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Self-Dealing and Compensation for Financial Advisors

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Abstract

Recent legislative and regulatory activity related to investment advice in 401(k) plans has focused on the issue of self-dealing. In this paper, we develop a framework that addresses questions of self-dealing based on the direct-marketing model introduced by Inderst and Ottaviani (2009). We specifically adapt the model to the setting of 401(k) plan advice, extend the theoretical framework to consider the implications of financial literacy and discuss various key aspects of existing and proposed 401(k) advice legislation in the context of the model's predictions.

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1 Introduction

Recent legislative and regulatory activity related to investment advice in 401(k) plans has focused on the issue of self-dealing. A common example of self-dealing arises if an advisor who works for a particular provider deliberately advises plan participants to purchase the provider's mutual funds in order to realize a sales commission or other benefits, without regards to their suitability. In this paper, we develop a framework that addresses questions of self-dealing based on the direct-marketing model introduced by Inderst and Ottaviani (2009) to analyze optimal incentive structures within the context of participant-directed defined contribution(DC) plans, with respect to issues such as financial advisors who are also plan managers, regulations related to advisor qualifications and compensation, incentive effects of future advising services beyond the plan itself, and the combination of other features such as automatic enrollment with advisory services. In this framework, a firm employs agents with two distinct tasks: approaching new customers as well as advising on the product's suitability. In this setting, the incentives needed to induce agents to search for new customers may also subsequently tempt them to advise inappropriate products.

In what follows we specifically adapt the model to the setting of 401(k) plan advice. We then extend the theoretical framework to consider the implications of financial literacy, which is not explored in the existing literature, and apply the model to the analysis of various aspects of proposed 401(k) advice legislation.

2 Background

2.1 Investment Advice and Self Dealing in 401(k) Plans

Under Section 3(21)(A)(ii) of ERISA, a "fiduciary" includes, inter alia, any person that renders investment advice for a fee or other compensation, directly or indirectly, with respect to any moneys or other property of an ERISA plan, or has the authority or responsibility to do so. The prohibited transaction rules of ERISA prevent self-dealing by barring fiduciaries from giving advice to participants regarding any investments that would result in the payment of additional fees to themselves (or their affiliates). This rule effectively limited mutual fund companies who were plan providers from offering advice to participants. However, as recent research has amply demonstrated, many 401(k) plan participants are not sufficiently prepared to manage their own investment accounts without support. As a first step, in 1997, the Department of Labor (DOL)'s Interpretive Bulletin (I.B. 96-1) identified specific categories of investment-related materials that did not constitute advice, but could be regarded as "education". To qualify, these would have to be restricted to generalized financial information and non-specific asset allocation models.

Under I.B. 96-1, plan providers were still be barred from offering participants individualized, one-on-one advice. In 2001, DOL Advisory Opinion (AO) 2001-09A (a letter to SunAmerica Inc) noted that the provision of fiduciary investment advice would not constitute a prohibited transaction if it resulted from the application of methodologies developed, maintained and overseen by an independent party. This AO resulted in the growth of a number of third-party structures which became known as SunAmerica arrangements, under which a provider would contract with another financial institution (such as Financial Engines, Inc and Ibbotson Associates, Inc) to provide advisory services.

Industry participants continued to propose several reasons for increasing plan providers' ability to directly give advice. Some argued for technical efficiency and complementarities, suggesting that detailed information about participants and pre-existing administrative platforms would enable providers to give better quality recommendations at lower cost than independent advisors. Others noted that reputational incentives could naturally constrain self-dealing, as opportunities to manage future rollover assets would provide a strong incentive for advisors to maintain good relationships with investors (J.P. Morgan(2004)).

A more significant step was taken in 2006, when the Pension Protection Act (PPA) amended ERISA by adding a new statutory prohibited transaction exemption that would also allow "eligible investment advice arrangements". An "eligible investment advice arrangement" would be an arrangement that (i) used a level-fee compensation structure that did not vary depending on the basis of any investment option selected; or (ii) used a unbiased computer model that met a number of statutory requirements. In addition, DOL clarified that a fiduciary's affiliate generally would be subject to the fee-leveling limits only if that affiliate itself provided advice to plan participants. The PPA would therefore effectively allow the provider to directly offer advice without an intermediary, subject to several reviews and restrictions including approval by a separate plan fiduciary, annual audits and various disclosure requirements.

Responses from interested parties solicited by DOL argued that the financial industry would still be highly constrained by the language of the statutory exemption. For instance , under the PPA, in addition to being unbiased, the computer model must use generally accepted investment theories, utilize relevant participant information (which may include age, retirement age, life expectancy, risk tolerance), and take into account the full range of investments, including equities and bonds, in determining the investment portfolios of the beneficiary. Financial industry representatives argued that, given the wide range of allowable investments, models that conformed to these requirements in their strictest sense would be highly infeasible.

In August 2008, DOL proposed regulation implementing the PPA that included an additional class exemption with two important features. Firstly, the proposed class exemption would permit advisors to provide individualized advice to a worker after giving advice generated by use of a computer model and would permit advice that might generate greater income for the advisor and his/her affiliates if the advice were found to be in the best interest of the worker. Secondly, the level-fee arrangement would apply only to the individual advisor and not to his or her firm. In January 2009, DOL issued this regulation as a Final Rule, to be effective March 2009.

However, new developments have moved sharply in the opposing direction. In particular, recent stock market volatility, skepticism about the credibility of financial institutions and large observed drops in the value of retirement savings portfolios overall have raised concerns about unsuitable high-margin overly-risky investments being sold to unsophisticated participants. At the request of the entering Obama administration, DOL drew out the applicability and effective dates of the final regulation from March 23 to May 22. On May 21st, the DOL announced a second extension for public comments on the final regulations, until November 18, 2009.

In April of 2009, the House Education and Labor Committee Chairman George Miller introduced the 401(k) Fair Disclosure for Retirement Security Act of 2009 to Congress. The Act would repeal the investment advice provision enacted in the PPA and also prohibit several practices existing prior to the PPA. Specifically, the investment advisor must not be the plan investment provider, must satisfy the pre-PPA level fee rule, and must comply with other requirements including disclosure of indirect benefits. Alternatively, it allows the provision of advice by a computer model under the existing PPA rules, with additional restrictions. SunAmerica arrangements would be disallowed unless the independent third party accepted fiduciary responsibility or if the computer model were to adopt the PPA rules, including rules governing the asset universe to be including and annual audits. The Act also eliminates managed accounts, whereby advice is automatically implemented pursuant to a participants prior authorization. On June 24, 2009, the House Education and Labor Committee reported out a bill (H.R. 2989) basically incorporating Congressman Miller's proposals, with some modifications. At the time of this draft, H.R. 2989 remains pending.

2.2 Previous Theoretical Work

The theoretical literature related to financial advice is quite rich, but offers surprisingly little that is directly relevant to the issues described above in the context of self-dealing. A large body of work focuses attention on risk-sharing between advisors and advisees (see, for example Golec (1992),Coles, Daniel, and Naveen (2006),Das and Sundaram (2002),Golec and Starks (2004)), rather than the issue of conflict of interest on the part of the advisor.

Building off the seminal work of Crawford and Sobel (1982), more recent research has addressed the advisor-advisee relationship in the context of strategic information transmission. This line of research examines the design of optimal compensation contracts and the costs/benefits of delegation when advisors have private information about advisees (see for example Liu (2005), Krishna and Morgan (2008)). In most of these papers, however, advisor bias is specified exogenously. These models are not informative for an analysis of how incentives or organizational structures themselves induce or reduce bias.

To model self-dealing in 401(k) plans, we instead adapt a model of direct selling from the work of Inderst and Ottaviani (2009), in which we consider agents who have to be simultaneously motivated to sell but also to not missell products. In their approach, they highlight the agency problem between a firm and its own agents, and the role of potential policy interventions when the targeted action is carried out by agents rather than the firm itself. This model has important implications for various settings where consumers, product providers and advising agents interact.

Finally, most of the theory literature ignores investor heterogeneity due to financial literacy (A key exception is Ottaviani (2000)). Yet, financial literacy is a key element of the policy debate : individuals who are more literate may benefit from additional information, but the concern is for individuals who are more susceptible and hence more likely to be taken advantage of. In what follows, we make a simple extension to the existing framework to include naive and sophisticated investors, and to demonstrate that this heterogeneity can have meaningful implications for outcomes as well as potential policy interventions.

3 Model

Consider a risk-neutral firm which is a pension plan provider. The firm sells one product, an equity mutual fund at price p, through a risk-neutral agent, who promotes the company's mutual fund to plan participants while also recommending the appropriate asset allocation between the mutual fund and a risk free asset, cash.

3.1 Participants

Plan participants have two investment-relevant types, $\theta = l, h$, and derive utility from the investment product based on type, where $\theta_h > 0 > \theta_l$. θ may be thought of as based on risk preferences and other considerations, where only the high type h benefit from buying the provider's funds and the low type l benefit from simply holding cash.The participant does not know his own type with certainty, but has the prior $q = Pr[\theta = h]$.

Based on the prior alone, the participant's expected utility from the product is $qu_h + (1-q)u_l$. We assume that $qu_h + (1-q)u_l < 0$, implying that with this initial belief, participants will not buy the fund even at a zero price; there will be no investment.

3.2 Multitask Agents

We use the terminology of Inderst and Ottaviani (2009) to describe the agent's two tasks : the agent firstly has to approach new customers ("prospecting") and then give them recommendations about whether to buy the fund ("advising").

For the "prospecting" task, the agent can choose to expend effort at a private cost $c_s > 0$ in order to contact a potential participantand encourage them to contribute, after which participants decide with probability μ to invest their funds in the plan.

However, participants who decide to invest are imperfectly informed about the most appropriate investment mix, and hence rely on the agent to make recommendations based on his private assessment. For the "'advising" task, the agent can therefore further expend effort to privately observe a signal about the customer's type $s \in [0, 1]$ at a private cost $c_a > 0$ and a firm resource cost of $k > 0$. The agent then reports a recommendation $r(s)$ where $r(s) = 1$ if the agent's recommendation is to buy the fund and $r(s) = 0$ if not.

The signal is realized according to the type-dependent distribution F_θ, where F_h dominates F_l in the monotone likelihood ratio order. The unconditional distribution of the signal, $F(s)$, may be characterised as a function of the prior probability and the type-dependent densities, where we define $f(s) = qf_h(s) + (1-q)f_l(s)$. We assume that each density function $f_\theta(s)$ is continuous and strictly positive for $s \in (0, 1)$, which allows us to assume a strictly increasing posterior probability $q(s) = Pr[\theta = h|s]$. We further assume the boundary conditions $f_h(1) > 0$, $f_l(0) > 0$, and $f_h(0) = f_l(1) = 0$, such that extreme signals are fully informative: $q(0) = 0$ and $q(1) = 1$.

3.3 Financial Literacy

In this setting, to capture the concern that financially illiterate individuals are susceptible to misguided advice, we model participant response to advice. The sophisticated consumer internalizes the advice process, and for any anticipated signal s, weights the recommendation of the advisor accordingly into his expected utility $u(s)$, such that $u(s) = q(s)u_h + (1 - q(s))u_l$, regardless of $r(s)$. The sophisticated consumer therefore believes with some probability that the advisor's recommendation may not be suitable. However, financially-illiterate individuals may be naive or display other types of behavioral biases. A naive consumer takes any recommendation at face value, as an indication that they are in fact a high type i.e. $u(s) = u_h$ if $r(s) = 1$ and $u(s) = u_l$ if $r(s) = 0$.

We first derive the results for consumers that are financially literate and then explore the implications of financial illiteracy. The results presented throughout reflect financially-literate consumers unless otherwise specified. Note that the terms "sophisticated" and "financially-literate" interchangeably.

3.4 Penalties For Misselling

In their model, Inderst and Ottaviani (2009) also allow for an *ex-post* signal about the quality of the match. In this case, consider that plan participants who are unsatisfied with the performance of their mutual funds may lodge a complaint with the fiduciary, the plan provider; or alternatively, a regular audit of advisor activity may result in the discovery of misselling to unsuitable types [1].

We define $0 < \phi < 1$ to be the probability of a verifiable audit or complaint after the sale of a fund to a low type, θ_l. We assume that if a complaint is received, the provider is liable for an exogenously determined fine or

[1] In an analysis focused on self-dealing, we do not examine the case in which high types are not sold the funds, although they would have benefited from holding them

penalty. This may capture direct costs and penalties e.g. fines or legal fees, or indirect costs such as reputation (as emphasized by providers in real life). We denote the expected value of penalties from selling to a θ_l participant to be ρ.

3.5 Advisor Compensation Scheme

When deciding how to compensate the advisor, the provider observes neither their activities nor the participants' type. The provider observes only three outcomes and can therefore in theory pay three separate levels of compensation.

1. No sale $= w_1$
2. Sale, without complaint $= w_2$
3. Sale, with a complaint $= w_3$

We assume that the advisor is protected by limited liability and can never receive less than zero compensation in any case, so $w_1, w_2, w_3 \geq 0$. We further normalize the value of the outside option for the advisor to be 0.

3.6 Timing

The full interaction between the plan provider, the advisors and the participant proceeds as follows

- The plan provider sets the price p for their mutual fund product
- The provider sets the compensation scheme (w_1, w_2, w_3) for the advisor
- The advisor chooses whether to exert initial effort to approach the participant
- If yes, the advisor expends c_s and participant becomes interested with probability μ
- The advisor chooses whether to exert effort to advise the participant

- If yes, the advisor evaluates the participant with private cost c_a and firm cost k, observing the signal s about their type
- The advisor makes a purchase recommendation
- The participant decides whether or not to purchase mutual funds at price p
- If a θ_l participant purchases the fund product inappropriately, a violation is observed with probability ϕ and the provider pays an expected penalty of ρ.
- The advisor receives compensation based on the realized outcomes.

4 Compensation-Setting

This setup is particularly suited to the analysis of regulating compensation and misselling, as the advisor's preferences and ultimately behavior depend solely on the incentives provided by the firm. The advisor's best strategy in the model takes the form of a rule based on a cutoff value for the signal, s^*. We show that participants will be advised to buy a fund product if and only the advisor observes a signal $s > s^*$, and the value of s^* that is implemented depends on the choice of compensation. We refer to this threshold value of s^* as the *standard*. An intuitive interpretation would be that s is a signal of risk tolerance. Participants are recommended to purchase the risky mutual fund product only if they meet the standards for risk-tolerance, i.e. only if the advisor's assessment of their risk-tolerance exceeds s^* . Following the method of Grossman and Hart(1983), the provider's optimal compensation scheme is obtained by computing agency costs for any level s^* and then identifying the least costly value of s^*.

4.1 Threshold-Setting

We first show that the firm can set the agent's optimal response such that having observed a signal s, the agent complies with a threshold standard,

s^*, and recommends buying the mutual fund product only if s exceeds the standard.

Proposition 4.1. *The agent's compensation scheme* (w_1, w_2, w_3) *can be chosen to implement a standard* $s^* > 0$ *such that the agent recommends a sale if* $s > s^*$ *and* 0 *otherwise.*

Proof. For any signal s, the advisor's expected compensation from a sale, $V(s)$, may be written as $q(s)w_2 + (1 - q(s))[(1 - \phi)w_2 + \phi w_3]$. This can be rearranged to give

$$V(s) = w_3 + [1 - \phi(1 - q(s))](w_2 - w_3)]$$

If $w_2 > w_3$ then $V(s)$ is strictly increasing and continuous in s. Furthermore, if $w_2 > w_1 > (1 - \phi)w_2$, $V(0) < w_1$ and $V(1) > w_1$. Then there exists a cutoff signal $s^* > 0$ such that $V(s^*) = w_1$, where the advisor is indifferent between making a sale or no sale. □

4.2 Incentivizing Effort

In this model, suppose that advice effort is observable by the customer, but not by the firm. By assumption, $qu_h + (1 - q)u_l < 0$, so for any price p set by the firm, customers will not purchase the product if the agent is seen to shirk his advice effort. Consequently, any agent incentivized to provide sales effort for a participantalso must find it optimal to exert advice effort.

Without exerting any effort, the agent can always earn w_1. By exerting sales effort c_s, the agent interests a participantwith probability μ and then has to exert further effort c_a to observe s. For a given standard s^*, the agent realizes the expected compensation $V(s)$ if $s > s^*$. The agent thus exerts effort only if the expected additional compensation $\mu \int_{s^*}^1 [V(s) - w_1] f(s) ds$ exceeds the additional expected cost of effort, $c_s + \mu c_a$.

The incentive constraint can then be written as

$$\int_{s^*}^1 [V(s) - w_1] f(s) ds \geq \frac{c_s}{\mu} + c_a \tag{4.1}$$

4.3 Optimal Compensation and Agency Cost

We first show that the optimal (minimum cost) compensation scheme for any standard s^* takes the form of a base salary and a sales commission, both of which are forfeited in the event of a complaint.

Proposition 4.2. *To implement any standard $s^* > 0$, the optimal (minimum cost) compensation scheme comprises a base salary w and an additional sales commission b such that*

$$w = \frac{(\frac{c_s}{\mu} + c_a)[1 - \phi(1 - q(s^*))]}{\int_{s^*}^1 [q(s) - q(s^*)]f(s)ds} \tag{4.2}$$

and

$$b = \frac{(\frac{c_s}{\mu} + c_a)}{\int_{s^*}^1 [q(s) - q(s^*)]f(s)ds} \tag{4.3}$$

In the event of an ex-postcomplaint, the provider pays the advisor nothing, equivalent to levying a forfeit of $w + b$.

Proof. At the optimum, the incentive constraint equation 4.1 has to bind. We can then substitute the expression for $V(s)$ and the observation that $w_1 = V(s^*)$ into 4.1, such that

$$\int_{s^*}^1 [V(s) - V(s^*)]f(s)ds = \frac{c_s}{\mu} + c_a$$

which gives us in turn

$$w_2 = w_3 + \frac{\frac{c_s}{\mu} + c_a}{\int_{s^*}^1 [q(s) - q(s^*)]f(s)ds} \tag{4.4}$$

and

$$w_1 = w_3 + \frac{(\frac{c_s}{\mu} + c_a)[1 - \phi(1 - q(s^*))]}{\int_{s^*}^1 [q(s) - q(s^*)]f(s)ds} \tag{4.5}$$

Given the limited liability constraint $w_1, w_2, w_3 \geq 0$, the minimum compensation scheme then sets $w_3 = 0$. We can then express the compensation scheme as $w_1 = w$, $w_2 = w + b$ where $b = w_2 - w_1$. This allows us to interpret $w \geq 0$ as a base salary, $b \geq 0$ as a sales bonus. Substituting these parameters into 4.4 and 4.5 leads to the optimal compensation scheme in Proposition 4.2.

Finally, we check the two conditions given in Proposition 4.1 for the existence of $s^* > 0$ and verify that they hold. We want to check that $w_2 > w_3$ and $w_2 > w_1 > (1-\phi)$. We can easily verify $w_2 > w_3$ since $w + b > 0$, and $w_2 > w_1$, since $w + b > w$. Then, $w_1 > (1-\phi)w_2$ $w > (1-\phi)(w+b)$ can be written as $\frac{b}{w} < \frac{\phi}{1-\phi}$. Substituting w and b into our expression for the cutoff signal $V(s^*) = w_1$ gives

$$\frac{b}{w} = \frac{\phi(1-q(s^*))}{1-\phi(1-q(s^*)} < \frac{\phi}{1-\phi} \tag{4.6}$$

□

In this case, the base salary w, which is paid whether or not a sale is realized, may be regarded as an information rent for implementing a particular standard.

Proposition 4.3. *The salary needed to ensure compliance with a particular standard (i) increases in the standard s^*, (ii) increases in the cost of sales c_s (iii) increases in the cost of advice c_a and also (iv) decreases in the frequency of complaints or audits ϕ*

Proof. By differentiation of Equation 4.2, applying Leibniz' integral rule, we find

$$\frac{dw}{ds^*} = (\frac{c_s}{\mu} + c_a)\frac{dq(s^*)}{ds^*}\frac{\int_{s^*}^1 [1-\phi(1-q(s^*))]f(s)ds}{\phi[\int_{s^*}^1 [q(s)-q(s^*)]f(s)ds]^2} > 0$$

The other first derivatives of Equation 4.2 are more straightforward

$$\frac{dw}{dc_s} = \frac{1-\phi(1-q(s^*))}{\mu\int_{s^*}^1 [q(s)-q(s^*)]f(s)ds} > 0$$

$$\frac{dw}{dc_a} = \frac{1-\phi(1-q(s^*))}{\int_{s^*}^1 [q(s)-q(s^*)]f(s)ds} > 0$$

$$\frac{dw}{d\phi} = \frac{-(\frac{c_s}{\mu}+c_a)(1-q(s^*)}{\int_{s^*}^1 [q(s)-q(s^*)]f(s)ds} < 0$$

□

5 Basic Equilibrium

In what follows, we assume that plan participants are not able to observe the fee structure (and by extension, the provider standard, s^*). The provider's best response function $s^*(p)$ describes the firm's willingness to sell at a given standard as a function of price. In turn, the participant's best response function $p(s^*)$ describes his willingness to pay as a function of his expected standard. In equilibrium, the price p and the standard s^* are jointly determined such that the firm sets s^* optimally given the market price p, which in turn reflects the correct expectation of s^* by the participants.

5.1 Provider willingness to sell

The providers' expected gross profits for any s^* given price p can be written

$$\Pi_G = \mu \int_{s^*}^{1} \pi(s) f(s) ds$$

where the expected profit from realizing a sale is the revenue less resource costs and expected penalty, $\pi(s) = p - k - \rho(1 - q(s))$.

At the optimum, the incentive constraint equation 4.1 has to bind, such that the advisor's expected compensation for exerting effort net of his base salary, is equal to $c_s + \mu c_a$. The firms' expected wage bill is therefore $w + c_s + \mu c_a$, and expected net profits are $W = \Pi_G - w - c_s - \mu c_a$

The provider's problem is then to choose s^* to maximize expected net profits W for a given value of p. Ignoring the corner solution $s^* = 0$, the first order condition with respect to s^* gives a unique interior solution s^* implicitly defined by

$$-f(s^*)\mu\pi(s^*) = \frac{dw}{ds^*} \tag{5.1}$$

Inderst and Ottaviani (2009) note that $\frac{dw}{ds^*} > 0$ implies that $\pi(s^*) < 0$; i.e. at the optimal standard s^* the firm realizes a net loss on the marginal sale. However, the total expected net profit is maximized because implementing this standard reduces the wage cost needed to *ex-ante* properly incentivize the agent.

The firm's standard decreases with the equilibrium price of the mutual fund, but increases with the expected penalty from misselling and the probability of an inappropriate sale being discovered.

Lemma 5.1. *The providers' best response function $s^*(p)$ is decreasing in p, increasing in ρ and increasing in ϕ.*

Proof. We define a function $\psi = -f(s^*)\mu\pi(s^*) - \frac{dw}{ds^*} = 0$ from Equation 5.1. Since $\partial\psi/\partial s^* < 0$, then $\partial\psi/\partial p < 0$, $\partial\psi/\partial\rho > 0$ and $\partial\psi/\partial\phi > 0$, the results above follow directly from the implicit function theorem[2]. □

5.2 Participant willingness to pay

For any standard s, a sophisticated participant's expected utility is $q(s)u_h + (1-q(s))u_l$. For an expected standard s^*, the participant receives a purchase recommendation with probability $1 - F(s^*)$. His willingness to pay for the fund is equal to expected utility conditional on receiving the recommendation,

$$p(s^*) = \int_{s^*}^{1} [q(s)u_h + (1 - q(s))u_l] \frac{f(s)}{1 - F(s^*)} ds \tag{5.2}$$

Lemma 5.2. *A sophisticated participant's willingness to pay, $p(s^*)$, is increasing in the expected standard s^*, and increasing in both u_h and u_l.*

Proof. We compute the partial derivative

$$\frac{\partial p(s^*)}{\partial s^*} = \frac{f(s^*)}{1 - F(s^*)} [p(s^*) - [q(s^*)u_h + (1 - q(s^*))u_l)] > 0 \tag{5.3}$$

since for any expected standard s^*, the conditional expected utility $p(s^*)$ over the range of signals greater than s^* is greater than the expected utility condition on the signal being exactly s^*, $q(s^*)u_h + (1 - q(s^*))u_l$. We also note that $\frac{\partial^2 p(s^*)}{\partial u_h} = \int_{s^*}^{1} q(s) \frac{f(s)}{1-F(s^*)} ds > 0$ and $\frac{\partial^2 p(s^*)}{\partial u_l} = \int_{s^*}^{1} (1-q(s)) \frac{f(s)}{1-F(s^*)} ds > 0$. □

[2]For explicit computation, see Appendix, Inderst and Ottaviani (2009)

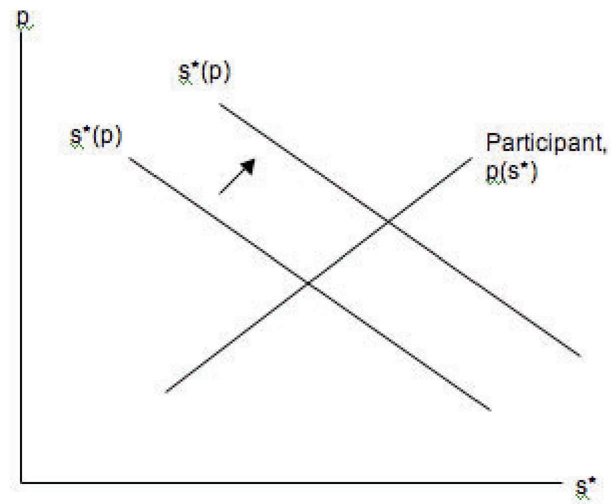

Figure 5.1: Stylized Equilibrium

Proposition 5.3. *In an equilibrium with no disclosure about* (w, b)*,* (p, s^*) *is uniquely characterised by*

$$p(s^*) = \int_{s^*}^{1} [q(s)u_h + (1 - q(s))u_l] \frac{f(s)}{1 - F(s^*)} ds \tag{5.4}$$

and

$$-f(s^*)\mu[p - k - \rho(1 - q(s^*))] = \frac{dw}{ds^*} \tag{5.5}$$

In equilibrium, the following must hold: firstly, the profit-maximizing firm sets the maximum feasible price under the expected standard s^*, equal to the participants' maximum willingness to pay, such that $p(s^*) = p$. Secondly, participant's expected standard s^* must be the realized signal that is optimal for the firm $s^* = s^*(p)$. A stylized illustration of equilibrium is presented in Figure 5.2.

6 Equilibrium with low participant financial literacy

A straightforward interpretation of financial illiteracy (and a key concern for misselling) is *naivete.* A naive participant interprets advice literally and believes his expected utility to be u_h conditional on receiving a buy recommendation. Consequently, conditional on being told to buy, regardless of the expected standard s^*, he is always willing to pay u_h (see Figure 6).

Proposition 6.1. *In an equilibrium with only naive participants, the price p is the highest that the firm can charge, but the prevailing standard s^* is lower than in an equilibrium with only sophisticated (financially-literate) participants.*

Proof. For an expected standard s^*, the financially illiterate participant receives a purchase recommendation with probability $1-F(s^*)$. The provider's best response function remains the same, but the customers' demand curve is now flat. In equilibrium, the provider will charge $p = u_h > \int_{s^*}^{1} [q(s)u_h + (1-q(s))u_l] \frac{f(s)}{1-F(s^*)} ds$. Since $dp > 0$, by Lemma 5.1, there is also a resulting fall in the equilibrium threshold standard s^*. □

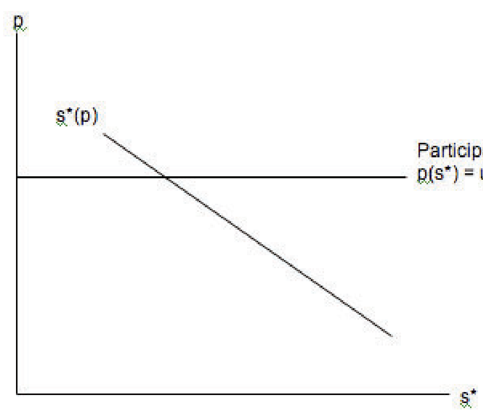

Figure 6.1: Stylized Equilibrium with Naive Participants

In this case, less financially literate consumers are twice disadvantaged: they are more willing to pay for the product, leading to a higher equilibrium product price, and also a correspondingly lower standard for advice. It is important to note that this is not a general remark: the type of behavioral bias is important, as different manifestations of financial illiteracy may not lead uniformly to lower standards.

For instance, another interpretation of financial illiteracy is the failure to appreciate the value of risky assets. Unlike the naive participant, in this case, the financially illiterate participant may believe the utility of the high type to be higher or lower than u_h. In this case, the participants willingness to pay, $p(s^*)$ is higher or lower for any threshold s^*, than in the basic equilibrium, By the same reasoning as above, the equilibrium price that prevails is therefore higher or lower than the price in the basic equilibrium. General overconfidence on the part of participants therefore results in a higher price and a lower threshold standard. Conversely, underconfidence leads to lower demand, and results in a lower overall price and also a higher threshold standard.

7 Policy Implications

7.1 External audits and penalties

In this model, regular audit requirements may be straightforwardly interpreted as a higher value for ϕ, i.e. a uniformly higher probability of discovery when misselling occurs. A more stringent expected penalty may be interpreted as a higher ρ. In equilibrium, the threshold standard s^* is increasing in the penalty ρ, and increasing in the quality of monitoring ϕ. Changes in ϕ and ρ affect only the firm's best response function, but leave the consumer response unchanged. From Lemma 5.1, $\frac{ds^*}{d\rho}$ and $\frac{ds^*}{d\phi}$ are both positive, resulting in the upward shift in $s^*(p)$, as depicted in Figure 5.2. The model therefore suggests that audits and penalties will have a direct effect on raising standards, regardless of the financial literacy of the participant population.

Changes in price due to higher standards, however, depends on the participant population. For a sophisticated population, the higher prevailing equilibrium standard s^* is accompanied by a higher equilibrium price p, as consumers are more willing to pay for the added security of the higher threshold standard. There is no change in the equilibrium price if participants are naive, since the firm is already charging as much as possible.

We note that in the absence of formal regulation, other mechanisms that affect these parameters in the same way will have the same effect. For instance, greater participant activism or a more well-functioning system of complaints can raise ϕ, and therefore standards. Alternatively, if firms incur a large reputation cost from misselling, this can raise the expected penalty ρ.

7.2 Level compensation and task separation

We may interpret level-fee restrictions as a requirement for setting $b = 0$. Assuming that the firm is not able to separately employ advisors and salespeople, but relies only on a single agent who undertakes both tasks, this constraint will significantly impact its activity. Without the sales commission, the agent will exert no effort either to contact participants or to observe the signal s, and so the optimal value of w in this case is then also 0. The firm has no incentives to offer the agent, and no customers are solicited.

Suppose that, as recent policy proposals, suggest, firms are able to completely separate the roles of advisor and salesperson, but still cannot monitor the advisor's effort.

Proposition 7.1. *Compared to the baseline case, when advisors are separated from sales, the firm's best response results in a higher advice standard* s^*

Proof. In the separation case, the firm effectively reduces $c_s = 0$. The advisor still has to choose to expend c_a in order to observe the signal but for any standard s^*, the optimal w is lower. As before, recall we define a function $\psi = -f(s^*)\mu\pi(s^*) - \frac{dw}{ds^*} = 0$ from Equation 5.1. We know from previously that $\partial\psi/\partial s^* < 0$, and differentiation of $\frac{dw}{ds^*}$ gives $\frac{d^2w}{ds^* d_{c_s}} > 0$. This implies $\partial\psi/\partial c_s < 0$and from the implicit function theorem we then have $\partial s^* \partial c_s > 0$: for any price p, the firm's best response s^* is higher. □

Note that this result is general to a reduced cost of sales effort. In other words, making it less effortful for advisors to meet clients will also result in higher standards, for instance if the plan automatically matches participants to advisors. However, even if advisors and salespeople are separated, a sales commission may is be optimal.

Proposition 7.2. *Even under task separation, if the effort of providing advice is privately costly and cannot be observed, non-zero commissions are still optimal for any positive standard* s^*

Proof. The firm's optimal compensation scheme for implementing s^* is $b = \frac{c_a}{\int_{s^*}^1 [q(s)-q(s^*)]f(s)ds} > 0$ as long as $c_a > 0$ □

In the absence of a commission, the advisor will not be motivated to expend costly unseen effort and therefore the participant will not purchase. The only way to implement level-compensation in an incentive compatible way is for the firm to (a) observe advisors' efforts directly and pay compensation conditional on observed effort or (b) reduce c_a to zero. Option (a) is equivalent to stating that the firm needs to resolve the fundamental information asymmetry. Reducing advisors' cost of effort is more difficult, but some might argue that having advisors provide only generic assessment from computer models can help achieve this goal. Realistically speaking, however, it is not clear that such options are generally feasible, suggests that some firms (particularly those that cannot separate advisors from salespeople) will not find it optimal to do business.

7.3 Fee Disclosure Regulation

In the preceding analysis, s^* and p are jointly determined in equilibrium, given that compensation and s^* itself are not observable. Suppose however, that regulation mandates credible disclosure of (w, b). In this case, (w, b) uniquely reveals s^* to the participants. The best response function for participants is then a function of the true s^* rather than their expectations.

The firm now maximizes a profit function in which the price p is determined by participants' best response to the firm's own choice of standard, rather than taken as exogenous, i.e. the firm sets s^* to maximize

$$\mu \int_{s^*}^{1} p(s) - k - \rho(1 - q(s))f(s)ds - w - c_s \tag{7.1}$$

This results in the following FOC for s^*,

$$\mu \frac{dp(s^*)}{ds^*}[1 - F(s^*)] - f(s^*)\mu\pi(s^*) = \frac{dw}{ds^*} \tag{7.2}$$

Equilibrium is thus defined by the participants' best response function 5.2 and the new FOC, 7.2.Compared to the FOC under no-transparency $-f(s^*)\mu\pi(s^*) = \frac{dw}{ds^*}$, the additional first term captures the impact of having observable s^*. Intuitively, with the additional disclosure, firms can credibly commit to a higher standard of advice, but will also as a result charge more.

Proposition 7.3. *With sophisticated participants, disclosure increases standards, but also firm profits and prices*

Proof. In this case, the additional first term $\mu\frac{dp(s^*)}{ds^*}[1 - F(s^*)]$ is always positive. All other parameters being held equal (including therefore $\frac{dw}{ds^*}$) , this implies that under the new FOC, the equilibrium value of $\pi(s^*)$ is higher under transparency , for any value of s^*. This therefore also implies a higher equilibrium price p for any s^*. Finally, given that participants' best response $p(s^*)$ is unchanged, this also implies a higher prevailing equilibrium standard s^*. □

Proposition 7.4. *With naive participants, disclosure will not affect the equilibrium outcomes.*

Proof. If participants are not financially literate, the FOC under no-transparency (the basic equilibrium) and transparency are identical, since $\frac{dp(s^*)}{ds^*} = 0$. The intuitive reasoning is that if naive participants take recommendations at face value, disclosing the actual standard has no bearing on their behavior. Thus, disclosure requirements are not likely to be effective if participants are too naive to incorporate this information into their decisions. □

The model then suggests that firms may have an incentive to support disclosure regulation if participants are sophisticated enough to appreciate the gain in credibility as a result. In this case, standards are also likely to increase. However, if participants are not, there is no incentive for the firm to support increasing disclosures, particularly if disclosure is costly; and in this case there may be no appreciable gain in standards either.

8 Concluding Remarks

In this paper, we adapt the direct selling model of Inderst and Ottaviani (2009) to the context of 401(k) plans, and examine its implications for some of the leading policy proposals currently under discussion. The results of the model underscore the basic tradeoff that firms face between cutting down on misselling and sufficiently motivating advisors to provide valuable services. Our extension to include financial literacy shows that differences in investor sophistication can have significant implications for what prices and standards ultimately prevail in the financial marketplace. The model suggests that policy tools such as monitoring, auditing and disclosure can have large effects on standards, working indirectly through compensation, but directly manipulating compensation may lead to compromises in agent incentives that affect firms' ability to do business. Other policy tools that could be discussed in later work include the possibility of self-regulation.

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