

(Mis)selling through Agents*

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Abstract

This paper studies the implications of the inherent conflict between two tasks performed by sales agents: prospecting for customers and advising on the suitability of the product sold. When structuring their salesforce compensation, firms trade off the expected losses resulting from “misselling” with the agency costs of providing marketing incentives. We characterize how the equilibrium amount of misselling and the scope for policy intervention depend on a number of features of the identified agency problem, such as a firm’s internal organization of the sales process, the transparency of its commission structure, and the steepness of its agents’ sales incentives.

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1 Introduction

When purchasing complex or unfamiliar products, consumers often rely on information and advice provided by representatives of the seller. This opens the possibility of “misselling”, the questionable practice of a salesperson misleading customers about the match between the product’s characteristics and the customer’s needs.¹ An important feature of this problem is that the seller often deals with the customer through an agent, rather than directly. In the simplest case, the agent could be an employee of the seller, though in many industries firms increasingly rely on independent advisers and brokers.

Our model analyzes the possibility of misselling through the lens of the agency relationship between the selling firm and its salesforce.² We argue that the risk of misselling is particularly acute when the firm hires the same agents both to prospecting for new customers and to provide advice. When the firm provides steeper incentives—for example, because competition makes it harder for agents to find customers—the agents become more tempted to inflate the perceived value of the product or to recommend purchase even if the product is inappropriate for the customers they locate.

Firms that missell through their own employees may be held vicariously liable or may damage their reputation vis-à-vis customers. When misselling takes place through independent intermediaries, firms still risk being sued, losing their licence, or facing regulatory sanctions.³ Therefore, firms should have a vital interest in ensuring that their agents com-

¹In the code of conduct for the employees of a major bank we found the following fitting illustration: “Typically, mis-selling is associated with investment products when there may have been a failure to disclose all the associated risks or where an investment product is inappropriate to a customer’s needs. For example, a product with a long tenor (eg ten years) may have a guaranteed repayment of principal only on maturity date, but if prematurely liquidated it may not repay the full principal. This may result in misselling if it is sold to customer who may have had a short term need for cash or to a customer who is 70 years old.” ‘Group Code of Conduct: Leading by Example,’ Standard Chartered Bank, http://www.standardchartered.com/sustainability/files/sc_codeOfConduct_010405.pdf.

²The importance of the agency problem is noted, for instance, with regards to the recent turmoil in the US subprime mortgage market. Here, *The Economist* observes that “[m]any [customers] appear to have been encouraged to take out loans by brokers more bothered about their fees than their clients’ ability to repay their debts” and that “[m]any of the riskiest mortgages were made by independent, non-bank lenders.” (‘The trouble with the housing market’ (page 11) and ‘America’s housing market’ (page 79), March 24, 2007.)

³The liability risk for the seller increases if customers find it difficult to obtain compensation from small brokers and advisors. For instance, although independent financial advisers and mortgage brokers play an essential part in the UK retail finance sector, in recent misselling scandals the greatest burden of compensation was shouldered by financial institutions. The two largest scandals involved the alleged misselling of private pensions and endowment mortgages. After a full review in 1994, the first reportedly led to total compensation in excess of £12 billion. For the second, compensation is still being paid and

ply with the chosen standard of advice. Compliance by the sales agents is, however, costly for the firm, as it requires internal reviews and may also involve an increase in overall compensation, resulting in rents for the agents. Our first objective is to identify when an increase in these agency costs affects firms' incentives to adjust their standard and to become more tolerant towards misselling.

We show that the internal organization of a firm's sales process, the steepness of its agents' sales incentives (as determined by competition for customers), and the transparency of its commission structure all affect the firm's tolerance towards misselling. Importantly, it is only through the identified internal agency relationship that these factors start to affect the potential for misselling. Casting the firm instead as an entrepreneurial entity (akin to a self-employed lawyer or doctor, as in the extant literature on credence goods) would lead us to miss out on these factors. As we argue, this could be particularly problematic in evaluating the role and scope for possible policy intervention, say through imposing regulation or probing into cases of alleged misselling. In addition, while taking into account the agency problem internal to the firm strengthens the case for intervention, it also calls for policy makers and regulators to adopt a more fine-tuned approach, e.g., by adapting their response to the organization of sales processes and the prevailing competition.

The need for sales advice may be particularly acute in the case of retail financial services, such as mortgages or pensions (Campbell, 2006). Brokers or advisors often recommend specific products, after inquiring about the borrower's or investor's particular circumstances and needs. In the case of securities, the National Association of Security Dealers (NASD), the major self-regulatory organization in the US securities industry, requires that the recommendations made by brokers-dealers be "suitable" to the clients' needs.⁴ Brokers-dealers who make unsuitable recommendations are subject to NASD dis-

more than £2 billion has already been given to policyholders in redress.

⁴NASD Conduct Rule 2310(a) "Recommendation to Customers (Suitability)", originally adopted in 1939, prescribes: "In recommending to a customer the purchase, sale or exchange of any security, a member shall have reasonable grounds for believing that the recommendation is suitable for such customer upon the basis of the facts, if any, disclosed by such customer as to his other security holdings and as to his financial situation and needs." Added in 1991, Rule 2310 (b) "Broker's Duty of Inquiry" further requires: "Prior to the execution of a transaction recommended to a non-institutional customer, other than transactions with customers where investments are limited to money market mutual funds, a member shall make reasonable efforts to obtain information concerning: (1) the customer's financial status; (2) the customer's tax status; (3) the customer's investment objectives; and (4) such other information used or considered to be reasonable by such member or registered representative in making recommendations to the customer." Non-institutional customers are defined in Rules 2310(c) and 3110(c)(4). In addition, Rule 3010 imposes a duty of supervision on the firm employing the broker-dealer. See Lowenfels and Bromberg (1999) for an

ciplinary procedures, with right of appeal to the Securities and Exchanges Commission (SEC). According to Lowenfels and Bromberg (1999), “unsuitability claims are the most common and yet the most ambiguous of all customer claims.”

Beyond financial and insurance services, our model applies more broadly to situations in which agents are tempted to inflate the perceived value of products.⁵ For instance, a salesperson may praise certain features but hide others when trying to convince a client to switch to a particular calling plan, or utility contract, both of which may be sufficiently complex so as to make such deception successful.⁶

At the heart of our basic model lies a multi-task problem. The same agent must, first, locate potential customers and get them interested in the product and, second, provide customers with adequate product information and advice. It is through the incentives that agents require on the first task that they subsequently become tempted towards misselling. If the firm wants to ensure compliance to a high standard, it needs to monitor and control agents’ sales practices.⁷ Through the use of contingent commissions, which are clawed back in cases of alleged misselling or when dissatisfied customers cancel a contract, the resulting agency cost to the firm can be reduced. As we point out, agency costs may be more limited if advisors are to some extent relieved of the task of “marketing” the firm’s product (for example, when they are only advising incoming clients in a bank’s local branch, where client footfall is driven by the bank’s marketing campaign).

In our model, the product’s price is endogenously determined. The standard of advice set by the firm through its commission structure affects the customers’ willingness to pay, which in turn determines the maximum price that the firm can charge. On the other hand,

overview of the main regulatory and legal issues related to suitability in securities transactions.

⁵Section 2-315 of the US Uniform Commercial Code requires that: “Where the seller at the time of contracting has reason to know any particular purpose for which the goods are required and that the buyer is relying on the seller’s skill or judgment to select or furnish suitable goods, there is unless excluded or modified under the next section an implied warranty that the goods shall be fit for such purpose.”

⁶See the discussion by the UK telecommunication regulator in ‘Protecting Citizen and Consumers from Mis-selling of Fixed-Line Telecommunication Services,’ Notification of Modification to a General Condition, Office of Communications, April 13, 2005, <http://www.ofcom.org.uk/consult/condocs/misselling/statement.pdf>, and ‘Migration, Switching and Mis-selling,’ Consultation Document, Office of Communications, February 16, 2006, <http://www.ofcom.org.uk/consult/condocs/migrations/migrations.pdf>.

⁷This includes the employment of an internal compliance officer, regular auditing of agents’ “fact finds”, or the use of Customer Relationship Management (CRM) systems. Through these systems, the seller can limit the agent’s discretion about the selection of products deemed suitable to the customer’s needs. In addition, the audit trail for the transaction allows the seller to monitor more easily the agent’s performance and to resolve disputes over allegations of misselling.

the price also affects the firm’s incentives to expand sales by tolerating a lower standard of advice. Even though in our main analysis customers cannot observe the agent’s incentives, in equilibrium they have correct expectations about the commission structure and the resulting standard of advice.

Given that the expectation of misselling reduces the customers’ willingness to pay, the firm would benefit *ex ante* from committing to pay *ex-post* penalties for misselling. Firms might be able to achieve this commitment through self-regulatory organizations, such as the NASD. However, the standard of suitability achieved thereby may still be too low from a social planner’s perspective, creating a possible role for policy intervention. In addition to penalties for misselling, regulators could mandate disclosure of the commissions paid to sales advisers. In the UK, for example, financial advisers are required by the Financial Services Authority to disclose their compensation to customers.⁸ We show that when supported by public policy that makes such disclosure credible, the firm’s internal agency relationship may then be turned from a disadvantage into a strategic advantage, diminishing the need for further policy intervention. When the firm’s incentive scheme is credibly disclosed, the firm is partly deterred from lowering the standard due to the price reduction triggered by this change in standard.

The marketing literature has extensively analyzed the optimal compensation mix (salary and commission) for the salesforce, specifically examining the traditional trade-off between risk-sharing and incentives (see Basu, Lal, Srinivasan, and Staelin, 1985). We focus instead on the conflict between the sales agent’s incentives to prospect for customers and to provide adequate advice. The compensation needed to elicit effort on one task creates a conflict of interest between the firm and the agent for the second task. This conflict endogenously generates a multi-task agency problem (Holmström and Milgrom, 1991), analogous to the problems analyzed by Levitt and Snyder (1997) and Dewatripont and Tirole (1999) in different environments.⁹

Whereas in the literature on optimal delegation (e.g., Dessein, 2002, and Alonso and Matouschek, 2007) the preference divergence between a principal and an agent is given exogenously, in our model this conflict of interest derives from the compensation that the

⁸See Section 4.1 for further details.

⁹For other models of “delegated expertise” see Lambert (1986), Demski and Sappington (1987), Lewis and Sappington (1997), and Garicano and Santos (2004). More recently, also Athey and Roberts (2001) and Dessein, Garicano, and Gertner (2006) study the trade-off between high-powered incentives to induce effort and biased decision-making.

principal offers the agent. By adding this vertical layer, we can analyze how transparency of the contract between the firm and the agent affect equilibrium outcomes.

Our assumption that the principal (the firm) bears responsibility for the misdeeds of its agents has been investigated more broadly in the literature on vicarious liability (see for example Pitchford, 1995, and Che and Spier, 2006). Our paper speaks more generally to the question of how to design policy intervention if the targeted action—the quality of advice in our setting—is not carried out directly by the targeted firm. The consideration of the firm’s internal agency problem is crucial to determining what affects the need and scope for policy intervention.

Our focus on the firm’s agency problem is also novel to the literature on credence and experience goods, following Darby and Karni (1973). In their analysis of the incentives for information provision by sellers of financial products, Bolton, Freixas, and Shapiro (2005) compare the performance of different organizational structures (one-stop versus universal banking), but do not consider explicitly the firms’ internal agency problem. DeMarzo, Fishman, and Hagerty (2005) analyze the choice of anti-fraud standards by a self-regulatory organization, abstracting from the agency problem between the seller and its sales agent. By spelling out this agency problem, instead, we can analyze the two-way interaction between the internal organization of the sales process and the regulatory framework.¹⁰

The rest of the paper is organized as follows. Section 2 introduces the fundamental agency problem in the most basic model. The agency model is embedded in a market setting in Section 3 and it is put to various applications in Section 4. Section 5 concludes. All proofs are collected in Appendix A. Appendix B discusses optimal task allocation.

2 Marketing Agency Problem

In this section we formulate a streamlined model of the firm’s agency problem, on which the rest of the paper builds. Consider a (risk-neutral) firm selling a single product through an agent. By exerting sales effort at private disutility $c_S > 0$, the (risk-neutral) agent obtains a contact with a potential customer with probability $\mu > 0$. Think of the agent as

¹⁰In their factual account of the UK pension misselling scandal, Black and Nobles (1998) also stress this interaction while arguing that this episode “demonstrates all too clearly that regulation has to be treated as an issue which is central to management strategy.”

either contacting previous clients or prospecting new clients. Moreover, the cost c_S may be required to explain some features of the possibly novel product to customers.

In addition, the agent can assist customers in deciding whether the product is suitable for their specific needs. More precisely, we stipulate that there are two types of customers, $\theta = l, h$, who derive utilities $u_l < 0 < u_h$ from consuming the good.¹¹ The prior probability that $\theta = h$ is given by $0 < \pi < 1$, which is also the only information that the customer has. In contrast, the agent learns the customer's type. Because this is not key to our analysis, until Section 4 we specify that this information is available to the agent at no additional cost. We assume that $u_\emptyset := \pi u_h + (1 - \pi)u_l < 0$, which makes it always unprofitable to sell the product without giving advice.

Contracts cannot be based directly on the agent's effort and the customer's type, because they are not observed by the firm. Instead, the firm can condition the payment, first, on whether a sale has been made and, second, on a post-sale signal about whether the product indeed was suitable for the customer. We specify that this signal reveals with probability $0 < \psi < 1$ whether a sale was made to a type- l customer.¹² Such a signal could be produced through an internal sales review process.¹³

In the context of this section's simplified model, we posit that the firm wants the agent to sell only to high-type customers.¹⁴ The firm's objective then is simply to choose a compensation scheme that minimizes the respective wage costs. As the agent is protected by limited liability and as we set his market wage to zero, the agent should optimally receive a zero wage when the information revealed after a sale indicates that the customer was of type l . That leaves us with two compensation levels for the other two verifiable states: a wage of w_1 if no sale is made, and a wage of w_2 if no such negative information

¹¹Utilities are taken to be net of the respective next-best option. For instance, retail investment products may have a particular risk-return profile that is not optimal for all investors. Likewise, one product may create a particular tax advantage, though possibly at the cost of higher risk.

¹²All of our results hold if we instead assume more symmetrically that, following a sale to *any* type of customer, an informative but noisy signal $s \in \{l, h\}$ is revealed. Also, we could allow for ψ to be endogenous, in which case the firm's total costs of controlling the agency problem would include the respective expenditures besides the agent's rent. These changes, however, would complicate the expressions in the extended model analyzed in Sections 3 and 4.

¹³One example is given in a case description by the Financial Services Authority (see <http://www.fsa.gov.uk/pages/Doing/Regulated/tcf/case/networks.shtml>). There, it is reported that the particular firm has a target of "checking 10% of fact finds" for each appointed representative and for each adviser.

¹⁴In Section 3's richer model, we endogenize the firm's choice of which customers to serve depending on the legal consequences and reputational costs following misselling.

is received following a sale. Because the agent's expected payoff from a sale to a type- l customer is $(1 - \psi)w_2$, it must thus hold that

$$w_1 \geq (1 - \psi)w_2 \tag{1}$$

to ensure that only type- h agents purchase.¹⁵ To guarantee that the agent does not sell indiscriminately to all customers, the wage w_1 must thus be large enough to compensate the agent for the payoff foregone when not recommending a purchase. Intuitively, condition (1) is easier to satisfy if a deviation (i.e., misselling to a low-type customer) is detected with a higher probability ψ .

In addition, the compensation scheme must incentivize the agent to exert sales effort and to contact a customer in the first place. Recall here that, once cost c_S is incurred, there will be a subsequent sale only with probability $\mu\pi$, given that a potential customer is located with probability μ and that the fraction of high types is π . Because the agent receives w_1 when not concluding a sale, he will only exert effort if

$$\mu\pi(w_2 - w_1) \geq c_S. \tag{2}$$

That is, the bonus (or commission) $w_2 - w_1$ that the agent realizes when making a sale to a high-type customer must be sufficiently large. Condition (2) is easier to satisfy if it is more likely overall that a sale is made after incurring cost c_S .

Intuitively, in order to minimize the respective wage costs, both constraints (1) and (2) must be binding. We find that the firm's wage costs then are equal to $c_S + w_1$, which comprise the agent's compensation for sales effort, c_S , and the agent's rent, w_1 . The latter is intuitive because the agent can always ensure himself a wage of w_1 , even without exerting sales effort.

Proposition 1 *To ensure that the agent both exerts effort to contact customers and subsequently advises only type- h customers to buy, the firm must incur total costs of*

$$c_S + c_S \left(\frac{1 - \psi}{\psi} \frac{1}{\mu\pi} \right). \tag{3}$$

¹⁵As is immediately apparent, the agent under the optimal contract will strictly prefer to advise high-type customers to buy. Note also that we currently assume that the customer follows the agent's advice. In the extended model, the firm's choice of the product's price will ensure that this is always the case.

The key to Proposition 1 is that the firm cannot compensate the agent independently for the two tasks. The agent may not sell to a customer for two reasons: either the agent failed to prospect for a customer (which is bad news about the agent’s search effort), or an unsuitable customer was located (indicating proper search and advice by the agent). This attribution problem creates the conflict between the tasks of search and advice. Instead, if it was verifiable whether the agent contacted a customer, then the firm could directly compensate the agent for the associated effort cost c_S , thereby ensuring that the respective reward would not bias the agent towards recommending customers to purchase the product.¹⁶

The following comparative results follow immediately from Proposition 1.

Corollary 1 *The firm’s cost of preventing misselling to low-type customers is strictly increasing in the cost of sales effort, c_S . In addition, the firm’s cost is strictly higher if it is less likely that the effort results in a sale as either μ or π are lower, and if detection of misselling is less likely as ψ is lower.*

For our further analysis the first assertion in Corollary 1 will prove to be key. From this assertion, the agent’s rent—which is borne by the firm to prevent selling to low-type customers—is strictly increasing in the agent’s cost of sales effort, c_S . This interdependence is due to the agent’s multi-task problem. To bring this out more clearly, it is helpful to introduce at this point a slight change in notation. From now on, we refer to $w = w_1$ as the agent’s base salary, which is paid even when no sale is made. When making a sale that is not subsequently contested, the agent realizes in addition the bonus $b := w_2 - w_1$. With this change in notation, we can rewrite the agent’s binding constraint (2), which must hold to elicit sales effort, as

$$b = \frac{1}{\pi} \frac{c_S}{\mu}.$$

Hence, a higher bonus is necessary after an increase in c_S or a decrease in $\pi\mu$. In either case, generating a suitable sales opportunity is more costly for the agent, implying that incentives must increase. But the higher are the agent’s incentives, the more the agent is tempted to subsequently missell to a low-type customer. Transforming the respective

¹⁶Also, paying the agent a rent would no longer be necessary if the customer type was verifiable. In that case, the firm could simply specify $w_l = 0$ for a sale to a low-type customer and $w_h = c_S/(\pi\mu)$ for a sale to a high-type customer.

binding constraint (1) into the requirement that

$$w = b \left(\frac{1 - \psi}{\psi} \right),$$

we see that the firm must in turn make it more attractive for the agent not to sell at all, which is done through an increase in his base salary w . Hence, when the task of locating potential customers and generating interest in the product becomes more difficult, the firm must increase not only the incentive pay but also the base salary to make sure that the agent performs on both of his tasks. Intuitively and as confirmed also by Corollary 1, the extent to which the firm must pay the agent a rent through the base salary is determined as well by ψ , which captures the severity of the firm's internal agency problem.

3 Misselling in Market Equilibrium

To isolate the firm's agency problem, our basic model specified that the agent can discriminate perfectly between customer types. To obtain a richer set of results in what follows, we extend the model to more gradually capture the extent of possible misselling. We do so by stipulating from now on that the agent only observes a noisy signal $s \in [0, 1]$ of the customer's type. We specify that s is realized according to the prior distribution $F(s)$ with density $f(s)$ and that the conditional probability $q(s) = \Pr[\theta = h \mid s]$ is strictly increasing. It is also convenient to assume that $q(s)$ is continuous with $q(0) = 0$ and $q(1) = 1$.¹⁷

Now the firm can control the agent's actions more gradually. The firm's strategy is to implement a threshold signal, or "standard of advice", s^* , such that the agent only advises a customer to purchase the product if $s \in [s^*, 1]$. Using continuity of the conditional probability $q(s)$, incentive compatibility requires that at s^* the agent is indifferent between making a sale or advising against a purchase.

We proceed by breaking the firm's problem into a computation of the costs and benefits of the agent's standard of advice, following Grossman and Hart's (1983) two-stage

¹⁷It is immediate to endogenize this structure. For this, suppose that s is realized according to the type-dependent distribution function G_θ and that signals are ordered such that G_h dominates G_l in the Monotone Likelihood Ratio order. With densities satisfying $g_h(1) > 0$, $g_l(0) > 0$, and $g_h(0) = g_l(1) = 0$, the signal is fully informative at the boundaries. Define then $F(s)$ with density $f(s) := \pi g_h(s) + (1 - \pi)g_l(s)$ and finally

$$q(s) := \frac{\pi g_h(s)}{\pi g_h(s) + (1 - \pi)g_l(s)}.$$

approach. After deriving the incentive constraints for the agent in Section 3.1, in Section 3.2 we characterize the least-cost way of implementing a given standard with which the firm wants the agent to comply. In Section 3.3 we set up the firm's maximization program, which trades off the penalties for misselling with the agency costs associated to marketing, when the product's price is determined by the customers' expectation about the standard. In Section 3.4 we characterize the equilibrium that results by imposing that the product's price is equal to the customers' willingness to pay given the suitability standard optimally set by the firm. We conclude in Section 3.5 by discussing the role of the agency problem.

3.1 Incentive Constraints

Recall that from an uncontested sale the agent realizes the bonus b next to the base salary w , while his payoff is zero if a sale was subsequently contested, which now is the case with probability $\psi [1 - q(s)]$. For what follows, it is convenient to express the agent's expected payoff for a given s by

$$V(s) := [1 - \psi [1 - q(s)]] (w + b). \quad (4)$$

Hence, for the agent to be indifferent at $s = s^*$, it must thus hold that $V(s^*) = w$. Substituting from the definition of $V(s)$ in (4) and rearranging terms, this requirement becomes

$$\frac{b}{w} = \frac{\psi [1 - q(s^*)]}{1 - \psi [1 - q(s^*)]}. \quad (5)$$

Condition (5) is already revealing about the structure of compensation. Intuitively, the ratio of the sales commission to the salary, b/w , must be lower if the firm wants to ensure compliance with a higher standard s^* . On the other hand, the ratio b/w can be higher for given s^* if the firm can better control misselling.

Turning to the agent's incentive constraint for prospecting for customers at the initial stage, observe that now by exerting sales effort at private costs c_S , the agent ultimately realizes a sale only with probability μ times $1 - F(s^*)$. Again noting that the agent earns the salary w even without a sale, the agent's incentive constraint at the initial stage becomes

$$\mu \int_{s^*}^1 [V(s) - w] f(s) ds \geq c_S. \quad (6)$$

That is, there must be a sufficiently large “wedge” between the expected compensation from a sale in case $s \geq s^*$ and the base salary w so as to make exerting effort worthwhile to the agent. The incentive constraint (6) will again be binding. It is further convenient to rewrite the binding constraint as

$$\int_{s^*}^1 [V(s) - w] f(s) ds = \Delta := \frac{c_S}{\mu}. \quad (7)$$

Note that $\Delta = c_S/\mu$ is also an agent’s *expected* cost to locate a single potential customer, given that his effort leads to a contact only with probability μ . Hence, Δ represents a combined measure for the incentives the firm must provide to ensure that the agent exerts effort. The higher Δ , the more incentives the firms must give to its agent.

3.2 Optimal Compensation

For a given choice of standard s^* , the optimal contract (w, b) minimizes the firm’s respective wage costs. The contract is uniquely pinned down by the two binding incentive constraints, (5) and (7). Substituting for $V(s)$ from (4), we then can solve for the respective salary

$$w = \frac{\Delta}{\psi} \left[\frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right] \quad (8)$$

and bonus

$$b = \Delta \left[\frac{1 - q(s^*)}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right]. \quad (9)$$

Proposition 2 *To ensure the agent’s compliance to some standard s^* , the firm’s optimal incentive scheme prescribes the salary w as in (8) and the bonus b as in (9). The higher s^* , the more costly it is for the firm to ensure compliance, given that w must increase. Also, w increases in the agent’s expected sales cost Δ and decreases in the quality ψ of ex-post information.*

Proposition 2 mirrors the results from the basic model (cf. Proposition 1 and Corollary 1). Intuitively, the firm’s overall cost of both incentivizing the agent and ensuring compliance to a given standard s^* , which are again equal to the sum of the effort cost c_S and the agent’s rent w , are strictly lower the better the firm can control the agent through better feedback and information ψ . Also, as discussed in detail after Corollary 1, the costs to

ensure internal compliance are higher the harder it is for the agent to generate a potential customer (higher Δ).

The novel feature in Proposition 2 is that the costs to ensure compliance are also increasing in the targeted standard s^* . This may at first not be entirely obvious given that the agent does not incur any direct costs *per se* when adopting a higher standard. An agent who is supposed to follow a more stringent standard will, however, turn a contact into a sale only with a strictly lower probability. To then still make it worthwhile for the agent to exert sales effort initially, the firm has to step up the agent's incentives. Formally, this can be seen from the monotonic relationship between b and s^* in (9). As the increased incentives subsequently tempt the agent even more to advise a customer to purchase the product to still ensure compliance to the targeted standard s^* , the firm must respond by increasing w according to the characterization in (8).

While Proposition 2 reports how the firm's absolute cost changes in the underlying parameters, what turns out to be more important in what follows is how the firm's marginal cost of raising the standard, dw/ds^* , changes. Twice differentiating (8), we obtain the following result.

Corollary 2 *The firm's marginal cost of raising the standard s^* is strictly increasing in Δ and strictly decreasing in ψ .*

As the agent has to be given higher incentives to make a sale or as it becomes harder for the firm to control the agent, this both raises the firm's total cost for a given sales standard s^* (cf. Proposition 2) and makes also any marginal increase in s^* more costly (cf. Corollary 2).

3.3 Firm's Problem

Before we can make use of the preceding results to explore the firm's optimal choice of the standard, to which it wants the agent to comply, we first have to set up the firm's overall program. For this, note first that customers can neither directly observe the agent's signal s nor the standard s^* that the firm enforces internally.¹⁸ What could keep the firm from lowering s^* , though, is the danger of losing reputation in case of alleged misselling.

¹⁸This also precludes the possibility of credibly disclosing to customers the agent's incentive scheme. Compare, however, Section 4.

As already noted in the introduction, the firm may also face legal costs and may have to pay compensation following prosecution for misselling, irrespective of whether the agent is the firm’s own employee or whether the firm sells through independent intermediaries. In regulated sectors, the firm also may face the risk of losing its licence, being brought under closer regulatory scrutiny, or facing lowered chances of successfully contesting any future disciplinary action for alleged misconduct.¹⁹

We choose to model these costs in a parsimonious way by stipulating that the firm incurs an expected penalty ρ when selling to a low-type customer.²⁰ Denoting the product’s price by p and normalizing the costs of serving a customer to zero, the firm’s expected gross profits are

$$\Pi_G := \mu \int_{s^*}^1 [p - [1 - q(s)]\rho] f(s) ds, \quad (10)$$

and its net (of wages) profits are $\Pi := \Pi_G - c_S - w$.²¹

It is worthwhile to note as well that the only way the firm could be sure not to incur the penalty ρ is by foregoing any sale through setting $s^* = 1$. Hence, our set-up precludes the somewhat unrealistic case where a policymaker could enforce a particular standard s^* by imposing some draconian punishment that would never be executed in equilibrium. We postpone until Section 4 a further discussion of how policy makers may want to influence ρ .

3.4 Equilibrium

To solve for the equilibrium standard s^* , recall again that the firm’s additional costs of ensuring compliance are equal to the agent’s rent w . Holding constant the price p for now, the firm’s first-order condition with respect to s^* is $d\Pi_G/ds^* = dw/ds^*$. Substituting for

¹⁹As explained by Lowenfels and Bromberg (1999), NASD and SEC suitability rules constitute an “ethical standard of due care and fair dealing between brokers and customers.” NASD members who violate Rule 2310 (see note 4) are fined and suspended, but typically customers are unable to obtain compensation for damages. Traditionally, customers may obtain private damages only by demonstrating fraud and breach of fiduciary duty, which requires a much more stringent burden of proof compared to suitability violations.

²⁰The likelihood that disgruntled customers lodge complaints, or that sufficient information of alleged misselling surfaces, may be low. Still, ρ can be substantial if the imposed penalty is itself sufficiently large.

²¹As we argue in Section 4, the assumption that the firm earns the same margin (gross of ρ) independent of the agent’s type is not important for our qualitative results. There, we derive additional implications for the more general case in which the cost of serving different customers is type dependent.

w from (8) and for Π_G from (10), this more explicitly becomes

$$\begin{aligned} & -f(s^*)\mu [p - [1 - q(s^*)]\rho] \\ = & \frac{\Delta}{\psi} \frac{d}{ds^*} \left(\frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right). \end{aligned} \tag{11}$$

From Proposition 3 we know that the right-hand side of (11) is strictly positive, because it is more costly for the firm to ensure compliance to a higher standard s^* . A first insight from this observation is that the firm actually would *not* like to make a sale to the customer at the optimally implemented standard s^* , given that $p - [1 - q(s^*)]\rho < 0$. However, implementing a lower standard than what would be *ex-post* optimal for the firm is in turn optimal from an *ex-ante* perspective, because it involves lower costs of subsequently ensuring compliance.

In what follows, we assume for brevity that the firm's program is strictly quasiconcave: the first-order condition (11) is also sufficient and pins down a unique solution. We denote this solution by \widehat{s}^* , which is a continuous function of all other parameters of the model. We can next derive some intuitive comparative results for \widehat{s}^* . Recall for these that from Corollary 2 the marginal cost dw/ds^* of raising s^* is strictly higher either if Δ increases such that sales incentives have to be stepped up or if ψ decreases such that the firm finds it harder to control the agent. From implicit differentiation of the first-order condition (11) we then have that *ceteris paribus* \widehat{s}^* is strictly lower if the agent's sales incentives are higher (higher Δ) or if the firm has less control over the agent (lower ψ). We can also conduct a comparative analysis with respect to the newly introduced parameters ρ and p , both of which appear only on the left-hand side of the first-order condition (11). Intuitively, the marginal gross profits from expanding sales through a lowering of s^* are higher if the product commands a higher price p and lower if the penalty ρ is higher. By implicit differentiation of (11), \widehat{s}^* then is strictly increasing in ρ and strictly decreasing in p . Summing up, we have the following comparative results.

Lemma 1 *Holding all else constant, the firm's optimal choice of the standard, \widehat{s}^* , is continuous and monotonic with $d\widehat{s}^*/d\rho > 0$, $d\widehat{s}^*/dp < 0$, $d\widehat{s}^*/d\Delta < 0$, and $d\widehat{s}^*/d\psi > 0$.*

Next, we endogenize the product's price p . If a customer follows the agent's recommendation, then for given s his expected payoff is

$$U(s) := q(s)u_h + [1 - q(s)]u_l - p.$$

However, the realization of s is not known to the customer. The maximum price that the firm can charge thus depends on the customers' expectation about the implemented standard s^* . The customer will only follow the agent's advice if $\int_{s^*}^1 U(s)f(s)ds \geq 0$. As we show, by optimality for the firm, this condition will bind in equilibrium. This gives rise to a price

$$\widehat{p}(s^*) := \frac{\int_{s^*}^1 [q(s)u_h + [1 - q(s)]u_l] f(s)ds}{1 - F(s^*)}. \quad (12)$$

Intuitively, when the seller is expected to enforce a more stringent standard, the customer is willing to pay more for the product.

Lemma 2 *The price the seller can charge, $\widehat{p}(s^*)$, is a strictly increasing and continuous function of customers' anticipated selling standard s^* .*

The equilibrium is pinned down by the requirements that $p = \widehat{p}(s^*)$ and that the anticipated standard s^* is indeed optimal for the firm: $s^* = \widehat{s}^*(p)$.

Before characterizing the equilibrium, we comment on the derivation of $\widehat{p}(s^*)$ in equation (12). In some cases regulation may deprive the firm of full control over the price p . As it turns out, though, our subsequently derived key results that hold with an endogenous price $\widehat{p}(s^*)$ mirror those from Lemma 1, where we only considered the firm's optimization problem and left the price unchanged. Furthermore, ρ affects $\widehat{p}(s^*)$ only indirectly, through the standard s^* that prevails in equilibrium. This should hold if firms care about their reputation or if ρ represents penalties imposed by a regulator, including the withdrawal of the firm's licence.²²

Proposition 3 *There is a unique equilibrium in which the implemented standard s^* is strictly lower the higher are the agent's sales incentives Δ , the lower is the expected penalty ρ , and the lower is ψ (as the firm's internal agency problem worsens).*

While the expected penalty for misselling imposes an ex-post cost for the firm, it also increases the firm's standard and therefore the price the firm can charge for its product ex ante. This channel is partly present even in the absence of the agency problem—what is then the role played by the agency problem?

²²If instead ρ also comprised compensation to customers in case the firm is successfully prosecuted for misselling, there would be an additional level change in $\widehat{p}(s^*)$. This variation would not qualitatively alter our analysis, but would complicate it.

3.5 Role of Agency

To understand the role of the agency problem, it is useful to briefly consider the case of an entrepreneurial firm's owner who sells directly to customers. For a firm that does not hire an agent, the right-hand side of the first-order condition in (11) would become zero. A first implication of this is that while also an entrepreneurial owner would incur the cost of sales effort c_S , this cost would no longer affect the incentives to advise customers and thereby ultimately the optimal choice of s^* . Compared to Proposition 3, the only comparative result that would still apply then is that s^* increases in ρ . Moreover, because replacing the agent with an entrepreneurial owner is, albeit in an extreme way, akin to reducing the firm's internal agency problem, we know from the comparative results with respect to ψ that the equilibrium standard s^* would also be higher.

Combining the results from Proposition 3 and this discussion of the case without the internal agency problem, we conclude that taking into account the firm's internal agency problem is important in two respects. First, there is a level effect on the equilibrium standard. Because the agency problem increases the firm's marginal cost from raising the standard s^* , the equilibrium standard will be lower.

Second, because of the agency problem, s^* becomes dependent on additional parameters that would be completely ignored when casting the problem as one of an entrepreneurial (owner-managed) firm. This naturally holds for all factors that determine the severity of the agency problem, which we captured by ψ , representing the precision and timeliness of any information about the agent's advice. In addition, through the interdependence of the agent's tasks, s^* becomes dependent on the sales incentives that the firm must give to its agent. Here, we could imagine, for instance, that Δ is higher in a more competitive market place as, in this case, it will be harder for an agent to locate an interested customer, given that any prospected customer may already have bought or may currently be contemplating purchasing an alternative product. Consequently, as other firms step up their sales efforts or make their offers more competitive, a higher Δ would then also require higher sales incentives for an individual firm.²³ We know that optimally the firm will then also tolerate a lower standard s^* , given that a higher Δ raises the marginal cost of increasing s^* .

²³Clearly, there could also be other reasons why a firm would want to provide higher sales incentives. For instance, a firm may want to enter a new market where its products are little known.

4 Applications

In this section, we use the insights from Proposition 3 in a number of applications. To sharpen the analysis, we focus on how the firm’s internal agency problem affects the scope for policy intervention. Recall here that we offered several interpretations of ρ , in terms of the reputational costs of alleged misselling, or the penalties imposed by courts or regulators. Now we ask generally about the level of ρ that is required, and how it changes, so as to ensure that a certain (targeted) standard s_T^* arises in equilibrium.²⁴ Such an adjustment to ρ could result from a change in public policy.²⁵ The comparative analysis in Proposition 3 then implies the following:

Proposition 4 *Suppose that the firm’s expected cost from selling to low-type customers ρ depends on the chosen public policy. In order to achieve a targeted standard s_T^* , this policy has to become stricter in case the agent’s sales incentives are higher (higher Δ) or the firm has less control over the agent (lower ψ).*

Proposition 4 provides a starting point for our subsequent analysis, where we further analyze how policy may have to adjust as firms’ own incentives to ensure compliance to some standard of advice depend on the specific circumstances. Such a comparative analysis still begs, however, the question of whether policy intervention is warranted in the first place. If $\rho = 0$, then customers would rationally anticipate that as long as the firm earns a positive margin it still has incentives to reduce s^* .²⁶ This observation also implies that it is ultimately in the firm’s own interest to achieve commitment to a higher standard. Absent policy intervention, this could be achieved through (industry-wide) self-regulation.²⁷ Arguably, these institutions would ultimately have less power and fewer means to enforce standards and discipline members, while potentially suffering from

²⁴We intentionally sidestep the issue of how s_T^* might be determined, e.g., from a program to maximize welfare. This would require to impose considerably more structure, in terms of specifying both a cost function associated with identifying and prosecuting alleged misselling as well as what fraction of ρ represented deadweight loss.

²⁵For instance, Black and Nobles (1998, page 812) document how public policy responded, albeit slowly, to concerns about potential pension misselling in the UK. Besides a reorganization of the oversight of pension sales, regulation was tightened with a clearer specification of the suitability rule and an increased monitoring of “fact find” documents.

²⁶More precisely, in this case no standard $s^* > 0$ for which still $\hat{p}(s^*) > 0$ holds can then be sustained as an equilibrium.

²⁷In addition, one could also think about the issuance of warranties or, in the case of long-term contracts, about granting customers the right of early cancellation.

problems of free-riding and coordinating the interests and activities of many, possibly heterogeneous members.

If we nevertheless suppose that through self-regulation a firm could avail itself of the same “technology” as public policy intervention, which we captured by the penalty ρ , then the firm would choose ρ so as to optimally trade off the respective cost with the endogenously higher $\widehat{p}(s^*)$ that the resulting commitment to a higher standard would support. In the absence of an internal agency problem (that is, if the agent was in fact the entrepreneurial owner of the firm, as in the discussion following Proposition 3) we would not have to consider any further costs. If a policymaker puts the same weight on ρ as the firm itself—say because it all represents deadweight loss—then in this case the firm’s privately optimal choice of ρ , and thus of s^* , would equal the social optimum. In the presence of an internal agency problem, though, we know that the firm faces an additional marginal cost of raising s^* , leading to an equilibrium standard s^* under self-regulation that is below the socially optimal level.²⁸ In conclusion, the amount of misselling even with perfect self regulation would still be above the socially optimal level, justifying policy intervention even in this case.

4.1 Transparency of Commissions

As noted above, the choice of s^* represents a commitment problem. So far, the presence of the agency relationship worsens this commitment problem by raising the firm’s marginal cost of choosing a higher standard s^* . We show that the agency relationship can, however, be turned into an advantage if the firm could credibly disclose the agent’s compensation.

Recall that so far the standard $s^* = \widehat{s}^*(p)$ together with the prevailing price $p = \widehat{p}(s^*)$ were jointly determined in equilibrium, given that the firm’s ultimate choice of s^* was not observable to customers. By committing to a disclosed choice of (w, b) , though, the firm would be able to pick its optimal choice of s^* , which is clearly more profitable. The crux, however, is that the firm may then want to secretly deviate by subsequently adjusting its agents’ incentives.

The characterization of the equilibrium with transparent incentives is relatively simple.

²⁸Recall that this holds because the rent that is left to the agent represents merely a transfer from a social planner’s perspective. Furthermore, the preferences of the firm and the social planner may also diverge in other respects. For instance, the firm may wish to step up its sales incentives and thereby tolerate a lower standard of s^* so as to steal market share from its competitors.

The firm's optimization problem simplifies to the maximization of its profits Π w.r.t. s^* , where we substitute $p = \widehat{p}(s^*)$. If we still assume that the respective program is strictly quasiconcave, then s^* is now characterized uniquely by the respective first-order condition

$$\begin{aligned} & \mu \frac{d\widehat{p}(s^*)}{ds^*} [1 - F(s^*)] - f(s^*) \mu [\widehat{p}(s^*) - [1 - q(s^*)]\rho] \\ &= \frac{\Delta}{\psi} \frac{d}{ds^*} \left(\frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right). \end{aligned} \quad (13)$$

That is, the key difference from the previous problem, where the incentive scheme was not disclosed, lies in the first term: it captures the impact of a change in s^* on the maximum feasible price. Because this term is strictly positive, comparing (13) to (11) for the case with non-transparent contracting yields the following:

Proposition 5 *If the firm's incentive scheme can credibly be made transparent, then for a given ρ there will be a strictly higher choice of s^* .*

A further implication of Proposition 5 is that, under such disclosure, only a lower level of ρ is required to implement a certain targeted standard, s_T^* . If the firm's incentive scheme is credibly disclosed, then the price reduction provides an immediate feedback mechanism through which the firm suffers from a lower s^* . Suppose next that $\rho = 0$ and substitute this together with $u_\varnothing(s) := q(s)u_h + [1 - q(s)]u_l$ into (13). Then after substituting out for $d\widehat{p}(s^*)/ds^*$, we have in equilibrium that

$$\frac{1}{f(s^*)} \frac{1}{\mu} \frac{\Delta}{\psi} \frac{d}{ds^*} \left(\frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right) = -u_\varnothing(s^*), \quad (14)$$

That is, with $\rho = 0$ the firm would want to commit to choose s^* so as to equate the marginal cost from its internal agency problem to the marginal benefits in terms of a higher price. The marginal costs are stated on the left-hand side of (14), while the right-hand side captures the marginal change in customer utility, $-u_\varnothing(s^*)$, equal to the amount of the lost utility when the customer no longer buys at the marginal signal. Without the internal agency problem, (14) would imply that $u_\varnothing(s^*) = 0$, though in this case the entrepreneurial firm could not credibly use a disclosed incentive scheme as a commitment device.

The conclusion that the firm benefits from committing to a transparent incentive scheme relies squarely on the customer's ability to infer that a lower commission reduces

the agent’s incentives to missell, thereby increasing the average value of the product that is sold. If customers were instead unable to make such a sophisticated inference, this commitment effect would be clearly absent.

The firm might find it difficult to commit to transparency in a credible way, given that agents are compensated not only through explicit but also through implicit incentives. If customers could observe only part of the compensation, the firm would have a secret incentive to increase the unobservable elements of the commission. Policy intervention may provide firms with a means to commit more easily to credibly disclosing the incentives of their agents. For instance, in the UK the Financial Services Authority has recently imposed the requirement that financial advisors disclose information about their compensation by mandating a Fee and Commission Statement.²⁹

4.2 Organization of Sales Process

So far our analysis has focused on the case where the firm’s agents performed both the “marketing” task of contacting potential customers and that of advising customers. Firms whose products enjoy only little awareness in the market may have to rely on direct marketing, while for other firms and products this may not be the case. For instance, a brick-and-mortar bank could rely on the fact that its existing clients regularly frequent the bank’s branches and can at this occasion be informed about new savings or loan products. In addition, for some products it may not be feasible to conduct business off the firm’s premises while for other products such as personal loans legal restrictions may limit the use of prospecting.

In this section, we explore how such a different organization of the sales process affects the prevailing standard s^* . To render the case with split tasks non-trivial, we now suppose more generally that the agent has to incur private costs $c_A \geq 0$ in order to acquire a signal s . For instance, the agent may have to spend time and effort to familiarize himself with the personal circumstances of a particular customer.

Provided that the agent observes s , the subsequently applied threshold s^* is still determined by condition (5). Irrespective of the organization of the sales process, for $c_A > 0$ we

²⁹See ‘Reforming Polarisation: Implementation,’ Policy Statement 04/27, http://www.fsa.gov.uk/pubs/policy/ps04_27.pdf. Similarly, the German Federal Court of Justice (BGH) has ruled in February 2007 that banks and their advisors must disclose the commissions they receive from the investment funds they recommend to their customers.

now encounter an additional constraint. If the agent shirks and thus does not observe s , then he could indiscriminately recommend customers either to purchase or not to purchase. Consequently, the agent will only refrain from shirking at this stage if

$$F(s^*)w + \int_{s^*}^1 V(s)f(s)ds - c_A \geq \max \left\{ w, \int_0^1 V(s)f(s)ds \right\}. \quad (15)$$

If the agent also performs the task of contacting customers, then to elicit sales effort it must hold that

$$\mu \left[\int_{s^*}^1 [V(s) - w] f(s)ds - c_A \right] \geq c_S, \quad (16)$$

where compared to the previous condition (6) we now take into account the agent's subsequent cost c_A .

From the analysis in the preceding section we know that the compensation that the agent must obtain for his sales effort biases him towards applying a lower standard s^* . If the agent now no longer performs both tasks, then it is intuitive that the firm's marginal cost of raising s^* is lower. This observation gives then rise to the following result.

Proposition 6 *If the sales process for some product is organized such that the advising agent is not responsible for contacting customers, then for a given ρ the choice of s^* is strictly higher.*

A further implication of Proposition 6 is that in the absence of the multi-task problem, only a lower level of ρ is required to implement a certain targeted standard, s_T^* . Building on the analysis in this section, Appendix B compares the firm's profits under task separation and integration in various scenarios.

4.3 Contractual Limitations to Reduce Misselling

To implement an increasingly higher standard s^* the firm has to leave the agent with an always higher rent.³⁰ This may not only become too costly for the firm, but it may not be feasible as the high base salary makes working for the firm increasingly attractive even for agents with little or no skill and expertise in acquiring customers.³¹ For simplicity, we thus

³⁰In fact, from (8) we have that $w \rightarrow \infty$ as $s^* \rightarrow 1$.

³¹In the corporate finance literature, the latter agents are often called "fly-by-night" contractors. The existence of such unserious or fraudulent agents is typically invoked there to rule out flat (up-front) payments in financial contracts.

assume now that $w = 0$ must hold so that the agent can be incentivized to forego a sale to certain customers only through threat of being fired, in analogy to the efficiency-wage literature.³² We take a stationary incentive scheme such that the agent is fired with some probability v if negative information is revealed after a sale. It is straightforward to show that setting $v = 1$ is uniquely optimal as it minimizes the agent's rent.³³ Denoting the agent's (also stationary) rent by R and his discount factor by δ , conditional on a signal s his expected payoff from a sale is then

$$V(s) := [1 - \psi [1 - q(s)]] [b + \delta R], \quad (17)$$

while without a sale he realizes δR . Consequently, indifference at s^* now requires that $V(s^*) = \delta R$, which after substitution from (17) yields

$$\frac{b}{R} = \delta \frac{\psi [1 - q(s^*)]}{1 - \psi [1 - q(s^*)]}. \quad (18)$$

Note now that

$$R = \mu \left[F(s^*) \delta R + \int_{s^*}^1 V(s) f(s) ds \right] + (1 - \mu) \delta R - c_S,$$

which together with (17) and (18) finally yields

$$R = \frac{c_S}{\delta \mu \psi \left[\frac{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds}{1 - \psi [1 - q(s^*)]} \right] - (1 - \delta)}. \quad (19)$$

From (19) we see that all our previous comparative results continue to hold: through the agent's rent it is more costly for the firm to ensure compliance to some standard s^* if c_S/μ is higher or ψ is lower. (Formally, we now have that dR/ds^* is strictly higher if c_S/μ is higher or ψ is lower.) In addition, from inspection of (19) we have the following new insight:

Proposition 7 *Suppose the firm can punish the agent only by severing the relationship. Then the firm can only ensure compliance to standards $s^* \leq \bar{s}^* < 1$, where \bar{s}^* is defined by*

$$\frac{1 - \psi [1 - q(\bar{s}^*)]}{\int_{\bar{s}^*}^1 [q(s) - q(\bar{s}^*)] f(s) ds} = \frac{\delta}{1 - \delta} \mu \psi. \quad (20)$$

³²See Shapiro and Stiglitz (1984) and Akerlof and Yellen (1986) for early contributions to the efficiency-wage literature.

³³The stationary incentive scheme is also indeed optimal if we stipulate that, first, replacing the agent comes at no additional cost to the firm, and that, second, opportunism on the part of the firm makes it impossible to withhold commission for the purpose of building up an "account" from which then subtractions could be made as a form of punishment.

Hence, a policymaker's target s_T^* above \bar{s}^* would not be feasible. Also, when the standard s^* is already close to \bar{s}^* , any further increase in the desired standard would come at substantial incremental costs to the firm, thus also requiring a substantial increase in ρ . Intuitively, the upper boundary \bar{s}^* is from (20) strictly higher as the agent becomes more patient or as an increase in ψ allows the firm to better control the agent. Finally, it is interesting to note that though the agent's rent R is strictly increasing in c_S , as noted after (19), the boundary \bar{s}^* turns out to be independent of c_S .

4.4 Type-Dependent Margins and Assignee Liability

We stipulated so far that the firm earns the same margin with both types of customers. More generally, the margin could be type-dependent with $m_\theta = p - k_\theta$, where k_θ captures the net costs of serving the respective customer. All our qualitative insights hold irrespective of whether $m_h = m_l$, $m_h > m_l$, or $m_h < m_l$, where each case fits different applications. For instance, $m_h < m_l$ next to $u_h > u_l$ should hold if the firm offers some (pooling) insurance contract and if high types represent higher risk.³⁴ In contrast, $u_h > u_l$ and $m_h > m_l$ may apply to personal loans if a low-type household with a more risky future income benefits less from a loan in the presence of substantial personal bankruptcy costs.³⁵

To illustrate how the equilibrium standard s^* and thus also any policy response through ρ would have to depend on the particular specifications, in the context of the latter case of personal loans we now analyze the implications of the common practice of firms to resell the originated loans. For simplicity, we set $k_l > k_h = 0$. Then depending on s , the firm's expected payoff is now $p - [1 - q(s)](\rho + k_l)$ if the loan stays on its books, but $P - [1 - q(s)]\rho$ if the loan is resold at a price of P . We can show that P is optimally chosen as high as possible, so that given some anticipated standard s^* we have

$$P = p - k_l \frac{\int_{s^*}^1 [1 - q(s)] f(s) ds}{1 - F(s^*)}. \quad (21)$$

Note that (21) takes into account that the buyer of the loan will only realize $p - k_l$ from a type- l customer. We now consider a firm that resells a fraction τ of its loans, and keeps

³⁴The assumption that the firm's agent is better informed about the suitability of the product than the customer may apply, in particular, to some innovative insurance policies. (Without considering the agency relationship that is at the heart of our paper, Villeneuve, 2000, studies the problem of a better informed monopolistic insurer.)

³⁵Here, the lender may be more sophisticated in forecasting the likelihood of default.

the remaining fraction $1 - \tau$.³⁶

Proposition 8 *If type-dependent margins satisfy $k_l < k_h$, the standard is increasing in the fraction of loans the firms does not resell, τ .*

Consequently, a higher ρ would be required to implement the same targeted standard s_T^* in case τ is lower. An immediate corollary of Proposition 8 together with the optimal values of w and b in (8) and (9), is then the following:

Corollary 3 *For the case considered in Proposition 8, holding ρ constant, the more likely it is that the firm sells the loan, the lower will be the agent's salary w and the higher will be the ratio of the bonus to the salary, b/w .*

In the US mortgage market, banks and financial firms are the two main types of mortgage originators. According to Minton, Sanders, and Strahan (2004), banks are more likely to retain the loans they originate, while financial firms are more likely to sell their loans on the secondary market. Consistent with this, casual evidence suggests that bank loan officers are more likely to earn a fixed salary while loan officers in financial firms earn substantial commissions. Proposition 8 suggests that banks should optimally also apply a higher standard s^* internally. In terms of public policy, though, the heterogeneity of firms' proclivity to sell on loans, just as a potential heterogeneity in their previously analyzed internal sales processes or other characteristics, creates a problem in case the same policy ρ uniformly applies to all firms.

In the US, following the increase of defaults in subprime loans and the associated claims of misselling, some politicians have recently proposed a system of "assignee liability" to extend legal and financial liability to investment banks that repackage mortgages into bonds and sell them.³⁷ Unless the main purpose of such a policy is to increase the total amount of firms' assets that are available for compensation, our model would not support such a proposal. It is straightforward to show that if a given value of ρ is distributed such that the fraction ϕ of it is borne by the originating firm and the fraction $1 - \phi$ by the acquirer, the resulting standard is strictly higher the lower ϕ . In other words, a given level of liability is most effectively allocated at the level of the originating firm.³⁸

³⁶Note that as the firm does not observe s , it cannot opportunistically resell only loans with low s .

³⁷See 'Democrats hit out at Wall St. over subprime loans,' *Financial Times*, April 12, 2007.

³⁸This is not entirely obvious as an increase of $1 - \phi$ reduces P and has the potential to increase s^* through this channel.

5 Conclusion

A firm that sells through agents must ensure that they comply with its internal standards when providing customers with advice. When the sales force must be incentivized more (for example, as competition for customers intensifies), ensuring compliance with a given standard becomes more costly for the firm. Faced with a higher (marginal) cost of compliance, the firm gradually becomes more permissive towards potential misselling. The appropriate response of policymakers is then to impose higher expected penalties for alleged misselling.

More generally, to evaluate the standard that one should expect to prevail in a given industry, it is important to take into account firms' own agency problems, which can lead them to choose more permissive standards. Furthermore, through the internal agency problem, these standards are affected by a host of additional factors, such as the difficulty in attracting customers, the transparency of the commission structure, or the organization of the sales process. A key message from our analysis is thus that when addressing problems of misselling, regulators and policy makers must take into account these organizational variables, unless the industry is exclusively made up of entrepreneurial professionals. The consideration of firms' agency problems also points to a potential pitfall for policymakers. To the extent that firms vary in their respective characteristics, e.g., in how they organize their sales process, different policy standards would be required for different firms within the same industry, which may not always be feasible to implement.

Future work could adapt our framework to the circumstances of particular industries. Such analysis also could throw light on the interaction of differences in the regulatory framework and the organization of distribution across industries and countries. The prevailing policy may then affect firms' contractual and organizational choices, while the prevailing organization of the industry (including the level of vertical integration or use of independent intermediaries) in turn should influence the policy response. Furthermore, the general notion of taking into account firms' internal agency structure when determining the scope and level of policy intervention and regulation may also be more broadly applicable.

Appendix A: Proofs

Proof of Proposition 1. The firm's objective is to minimize expected wage costs $\mu\pi w_2 + (1 - \mu\pi)w_1$ subject to the constraints (1) and (2). If none was binding, the firm could profitably deviate by marginally reducing either of the two wages w_1 or w_2 . Suppose now that (1) was not binding, in which case we already know that (2) must bind. After substitution, the firm's expected wage costs become then $c_S + w_1$. As long as (1) was indeed not binding, the firm could then profitably deviate by further reducing w_1 . Having thus established that (1) must always bind, we can now substitute this to obtain the expected wage costs $w_2[1 - \psi + \psi\mu\pi]$. Unless also (2) binds, the firm could thus profitably deviate by further reducing w_2 . From the two binding constraints (1) and (2) we finally obtain

$$w_1 = c_S \left(\frac{1 - \psi}{\psi} \frac{1}{\mu\pi} \right).$$

From this, we then obtain (3) for the firm's total wage costs $c_S + w_1$. **Q.E.D.**

Proof of Proposition 2. The comparative results are obtained from differentiating (8):

$$\begin{aligned} \frac{dw}{d\Delta} &= \frac{1}{\psi} \left[\frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right] > 0, \\ \frac{dw}{d\psi} &= -\frac{1}{\psi^2} \frac{1}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} < 0, \end{aligned}$$

and

$$\frac{dw}{ds^*} = \frac{\Delta}{\psi} \frac{dq(s^*)}{ds^*} \frac{\int_{s^*}^1 [1 - \psi [1 - q(s)]] f(s) ds}{\left[\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds \right]^2} > 0. \quad (22)$$

Q.E.D.

Proof of Corollary 2. Differentiation of (22) gives:

$$\frac{dw^2}{ds^* d\Delta} = \frac{1}{\psi} \frac{dq(s^*)}{ds^*} \frac{\int_{s^*}^1 [1 - \psi [1 - q(s)]] f(s) ds}{\left[\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds \right]^2} > 0$$

and

$$\frac{dw^2}{ds^* d\psi} = -\frac{\Delta}{\psi^2} \frac{dq(s^*)}{ds^*} \frac{1 - F(s^*)}{\left[\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds \right]^2} < 0.$$

Q.E.D.

Proof of Proposition 3. We argue first more formally why $p = \widehat{p}(s^*)$ must hold in equilibrium. For this note first that gross profits Π_G are clearly strictly increasing in p , where we make use of the envelope theorem. Using continuity, we then have that $\int_{s^*}^1 U(s)f(s)ds = 0$ and thus $p = \widehat{p}(s^*)$ must hold in equilibrium.

Using that \widehat{s}^* is strictly decreasing and that \widehat{p} is strictly increasing, a unique equilibrium is then obtained from the fixed point to $s^* = \widehat{s}^*(p)$ and $p = \widehat{p}(s^*)$.³⁹ Note next that for the respective partial derivatives it holds that $\widehat{s}_\Delta^* < 0$, $\widehat{s}_p^* < 0$, and $\widehat{p}_{s^*} > 0$. From total differentiation of the two equations $s^* = \widehat{s}^*(p)$ and $p = \widehat{p}(s^*)$ we then have that $\frac{ds^*}{d\Delta} = \frac{\widehat{s}_\Delta^*}{D} < 0$, where $D := 1 - \widehat{s}_p^* \widehat{p}_{s^*} > 0$. Proceeding likewise we have finally that $\frac{ds^*}{dp} = \frac{\widehat{s}_p^*}{D} > 0$ and $\frac{ds^*}{d\psi} = \frac{\widehat{s}_\psi^*}{D} < 0$, where we now make use of the partial derivatives $\widehat{s}_\rho^* > 0$ and $\widehat{s}_\psi^* > 0$. **Q.E.D.**

Proof of Proposition 6. We first consider the program where the agent only performs the task of advising a customer. From the incentive constraint (15) we have to distinguish between two cases. In the first case, an agent who shirks and does not observe s prefers to indiscriminately advise a customer not to buy. In the second case, the agent prefers to advise the customer to buy.

In the first case, we have from (15) the requirement that

$$\int_{s^*}^1 [V(s) - w] f(s) ds \geq c_A, \quad (23)$$

while an uninformed agent would indeed want to advise the customer not to buy only if

$$\int_0^1 V(s) f(s) ds \leq w. \quad (24)$$

Note next that substituting for b from (5) and denoting $q_E := \int_0^1 q(s) f(s) ds$, we obtain

$$\int_0^1 V(s) f(s) ds = w \left[\frac{1 - \psi(1 - q_E)}{1 - \psi(1 - q(s^*))} \right]$$

so that (24) holds whenever $q_E \leq q(s^*)$. To see that this must indeed hold in equilibrium, note that from $u_\emptyset < 0$ the firm could not realize a positive price p unless in equilibrium $q(s^*) > q_E$.

By an analogous argument we can rule out the second case where an uninformed agent would prefer to indiscriminately advise a customer to buy as the converse of (23) holds

³⁹Given that both functions are continuous and that $\widehat{s}^*(\cdot) < 1$, existence of an interior solution with $s^* > 0$ is ensured if at $s^* = 0$ and with $p = u_\emptyset$ the left-hand side of (11) is strictly positive.

strictly. Proceeding then for the first case in analogy to Proposition 2, we have from (23) together with the requirement that $V(s^*) = w$ that now

$$w = c_A \left[\frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right].$$

That is, absent the multi-task problem the firm's total costs are given by⁴⁰

$$C_A := c_S + c_A \left[\mu + \frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right]. \quad (25)$$

Consequently, the firm's first-order condition in analogy to (11) becomes

$$-f(s^*)\mu [p - [1 - q(s^*)]\rho] = \frac{dC_A}{ds^*}. \quad (26)$$

If the agent performs both tasks, we can show in analogy to the preceding argument that also here only the case where (23) holds can apply. Consequently, the agent's compensation must now satisfy $V(s^*) = w$ as well as conditions (16) and (23). Clearly, whenever (16) is satisfied then also (23) holds. Proceeding as for Proposition 2, we now have in the multi-task setting the total cost of $C_M := w + c_S + \mu c_A$, which transforms to

$$C_M := (c_S + \mu c_A) \left[1 + \frac{1}{\mu} \frac{1 - \psi [1 - q(s^*)]}{\psi \int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right]. \quad (27)$$

Consequently, the firm's first-order condition for s^* becomes

$$-f(s^*)\mu [p - [1 - q(s^*)]\rho] = \frac{dC_M}{ds^*}. \quad (28)$$

Comparing (26) with (28), to prove Proposition 6 it thus remains to show that for any s^* the marginal costs of raising s^* are higher under multi-tasking, i.e., that $\frac{dC_M}{ds^*} > \frac{dC_A}{ds^*}$, which holds surely from $(c_S + \mu c_A) \frac{1}{\mu} > c_A$. **Q.E.D.**

Proof of Proposition 8. We first derive the new first-order condition for the firm. For this, note that the firm's profits as previously defined in (10) are now

$$\Pi_G = \mu \int_{s^*}^1 [\tau p + (1 - \tau)P - [1 - q(s)] [\rho + \tau k_l]] f(s) ds.$$

⁴⁰We use here that the choice of s^* does not affect any costs of marketing the product, e.g., through the effort that other agents provide.

Consequently, the first-order condition that $d\Pi_G/ds^* = dw/ds^*$ becomes

$$\begin{aligned} & -f(s^*)\mu [\tau p + (1 - \tau)P - [1 - q(s^*)] [\rho + \tau k_l]] \\ = & \frac{\Delta}{\psi} \frac{d}{ds^*} \left(\frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds} \right), \end{aligned} \quad (29)$$

which gives the optimal value $\widehat{s}^*(p, P)$, where we have made explicit the dependency on both p and P . We further denote the value P from (21) as a function of s^* and p by $\widehat{P}(s^*, p)$. An equilibrium must now jointly satisfy the three conditions: $p = \widehat{p}(s^*)$, $s^* = \widehat{s}^*(p, P)$, and $P = \widehat{P}(s^*, p)$.

To solve for an equilibrium, it is now convenient to reformulate the problem. For this purpose, define a value $\omega := \tau p + (1 - \tau)P$ such that we can now write more simply that $s^* = \widehat{s}^*(\omega)$. Furthermore, we define the function $\widehat{\omega}(s^*) := \tau \widehat{p}(s^*) + (1 - \tau) \widehat{P}(s^*, p)$, which transforms to

$$\widehat{\omega}(s^*) = \widehat{p}(s^*) - (1 - \tau)k_l \frac{\int_{s^*}^1 [1 - q(s)] f(s) ds}{1 - F(s^*)}. \quad (30)$$

An equilibrium is then characterized by the two requirements that $s^* = \widehat{s}^*(\omega)$ and $\omega = \widehat{\omega}(s^*)$. Uniqueness follows immediately as the respective partial derivatives of the two functions satisfy $\widehat{\omega}_{s^*} > 0$ and $\widehat{s}^*_{\omega} < 0$.⁴¹ To prove the assertion, it then remains to show that for the equilibrium value it holds that $ds^*/d\tau > 0$ and $ds^*/d\rho > 0$. Note here first that for the respective partial derivatives it holds that $\widehat{s}^*_{\rho} > 0$, $\widehat{s}^*_{\tau} > 0$, and $\widehat{\omega}_{\tau} > 0$. From total differentiation of the two requirements that $s^* = \widehat{s}^*(\omega)$ and $\omega = \widehat{\omega}(s^*)$ we then have in analogy to the proof of Proposition 3 that $ds^*/d\tau = -D_{\tau}/D > 0$ and $ds^*/d\rho = -D_{\rho}/D > 0$, where we now use that $D = 1 - \widehat{s}^*_{\omega} \widehat{\omega}_{s^*} > 0$, $D_{\rho} = -\widehat{s}^*_{\rho} < 0$, and $D_{\tau} = -\widehat{\omega}_{\tau} - \widehat{s}^*_{\tau} \widehat{\omega}_{s^*} < 0$. **Q.E.D.**

⁴¹Existence of a solution with $0 < s^* < 1$ is now ensured if at $s^* = 0$ and with $p = u_{\varnothing}$ and $P = u_{\varnothing} - (1 - \pi)k_l$ the left-hand side of (29) is strictly positive.

Appendix B: Optimal Task Allocation

This appendix extends Section 4.2 by comparing the performance of different sales processes. Economies of scope, as well as the nature of a particular product, may make a particular sales process optimal or render another simply infeasible. In what follows, we abstract from this and suppose, instead, that the firm could choose to allocate the two tasks to one or two agents without forsaking efficiencies or incurring additional costs.

If the firm allocates the two tasks to two different agents, then the agent who exerts sales effort (for example, by devising a marketing campaign) will not receive a rent. Formally, this agent would be compensated with a base salary of zero and a bonus equal to $c_S/[\mu(1 - F(s^*))]$.⁴²

To be more specific, consider a bank whose local branch officers advise incoming customers. Even though the bank's general marketing campaign may be the key driver of footfall, it should still be hard or even impossible to distinguish whether no sale was made because no interested customer showed up or because the officer advised against purchasing a given product. In this case, for $c_A > 0$ the respective agent still realizes a rent equal to his salary, $w > 0$. Relying on the insight from Proposition 6, though, the following result follows intuitively.

Proposition 9 *If it is feasible and does not involve additional cost, then the firm prefers to allocate the task of marketing its products and that of providing advice to two different agents.*

Proof. Denote the two levels of s^* that arise in equilibrium under multi-tasking and task separation by s_M^* and s_A^* , respectively. From Proposition 6 we know that $s_M^* < s_A^*$. Recall also that these standards arise from the fixed point problem to $s^* = \widehat{s}^*(p)$ and $p = \widehat{p}(s^*)$. Still, as for any given s^* we have from the proof of Proposition 6 that $C_M > C_A$, it is sufficient to show that under task separation the firm's profits are strictly higher under $s^* = s_A^*$ than under $s^* = s_M^*$. If under task separation the firm could also commit to s^* , we have in analogy to Proposition 5 that the optimal standard would then even exceed s_A^* . The assertion follows then from $s_M^* < s_A^*$ and quasiconcavity of the program. **Q.E.D.**

⁴²Clearly, this result relies on the assumption that there is only one level of positive effort. Note also that we have stipulated a market wage of zero, which further rules out immediate gains from employing fewer agents.

Realistically, the presence of economies of scope makes it optimal to allocate both search and advice tasks to the same agent. We conclude this section by noting that Proposition 9 depends crucially on the assumption that it is not possible to verify separately the reasons why an agent has advised an interested customer not to purchase. As noted previously, by this assumption agents receive the same level of compensation when the agent did not find a customer and when the customer found was unsuitable. In contrast, task separation would no longer be profitable once the firm could verify whether a lack of sale is due to the agent's failure to locate a customer.

Proposition 10 *Suppose that, in contrast to our previous assumptions, the reason why the agent did not conclude a sale can be verified, so that the firm's compensation scheme can now separately compensate agents for the two tasks. In this case, it is strictly profitable to allocate both tasks to a single agent.*

Proof. Take first the case where tasks are separated. Here, the analysis is the same as that in the proof of Proposition 6. That is, for given s^* expected costs are equal to C_A as given in (25).

Under multi-tasking, the optimal compensation scheme prescribes a wage of zero if no customer contact was established, while $w > 0$ is only paid if an interested customer was advised against a purchase. The respective constraints are then again $V(s^*) = w$ and (23), while now sales effort is only exercised if

$$\mu \left[\int_{s^*}^1 [V(s) - w] f(s) ds + w - c_A \right] \geq c_S. \quad (31)$$

In case (23) binds but not (31), then the respective costs are clearly only $C_A - c_S$, implying that multi-tasking is strictly more profitable. Substituting for w and comparing the respective constraints (23) and (31), this case applies if

$$\frac{c_S}{c_A} \frac{1}{\mu} \leq \frac{1 - \psi [1 - q(s^*)]}{\int_{s^*}^1 [q(s) - q(s^*)] f(s) ds}. \quad (32)$$

If condition (32) does not hold instead, then simply observe that under multi-tasking the total expected wage costs

$$\mu \left[F(s^*)w + \int_{s^*}^1 V(s) f(s) ds \right]$$

are now, from the binding constraint (31), equal to $c_S + c_A \mu$, implying that the agent does not realize a rent. This is clearly also strictly lower than C_A . **Q.E.D.**

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