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journal homepage: [www.elsevier.com/locate/eer](http://www.elsevier.com/locate/eer)Reputation for quality and adverse selection <sup>☆</sup>

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## ABSTRACT

We analyze a dynamic market with a seller who can make a one-time investment that affects the returns of tradable assets. The potential buyers of the assets cannot observe the seller's investment prior to the trade or verify it in any way after the trade. The market faces two types of inefficiency: the *ex-ante* inefficiency, i.e., the seller's moral hazard problem, and the *ex-post* inefficiency, i.e., inefficient *ex-post* allocations due to the adverse selection problem. We analyze how the observability of information by future buyers, through which the seller builds a reputation, affects the two types of inefficiency as well as the interplay between them.

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## 1. Introduction

The advent of securitization – converting illiquid assets into liquid securities – has transformed the traditional role of financial intermediaries in the mortgage market from the traditional relationship banking model to an “originate-to-distribute” model. In the aftermath of the 2008 financial crisis, however, a lot of attention has been brought to the potential moral hazard that arises from the separation of a loan's originator and the bearer of the loan's default risk.<sup>1</sup> Since investors do not observe the quality of the mortgages they are buying, the separation of the loan's originator and the bearer of the loan's default risk reduces the incentives for financial intermediaries to carefully screen borrowers. As a result, the securitization process endogenously creates the adverse selection problem – an impediment to efficient trade – via the moral hazard the originators face. Several recent empirical studies – e.g., Mian and Sufi (2009) and Keys et al. (2010) – support this view.

The proponents of securitization do not concur. Indeed, they point out that if potential investors believe that loans are originated without careful screening, then the originators face the risk of losing future investors. Therefore, loan originators are mindful of building a reputation through the information that potential investors have on them, including previous transactions and the performance of loans originated. The proponents of securitization argue that such reputational incentives should mitigate the moral hazard and the resulting adverse selection problem, if not solve them completely.

In this paper, we show that such an argument misses the mark in regard to the effect of the originator's reputational incentive on the unique interplay between the *ex-ante* inefficiency, i.e., the originator's moral hazard, and the *ex-post* inefficiency, i.e., inefficient *ex-post* allocation due to the adverse selection problem.

<sup>☆</sup> This paper was previously circulated under the title “Reputation and Securitization.”

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<sup>1</sup> For example, Geithner and Summers (2009) write: “In theory, securitization should serve to reduce credit risk by spreading it more widely. But by breaking the direct link between borrowers and lenders, securitization led to an erosion of lending standards, resulting in a market failure that fed the housing boom and deepened the housing bust.”

To see this point, we analyze a three-period game with a bank and short-lived buyers. The bank lives for three periods,  $t = 0, 1, 2$ . In  $t = 0$ , the bank decides whether or not to undertake an investment with cost  $c > 0$ .<sup>2</sup> In each period  $t = 1, 2$ , the bank is endowed with a loan that matures at the end of period  $t$ . If the bank chooses to invest, then the loans with which it is endowed are *good loans*, i.e., loans with a low expected default rate. In contrast, if the bank decides not to undertake the investment, then the loans with which it is endowed are *bad loans*, i.e., loans with a high expected default rate.

Now suppose that there is no securitization, i.e., no trade in the secondary markets. The bank is then the sole bearer of the loan's default risk. As a result, the bank undertakes the socially efficient investment, i.e., there is no moral hazard problem. Therefore, *the efficiency gains from securitization* in our model are measured by the difference between the two terms: (i) *the gains from trade*, that is, the *ex-post efficiency* created by the transfer of loans, and (ii) *the losses from moral hazard*, that is, the *ex-ante inefficiency* in the investment caused by the unobservability of the investment.

Next, suppose that the bank can sell its loans in the secondary markets, but future buyers cannot observe any information about the quality of past loans. The bank then has no reputational incentives. We show that the gains from trade are completely offset by the losses from the moral hazard, i.e., there are no efficiency gains from securitization. The objective of this paper is to show how the information about the quality of past loans affects the two types of inefficiency and their interplay.

To consider the model with reputational incentives, we assume that buyers in  $t = 2$  can observe (i) the highest offer in  $t = 1$  and (ii) the performance of the loan sold in  $t = 1$ . They cannot, however, observe the performance of any loans that the bank chooses not to sell.<sup>3</sup> There are then two ways the bank sends a signal that it has invested.

One way is to refuse to sell even for a high price. Then, any bank that does sell its loan in  $t = 1$  is perceived as a bad bank by the future buyers, irrespective of the performance of the loan sold in  $t = 1$ . In other words, a good bank strives to build a reputation by holding loans. In such a case, we say a good bank has a *trade-hindering reputational incentive* because such a reputational incentive hinders the trade in  $t = 1$ .

The efficiency gains from securitization in an equilibrium where a good bank has a trade-hindering reputational incentive turn out to be zero. This is because under such an equilibrium, a good bank can send a signal if and only if the buyers in  $t = 1$  make high offers. However, it never has an opportunity to do so on any equilibrium path because buyers never make such an offer while knowing that it will only be accepted by a bad bank. Therefore, the information that the buyers in  $t = 2$  have is no finer than the information that buyers in  $t = 1$  have. Consequently, the buyers who face the bank with a trade-hindering reputational incentive are in the same situation as the buyers who face the bank without any reputational incentives.

The other way that a good bank sends a signal is to sell its loan in  $t = 1$  even at a current loss in order to generate public information about the loan's performance. In this case, any bank with good performance is likely to be perceived as a good bank by future buyers and hence will receive high offers in  $t = 2$ . In such a case, we say a good bank has a *trade-inducing reputational incentive* because such a reputational incentive facilitates the trade.

In an equilibrium where a good bank has a trade-inducing reputational incentive, the buyers in  $t = 2$  have finer information than the buyers in  $t = 1$ . When a high offer – at which a good bank is willing to sell – is made in  $t = 1$ , the highest offer a bank receives in  $t = 2$  depends on the performance of the loan it sold in  $t = 1$ . If the loan did not default, then the highest offer the bank receives exceeds the reservation value of holding a good loan. On the other hand, in the case of default, the bank receives a low offer – i.e., an offer below the reservation value of holding a good loan – with a positive probability.

We show that the higher probability of facing product failure in itself is not sufficient to induce the bank to invest. The bank's reputational incentive induces inefficient ex-post trade, or creates more gains from trade, but only at the cost of offsetting losses from the moral hazard. Therefore, in contrast to what proponents of securitization argue, the reputational incentive can exacerbate the moral hazard.

The rest of the paper proceeds as follows. Section 2 reviews the relevant literature. Section 3 provides the model. Section 4 discusses the case in which there is no information through which the bank can build its reputation. Section 5 analyzes the case in which such information exists. Section 6 provides a discussion of the findings and concluding remarks.

## 2. Related literature

*Adverse selection in asset markets with reputational considerations:* Our paper is closely related to the literature on adverse selection in asset markets where the asset holders have reputational incentives.

Among others, Chari et al. (2010) analyze a model that is very close to the interim stage of our game, i.e., the game that starts from  $t = 1$ . As in our model, they find that a dynamic model with adverse selection and reputational incentives generates multiple equilibria: namely, a “good” reputational equilibrium in which products are actively traded and a “bad”

<sup>2</sup> The investment cost here could be understood as a cost of recruiting high-quality loan officers or as a reduced form of agency cost for inducing the effort of loan officers in an environment where rewriting a contract is costly. Alternatively, it could also be understood as the bank's investment in screening technology that has high initial setup costs but very small marginal costs for its use.

<sup>3</sup> This assumption could be seen as a proxy for the high cost of finding out the true performance of any loans that the bank has decided not to sell. For example, the bank can easily make it harder to find out the true performance of loans it has decided not to sell by means of creative accounting. This is the assumption used in much of the literature (see, e.g., Chari et al., 2010).

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