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Misselling (financial) products: The limits for internal compliance

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ABSTRACT

A firm advises customers through an agent, such as a mortgage broker, who is incentivized through commissions and the threat of firing. We show that this implies an upper boundary for the feasible "standard of advice", up to which the standard increases with commissions.

1. Introduction

Inderst and Ottaviani (2009) develop a model of "misselling" through agents. There, a firm must hire an agent, such as a salesperson or a broker, both to approach customers and to provide advice on how suitable the product is, given a customer's specific needs. Even when the firm intends to comply with a certain standard at the advice stage, this still needs to be enforced vis-à-vis the firm's agents.[1] In Inderst and Ottaviani (2009) this is achieved through paying the agent a sufficiently high rent in the form of fixed (base) wage. However, when a firm uses independent agents such as brokers or dealers, such fixed payments seem to be rare in practice. On the other hand, additional incentives arise from repeated interaction, i.e., from the threat of severing the business relationship.[2]

A key result of this note is the following policy implication of such a seemingly realistic contractual restriction. We find that, given its internal agency problem, this renders the firm unable to implement a standard of sales above a certain threshold. Making the firm vicariously liable for the agent's advice and imposing ever higher penalties in case of alleged unsuitable advice (or "misselling") may then be largely ineffective, though it could impose high costs on regulators, the legal system, and the firm.

Before proceeding to the analysis, it should be noted that, for the purpose of our analysis, we also abstract from the possibility to write long-term contracts that are contingent on the history of past performance.[3] As is standard, this can be justified on the grounds that the resulting "bond" that the agent would thereby post may not be feasible, given that it would induce opportunistic behavior by the firm. From a more applied perspective, the modelling framework may also be of interest to the large literature on salesforce competition (e.g., Basu et al., 1985). With respect to the application to retail financial products, this paper and Inderst and Ottaviani (2009) follow Bolton et al. (2007), who also consider the role of advice, albeit without the internal agency problem that is at the core of the present analysis.

2. Limits to compliance

A firm (the principal) can sell in each period $t \in \{1,\ldots,\infty\}$ a single product through an agent. Both parties are risk neutral and discount

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[1] The agency perspective is a key difference to the large literature on credence and experience goods, following Darby and Karni (1973).

[2] Such a limit to contracting has also been recognized in the financial contracting literature, where it is argued that such payments would swamp the firm with the "wrong" applicants—i.e., in the language of the present model, applicants who are unable to attract customers and are thus planning to have a "quiet life".

[3] Cf. Bolton and Dewatripont (2005, chapter 10) for a detailed account of this large literature.

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future payoffs by some common discount factor $0<\delta<1$. The agent is protected by limited liability and has a reservation value of zero. In each period, by exerting only privately observed effort at disutility $c>0$ the agent contacts a potential customer. The agent then advises the customer on whether the good is suitable for him or not. For this purpose, the agent privately observes the probability that the product is ultimately suitable for the respective customer: $q\in[0,1]$, which is distributed according to $G(q)$ with density $g(q)>0$. Denote $\hat{q}:=\int_0^1 qg(q)dq$, which is the *ex-ante* likelihood with which the product is suitable for any given customer.[4]

For the purpose of the present analysis, we abstract from the communication game between the agent and the customer, supposing that, first, the customer always follows the agent's advice and that, second, there is an exogenous price p at which the product is sold. The price $p>0$ exceeds the firm's cost, which is normalized to zero. In Inderst and Ottaviani (2009), p is determined endogenously, based on customers' rational beliefs about the agent's communication strategy. Adding this feature to the present model would not alter results in any way. Moreover, the specific case where p is exogenous may fit particular applications, e.g., to health care, where the price may be either regulated or negotiated and paid for by a third party (e.g., the insurer).

We only allow for positive payments if a sale was concluded. Such a payment is made in the form of a commission or fee $f\geq 0$. We further suppose that, say through some internal review process that checks a fraction γ of sales, the firm receives a signal about the customer's type, i.e., about the suitability of the purchase. This is only correct with probability $\varphi>0.5$. For simplicity, set $\gamma=1$.[5] The firm can replace the agent at the end of each period at zero cost. This makes it credible to retain or fire the agent conditional on the outcome of the check, which in turn is not verifiable. After a bad signal on the suitability, b, the agent is fired with probability η.[6] We let the firm choose (f, η) to maximize its profits.

The assumptions on observability and contractibility allow us to focus squarely on the dual role of the sales commission f, which we explore next. Provided that some choice of (f, η) ensures that the agent finds it optimal to participate and to exert effort in any given period, we ask first about the agent's optimal decision rule when advising a customer. Given the stationarity of the problem, we can denote the agent's expected utility at the beginning of each period by U. When observing some q, the agent will only advise the customer to purchase if

$$f\geq\eta[\varphi[1-q]+(1-\varphi)q]\delta U, \tag{1}$$

which captures the trade-off between earning f now and, thereby, running the risk of losing his continuation utility. Holding f and U fixed, this generates a cutoff q^*, such that Eq. (1) is satisfied only for values $q\geq q^*$. If this cutoff is interior, we have that

$$q^*=\frac{1}{2\varphi-1}\left[\varphi-\frac{f}{\eta\delta U}\right]. \tag{2}$$

Otherwise, the agent would either always or never want to advise the customer to purchase. We capture the latter two cases by setting either $q^*=0$ (in case $f\geq\eta\varphi\delta U$) or $q^*=1$ (in case $f\leq\eta(1-\varphi)\delta U$).[7]

[4] In the present setting, the cost $c>0$ ensures that the firm cannot simply pay a "wage" of zero and then make use of the agent's indifference at the advice stage. Alternatively, all results hold if in each period the agent would have, instead, an outside option with strictly positive value $u_R>0$.

[5] The following setting differs somewhat from Inderst and Ottaviani (2009). There, given the additional complexity of the model, only a simpler monitoring technology was considered.

[6] Firing the agent with positive probability after no sale was made or after observing g will not be in the firm's interest.

[7] Technically speaking, Eq. (2) represents the solution to the agent's Bellman equation. Note that the realizations $q=0$ and $q=1$ are zero-probability events.

Note, however, that U is endogenous and will, as discussed next, depend itself on the chosen q^*.

In the present section, we are concerned with the firm's internal agency problem alone, i.e., the firm's problem to induce effort *and* to implement a given "standard of advice": q^*. The question of what standard is optimal for the firm, taking into account its own profits from a sale, will be addressed subsequently.

Suppose that there is an interior cutoff q^* as in Eq. (2). From stationarity, provided that the agent exerts effort and applies the standard q^*, we have that

$$U=\frac{f[1-G(q^*)]-c}{1-\delta+\delta\eta\int_{q^*}^1[\varphi[1-q]+(1-\varphi)q]g(q)dq}. \tag{3}$$

(Cf. the proof of Lemma 1 for more details.) Intuitively, the expected utility of the agent is strictly increasing in f. Hence, when considering condition (2), there are thus two conflicting forces that affect the prevailing standard q^*. A higher f increases the agent's instant benefits from a sale, but it also increases the value that he puts at risk, namely δU. We explore this tension first, namely in Lemma 1 and Proposition 1, before fully characterizing the equilibrium outcome. Both Lemma 1 and Proposition 1 will thus, for the time being, build on the presumption that for the considered set of values (f, η) there exists a unique equilibrium standard q^*, satisfying Eq. (2).

Lemma 1. *A marginal increase in the sales commission f leads to an increase, rather than a decrease, in the lending standard if*

$$\int_{q^*}^1[q-q^*]dG(q)\ \frac{1}{\eta}\frac{1-\delta}{\delta}\frac{1}{2\varphi-1}. \tag{4}$$

Instead, if the converse of Eq. (4) holds strictly, then the standard decreases.

Proof. To first derive Eq. (3) more explicitly, we use $r(q):=\eta[\varphi[1-q]+(1-\varphi)q]$, such that Eq. (2) can be expressed as $r(q^*)=\frac{f}{\delta U}$. From stationarity, we have next

$$U=\delta UG(q^*)+\int_{q^*}^1[f+[1-r(q)]\delta U]dG(q)-c,$$

which can be solved to obtain Eq. (3). Note next that, using optimality of q^*, we have that

$$\frac{dU}{df}=\frac{\partial U}{\partial f}=\frac{1-G(q^*)}{1-\delta+\delta\int_{q^*}^1 r(q)dG(q).} \tag{5}$$

Implicit differentiation of $r(q^*)\delta U-f=0$ from Eq. (2) yields next

$$\frac{dq^*}{df}=-\frac{1}{\delta Ur'(q^*)}\left[r(q^*)\delta\frac{\partial U}{\partial f}-1\right], \tag{6}$$

which from $r'(q^*)<0$ is thus positive if and only if $r(q^*)\delta\frac{\partial U}{\partial f}>1$. After substitution from Eq. (5), this yields Eq. (4). □

From Lemma 1, the effect that a change in f has on the equilibrium standard q^* depends thus on condition (4). There are two key observations to be made. First, an increase in f can push up the standard, even though the agent's contemporaneous benefits from selling increase. Second, this may work, however, only at low values of q^* that still satisfy condition (4). The intuition for this is as follows. An increase in f always has the same impact on the agent's incentives to conclude a sale in a given period (cf. the right-hand side of Eq. (1). Instead, the impact that this has on the agent's continuation value, U, depends clearly on the likelihood with which the agent earns the incremental commission in any future period, which is $1-G(q^*)$. When this is low, as q^* is already high, then the latter effect is surely dominated by the former, implying that a further increase in f will push down, rather than push up, q^*.

Proposition 1. *Suppose*

$$\frac{1}{\eta}\frac{1-\delta}{\delta}\frac{1}{2\varphi-1}<\hat{q} \tag{7}$$

holds. Then there exists $0<\overline{q}<1$ *satisfying*

$$\int_{\overline{q}}^{1}[q-\overline{q}]dG(q)=\frac{1}{\eta}\frac{1-\delta}{\delta}\frac{1}{2\varphi-1}, \tag{8}$$

such that it is only feasible to implement a standard q^* *that satisfies* $q^*\leq\overline{q}$*. The boundary* $\overline{q}$ *is higher in case:*

i) *the one-shot agency problem is less severe, as* φ *is higher;*
ii) *the agent is more patient, as* δ *is higher;*
iii) *or the agent is fired with a higher probability* η *after a bad signal.*

In case Eq. (7) does not hold, then no positive standard $q^*>0$ *can be achieved.*

Proof. Observe first that $\int_{q^*}^{1}[q-q^*]g(q)dq=\hat{q}$ holds for $q^*=0$. The upper boundary $\overline{q}$ follows immediately from rewriting condition (4). The comparative analysis in i)–iii) follows, in turn, after noting that the left-hand side of Eq. (8) is strictly decreasing in $\overline{q}$. □

To complete the analysis in this section, we have to fully characterize the equilibrium for given choices (f,η). For this we also have to take into account that if f is too low, then the agent will not work. In fact, effort is only privately optimal for the agent in case $u\geq0$, where u depends, however, also on q^*.

Proposition 2. *For given* $(f,\ \eta)$*, we have the following equilibrium characterization: i) If* $c>f$*, then no effort will be exerted; ii) If* $c=f$*, then there exist multiple equilibria in which either no effort is exerted or effort is exerted and the standard* $q^*=0$ *is chosen; iii) if* $c<f$*, then effort is exerted and the following cases apply:*

– *In case condition (7) holds together with*

$$f\geq c\frac{\delta\eta\varphi}{\delta(2\varphi-1)\eta\hat{q}-(1-\delta)}, \tag{9}$$

then there exists a unique equilibrium that leads to an interior cutoff $0<q^*\leq\overline{q}$*.*

– *If either Eq. (7) or Eq. (9) do not hold, then* $q^*=0$*.*

Proof. We ask first when there exists an equilibrium with $0<q^*\leq\overline{q}$. From our previous observations, for given $(f,\ \eta)$, a necessary and sufficient condition for an equilibrium, as characterized by q^* and U, is that the following conditions hold jointly. First, to ensure that effort is exercised, it must hold that $u\geq0$. Second, q^* and U must jointly satisfy Eqs. (2) and (3), which holds if

$$\psi(q^*):=\delta f\left[\int_{q^*}^{1}[r(q^*)-r(q)]g(q)dq\right]-f(1-\delta)-c\delta r(q^*)=0. \tag{10}$$

Note next that $\psi'(q^*)<0$ holds if and only if $c<\mu f[1-G(q^*)]$, i.e., if and only if $u>0$. Together with $\psi(1)<0$, we thus have that for $c>\mu f$ there is no value q^* satisfying $\psi(q^*)=0$, while for $c<f$ any such value must be unique. In the latter case, such a value $q^*>0$ indeed exists if $\psi(0)>0$ and thus, after some transformations, if

$$f[\delta(2\varphi-1)\eta\hat{q}-(1-\delta)]\ c\delta\eta\varphi. \tag{11}$$

Condition Eq. (11) holds, in turn, only if two conditions are jointly satisfied: conditions Eqs. (7) and (9). □

3. Optimal standard

As in Inderst and Ottaviani (2009), we suppose that a customer who bought an unsuitable product imposes on the firm a cost $\rho>0$ (e.g., through loss of reputation or the actions of a regulator or courts). We further suppose that it is indeed optimal for the firm to operate (which is the case when ρ is not too large). The firm's discounted profits are, for given (f,η) and with corresponding q^*, equal to[8]

$$\pi=\frac{1}{1-\delta}\int_{q^*}^{1}[p-f-(1-q)\rho]g(q)dq. \tag{12}$$

Note that when the firm implements $q^*=0$ and thus chooses $f=c$ the agent does not realize any rent. At any higher q^*, the agent realizes a strictly positive rent $U>0$. From Proposition 2, a strictly positive standard can only be obtained if condition (7), which is only on the primitives and on η, holds. Moreover, in this case f must exceed Eq. (9). From Lemma 1, any further increase results in a strictly higher q^*, albeit not beyond $\overline{q}$. In fact, the marginal impact that f has on q^* goes to zero as $q^*\rightarrow\overline{q}$. While the firm can thus be induced to set a higher standard, namely through a higher "penalty" ρ, this becomes largely ineffective as the penalty increases and q^* approaches $\overline{q}$.

Proposition 3. *Suppose that it is optimal for the firm to implement a strictly positive standard* $q^*>0$*. Then the firm optimally chooses* $\eta=1$*, while* $q<^*\overline{q}$ *satisfies*

$$-\left[p-f-(1-q^*)\rho\right]g(q^*)=\left[1-G(q^*)\right]\frac{df}{dq^*}, \tag{13}$$

where $df/dq^*>0$*. Both the prevailing commission and the prevailing standard jointly increase in* ρ*, while* $dq^*/d\rho\rightarrow0$ *as we further increase* ρ*.*

Proof. We first show that $\eta=1$ is indeed uniquely optimal. This follows as a given $q^*>0$ can be implemented by a strictly smaller fee f in case η is chosen higher. Formally, we have from implicit differentiation of $\psi(q^*)=0$ in Eq. (10), which can be rewritten as

$$f\left[\delta\eta(2\varphi-1)\int_{q^*}^{1}[q-q^*]g(q)dq-(1-\delta)\right]-c\delta r(q^*)=0,$$

that $df/d\eta<0$. Furthermore, that $dq^*/d\rho>0$ is obtained immediately from Eq. (13), after implicit differentiation and appealing to strict quasiconcavity of the objective function. Finally, observe that as $q^*\rightarrow\overline{q}$, it holds that $df/dq^*\rightarrow0$ (cf. Eq. (6)). □

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[8] Recall that replacing the present agent comes at zero cost.