Using clients’ rejection to build trust

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Abstract

This paper studies the impact of an expert’s concern for future business on his conduct and market efficiency. In markets for professional services including health care, legal services, consulting and car mechanic services, clients often lack the expertise to assess the value of services provided by an expert both before and after consumption. Clients’ ignorance exposes them to the risk of being exploited by the expert. When the expert has no concern for future business, market collapses and clients’ problems are never fixed. We characterize the most profitable equilibrium in a repeated game. When the expert sufficiently cares about future business, trade will happen but full efficiency is never achieved. We find that either undertreatment for the serious problem or overtreatment for the minor problem can happen in the most profitable equilibrium. We characterize the conditions under which undertreatment or overtreatment arises.

Keywords: credence goods, repeated purchase, reputation, liability.
1 Introduction

This paper studies reputation building in credence goods markets. Credence good is similar to experience good in that the seller has superior information about the value of the good or service to the buyer. However, it is distinctive due to the feature that buyers cannot assess the value of the credence good or service even after consuming it. For example, consider that a homeowner finds mold in the basement wall and relies on a handyman for diagnosis and repair. Suppose the handyman claims that the only way to prevent mold from growing is to dig a drain around the house to waterproof the basement. If the homeowner takes the handyman’s recommendation, she can verify whether the mold problem is gone but could hardly tell whether the handyman has exaggerated the problem and made an unnecessarily expensive repair. Clients in need of professional services including health care, car repair, home repair and legal services often suffer this information disadvantages. The superior information possessed by sellers makes them “experts” in diagnosing and solving clients’ problem, but also provides them with incentives to exploit their clients.

Much anecdotal evidence suggests that reputation plays an important role in facilitating trade between experts and their clients. For instance, many of us tend to see the same doctor once we believe he is trustworthy, and homeowners are reluctant to switch handymen once they prove to be reputable. Despite its importance, reputation in credence goods markets has not been formally analyzed in the literature and the mechanism through which credence-goods sellers establish their reputations is not well understood. One possible reason that the subject has not received the attention it deserves is that one may presume the reputation mechanism for credence goods is similar to that of experience goods. Nevertheless, we argue that the reputation mechanisms must be quite different. For the seller to be able to build reputation, it is important that the buyer is able to monitor the seller’s previous actions (even with noise). An experience-good buyer can monitor the quality of the good based on her consumption experience. However, such monitoring technology is ineffective for credence-good buyers due to the fact that once the client has received the expert’s service and her problem has been fixed, she cannot tell whether she really needed the service, i.e., whether the expert was honest. In this paper, we build a repeated game to formally investigate expert’s reputation building mechanism.
In our model, a long-lived expert interacts with a sequence of short-lived clients, each with a problem which causes a substantial or a minor loss. We thereafter call the problem serious or minor, respectively. Clients rely on the expert to diagnose and repair their problems. They are willing to pay more to fix the serious problem than the minor problem, and the cost of fixing the serious problem is at least the cost of fixing the minor problem. The expert is liable for fixing a client’s problem once his recommendation is accepted by the client. Although the client is guaranteed that her problem will be resolved after a repair, she can not verify whether the expert has honestly reported the loss of her problem after it is fixed. We assume that it is efficient to fix the serious problem but inefficient to fix the minor problem. Furthermore, clients' average loss is lower than the cost of fixing the serious problem. Under these assumptions, in the static model clients always reject the expert’s treatment recommendations for fear of being exploited. Therefore, market breaks down completely when the expert is not concerned about future business. When a client rejects the expert’s recommendation and suffers the loss of the problem, she learns whether the expert has made an honest recommendation. In the static model, this knowledge is irrelevant because the damage of leaving the problem untreated is already done. However, this information can be useful for monitoring the expert’s honesty in a repeated game setting.

In the repeated game, when a client arrives in the market, she observes the expert’s recommendations made to previous clients, those clients’ acceptance decisions and their utilities from accepting or rejecting the expert’s recommendations. In other words, the client can observe previous clients’ experiences with the expert. This assumption is justified on the ground that consumers actively post and share reviews on experts’ services on websites like Angie’s list, yelp and RateMDs. We characterize two types of equilibria: monitoring-by-rejection equilibria and one-price-fix-all equilibria. The expert adopts different recommendation strategies in different types of equilibria, yielding different welfare implications. The most profitable equilibrium is either the most profitable monitoring-by-rejection equilibrium or the most profitable one-price-fix-all equilibrium.

In the most profitable monitoring-by-rejection equilibrium, the expert posts clients’ maximum willingness to pay for fixing the serious problem and makes honest recommendations. That is, the expert recommends the treatment for the serious problem and refuses to treat the minor problem. The client accepts the treatment
offer with a probability less than one. Since the client is charged her maximum willingness to pay for fixing
the serious problem, it is her best response to reject the offer with a positive probability, which results in an
inefficiency due to the *undertreatment* of the serious problem. In fact, the client’s rejection is necessary to
support the expert’s honest recommendations. To see this, suppose the expert diagnoses a minor problem.
If he recommends the treatment instead of revealing that the problem is minor and not worth repairing, he
has a current gain when the offer is accepted by the client. The expert, however, bears a future loss when the
offer is rejected because the client will find out that the expert has made a dishonest recommendation and all
future clients will revert to the static Nash equilibrium, yielding the expert zero profit. If the client always
accept the treatment offer, the expert does not bear any future loss from lying. Hence, he will recommend
the treatment irrespective of the loss of the client’s problem. In the most profitable *monitoring-by-rejection*
equilibrium, the client’s rejection rate balances out the expert’s current gain and future loss from lying and
makes him just indifferent between whether or not to recommend the treatment for the minor problem.
Hence, it is the expert’s best response to make honest recommendations.

The most profitable *monitoring-by-rejection* equilibrium is sustainable when the expert’s discount factor
is above certain threshold. Moreover, the client’s acceptance rate is increasing in the expert’s discount factor
and the likelihood of the serious problem. When the expert cares more about future business, a smaller
rejection rate is sufficient to deter him from making dishonest recommendation. As the discount factor
approaches to one, the *monitoring-by-rejection* equilibrium approaches to full efficiency. To see the client’s
acceptance rate increasing in the likelihood of the serious problem, recall that the expert’s equilibrium profit
stems from repairing the serious problem and hence increases in the likelihood of the serious problem. As a
result, the expert bears a larger future loss from lying when the likelihood of the serious problem increases.
By contrast, the expert’s current gain from lying does not change in the likelihood of the serious problem.
So, when clients’ problems are more likely to be serious, lying becomes more costly and therefore a higher
client acceptance rate is sufficient to support the expert’s honest recommendation.

In the most profitable *one-price-fix-all* equilibrium, the expert posts a single price at the client’s average
loss from the problem and is expected to fix both types of the problem at this price. Given the assumption
that the client’s average loss from the problem is lower than the cost of fixing the serious problem, the
expert makes a loss from repairing the serious problem at the quoted price, and hence has an incentive to refuse to fix it. Expert’s refusal to treat the client’s problem is perfectly observable to future clients, and will trigger the punishment phase in which the expert loses all future business. When the discount factor is high enough, the future loss from refusal to fix the serious problem dominates the current gain and the expert will commit to fixing both types of problem. Although the serious problem is always fixed, the most profitable one-price-fix-all equilibrium is inefficient because of the overtreatment of the minor problem.

The most profitable monitoring-by-rejection equilibrium dominates the most profitable one-price-fix-all equilibrium in profit either when the likelihood of the serious problem is low or when the discount factor is sufficiently high. Note that in both equilibria the expert fully extracts the surplus from trade. Hence, the profitability of these two equilibria hinges on their efficiency. When the likelihood of the serious problem is low, the inefficiency from overtreatment for the minor problem in the one-price-fix-all equilibrium is high. On the other hand, the overall cost of using rejection of treatment for the serious problem to discipline the expert is low, rendering the monitoring-by-rejection equilibrium more efficient. When the expert sufficiently cares about the future profit (high discount factor), the client only has to reject the serious treatment with a low probability, rendering monitoring by rejection more efficient and profitable.

Most of the existing literature focuses on a one-time transaction between experts and clients. Contributions to this literature can be broadly classified into two categories. In the first, it is assumed that the expert is liable to fix the client’s problem once the expert has charged the client. Papers in this category include Pitchik and Schotter (1987), Wolinsky (1993), Fong (2005), Dulleck et al. (2006), Liu (2011). In the second category, it is assumed that the repair service provided by the expert is verifiable so the expert cannot provide a service different from the one he promised to deliver. Papers in the second category include Emons (1997, 2001), Dulleck et al. (2006). Alger & Salanie (2006) study a model with partial verifiability. Fong, Liu and Wright (2014) compares market outcomes under liability and verifiability. Please also see Dulleck et al. (2006) for a comprehensive review of the literature.

While the literature has heavily studied different mechanisms that discipline the expert’s behavior in a static game, the role of reputation concern has not been as formally investigated. In particular, we believe
we are the first to point out that the monitoring technology in credence goods markets is different in nature from that in experience goods markets and explore its implication on expert honesty and market efficiency. We are also not aware of any paper that investigate how reputation concern shapes the expert’s pricing and recommendation strategies in a repeated game setting. Darby and Karni (1973) informally discuss the role of reputation. The paper most closely related papers is Wolinsky (1993). While Wolinsky formally investigates the expert’s reputation concern in Section 5 of his paper as an extension, there are important differences between our and his work. First, in Wolinsky’s analysis of expert reputation, the client commits to accepting any recommendation by the expert. Client commitment takes away the possible inefficiency due to the client refusing the recommendation of an expensive repair for fear of being exploited. We do not assume client commitment. In fact, if we assumed client commitment, we would not be able to study the use of rejection as a monitoring technology. Second, Wolinsky studies a competitive equilibrium in which all experts post a single price and promise to always fix clients’ problems at this price. This one-price-for-all strategy eliminates the expert’s incentives to misreport the client’s problem. We investigate a monopoly expert who may optimally charge different prices for different repairs. Under this price structure, we could investigate how reputation concern affects the expert’s incentive to cheat. Third, Wonlinsky considers the case where it is always efficient to fix the client’s problem. Our emphasis is instead on the case that it is inefficient to fix the minor problem. Pesendorfer and Wolinsky (2003) study how search for second opinion can be used to cross check whether experts exert effort to provide accurate diagnosis. All search takes place in one period and there is no time dimension in their model. As a result, experts in their setting do not have concern for future business. Moreover, consumers can perform additional search without paying additional search cost whereas we focus on the case where search is too costly.

Park (2005) also analyzes the reputations of experts. In his setting, the expert’s fraudulent behavior is detectable even when the client fully trusts the expert. By contrast, in our setting, when the client fully trusts the expert, his fraudulent behavior is not detectable. Frankel, Alexander and Michael Schwarz (2009) and Ely, Jeffrey and Juuso Välimäki (2003) investigate a long-lived expert’s recommendation strategy when facing a sequence of short-lived consumers. In their models, the prices for different treatments are fixed. In our model, the expert chooses prices for different repairs in each period. Dulleck, Kerschbamer, and
Sutter (2011) experimentally study the effect of reputation on expert behavior. However, their setup is of a predetermined and fixed number of periods, so their model will predict the same outcomes as in a static game. Fong and Liu (2014) study experts’ reputation building in a repeated game when it is efficient to treat both the serious and minor problem. They find that when expert is sufficiently patient, market efficiency can be achieved by the expert fixing both problems at a single price. Our project complements Fong and Liu (2014) by investigating the expert’s reputation building when it is efficient to fix the serious problem but inefficient to fix the minor problem. In Fong and Liu (2014), when the expert is patient, the optimal equilibrium is pooling and the expert fixes both problems at the same price. We instead show that full separation is optimal to the expert when the expert is patient.