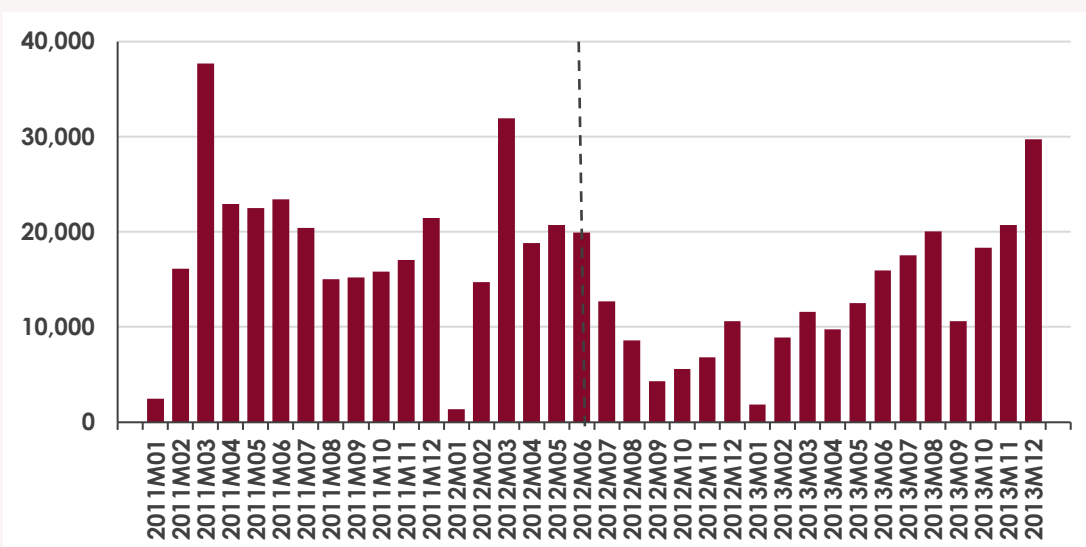


### Box 14. Analysis of the effects of a risk-sharing model: the case of the ICO liquidity second-floor facility

In 2009, the ICO liquidity facility was created with the aim of mitigating the effects of the financial crisis on Spanish companies. Originally, **unlike ICO's other second-floor facilities**, where the risk of the operation is borne entirely by the mediating bank, **the risk of non-payment of the loans under this facility was shared between the ICO and the financial institutions equally**. This sharing was intended to increase the liquidity of the financial system by reducing the risk aversion of financial institutions in the midst of an unprecedented financial crisis. The **important role played by** the facility can be seen in the consequences of its closure in July 2012, with a sharp fall in the total number of ICO second-floor facility operations since mid-2012 (figure b\_14.1 ).

FIGURE B\_14.1. BIWEEKLY EVOLUTION OF THE NUMBER OF OPERATIONS OF THE SECOND-FLOOR FACILITIES 2011-2013



Source: AIReF with ICO data.

In 2010, a category was added to the liquidity facility where 100% of the risk is assumed by the financial institution and between 2010 and 2012, the two categories coexisted, that of the risk assumed by the financial institutions and that of the shared risk. The **financial institution was responsible for carrying out the risk assessment** and choosing the category and the interest rate, with the ICO setting the same rate as the financial institution in the case of the risk-sharing category.

TABLE B\_14.1. SUMMARY OF DIFFERENCES BETWEEN THE TWO TYPES OF LIQUIDITY FACILITIES

	Category 1 (50-50% ICO-Financial instruments)	Category 2 (100% Financial instruments)
In force	From 2009 to 2012	From 2010 to 2012
Acceptance of risk	50% ICO – 50% Financial instruments	100% Financial instruments
Provision of funds	50% ICO – 50% Financial instruments *	100% ICO

Source: AIReF with ICO data.

Note: \* Except in 2012 when the ICO provides 100% of the funds.

**This box uses a descriptive approach to compare the two categories of the facility (100% risk versus shared risk) with the aim of determining whether a different form of provision in the shared risk category extended the spectrum of companies to which the intervention reached in scope, solvency and survival of the beneficiary companies.**

**To try to reduce the moral hazard of the operation in the risk-sharing category, the ICO introduced a safeguard whereby the financial institution had to contribute 50% of the loan funds (table b\_14.1). The aim was to align the incentives of financial institutions and the ICO, agent and principal, respectively, in the granting of loans.** In a context in which the market strongly discriminated between financial institutions in relation to their perceived risk, this may explain why, especially at the start of the period, the institutions were perceived as more solvent by the market - for example, based on the price of their Credit Default Swap (the higher the CDS, the higher the risk) - and, therefore, whose funding cost was lower, that most used the risk-sharing category.

The two categories also differed in how the interest rate of the operation was set. In 2010 and 2011, the risk-sharing category allowed financial institutions greater margins and the application of an additional spread. Specifically, the interest rate structure by category is shown in table b\_14.2.

TABLE B\_14.2. INTEREST RATES APPLICABLE TO THE TWO LIQUIDITY FACILITY CATEGORIES

Year/Category	50-50% ICO- Financial instruments	100% Financial instruments
2010	Euribor + margin up to (2%, 2.5%, 3%, 3.5%) + spread*	Euribor + margin up to 3.5%
2011	Euribor + margin up to (2.5%, 3%) + spread	Euribor + margin up to 2%
2012	Euribor + 2% margin	Euribor + margin up to 2%

Source: AIReF with ICO data.

Note: \* Up to 1.5% for funds contributed by financial institutions

**In short, what the risk-sharing facility allowed compared with the 100% facility was that at the same interest rate, credit institutions had more margin to grant loans to companies with a higher risk of default (as it was shared with the ICO) provided their funding cost was not very high. In other words, institutions with a reduced cost of raising funds in the market would prefer the risk-sharing category since they assumed half the risk of the operation.** At the same interest rate, the institution will prefer the risk-sharing category (left of the equation) to 100% risk (right of the equation) provided that:

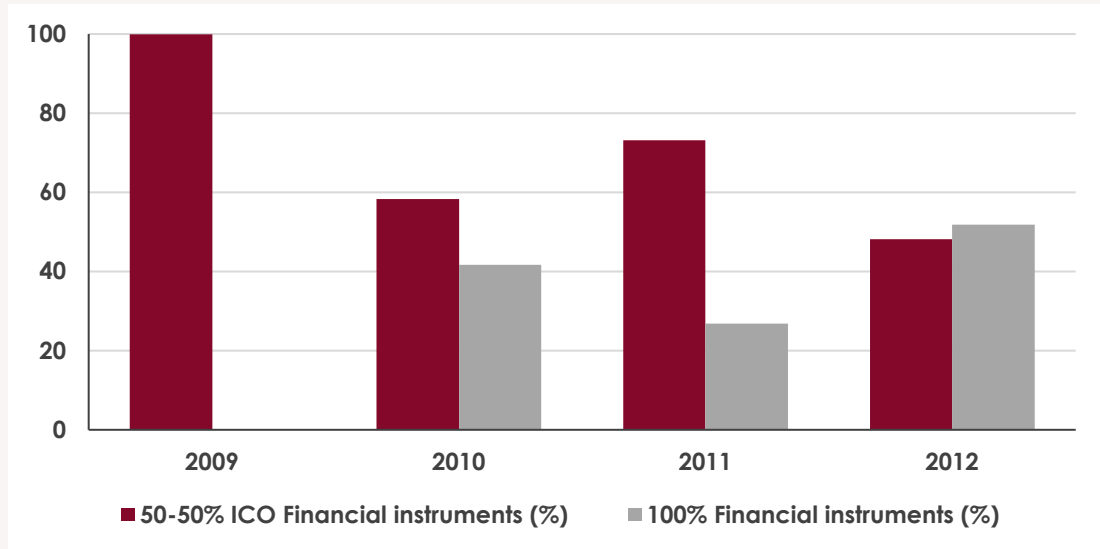
$$\begin{aligned} \frac{d}{2} + c &< d \\ \frac{1}{2}d - c &> 0 \end{aligned}$$

Where  $d$  is the risk of default and  $c$  the cost of funding. Therefore, **institutions with a low funding cost  $c \cong 0$  will prefer the risk-sharing category as it provides them with a larger implicit margin that they could use to provide loans to less solvent companies that would not have been beneficiaries had this category not existed.**

**The results show that this was the case:**

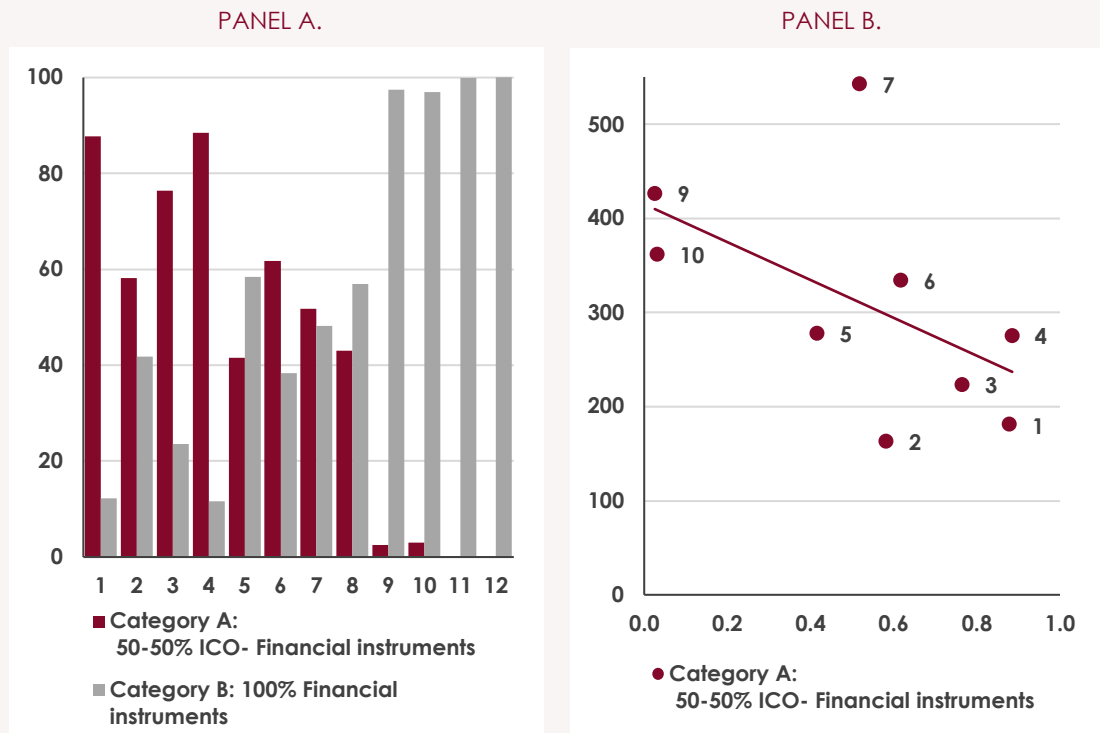
- There was an intensive use of both the risk-sharing category and the category of 100% risk assumed by financial institutions (figure b\_14.2). The amount of the loans tends to be lower on average for the risk-sharing category compared with the category of 100% risk assumed by the financial institutions.
- Here was heterogeneous behaviour in the use of these categories by financial institutions, mainly in 2010 (figure b\_14.3: Panel A). As expected, the financial institutions with the lower funding cost (approximated by the CDS), made greater use of the risk-sharing category (figure b\_14.3: Panel B).

FIGURE B\_14.2. PERCENTAGE OF OPERATIONS UNDER CATEGORY 50-50% ICO FINANCIAL INSTITUTIONS AND 100% FINANCIAL INSTITUTIONS



Source: AIReF based on data from financial instrument institutions

FIGURE B\_14.3. PANEL A: PERCENTAGE OF OPERATIONS UNDER CATEGORY 50-50% ICO FINANCIAL INSTITUTIONS AND 100% FINANCIAL INSTITUTIONS BY BANKS WITH MORE THAN 1,500 OPERATIONS IN THE LIQUIDITY FACILITY. PANEL B: CORRELATION BETWEEN RISK-SHARING CATEGORY AND CREDIT DEFAULT RISK (CDS), YEAR 2010



Source: AIReF with ICO data.

**Combining the transaction data with information from the Central Balance Sheet Data Office of the Bank of Spain, the ex-ante risk profile of the beneficiary companies has been analysed** on the basis of their annual accounts and their survival rate (ex-post or realised risk) **to verify whether the risk-sharing category actually reached companies with a higher risk profile.** The use of a realised risk metric is intended to capture those credit risk factors that are not reflected in the annual accounts but which are observable by the bank (for example, credit history).

**The ex ante short-term solvency risk is approximated through a dynamic ratio that tells us whether the company generates enough cash through its ordinary activity to meet its financial requirements.** In general, companies with a value of this ratio greater than one will be considered solvent in the short term, since they can meet their financial requirements with the cash from their ordinary activity. By combining the information of this ratio with that of the net ordinary profit, the following types can be established:

TABLE B\_14.3. SHORT-TERM SOLVENCY RISK

	Short-term dynamic ratio < 1	Short-term dynamic ratio > 1
Net ordinary result < 0	There is very high solvency risk in the short and long-term	There is very high solvency risk only in the long term

Source: AIReF.

**To measure the ex-post risk, the survival rates of the companies that used this second-floor facility are analysed using a survival indicator** that takes the value one if the company appears in the Data Office two years after the loan. The probability of survival is estimated with a probit model controlling for their characteristics (e.g. age, size, sector, solvency risk, etc.).

The results of this analysis show the following:

- With the closure of the risk-sharing category, it can be seen that the average solvency of companies in second-floor facilities increases sharply (figure b\_14.4, panel A). This result, together with the reduction in the total number of operations (figure b\_14.1), **shows that the facility reached a significant number of companies that, due to their risk, had not accessed loans.**
- There is a **higher ex ante short-term credit risk of companies assigned to the risk-sharing category** compared with companies assigned to the category of 100% risk assumed by the financial institutions. Long-term default expectations are lower than short-term ones (figure b\_14.4, panel B).

- **The two-year survival rate** (ex post measure of risk or realised risk) **is lower in the risk-sharing category** (figure b\_14.5, panel A). In the risk-sharing category, it is observed that the survival rate falls as the (maximum allowed) margin increases, that is, **for companies considered as higher risk by the bank, the survival rate is lower**. Particularly relevant is the comparison between operations at equal interest rates, where the **survival rate is clearly lower for companies in the risk-sharing category**.
- The probability of surviving is higher, on average, for companies with operations in the category of 100% risk assumed by the financial institutions (figure b\_14.5, panel B).

FIGURE B\_14.4. MEDIAN SHORT-TERM DYNAMIC RATIO PER HALF MONTH, PERIOD 2011-2013

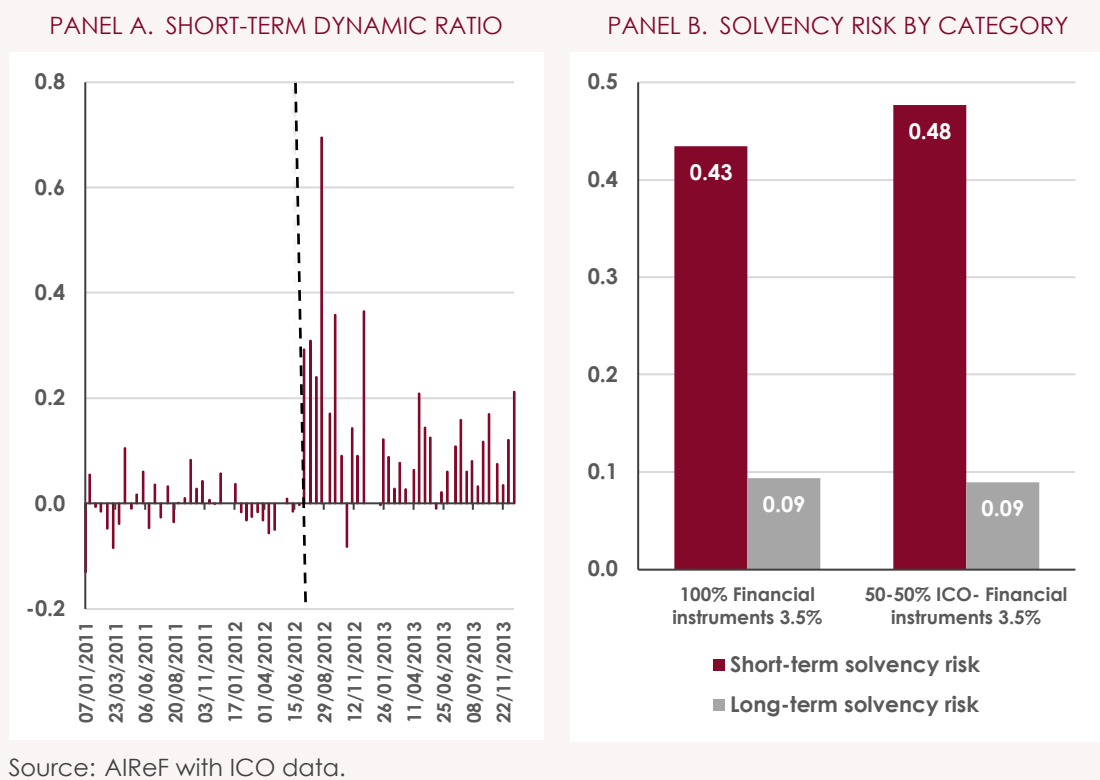
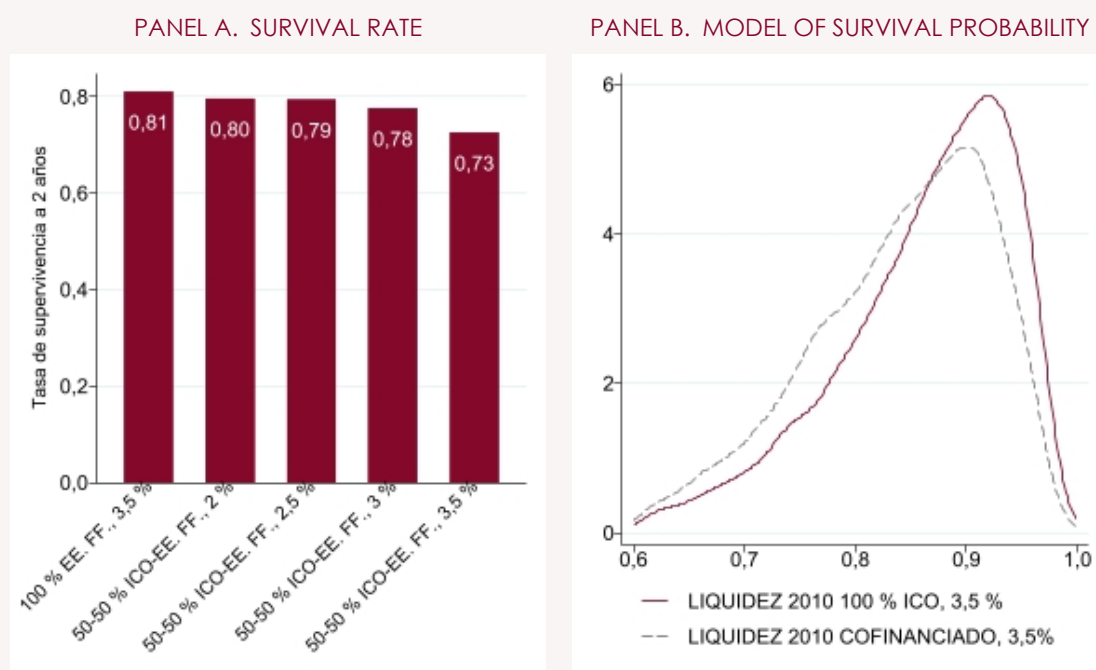


FIGURE B\_14.5. SURVIVAL RATE AND MODEL OF SURVIVAL PROBABILITY BY CATEGORY



Source: AIReF with ICO data.

**In conclusion, the existence of a facility with two categories is an interesting case for the study of the design of financial instruments. The decision on who bears the risk (ICO-financial institutions) involves trade-offs.** On the one hand, a risk-sharing model allowed access to financing for companies that were more fragile or that, due to their characteristics (for example, their size), had more limited access to credit. On the other hand, the problems of moral hazard and adverse selection could be intensified affecting the ICO's results. The Government's intention in introducing the category was to **use financial instruments to help alleviate companies' liquidity problems at a time of a widespread credit crunch and increased risk aversion, while trying to minimise moral hazard through the loan co-financing formula.**

In practice, however, **this selected against banks perceived as less solvent**, but not necessarily less solvent companies. The results of the risk-sharing category can be considered ambivalent. On the one hand, the number of loans granted in a context of restricted credit rose significantly. In addition, this liquidity reached companies that, due to their risk profile, could not access other categories. On the other hand, this risk translated into a higher default rate. The mechanism implemented to align the incentives of financial institutions and the ICO through a co-financing formula meant that potential beneficiary companies were left out of the formula as their bank was unable to access

the facility due to its financing difficulties, in the context of sharp restriction in liquidity. **The *de facto* result was a discrimination between companies with an identical risk profile only due to the bank with which they worked, which revealed some of the costs of the second-floor facility model.**

**In short, the second-floor facility model is a complex model in which the interests of the agents, the information problems and the difficulties of coordination and control are the counterbalance to the major advantages of efficiency and scope that it provides for the State.**