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# What is responsible for the easing of credit standards before the crisis: monetary policy or the savings glut?

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*This* Rue de la Banque *compares two explanations for the significant easing of credit standards and risk premia observed before the crisis: the easing of monetary policy and the increase in global savings (the famous "savings glut" of Ben Bernanke). The results of our modelling show that only the savings glut appears to explain the pre-crisis behaviour.*

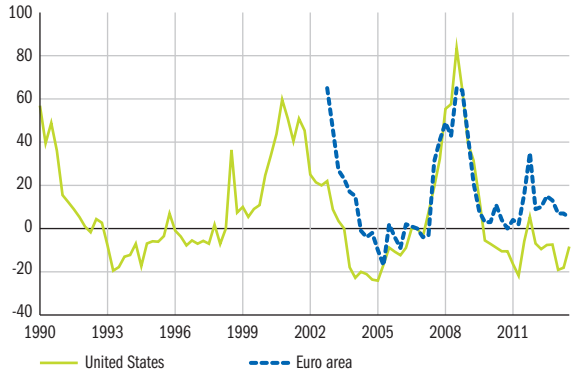
The global financial crisis which began in the summer of 2007 and intensified in 2008 triggered the deepest economic downturn since the Great Depression. Why did it happen?[1]

There is, of course, no single or simple answer. But a crucial element was that in the years leading up to the crisis, major western banks were lending on easier terms to less creditworthy borrowers. Their balance sheets were more vulnerable when the crisis struck. This was exemplified by the rise in sub-prime mortgages in the United States but was also evident in the residential real estate booms in Spain and Ireland. In the corporate sector, loan covenants were also weakened, credit standards relaxed and credit spreads narrowed.

Chart 1 illustrates the net balance of respondents reporting a tightening of credit standards in the United States and the euro area. It is clear from the US data that credit standards move in cycles but the period during the mid-2000s was particularly relaxed.

**C1 Net balance of respondents reporting a tightening of credit standards**

*(percentage of respondents)*




*Sources: Federal Reserve Senior Loan Officer Survey, ECB Bank Lending Survey (starting 2003:Q1).*

1 *This note summarises Penalver (2014).*

Chart 2, focusing on the euro area, shows that compensation for taking risk was decreasing even as credit standards were being relaxed.

There are two schools of thought about why this happened, with different implications for the conduct of monetary policy and macroprudential policies.

According to Borio and Zhu (2011) banks took more risk at lower spreads because of low official interest rates. (The ECB target rate was set at 2% from June 2003 to December 2005 and the Federal Funds rate was at or below 2% from November 2001 to November 2004.) The 'risk-taking channel' of monetary policy works through a number of interlocking effects. Low risk-free rates increase asset prices, making collateral appear more valuable and thus more can be recovered in the event of default. Moreover, falling default risk contributes to lower asset price volatility which in turn reduces the apparent riskiness of portfolios, for example as measured by popular indicators such as value-at-risk. Credit spreads are competed away. Asset managers, particularly those subject to nominal return targets, are pushed into more and more risky investments in a 'search for yield'.

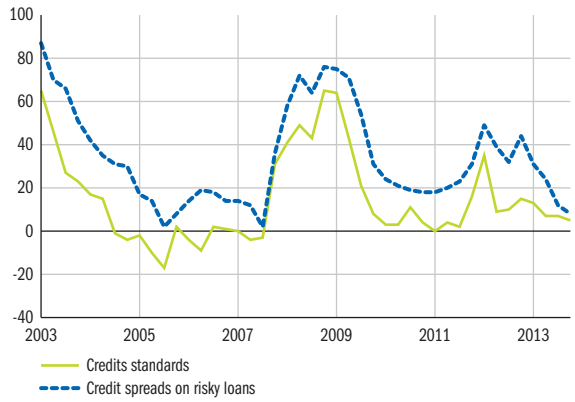
According to Ben Bernanke, then the Chairman of the Federal Reserve (2010), it was not monetary policy but an increase in the supply of global savings. The increased demand for foreign exchange reserves, particularly in Asia, created a global 'savings glut'. Central banks from emerging markets bought government bonds from private investors who then needed alternative uses for their funds, setting up a 'search for the marginal borrower'. Willing borrowers were found in the real estate market, including amongst those who had previously been denied credit because of high default risk. With lower borrowing rates and rising asset prices, these looked like better credit risk than previously.

The risk-taking channel has received significant empirical support. Jiménez, Ongena, Peydró and Saurina (2008) used data from the Spanish credit registry over the period 1984-2006 and found a statistically significant increase in the credit riskiness of new loans when policy rates were low at the time of loan origination. Moreover, if interest rates subsequently rose, then the hazard rate on these riskier loans was materially higher. On the other hand, Merrouche and Nier (2014) find no effect of monetary policy on bank risk taking once capital inflows and supervisory characteristics are taken into account.

Since the data are inconclusive, Penalver (2014) builds a theoretical model of credit risk management to compare these hypotheses on a consistent basis.

**C2 Compensation for taking risk and credit standards**

*(percentage of respondents)*




*Source: ECB Bank Lending Survey.*

The model describes the behaviour of a bank which intermediates funds between depositors and borrowers. The borrowers take out a loan to create a firm. The profits from the firm have a persistent random component to them and can be positive or negative. Crucially, it is assumed that it is costly to start up a firm (a restaurant needs to fit a kitchen, buy tables and chairs, advertise etc) and costly to exit (severance pay, liquidation of stock at below cost etc). Naturally these costs affect the decisions to start or close down a firm. In particular, an entrepreneur will try to ride out a period of mild losses if there is sufficient probability of a return to profitability.

The model also assumes that borrowers have limited liability. If firm losses are too high, borrowers have the option to declare bankruptcy and default. Going bankrupt is costly but in extreme circumstances it will be the least-worst option. If borrowers default, it is the bank that has to close down the project and it is assumed that the bank is less efficient at doing this than the borrower would be. As a result, the bank incurs a loss in the event of default.

The bank faces the following difficulty: borrowers who are making losses and gambling on a return to profitability and hoping to avoid paying the exit costs are the ones most likely to declare bankruptcy in subsequent periods and in turn impose credit losses on the bank. The bank, therefore, has an interest in trying to influence the exit decision. One way it can do this is set an exit threshold of its own through a covenant in the loan contract. If profitability falls below this covenant threshold, then the bank has the right to demand immediate repayment.

Such a covenant would be easy to enforce if the bank always knows the profits of each firm. In the model it is assumed that the bank has to pay a monitoring cost to find out the state of the firm and the bank can enforce the covenant only if the monitoring reveals that the profits of the firm are indeed below the profitability threshold.

Finally, it is assumed that entrepreneurs who are not currently producing are savers who deposit their wealth at the bank.

All these ingredients go together to influence the bank's loan terms. The objective of the bank is to maximise profits by choosing its loan interest rate and loan monitoring intensity subject to the constraint that it has to have as many deposits as loans. The monitoring intensity can be zero or one (never or always monitoring, respectively) or any probability in between.

To understand the key trade-off for the bank, it is useful to consider the firm continuation decision. If the bank never monitors, the borrower alone chooses to continue or exit. If the bank always monitors, then the bank has the continuation or exit choice. If the bank monitors with some probability (say a half), this splits control over the continuation decision between the two parties. The greater the control exercised by the bank, the lower the value of the contract to the borrower and therefore the lower the loan interest rate that the borrowers are willing to pay. So the key trade-off is that the more the bank monitors, the lower the credit risk but the lower the interest rate it can charge.

Chart 3 illustrates the interplay of the main forces that influence credit supply by banks and loan demand by firms. The credit management line (CM) has a positive relationship between the monitoring rate and the loan interest rate. When interest rates are higher, the default rate is higher because net profits are lower. So for any given cost of monitoring, the bank will want to monitor more.

The balance sheet line (BS) has a negative relationship between the monitoring rate and the loan interest rate. It represents combinations of contract terms for which the marginal borrower is indifferent. The higher the monitoring rate, the less attractive the loan for a potential borrower and thus the lower interest rate that can be charged to match the volume of borrowers with the volume of depositors. In other words, higher monitoring intensity reduces the demand for credit, forcing the bank to lower its loan interest rate. The equilibrium is at the intersection of the two lines.

Let's now turn to the predictions of the model on the effects on credit standards and credit spreads of a global savings shock and a monetary policy shock.[2]

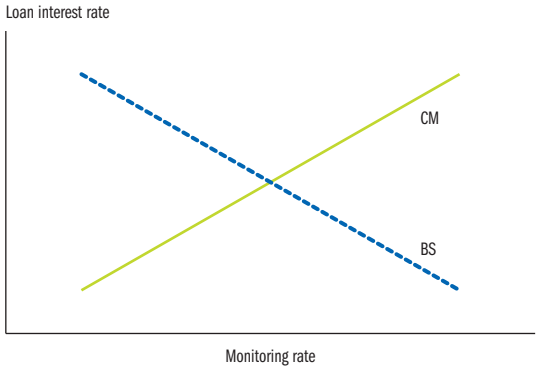
In the model:

- The global saving shock is modeled as an exogenous rise in deposits.

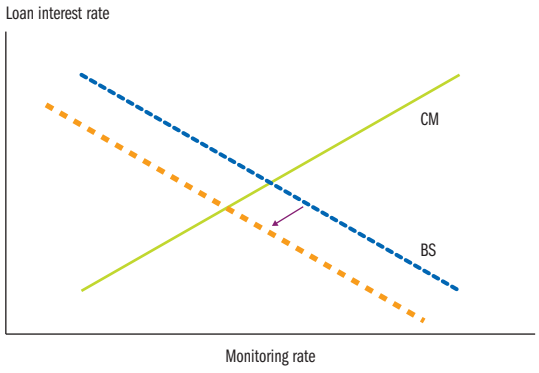
- The monetary policy shock is modeled as a reduction in the exogenous deposit rate.

Chart 4 illustrates the effect of an exogenous supply of deposits from outside the economy. This doesn't change the relationship between loan interest rates and default and thus the incentive to monitor so the CM line

**C3 Interplay of the main forces that influence credit supply by banks and loan demand by firms**




**C4 Effect of an exogenous supply of deposits**




*2 This section summarises the technical results in the paper.*

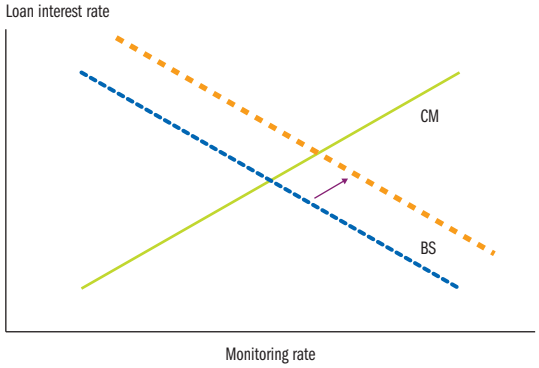
is unchanged. Instead, the additional supply of deposits disturbs the balance sheet because the bank finds itself with more deposits than loans.

The new marginal borrower will have a less profitable project and can only be induced to borrow with easier credit terms – an inward shift in the BS line. Accommodating this rise in savings could be achieved by lowering the loan interest rate only. But lower loan interest rates lower default risk – represented by the CM line – and the most profitable combination for the bank is to lower the monitoring rate as well. The bank not only saves on monitoring costs but also manages to reduce the amount of loan margin it loses. Overall, the savings glut shock is consistent with a fall in credit standards and lower loan margins.

By contrast, as illustrated in Chart 5, a cut in the deposit rate causes a rise in the monitoring rate and a rise in loan interest rates. How does this arise? As in the external deposit shock, the CM line is unaffected because the relationship between loan interest rates and default is unchanged. But the BS line shifts outwards this time so the new equilibrium requires higher loan interest rates and more monitoring.

Why does the BS line shift outwards? When the deposit rate falls, the incentive to be a depositor falls and the incentive to be a borrower rises. This leads to an excess demand for loans. To reequilibrate the balance sheet without an additional external supply of deposits, the bank has to tighten credit terms, which pushes the BS curve outwards. As loan interest rates rise, so does default risk and the bank has the incentive to monitor more. Overall, a shock to monetary policy, by itself, does not replicate pre-crisis "behaviour".

**C5 Effect of an easing of monetary policy**




Penalver (2014) presented a model of credit standards in which a bank sets its monitoring intensity by balancing the effects on its profits of reducing default risk and a lower market-clearing interest rate. If there is an exogenous increase in deposits, credit terms ease and loan margins fall. By contrast, a cut in the deposit rate leads to a tightening of credit terms. This analysis suggests that only the savings glut hypothesis can explain pre-crisis behaviour. Monetary policy is innocent.

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