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Good Securitization, Bad Securitization

Guillaume Plantin

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Abstract

I use a simple banking model to study the circumstances under which excessive and inefficient securitization may occur. I first stress that increasing securitization rates that reduce banks' incentives to screen borrowers and thus lead to more defaults need not be inefficient. This may be an efficient response to higher gains from trade between banks and fixed-income markets in the presence of bank moral hazard. I then argue that if reaping such higher gains from trade induces a reduction in the informational efficiency of the securitization market, then there is room for excessive securitization. The model points at increased transparency and informational efficiency of the securitization market as key improvements for the future of the banking system.

Keywords: banking; securitization; liquidity
JEL classification: G01, G18, G21

***Toulouse School of Economics and CEPR (E-mail: guillaume.plantin@tse-fr.eu)**

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1 Introduction

A boom-and-bust in securitization markets is at the origin of the severe financial crisis that started in 2007. When price levels and trading volume in a given asset class swing up and down, observers' views about the asset class also evolve rapidly. Before the 2007 increase in subprime mortgage delinquencies, the dominant view on the spectacular development of securitization initiated a decade ago was by and large positive. The prevailing opinion was that the increase in securitization rates of many types of loans was reflecting overall efficiency gains in markets for loanable funds. In support of this view, many observers argued that technological progress in IT and financial engineering were the fundamental reasons behind innovation in credit markets. This was viewed as spurring the evolution of credit markets towards the paradigm of efficient and complete markets. Also, a "light-touch" approach to prudential regulation was supposed to let financial institutions and markets discover optimal risk bearing and leverage profiles without unnecessary regulatory distortions. The "originate-and-distribute" model, whereby banks are passive pass-throughs between borrowers and fixed-income investors, was viewed as a permanent shift towards a more efficient banking business model. These observers stressed that these evolutions benefitted not only the financial services industry, but also society as a whole. It made the dream of owning a home become true for many low-income American families. After the most severe global banking crisis in decades, the *ex post* assessment of this securitization and lending boom has become much more negative. The most widespread contention is now that credit risk transfer and securitization have grown out of control. Accordingly, that banks were free to transfer any of the risks that they originated to other agents (actually, to a large extent, to other banks) ruined their incentives to perform what they have always been doing: producing soft information that enables them to monitor and screen information-problematic borrowers. Thus the dominant view is now that there has been excessive, inefficient securitization.

The goal of this paper is to offer simple and intuitive sets of conditions under which each view is valid in a rational model. I aim at providing sound theoretical foundations for the debate on the social gains from securitization, and to point at the possible securitization market failures that ought to be fixed. Before outlining the model, it is worthwhile summarizing the three defining features of the securitization boom:

1. Long-term risk-free rates and credit risk premia in the U.S. have been quite low throughout the period. Explanations ranged from the role of global imbalances to the effect of overly loose monetary policies.

2. The volume and securitization rate of subprime mortgages have both soared. According to Keys et al. (2010), the securitization rate of subprime loans was over 80 percent in 2006 from 30 percent in 1995, while subprime lending increased from $65 billion in 1995 to $500 billion in 2005.

3. Delinquency rates on residential mortgages remained stable until the second half of 2007, and then increased quickly, from roughly 5% to above 15% for instance for the subprime segment (see, e.g., Keys et al. (2010)).

Recent empirical findings in the subprime mortgage market by Keys et al. (2010), Mian and Sufi (2009), and Rajan et al. (2009) are broadly consistent with the following connections between these three facts. The low rates at which markets discounted mortgage-backed instruments made it tempting for banks to securitize a higher fraction of their loans. A more intensive recourse to the "originate-and-distribute" model enabled them to satisfy a larger fraction of subprime loan demand. At the same time, this also reduced their incentives to screen and monitor their borrowers. This resulted in a lower average quality of borrowers that ultimately materialized in higher delinquency rates.

Even if this interpretation of the facts based on moral hazard is the correct one,[1] *it is important to stress that it does not suggest any obvious failure in securitization markets. It is perfectly consistent with an efficient view of the securitization boom and bust.* To see this, one can draw an analogy with a canonical moral-hazard problem such as the one developed by Homstrom (1979). Holmstrom (1979) studies optimal contracting between a principal and an agent. The principal hires the agent to perform a given task. The outcome of the task is uncertain, and stochastically increases with respect to the agent's effort. The agent's effort choice is not observable by the principal. Effort comes at a private cost for the agent. As is well known, the optimal contract trades off the gains from sharing risk between these two risk-averse agents with the needs to provide the agent with incentives that are compatible with the equilibrium effort level. Under the standard assumption of separability of utility in effort and consumption, if all else equal the agent is more risk-averse, then the optimal contract will feature more risk-bearing by the principal, and thus weaker incentives and lower effort provision by the agent.

If one views securitization as a transaction whereby markets supply insurance to banks against the risk of future binding liquidity or solvency constraints, then the same reasoning applies to securitization. Higher gains from

[1] see Bubb and Kaufman (2010) for a critique of this interpretation, and Keys et al. (2010 (II)) for a response.

trade between banks and markets should optimally lead to more securitization, and thus lower incentives for banks to originate high-quality loans. In other words, even if one believes that the appropriate way of thinking about the subprime boom and bust is the following:

$$
\begin{aligned}
\textit{Higher investors' risk appetite} &\rightarrow \textit{more securitization} \\
\textit{more securitization} &\rightarrow \textit{lower screening/monitoring incentives for banks} \\
\textit{less screening/monitoring by banks} &\rightarrow \textit{more defaults,}
\end{aligned}
$$

one still has no reason to suspect that there is anything wrong nor socially undesirable with this. Based on the theory of incentives in its simplest form, the securitization boom can be viewed as a constrained-optimal response to higher gains from trade between banks and markets.

The rest of the paper first develops a positive view on securitization based on such a simple moral-hazard model. It then studies a simple variation of this model in which an inefficient securitization boom becomes possible.

2 A Positive View on Securitization

2.1 Setup

There are three dates indexed by 0, 1, and 2. There is a single consumption good used as the numéraire. There are two types of agents: one bank and several investors.

Preferences. Investors rank consumption streams (c_0, c_1, c_2) according to the criterion:

$$c_0 + c_1 + c_2.$$

The bank uses the criterion

$$c_0 + c_1 + \frac{c_2}{1+r},$$

where $r > 0$.

Endowments. Investors receive a large endowment of the consumption good at each date. At the outset of the model ($t = 0$), the bank owns a claim to a loan that pays off at date 2. If the bank monitors the loan between $t = 1$ and $t = 2$, then the loan pays off R with prob. p, and 0 otherwise. If the bank does not monitor the loan between $t = 1$ and $t = 2$ ("shirks") then the loan pays off R with prob. $p - \Delta p$, and 0 otherwise.

Informational frictions. There is a moral hazard problem: Whether the bank monitors the loan or not between $t = 1$ and $t = 2$ cannot be observed by investors. Monitoring has two consequences:

1. It costs the bank the loss of a private benefit $B > 0$.

2. At the end of the monitoring period, the bank privately learns whether the loan will pay off R or 0.

Contracting environment. The bank makes take-it-or-leave-it contracting offers to investors. The bank is protected by limited liability. The bank is free to renegotiate any contract at any date. Figure 1 summarizes the situation.

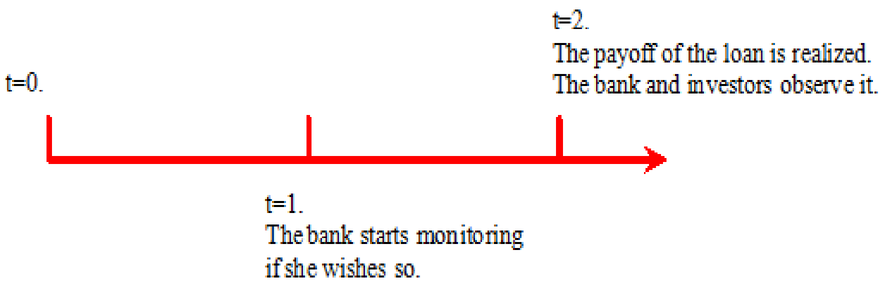

Figure 1.

2.2 Discussion of the Environment

There are two assumptions that will play a role in the next section but are immaterial here: the bank's inability to commit to a contract, and the fact that the bank privately learns the payoff of the loan at the end of the monitoring period. Since both monitoring and gains from trade are only relevant from date 1 on, the contracting problem is a static one that takes place over the second period. At the end of this second period, there is no room for renegotiation and private information plays no role because the economy ends, and all uncertainty resolves. Since these two assumptions play no role for the moment, we postpone their analysis to the next section of the paper in which they will play an important role.

Apart from these two assumptions, the model has the standard ingredients of a moral hazard problem. On one hand, there are gains from trade between a principal and an agent. The gains from trade stem from the fact that the bank has a claim to remote cash flows but is more impatient than investors. On the other hand, the principal - that is, investors - does not observe all the actions of the agent. The bank can secretly monitor or shirk here. The resulting need to provide incentives conflicts with reaping the gains from trade. Canonical moral hazard models assume, as we do, a hidden effort problem, but typically posit that it conflicts with a risk-sharing problem (see Holmstrom (1979)). Introducing a difference in discount rates in a risk-neutral environment instead of a risk-sharing problem slightly simplifies the analysis but is not crucial.

That banks create value by handling soft information that enables them to finance information-problematic borrowers is the cornerstone of banking theory (see, e.g., Diamond (1984)). We capture this with our assumption of bank's exclusive monitoring skills. The assumption that banks are less natural holders of long-term cash flows than markets is a metaphor for the financial fragility of banks due to the mismatch between the profiles of their assets and liabilities. In this paper, financial fragility of banks is assumed. Interestingly, Diamond and Rajan (2001) argue that this financial fragility is actually the endogenous source of banks' ability to handle difficult borrowers. The risk of run acts as an optimal disciplining device that curbs banks' opportunistic behaviour.

2.3 Solution

To simplify the discussion, we will assume throughout:

$$\frac{(1+r)\,B}{\Delta p} < R. \tag{1}$$

Condition (1) imposes a lower bound on the efficiency of the monitoring technology. It says that the pecuniary gains from monitoring $\frac{R\Delta p}{1+r}$ are sufficiently large relative to the private benefit of shirking B.

There are gains from trade between the bank and investors since the bank is less patient than investors, and receives consumption only at date 2 in autarky. On the other hand, if the bank sells 100% of its loan at date 1, it will not monitor. This may be suboptimal. Given limited liability, the only way to provide the bank with incentives to monitor is to ensure that it keeps a stake in the outcome of the project $R_B \geq 0$ such that

$$\frac{pR_B}{1+r} \geq B + \frac{(p-\Delta p)R_B}{1+r} \Longleftrightarrow R_B \geq \frac{(1+r)\,B}{\Delta p}.$$

In this case the bank has an expected payoff equal to

$$\begin{aligned} & p(R-R_B) + \frac{pR_B}{1+r} \\ = \; & p\left(R - \frac{rB}{\Delta p}\right). \end{aligned} \tag{2}$$

The intuition for the bank's valuation of the loan (2) is very simple. It is equal to the future payoff pR reduced by the cost of carrying a stake in the loan during the second period for incentive purposes. The present value of the bank's stake is $\frac{pB}{\Delta p}$, and the cost of holding it is r.

The bank may also find it preferable to sell its entire loan at date 0 or 1, and not monitor, in which case the expected payoff is

$$(p - \Delta p)\, R + B.$$

This yields the following:

Proposition 1

If $r \leq \frac{\Delta p(R\Delta p - B)}{pB}$*, then there is only partial securitization. The bank monitors and the probability of default of the loan is* $1 - p$*.*

If $r > \frac{\Delta p(R\Delta p - B)}{pB}$*, then there is complete securitization and the probability of default of the loan is higher because the bank does not monitor. It is equal to* $1 - p + \Delta p$*.*

Proof. See discussion above.■

According to this model, there is no reason to believe that market forces may lead to inefficient outcomes in the securitization market. Securitization may be more or less important. This affects the bank's incentives to monitor, and thus the quality of the loan. But the constrained-efficient outcome, which optimally trades off gains from trade and incentives, is always reached.

2.4 The Subprime Boom and Bust Through the Lens of this Model

As mentioned in the introduction, three salient stylized facts characterize the subprime boom and bust:

1. Credit risk premia, and in particular spreads on structured products, reached historical lows.

2. The securitization rate of subprime loans surged.

3. Loan delinquencies increased sharply in the second half of 2007.

A simple comparative statics exercise generates these three facts in our model. Consider the situation in which, other things equal, banks' cost of holding loans until maturity becomes relatively higher than that of markets: r increases. From Proposition 1, an increase in r corresponds to a switch from the situation in which there is only partial securitization of loans and monitoring, to the one in which banks are in a non-monitoring mode and fully trade their loans. In this partial equilibrium model at least, this is fully efficient. Banks and investors agree that the social cost of monitoring overcome its benefits and are content with this solution.

Notice that an increase in r means that the relative discount rate of banks becomes higher than that of markets. This is all that is needed to obtain the non-monitoring equilibrium. It would be straightforward to capture this relative impatience of banks in a model in which their discount rate is given, while that of markets decreases because of a positive liquidity supply shock. If investors had outside opportunities with decreasing returns to scale, such a shock would lower the rate at which they are willing to purchase loans. This way, the model would square with the widely held view that lax lending standards were caused by excessive liquidity being invested in the U.S.

Notice that the fact that the bank either sells its entire loan and does not monitor at all, or monitors and keeps a retention is due to our simple modelling choice of a binary effort level. With a continuum of effort levels, at the cost of some additional complexity, we would obtain the more realistic result that the effort level and the retention of the bank decrease continuously as r increases.

I now study a small variation of this model in which the rise of default and securitization after an increase in r is no longer necessarily efficient from the standpoint of banks and investors.

3 A Less Positive View on Securitization

3.1 Setup

Consider now the following elementary modification of the previous model. Suppose that the period during which the bank monitors the loan is no longer the last one, but rather the first one. Figure 2 illustrates this change:

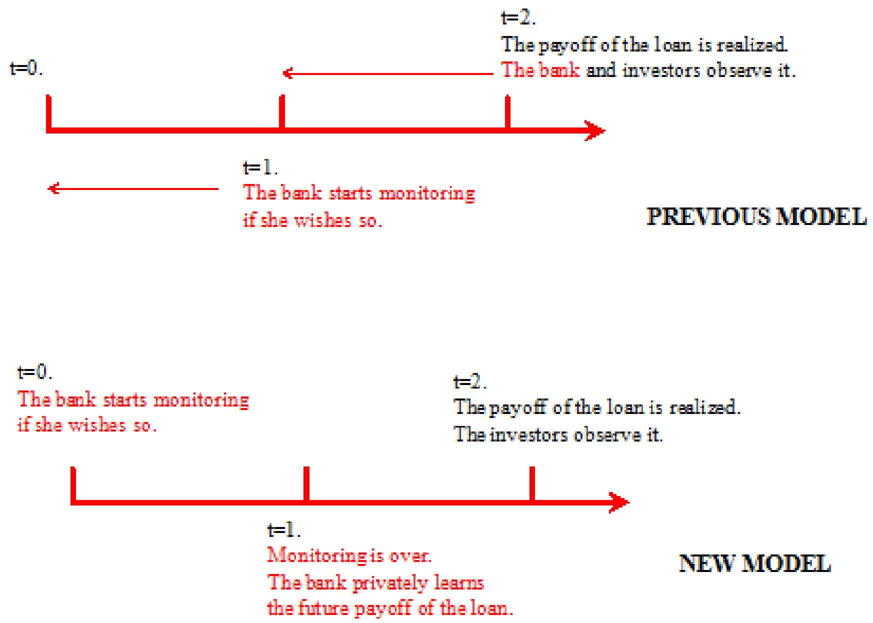

Figure 2.

The rest of the model is unchanged.

3.2 Solution

Two assumptions that were immaterial in the previous model are now important: i) the bank's inability to commit, and ii) the bank's private information about the date-2 cash flow after monitoring. First, the bank's inability to commit may be problematic because it is unambiguously *ex post* efficient for the bank to sell the entire loan to investors at date 1. There is no point in providing further incentives at this stage since monitoring is over. Thus, agents can exhaust the gains from trade. However, the bank's informational advantage may create illiquidity at date 1. In order to solve for the model in this case, we proceed recursively given the bank's lack of commitment power. We first study the liquidity of the date-1 market, and then determine the resulting date-0 optimal arrangement.

Date-1 trades. Note first that if the bank finds it optimal to not monitor at date 0, then it may as well sell its entire loan at date 0 and pocket $(p - \Delta p) R$. On the other hand, if the solution involves monitoring, then it must be that the bank has kept a stake R_B in the loan between date 0 and date 1. By monitoring, the bank learns the date-2 payoff at date 1.

We refer to a bank which knows at date 1 that the loan will pay off R at date 2 as a "good bank," and to a bank which knows that the loan will default at date 2 as a "bad bank." We first show that a good bank never finds it optimal to signal its information to the market. Assume the bank has some cash on hand at date 1, for example the proceeds $p(R - R_B)$ from selling the stake $R - R_B$ at date 0. In principle, this cash can be used as collateral for a sale with recourse. In order to signal its type, a good bank can promise, for each unit of its claim to R_B that it sells at date 1, to pay an amount of cash c at date 2 if the loan turns out to be nonperforming. A bad bank is unwilling to mimick a good bank and offer the same deal if and only if:

$$1 < c. \tag{3}$$

It must be the case, indeed, that a bad bank prefers to consume the collateral c now rather than receiving 1 right now and losing the collateral. But then, inequality (3) shows that a good bank will never find signalling optimal. It is better off consuming c now and 1 at date 2 rather than 1 now and c at date 2 for any value of $r > 0$ because $c > 1$ implies

$$1 + \frac{c}{1+r} < c + \frac{1}{1+r}.$$

Absent the possibility of signalling, the characterization of the date-1 market is now simple. In the eyes of a good bank, the stake is worth R_B, while it is worthless from the standpoint of a bad bank. On the other hand, competitive investors are willing to pay pR_B for the date-1 bank's stake.

Thus, if

$$p < \frac{1}{1+r},$$

there is no securitization of stakes in good loans: the bank with a performing loan prefers to keep its stake. Only nonperforming loans trade in the market at their fair value of 0.

If

$$p \geq \frac{1}{1+r},$$

then the bank, either good or bad, makes a take-it-or-leave it-offer at the pooling price pR_B. The date-1 sale of the equity stake that the bank retained at date 0 is akin to the development of CDOs during the credit boom that were used by banks to bundle and repackage their residual exposures.

The initial date-0 contract depends on which of these two possible date-1 outcomes agents expect. Suppose first that

$$p < \frac{1}{1+r},$$

so that there is no date-1 trade of a good stake. In this case, the stake R_B that is incentive-compatible for the bank at date 0 solves

$$\frac{pR_B}{1+r} \geq B + \frac{(p - \Delta p)\, R_B}{1+r},$$

or

$$R_B \geq \frac{(1+r)\, B}{\Delta p}.$$

This is the same incentive-compatible stake as in our first model because it is exactly the same trade-off between providing incentives and liquidity to the bank. In this case the bank values the loan as

$$\begin{aligned} & p\,(R - R_B) + \frac{pR_B}{1+r} \\ = \;& p\left(R - \frac{rB}{\Delta p}\right). \end{aligned}$$

Not monitoring is better if this is smaller than $(p - \Delta p)R + B$, or

$$r > \frac{\Delta p\,(R\Delta p - B)}{pB}.$$

Suppose now that

$$p \geq \frac{1}{1+r},$$

so that the date-1 market for the bank's stake is pooling. The stake R_B that is incentive-compatible for the bank at date 0 now solves

$$pR_B \geq B + pR_B. \tag{4}$$

The left-hand side is the expected payoff from monitoring. The right-hand side is the expected payoff from shirking. Inequality (4) is never satisfied. Thus it must be in this case that the bank does not monitor. The following proposition collects these results.

Proposition 2

1. If $p < \frac{1}{1+r}$*, then securitization is always optimal and*

1.1. if $r \leq \frac{\Delta p(R\Delta p - B)}{pB}$ *then the bank monitors and there is partial securitization.*

1.2. if $r > \frac{\Delta p(R\Delta p - B)}{pB}$ *then the bank does not monitor and sells its entire loan at date* 0 *(or* 1*).*

2. If $p \geq \frac{1}{1+r}$ *then the bank does not monitor and sells its entire loan at date* 0 *(or* 1*). This is suboptimal if and only if* $r \leq \frac{\Delta p(R\Delta p - B)}{pB}$.

Proof. From the above discussion.■

Even though I simply shift monitoring from the second to the first period in this new model, I obtain significantly different implications regarding efficiency. Now the bank's commitment problem is important. Consider the case in which $r \leq \frac{\Delta p(R\Delta p - B)}{pB}$ and $p \geq \frac{1}{1+r}$. In this case, the bank does not monitor, and this is inefficient: the bank would be strictly better off if it could credibly commit to not trade its stake at date 1, and thus monitor the loan. This can be interpreted as a situation of excessive securitization and overly lax lending. Banks know that they can sell their loans at a pooling price, and this inefficiently destroys their incentives to monitor.

As is often the case, the addition of a second friction to this commitment problem - the date-1 lemons problem - may restore efficiency. If the lemons problem is important at date 1 ($p < \frac{1}{1+r}$), then the bank trades or monitors only when it is desirable.

Another way to describe the results in Proposition 2 is as follows. Adverse selection in the date-1 market creates a tension between the allocative efficiency and the informational efficiency of the securitization market. Essentially, either the market transfers claims to future cash flows from impatient to patient agents, but in this case it can do so only at a pooling price that does not reflect the information of the seller, or the market fails to do so and in this case traded claims are fairly priced (only loans worth 0 trade for a price of 0). The informational inefficiency of the pooling price at which the market is allocationally efficient has devastating *ex ante* consequences for incentives. That the informational efficiency of the date-1 market is lower when trading volume is higher also has implications for the pricing of the loans sold in this market. Because the type of traded loans is revealed in an illiquid market, one should expect large pricing differences across portfolios that have similar observable characteristics (summarized for instance by their composition and ratings). On the other hand, in a pooling market, portfolios with similar observable characteristics should command similar risk premia.

3.3 The Subprime Boom and Bust Through the Lens of This Model

This version of the model offers a much more pessimistic view on the channel through which an increase in banks' relative opportunity cost of holding loans has caused a surge in securitization, and in turn higher default rates.

Based on this model, a possible view is that before the subprime bust, r was such that $p < \frac{1}{1+r}$ and $r \leq \frac{\Delta p(R\Delta p - B)}{pB}$. Thus, banks were forced to hold on to an incentive-compatible stake because the adverse selection discount in the market for subprime-backed securities was larger than their relative opportunity cost of holding loans until maturity. Then, the inefficient situation in which $r \leq \frac{\Delta p(R\Delta p - B)}{pB}$ and $p \geq \frac{1}{1+r}$ was reached, giving rise to excessive and inefficient securitization and inefficiently low monitoring. This pessimistic view of the subprime boom and bust states that lack of commitment and adverse selection were neutralizing each other before the boom. Then, the inefficiencies associated with the lack of commitment became important as the securitization market switched from a lemons market to a pooling market.

To be sure, the optimistic view of an efficient securitization boom is also a theoretical possibility here. This corresponds to the case in which r just shifts from below $\frac{\Delta p(R\Delta p-B)}{pB}$ to above this threshold while p remains smaller than $\frac{1}{1+r}$ throughout the subprime boom.

My setup is too simple to deliver additional testable implications that could help separate out these two interpretations that have very different implications in terms of the efficiency of securitization. Notice, however, that in the case in which the private monitoring costs become very small, so that $B \to 0$, then inequality $r \leq \frac{\Delta p(R\Delta p-B)}{pB}$ is likely to hold for any value of r. On the other hand, the relative values of p and $\frac{1}{1+r}$ are not affected by B. **In other words, in the limiting case $B \to 0$ of small moral hazard, an increase in securitization rates and default rates due to an increase in r are most likely to be inefficient.**

The empirical counterpart of the monitoring cost B is not the total monitoring cost spent by banks, but rather the fraction of these costs that are private, and thus not observable by outsiders. The observed fraction of these costs is included in the operational costs reported by banks and are factored in R in our setup. Thus, if one believes that the fraction of the bank's monitoring costs that are not observable by outsiders - the "private costs" - is small, then one should find the pessimistic view on securitization more likely.

3.4 Discussion of the Critical Assumptions

The three assumptions that drive the inefficiency result are:

1. The bank is unable to commit to a credit risk transfer policy.

2. Monitoring by the bank takes place early in the life of the loan, before securitization.

3. The bank acquires a lot of private information through monitoring.

We now discuss each of these three assumptions in turn.

The first assumption seems very plausible given the "light touch" regulatory environment and the opaque market for credit risk transfer that prevailed before the crisis. It was very easy, indeed, for a bank to secretely buy protection against the default risk on part of its loan portfolio. Morrison (2005) develops a model in which this opaqueness of the credit risk transfer market has inefficient consequences similar to ours.

The second assumption may seem more questionable. In practice, retail loans are securitized very shortly after origination. One could therefore argue that a significant fraction of bank monitoring takes place after securitization, as is the case in our first model. The strong and somewhat surprising results by Keys et al. (2010) and Rajan et al. (2009) mentioned in the introduction suggest, however, that a lot of important soft information production by banks takes place right at the origination of the mortgage, and before securitization. One can therefore reinterpret "monitoring" in our model as a screening technology that enables banks to privately observe the quality of the potential borrowers at the outset, and thus turn down low-quality ones at some cost. In sum, the early moral hazard problem described in the second model captures well the type of screening incentives that, according to Keys et al. (2010), mattered for subprime mortgages.

Regarding the third assumption, notice first that as is well-known, any *ex ante* moral hazard problem turns into an *ex post* adverse selection problem in general. Since only the agent knows his effort level, he has private information about the distribution of his output after having chosen a given effort level. Crucially, the degree of *ex post* adverse selection that we assume goes beyond this, since we posit that the bank knows the exact loan payoff at date 1. The assumption that lending generates proprietary information about the borrower even for a given observable effort level is common in the banking literature (see, e.g., Rajan (1992)). What does this assumption buy us? Notice that lack of commitment would be dramatically more inefficient here if the informational advantage of the bank was only that the bank knows at date 1 if the loan pays off with probability p or $p - \Delta p$ depending on its monitoring effort, and not the exact payoff as in our model. If this were the case, then the incentive-compatibility constraint of the bank would be again (4) and monitoring would be impossible. The case $p < \frac{1}{1+r}$ in which the *ex post* lemons problem restores *ex ante* incentives to monitor would disappear. Thus, this assumption buys us the result that if the opportunity cost of holding loan is sufficiently low (r sufficiently low), then banks' private information acts as a commitment device that prevents them from inefficiently shedding credit risk and thus lose any incentives to monitor.

3.5 Conclusion: Policy Implications

I have developed a rational model in which an unanticipated increase in banks' relative opportunity cost of holding loans in their balance sheets leads to inefficient, excessive securitization and suboptimal lending standards. With a low opportunity cost of holding loans, two frictions offset each other, which leads to the second-best. On one hand, banks cannot commit not to transfer credit risk in an opaque secondary market. On the other hand, their private information about their loan portfolios creates a lemons problem that serves as a commitment device not to do so. If the opportunity cost of carrying loans is higher all else equal, then the commitment problem remains while the second friction - the lemons problem - vanishes. This leads to excessive securitization and suboptimally low monitoring effort by banks. There are two ways, in principle, to Pareto improve the situation. First, if a high r eliminates adverse selection as a commitment device, then another source of commitment power can be introduced, which would restore the second best. Second, and more radically, if information was symmetric in the date-1 securitization market - if investors knew as much as the bank, then there would no longer be a trade-off between allocative and informational efficiencies in this market and the first-best would be restored. In this case, banks could securitize at a price that reflects all their information at date 1. This would exhaust the gains from trade without hurting incentives to monitor *ex ante.*

Any reform, either initiated by the government or by the industry, aimed at reducing the opaqueness of the credit risk transfer market would improve the situation on both fronts. First, if the quantity of protection that a bank purchases against any type of risk that it has originated was easily observable, this would greatly increase banks' ability to *ex ante* commit to securitization ratios that are consistent with proper incentives to monitor. Second, if credit risk transfer was achieved through the trading of more standardized contracts with strong disclosure requirements for which the informational playing field between primary and secondary loan holders was levelled, this would increase informational efficiency.

Clearly, such reforms would also come with costs. One alleged advantage of the development of credit risk transfer markets was that it enabled banks to disentangle the management of their relationship with their customers and the management of their balance sheets. With a more transparent disclosure of the risks that a bank keeps or not, customer relationship management and risk management would be closely tied again. Second, the restriction of credit risk transfer through the exchange of more standardized intruments would introduce basis risk. These costs are simply the price to pay to ensure that banks "eat what they cook," and thus cook more carefully than during the subprime boom.

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