogous principal-agent relationships. This classification accounts for agency relationships' duties diverging significantly from each other (eg. stockbrokers facing different duties than real estate brokers). Moreover, this accounts for the increasing role of federal cases in interpreting state law. States where we find a different outcome have new cases that signal a change in the court's attitude. Our classification differs from Finke and Langdon's in the following states: Maine, Nebraska, New Jersey, Rhode Island, Vermont, Wyoming. In each of these states, Finke and Langdon find a quasi-fiduciary duty on brokers, but our research have not uncovered cases that are directly analogous to the retail investor/financial advisor relationship. In sum, this classification effectively refines the decisions by Finke and Langdon that lead to the quasi-fiduciary category.

Table B.7 shows the results of the modified classification. Risk adjusted returns increase by 33 bp in states with fiduciary duties on broker dealers, while raw returns increase by 54 bp. These increases are larger and more precisely estimated than with the original classification.

We find that the results are driven by largely similar changes in product characteristics. For instance, the probability of selling a VA drops by 14% with the revised classification relative to 12% in the baseline. The lowest 10th percentile return on a product sold increases more significantly with the revised classification. Minimum expense ratios decrease but

Table B.7: Returns on annuity products using modified classification

	Risk Adjusted				Unadjusted			
	(1) DID	(2) FD on BD	(3) FD on DR	(4) BD	(5) DID	(6) FD on BD	(7) FD on DR	(8) BD
Coef.	0.0033***	0.0030***	-0.0002	0.0016**	0.0054***	0.0042**	-0.0012*	-0.0035***
	(0.0011)	(0.0008)	(0.0007)	(0.0007)	(0.0019)	(0.0017)	(0.0006)	(0.0012)
Dep. Mean	0.028				0.063			

Annualized returns for annuities sold. Columns (1)–(3) each Columns (4)–(6) report coefficients of one regression. Contracts are restricted to borders, specifications include border fixed, contract month, and age fixed effects. Standard errors are clustered at the state. $N =$ 32,115. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

we cannot reject the null that average expense ratios do not. Fund returns within VAs sold increase, regardless of how investments are allocated. Finally, M&E fees drop significantly, by nearly 7%. Detailed results are available upon request.

C. Computing Investment Returns

C.1. Computing Returns for Variable Annuity Investment Options

We match each investment option to the CRSP US Mutual Fund Database, which gives us monthly net asset values dating from 1990. We compute monthly returns from changes in this net asset value instead of using CRSP's monthly return, as VA subaccounts do not reinvest dividends on behalf of annuitants. From CRSP, we also collect historical monthly risk-free rates (one-month treasury), the excess return of the market, and the Fama-French factors. We compute returns and covariances using two methods.

Stochastic Discount Factor. The first employs a linear factor model for the SDF and annuity returns. In this process, we first estimate the SDF m_t. We model $m_t = a - \sum_i b_i f_i$. In the one-factor case, f_i is the excess return of the S&P index over the risk-free rate. In the three-factor case, we add the size premium (small minus big) and the value premium (high minus low). We then posit a risk-free rate r^* to value the variable annuity, and estimate a and b_i using $\mathbb{E}[m(1 + r^*)] = 1$ and $\mathbb{E}[mf_i] = 0$.

We use a factor model for fund returns as well: $r_{jt} - r_t = \alpha_j + \sum_i \beta_{ji} f_{it} + \epsilon_{jt}$ for fund j in quarter t, where r_t is the observed risk-free rate. We estimate α_j and β_{ji} through OLS; we also recover a distribution of abnormal returns ϵ_{jt}. While almost all estimates α_j are negative—consistent with these funds having higher than normal expense ratios and sometimes withholding dividends—we estimate some funds to have (small) positive α.

We estimate the expected discounted mean of a fund as its empirical counterpart,

$\frac{1}{T}\sum_t \hat{m}_t \left(r^* + \hat{\alpha}_j + \sum_i \hat{\beta}_{ji} f_{it}\right)$, where the sum ranges over all quarters starting from 1990, r^* is the posited discount rate to be used for the value calculations, and the hats denote the estimates computed from above. In this version of the computation, $\hat{\beta}$ do not play a role in this calculation by construction, and $\hat{m}_t$ was chosen so that their product with the discount factor averaged to 0.

We compute the empirical covariance matrix $\hat{V}_1$ of the distribution of the terms in the summand above across funds j and the empirical covariance matrix $\hat{V}_\epsilon$ of the abnormal returns. We compute the terms of $\hat{V}_\epsilon$ pairwise, using all periods when both funds were available. If this does not lead to a positive semidefinite estimate of $\hat{V}_\epsilon$, we replace it with the closest positive definite matrix. The covariance matrix of all funds is $\hat{V} \equiv \hat{V}_1 + \mathbb{E}[\hat{m}^2]\hat{V}_\epsilon$.
Risk-Free Rate. To discount at the risk-free rate, we follow the above steps but impose $m = 1/(1+r^*)$. We still model the returns using the factor structure: given heterogeneity in when funds were introduced, the raw means and variances of returns would introduce bias.

C.2. Optimal Portfolio Allocation for Variable Annuities

Investment restrictions partition the set of funds available into groups and place minimums and maximums on the shares of assets that can be placed in each group. If s is the vector of shares of each fund, this amounts to a linear restriction $Ms \geq m$. If r is the vector of estimated returns and $\mathbb{1}$ is a vector of ones, the maximum possible return is $r^M \equiv \max_s r \cdot s$ s.t. $Ms \geq m$ and $s \cdot \mathbb{1} = 1$.

However, the client will not necessarily pick the mean-maximizing return: due to convexity of the contract, the client may prefer higher variance. Clients will choose portfolios on the "extended" mean-variance frontier: facing two portfolios with the same volatility, the client should pick the one with the higher mean. To compute this frontier, we compute the lowest and highest variance attainable for each mean. We solve for the variance-minimizing portfolios as $\min_s s'\hat{V}s$ s.t. $Ms \geq m$, $r \cdot s \geq \bar{r}$, and $s \cdot \mathbb{1} = 1$, for a grid of minimum returns. The variance-maximizing program replaces the min by a max. When products allow clients to choose among two possible investment restrictions, we solve the minimization or maximization problem separately for each set of restrictions.

C.3. Computing Rates for Fixed Indexed Annuities

We compute returns with a one-year risk-free return of 3%. However, rates for FIAs differ across crediting strategies and vary as rates change. To impute rates for these strategies, we interpolate based on the relationship between historical rates for each strategy and treasury rates. Fixing a product, the procedure follows.

1. We normalize rates to the rate that would be provided by the fixed crediting strategy: for each crediting strategy c and month m, we regress the fixed rate r_m^x on r_m^c. We then compute $\hat{r}_m^{xc}$, the predicted value of the fixed rate implied by the crediting strategy c in month m. This allows us to leverage the fact that rates for different crediting strategies are strongly linearly correlated to improve the accuracy of our predictions of rates.

2. We regress $\hat{r}_m^{xc}$ on the five-year treasury rate, stacking across all crediting strategies c provided by the product. This regression lets us predict the rate provided by the fixed crediting strategy for any value of the five-year treasury rate.

3. We compute the five-year rate implied by a one-year rate of 3%, averaging across historical realizations of the yield curve. To do so, we regress the five-year rate r_m^5 on the one-year rate r_m^1. We estimate an implied rate of 3.67%. We then plug this estimate into Step 2 to impute the rate provided by the fixed crediting strategy for this product.

4. To compute rates for other strategies, we run the reverse of Step 1, i.e., regress r_m^c on r_m^x. We then use the predicted value at the imputed rate for the fixed strategy from Step 3.

The results in this paper are robust to modifications such as dropping Step 3 (so that the rates are predicted at a five-year rate of 3%) or using a ten-year rather than the five-year rate.

D. Computations of Net Present Values of Annuities

This appendix explains how VA and FIAs are valued. We introduce notation and definitions, derive how to value contracts, and discuss the determinants of these valuations.

D.1. Definitions and Contract Rules

When a VA or an FIA contract is signed, the invested amount becomes the contract value at period 0, c_0. Contracts with living benefit riders also generate an income base b_0, which is equal to c_0 at $t = 0$, but will diverge over time. Let $c_t \in \mathbb{R}^+$ and $b_t \in [c_0, \bar{b}]$ denote the contract value and income base in period t, respectively. Contract values are bounded below by zero, and income bases are bounded below by the original contract value and above by an amount set by the insurance company—in our data, \$10 million.

Let $\mathcal{I}_t$ denote the set of asset allocations available in period t. For VAs, this is restricted by the set of funds available and by investment restrictions imposed by the contract-rider combination. For FIAs, this corresponds to the set of crediting strategies. Let $i_t \in \mathcal{I}_t$ denote a vector of chosen allocations in period t, and let $r_{t+1}(i_t)$ denote the return of that allocation, which is realized in period $t+1$. In some cases, crediting strategies for FIAs are realized in longer horizons. For clarity, we will ignore this for now and return to this issue below.

Variable and fixed indexed annuity contracts may have a fixed fee f_t, which for some contracts is waived for contract values above $\bar{f}$ and for all contracts is waived after 15 years, and a variable fee on the income base v^b. VA contracts also have a variable fee v^c on the contract value: $v^c = 0$ for all FIA contracts. Let $\bar{f} = \infty$ if the contract does not waive the annual fee for high contract values, and let $f_t = 0$ after fifteen contract years.

Contracts with a minimum withdrawal living benefit rider have two additional features that affect transitions of the income base and of the contract value. First, after a given age annuitants have the option of withdrawing the Guaranteed Annual Income (GAI) amount, which is equal to the income base times the relevant GAI rate for the period, $g_t \in \{g_1, ..., g_G\}$. We detail which GAI rate is available to the annuitant in each period below, as it is a function of the sequence of choices made in the past. Let $w_t \in \{0, 1\}$ denote whether the annuitant decides to withdraw the GAI amount in period t, so that the GAI withdrawal amount is $w_t \cdot g_t \cdot b_t$. Second, for the first E years of the contract, known as the enhancement period, the income base is guaranteed to grow at least by the enhancement rate e. Moreover, if certain conditions are met, an additional E years of enhancement rate eligibility can be earned. We denote the enhancement rate in period t by $e_t \in \{0, e\}$. Typical values of the enhancement period and enhancement rate during our sample period are 10 years and 5%.

Transitions of the contract value and the income base are governed by

$$\begin{aligned} \tilde{c}_t &= c_t - \left(w_t g_t + v^b\right) b_t - f_t \cdot 1[c_t < \bar{f}] \\ c_{t+1} &= \max[(1 + r_{t+1}(i_t) - v^c(i_t))\tilde{c}_t, 0] \end{aligned} \qquad b_{t+1} = \begin{cases} \min\left[\max\left[(1+e_t)\, b_t, \tilde{c}_t\right], \bar{b}\right] \text{ if } a_t < \bar{a} \\ b_t \text{ if } a_t \geq \bar{a} \end{cases} .$$

Define $\tilde{c}_t$ as the end-of-period contract value, equal to the contract value minus the annual fee, the fee on the income base, and the GAI withdrawal amount. We set $w_t g_t = 0$ in years where GAI withdrawals are not available. The next period contract value is equal to the end of period contract value times the net rate of return, or the difference between the realized return on investments and the contract fee. As mentioned earlier, contract value is bounded below by zero. Finally, in every period where the annuitant's age (a_t) is less than the contract's maximum purchase age, $\bar{a}$, the income base is equal to the maximum of the contract value and the enhanced income base, with a cap. After the contract's maximum purchase age, the income base is fixed. Note that GAI withdrawals decrease the contract value but not the income base, and that they continue even when contract value equals zero.

When the contract value exceeds the value of the enhanced income base and no GAI withdrawals take place, the contract is "stepped up." After a step up, the contract is eligible for E more years of enhancement. Let s_t denote the number of years since the last step up. Then $s_0 = 0$, $s_{t+1} = s_t \cdot 1\left[b_{t+1} \neq \tilde{c}_t \text{ or } w_t = 1\right] + 1$, and $e_t = e \cdot 1\left[s_t \leq E\right] \cdot 1\left[a_t < \bar{a}\right]$.

The GAI rate available in period t depends on the age at which the first GAI withdrawal occurs, a^{first}. GAI withdrawals cannot be taken before a certain age a_0, typically 55, and they are increasing in the age of first withdrawal until either 70 or 75. The contract specifies a map $G\left(a^{first}\right) : \{a_0, ..., \bar{a}\} \rightarrow \{g_1, ..., g_G\}$ from all possible ages at first withdrawal to GAI rates. For example, a contract might specify that an annuitant who takes a GAI withdrawal for the first time at age 60 receives a 3% GAI rate, while they would receive a 5% rate if they wait until age 75. Annuitants are locked in to the GAI rate at the age of first withdrawal, unless a step up takes place at a later age with a higher GAI rate. The GAI rate available in period t is $g_{G(a_t)}$ if $a_t \leq a^{first}$, $g_{G(a_{t-1})}$ if $a_t > a^{first}$ and $\tilde{b}_{t-1} = \tilde{c}_{t-1}$, and g_{t-1} if $a_t > a^{first}$ and $\tilde{b}_{t-1} \neq \tilde{c}_{t-1}$.

In summary, the set of relevant state variables in period t is (c_t, b_t, s_t, g_t), and the control variables are whether to take a GAI withdrawal w_t and the investment allocation i_t. Finally, annuitants can withdraw the contract value at any time, receiving $c_t \cdot (1 - d_t)$, where d_t is the surrender charge in period t, or they can annuitize the contract value, receiving an expected present discounted value of $z(a_t, c_t)$. Both options induce the loss of the income base. When annuitization is not available, we set $z(a_t, c_t) = 0$.

Defining μ_t as the probability of being alive in period t conditional having lived to period $t-1$, the value of a contract in period t is

$$V_t\left(c_t, b_t, s_t, g_t\right) = \max\Bigg[\max_{(w_t, i_t)} w_t \cdot g_t \cdot b_t + E\left[\delta\left(\mu_{t+1} E\left[V_{t+1}\left(c_{t+1}, b_{t+1}, s_{t+1}, g_{t+1}\right)\right]\right)\right.$$
$$\left. + \left(1 - \mu_{t+1}\right)\beta E\left[c_{t+1}\right]\right], (1 - d_t)c_t, z(a_t, c_t)\Bigg].$$

D.2. Valuing VA and FIA Contracts with Minimum Withdrawal Living Benefit Riders

Assume that the probability of death in period T is 1 and that annuitants value a dollar left after their death by β. In our calculations, we set $\beta = 1$. Then in period $T-1$ the continuation value is $\beta E[c_T]$. Since $a_{T-1} > \bar{a}$, the income base and GAI rate are locked in at $b_{\bar{t}}$ and $g_{\bar{t}}$. The problem in period $T-1$ is

$$V_{T-1}\left(c_{T-1}, b_{\bar{t}}, g_{\bar{t}}\right) = \max\Bigg[\left(\max_{(w_{T-1}, i_{T-1})} w_{T-1} \cdot g_{\bar{t}} \cdot b_{\bar{t}} + \beta \cdot E\left[\delta \cdot c_T\right]\right), \\ z(a_{T-1}, c_{T-1}), (1 - d_{T-1}) \cdot c_{T-1}\Bigg] \quad \text{(D.1)}$$

$$\text{s.t.} \quad E\left[\delta c_T\right] = E\left[\delta \max\left[\left(1 + r_T\left(i_{T-1}\right) - v_T^c\right)\tilde{c}_{T-1}, 0\right]\right] \\ \tilde{c}_{T-1} = c_{T-1} - \left(w_{T-1} g_{\bar{t}} + v_{T-1}^b\right) b_{\bar{t}} - f_{T-1} \cdot 1[c_{T-1} < \bar{f}].$$

To obtain the value of continuing the contract, we discretize the set of feasible investments $\mathcal{I}_t$ and the space of $(c_{T-1}, b_{\bar{t}})$. For every element in the contract value-income base grid (c^k, b^k), and conditional on the GAI rate, we find the asset allocation that yields the highest expected PDV when the annuitant decides to take GAI withdrawals and when they do not. Taking the maximum over utilities under both withdrawal strategies and over annuitization and full surrender yields $V_{T-1}^*(c^k, b^k, g_{\bar{t}})$, the value of following the optimal strategy after arriving at period $T-1$ with contract value c^k and income base b^k. We interpolate linearly over the (c_{T-1}, b_{T-1}) space to obtain $\hat{V}_{T-1}^*(c_{T-1}, b_{\bar{t}}, g_{\bar{t}})$, the value function in period $T-1$ given contract value, income base, and GAI rate. In period $T-2$, we then solve

$$V_{T-2}\left(c_{T-2}, b_{\bar{t}}, g_{\bar{t}}\right) = \max\Bigg[\max_{(w_{T-2}, i_{T-2})}\left(\mu_{T-1} \cdot E\left[\delta \hat{V}_{T-1}^*(c_{T-1}, b_{\bar{t}}, g_{\bar{t}})\right] + (1 - \mu_{T-1}) \cdot E[\delta c_{T-1}]\right) \\ + w_{T-2} \cdot g_{\bar{t}} \cdot b_{\bar{t}}, z(a_{T-2}, c_{T-2}), (1 - d_{T-2}) \cdot c_{T-2}\Bigg], \quad \text{(D.2)}$$

subject to the same set of constraints as (D.1) with T replaced by $T-1$.

The same approach allows us to find $\hat{V}_{T-2}^*(c_{T-2}, b_{\bar{t}}, g_{\bar{t}})$. We continue this process recursively until we reach the maximum purchase age in period $\bar{t}$, where we obtain $\hat{V}_{\bar{t}}^*(c_{\bar{t}}, b_{\bar{t}}, g_{\bar{t}})$. The general recursive formulation for earlier periods is

$$V_t\left(c_t, b_t, s_t, g_t\right) = \max\Bigg[\max_{(w_t, i_t)} w_t \cdot g_t \cdot b_t + \cdot \Big[\mu_t \cdot E\left[\delta \hat{V}_{t+1}^*\left(c_{t+1}, b_{t+1}, g_{t+1}\right)\right]$$

$$+ (1-\mu_{t\bar{+}1}) \cdot \beta \cdot E\left[\delta c_{t+1}\right]\right], z(a_t, c_t), (1-d_t)\cdot c_t)\Big] \quad \text{(D.3)}$$

$$\text{s.t. } E\left[\delta c_{t+1}\right] = E\left[\delta\left[\left(1+r_{t+1}\left(i_t\right)-v_t^c\right)\tilde{c}_t\right]^+\right] \quad \tilde{c}_t = c_t - \left(w_t g_t + v_t^b\right) b_t - f_t \cdot 1[c_t < \bar{f}]$$

$$b_t = \min\left[\max\left[\left(1+e_t\right) b_t, \tilde{c}_t\right], \bar{b}\right] \qquad g_{\bar{t}} = \begin{cases} g_{A(a_t)} \text{ if } b_t = \tilde{c}_t \text{ or } a^{first} = a_t \\ g_{t-1} \text{ otherwise} \end{cases}.$$

To increase precision, we transform the state space into a single dimension with $\frac{c_t}{b_t}$ as the state variable. To do so, we must show that the obtained values are equivalent. Note that

$$V_t(c_t, b_t, s_t, g_t) = \max_{w,i} g \cdot b_t \cdot w + E[\delta V_{t+1}(c_{t+1}, b_{t+1}, s_{t+1}, g_{t+1})]. \quad \text{(D.4)}$$

Expanding the second term, we have

$$b_t \cdot E\Bigg\{\delta \cdot \left[1\left[\frac{c_t}{b_t}(1-v^c) - (g\cdot w + v^b)R \geq e_t\right]\left(\frac{c_t}{b_t}(1-v^c) - v^b - g\cdot w\right) \cdot V_{t+1}(1, 1, \bar{s}, g_{t+1})\right] + \left[1\left[\frac{c_t}{b_t}(1-v^c) - (g\cdot w + v^b)R < e_t\right] e_t \cdot V_{t+1}\left(\frac{c_t}{b_t}(1-v^c) - (g\cdot w + v^b)\frac{R}{e_t}, 1, \bar{s}, g_{t+1}\right)\right]\Bigg\}, \quad \text{(D.5)}$$

where $\bar{s} \equiv \min[E, \bar{t} - t - 1]$. Grouping (D.4) and (D.5), we obtain $b_t \cdot V\left(\frac{c_t}{b_t}, 1, s_t, g_t\right)$.

As before, we solve for the value for periods earlier than $\bar{t}$ by backward induction, using a grid over $\frac{c_t}{b_t}$ and linearly interpolating for points between. Throughout the procedure, we use the 2012 Individual Annuity Mortality Basic Table from the Society of Actuaries.

Some asset allocation alternatives for FIAs lock in funds for more than one period. When that happens, we value that alternative using the continuation value for the appropriate horizon. When contracts do not have living benefit riders there is no income base, no enhancement, and no step up. Equations for this simpler case are available upon request.

D.3. Determinants of NPVs

To understand which contract characteristics explain the variation in NPVs across contracts, we regress annualized returns on contract and individual characteristics. The included characteristics are fixed dollar fees, contract fees, the mean maximizing annual return of

Table D.1: Determinants of NPVs

Shift From Q1 to Q3				Add Features		
Contract Fee	Max Return	Max Std.	MWLB Rate	MWLB	Persistency Bonus	Premium Charges
-18.2***	19.3***	15.5***	77.5***	118.***	3.06***	-14.3***
(0.45)	(0.48)	(0.46)	(0.34)	(0.92)	(0.65)	(0.47)

The first four columns show the changing a contract characteristic from the first quartile to the third among the set of observed contracts. The last three show the effect of adding a feature. MWLB refers to a minimum withdrawal benefit rider, and the addition involves adding it with a rate at the first quartile. Effects are in bp. $N =$ 146,174. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

the contract and its square, the maximum variance attainable in the contract and its square, whether the contract has a minimum withdrawal living benefit rider, the interaction between this variable and the average GAI rate of the contract, whether the contract has a persistency premium, whether the contract has premium charges, insurant age and its square. These covariates explain 72.1% of the variation in returns.

Table D.1 interprets these results by reporting the effects of changing particular contract characteristics. We find that shifting contract fees from the 25th to the 75th percentile of their empirical distribution decreases annualized returns by 0.182 pp, while increasing the mean-maximizing return from the 25th to the 75th percentile of its empirical distribution increases annualized returns by 0.193 pp. Increasing the maximum attainable return standard deviation in the same fashion increases annualized returns by 0.155 pp. Adding a minimum withdrawal minimum benefit rider with a mean GAI rate equivalent to the 25th percentile of the empirical distribution increases annualized returns by 0.118 pp, while increasing the generosity of the mean GAI payout to the 75th percentile of the empirical distribution has a further effect of 0.775 pp. Finally, adding persistency bonuses increases annualized returns by 0.03 pp, while adding premium charges decreases them by 0.143 pp.

E. Further Details of Structural Model

E.1. Microfoundations of the Parameterization

We build the profit function of a firm up from adviser profit functions. An adviser of regulatory status $S \in \{BD, DR\}$ with type η employed by a firm with registration $R \in$

$\{BD, DR\}$ generates profit

$$\exp\left(\tilde{\beta}_0^{T,S} + \tilde{\beta}_1^{T,S}(\eta - \bar{\eta}^{T,S})^2 - \tilde{\lambda} \cdot (a - \eta)^2 - \tilde{c} \cdot a^2 \cdot FD_m \cdot \mathbb{1}[S = BD]\right).$$

All DR advisers then select $\eta = a$, as do all BD advisers without fiduciary duty. BD advisers with fiduciary duty set advice equal to $\eta/(1 + \tilde{c}/\tilde{\lambda})$. Therefore at the optimum advice, defining $\breve{\lambda} \equiv \tilde{\lambda}\tilde{c}/(\tilde{c} + \tilde{\lambda})$, the profit that an adviser earns is given by

$$\exp\left(\beta_0^{R,S} + \beta_1^{R,S}(\eta - \bar{\eta}^{R,S})^2 - \breve{\lambda} \cdot \eta^2 \cdot FD_m \cdot \mathbb{1}[S = BD]\right).$$

A firm of type $(\theta_f^{BD}, \theta_f^{DR})$ employs advisers whose types are distributed $\eta^S \sim N\left(\theta_f^S, (\sigma_\eta^S)^2\right)$. At the time of choosing whether to enter, the firm expects to employ Q^S advisers of status S, where Q^S could be random (but independent of adviser type). Including the fixed cost K_f of entry, the profit function for such a firm is

$$\begin{aligned}\pi^R(\theta_f^{BD}, \theta_f^{DR}; FD_m) &= \mathbb{E}_\eta\left[Q^{DR} \cdot \exp\left(\tilde{\beta}_0^{R,DR} + \tilde{\beta}_1^{R,DR}(\eta - \bar{\eta}^{R,DR})^2\right) \mid \theta_f^{DR}\right] \\ &+ \mathbb{E}_\eta\left[Q^{BD} \cdot \exp\left(\tilde{\beta}_0^{R,BD} + \tilde{\beta}_1^{R,BD}(\eta - \bar{\eta}^{R,BD})^2 - \breve{\lambda} \cdot \eta^2 \cdot FD_m\right) \mid \theta_f^{BD}\right] - K_f. \quad \text{(E.1)}\end{aligned}$$

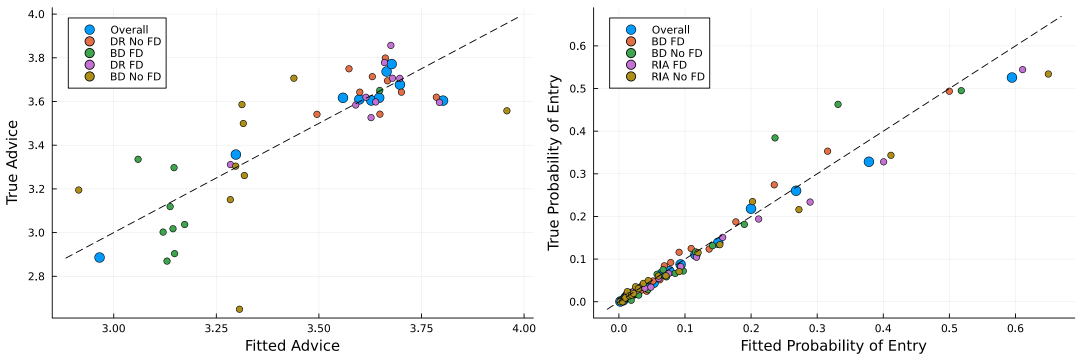
With the assumptions that η is distributed normally and that Q^S is independent of η, the right-hand side of (E.1) simplifies to (4), with appropriate redefinition of parameters.

This microfoundation has the elements of the model outlined in Section 5.1. The average advice by advisers of status S (without FD) is the average of η at that firm, which is θ_f^S by construction. Since each adviser who is impacted by FD scales distortion by $1 + c$ (for $c \equiv \tilde{c}/\tilde{\lambda}$), the average advice by BD advisers at the firm level also scales down. This also leads to a profit effect. Moreover, the profit function is a function of firm types.

A limitation of this microfoundation is that it does not allow for strategic behavior in selecting advisers. When deciding to enter, a firm has an expectation of the number of advisers of each type it will hire but does not know the exact number. That is, variation across firms in size, conditional on observables, is irrelevant for entry. Further, the model allows for firms to have different "screening" rules for advisers: a higher-θ firm by definition has higher-η advisers. However, firms do not adapt screening to regulation: a firm cannot differentially choose to screen out especially high-η advisers in response to FD. One justification is that it stems from an inability to perfectly predict adviser type when hiring, but it is admittedly a limitation. Finally, the formulation includes fixed costs only at the firm level and not at

Figure E.1: Model fit

(a) Distortion (b) Probability of Entry



the adviser level: all advisers are profitable to the firm. One could add a fixed cost at the adviser level, with the assumption that advisers cannot be screened as a function of η. In this version, the fixed cost channel could have an impact on DR firms as well, through the adviser-level cost for BDs. In that model, $\kappa_{2\times}$ would be the differential impact of FD on BD firms over DR firms. We believe that a model of adviser choice that responds to regulation is beyond the scope of this paper but could be an interesting avenue for future work.

E.2. Model Fit and Robustness Checks

To evaluate fit, we simulate the model to compute probabilities of entry and expected advice conditional on entry for each county in the dataset. Figure E.1 shows a binscatter of the observed outcomes against model predictions, grouped by adviser or firm type and fiduciary status. Panel (a) shows that the advice predictions are close to the 45° line, and estimates are correlated with observed values even within-group. Panel (b) shows that entry predictions are very closely aligned with predictions.

Robustness checks are in Table E.1. Column (1) is the baseline specification presented in Section 6.3, using a likelihood that only takes into account observed entry and advice decisions. Columns (2) and (3) change the number of local potential entrants in each market to 50% and 150% of the baseline, respectively. Column (4) adds in the likelihood associated with firm choice for each transaction; we do not use this as the baseline specification since it may be that selection of firms conditional on picking an FSP product is different from the selection of firms itself.[16] Column (5) uses entire borders as markets, so that potential

[16]Given our functional form for $f^R(\cdot)$, the probability of purchasing from a BD firm is $p_m \equiv \exp(u_{BD}) \cdot$

Table E.1: Parameter estimates for alternate specifications

	(1)	(2)	(3)	(4)	(5)
A. Means of Distribution of Distortion					
BD/BDF (Local)	4.395	4.378	4.374	4.442	4.279
	(0.108)	(0.048)	(0.088)	(0.102)	(0.103)
BD/BDF (Regional)	4.177	4.148	4.147	4.188	4.142
	(0.078)	(0.040)	(0.073)	(0.088)	(0.071)
BD/BDF (National)	3.819	3.956	3.946	3.784	3.941
	(0.078)	(0.061)	(0.068)	(0.050)	(0.056)
DR/BDF (Local)	3.542	3.581	3.567	3.543	3.621
	(0.046)	(0.057)	(0.056)	(0.053)	(0.078)
DR/BDF (Regional)	3.803	3.820	3.831	3.820	3.946
	(0.046)	(0.056)	(0.041)	(0.052)	(0.059)
DR/BDF (National)	3.733	3.762	3.756	3.737	3.748
	(0.045)	(0.053)	(0.045)	(0.049)	(0.061)
BD/DRF (Local)	2.961	2.990	3.001	3.009	3.183
	(0.064)	(0.075)	(0.115)	(0.088)	(0.125)
BD/DRF (Regional)	4.020	3.836	3.840	3.711	3.716
	(0.120)	(0.092)	(0.110)	(0.087)	(0.082)
BD/DRF (National)	3.343	3.355	3.364	3.363	3.313
	(0.031)	(0.035)	(0.043)	(0.026)	(0.044)
DR/DRF (Local)	4.153	4.142	4.160	4.146	4.159
	(0.042)	(0.051)	(0.057)	(0.048)	(0.114)
DR/DRF (Regional)	3.906	3.896	3.912	3.874	3.614
	(0.044)	(0.037)	(0.067)	(0.055)	(0.057)
DR/DRF (National)	3.743	3.751	3.757	3.750	3.692
	(0.021)	(0.022)	(0.020)	(0.023)	(0.040)
B. Variance of Distribution of Distortion					
$\sigma_{\text{BD,BDF}}$	0.131	0.111	0.040	0.152	0.032
	(0.053)	(0.046)	(0.060)	(0.052)	(0.046)
$\sigma_{\text{DR,BDF}}$	0.032	0.037	0.047	0.032	0.047
	(0.003)	(0.004)	(0.005)	(0.004)	(0.011)
ρ_{BDF}	0.636	0.634	0.625	0.640	0.530
	(0.013)	(0.015)	(0.015)	(0.010)	(0.027)
$\sigma_{\text{BD,DRF}}$	0.073	0.076	0.077	0.067	0.032
	(0.011)	(0.013)	(0.019)	(0.012)	(0.029)
$\sigma_{\text{DR,DRF}}$	0.212	0.222	0.239	0.209	0.175
	(0.014)	(0.015)	(0.013)	(0.013)	(0.018)
ρ_{DRF}	0.615	0.618	0.608	0.629	0.627
	(0.025)	(0.023)	(0.020)	(0.027)	(0.047)
$\sigma_{a,\text{BD}}$	0.796	0.793	0.794	0.793	0.793
	(0.027)	(0.026)	(0.026)	(0.023)	(0.017)
$\sigma_{\eta,\text{BD}}$	0.844	0.848	0.848	0.846	0.866
	(0.039)	(0.039)	(0.043)	(0.037)	(0.037)
$\sigma_{a,\text{DR}}$	0.627	0.628	0.631	0.628	0.628
	(0.016)	(0.019)	(0.018)	(0.014)	(0.010)
$\sigma_{\eta,\text{DR}}$	0.414	0.409	0.405	0.413	0.401
	(0.033)	(0.038)	(0.035)	(0.035)	(0.033)

	(1)	(2)	(3)	(4)	(5)
C. Profit Function					
$\bar{\theta}_{\text{BD,BDF}}$	0.132	0.126	0.125	0.121	0.120
	(0.021)	(0.023)	(0.019)	(0.027)	(0.043)
$\bar{\theta}_{\text{DR,BDF}}$	1.124	1.129	1.124	1.127	1.141
	(0.058)	(0.073)	(0.063)	(0.061)	(0.073)
$\bar{\theta}_{\text{BD,DR}}$	4.791	4.960	4.772	4.431	4.015
	(14.375)	(15.971)	(20.200)	(23.364)	(3.525)
$\bar{\theta}_{\text{DR,DR}}$	3.403	3.393	3.371	3.412	3.420
	(0.024)	(0.029)	(0.024)	(0.021)	(0.085)
Slope (BD/BDF)	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Slope (DR/BDF)	-0.625	-0.497	-0.414	-0.650	-0.366
	(0.039)	(0.033)	(0.033)	(0.057)	(0.065)
Slope (BD/DRF)	-0.117	-0.108	-0.110	-0.126	-0.287
	(0.022)	(0.023)	(0.025)	(0.020)	(0.077)
Slope (DR/DRF)	-0.042	-0.040	-0.036	-0.042	-0.033
	(0.003)	(0.003)	(0.002)	(0.003)	(0.007)
D. Market Size					
u_{BDF}	-8.028	-7.860	-7.897	-7.950	-7.817
	(0.546)	(0.546)	(0.615)	(0.507)	(0.571)
u_{DRF}	-6.385	-6.313	-6.325	-6.381	-6.838
	(0.516)	(0.833)	(0.967)	(0.515)	(0.586)
ν_{BDF}	0.971	0.982	0.990	0.971	0.960
	(0.007)	(0.010)	(0.016)	(0.007)	(0.016)
ν_{DRF}	0.990	0.990	0.990	0.990	0.985
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Log(Population)	0.100	0.107	0.119	0.098	0.098
	(0.005)	(0.006)	(0.006)	(0.005)	(0.011)
Log(Income)	0.316	0.335	0.369	0.303	0.174
	(0.020)	(0.019)	(0.018)	(0.018)	(0.041)
Log(House Prices)	-0.093	-0.098	-0.111	-0.087	0.012
	(0.010)	(0.012)	(0.015)	(0.011)	(0.020)
E. Advice Channel					
c_{BDF}	0.117	0.122	0.121	0.119	0.118
	(0.019)	(0.014)	(0.020)	(0.019)	(0.024)
c_{DRF}	0.056	0.058	0.060	0.061	0.064
	(0.009)	(0.015)	(0.013)	(0.011)	(0.013)
$\check{\lambda}_{\text{BDF}}$	5.045	5.043	5.045	5.051	5.012
	(0.018)	(0.069)	(0.040)	(0.023)	(0.047)
$\check{\lambda}_{\text{DRF}}$	0.005	0.008	0.011	0.002	0.001
	(0.004)	(0.006)	(0.013)	(0.005)	(0.006)
F. Fixed Cost Channel					
κ_{Local}	2.770	2.772	2.809	2.956	2.713
	(0.305)	(0.672)	(1.086)	(0.362)	(0.222)
κ_{Regional}	0.037	0.119	0.122	0.103	0.707
	(0.084)	(0.050)	(0.067)	(0.079)	(0.161)
κ_{National}	0.084	0.046	0.093	0.006	0.001
	(0.044)	(0.042)	(0.047)	(0.036)	(0.065)

(1) Baseline. (2) Reducing number of local potential entrants. (3) Increasing number of local potential entrants. (4) Including information about adviser choice. (5) Aggregating to border-state to define markets.

entrants in any county along the border are potential entrants in the market.

In most specifications, the parameters that govern the channels (c, λ, κ) are similar. With the alternate market definition (5), we find a larger effect of the fixed cost channel on regional firms. We find a weaker effect of income on market size and a zero effect of house prices on market size; this is in line with our suspicion that the negative estimated impact of house prices on market size is due to the correlation between income and house prices.

$N^{\nu_{BD}}_{BD,m}/[\exp(u_{BD})\cdot N^{\nu_{BD}}_{BD,m}+\exp(u_{DR})\cdot N^{\nu_{DR}}_{DR,m}]$. We can then add $\sum_t \log p_{m(t)}$ to the baseline likelihood, where $m(t)$ is the market in which transaction t occurred.