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Home ► All Journals ► Economics, Finance & Business ► Economics of Innovation and New Technology ► List of Issues ► Volume 17, Issue 6 ► IMPACT OF FINANCIAL CONSTRAINTS ON INNOV ...

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IMPACT OF FINANCIAL CONSTRAINTS ON INNOVATION: WHAT CAN BE LEARNED FROM A DIRECT MEASURE?

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significantly reduce the likelihood that firms have innovative activities. The probability

to encounter financial constraints is explained by firms’ ex ante financing structure and economic performances.

Keywords:

- Innovation
- Financing constraints
- Recursive bivariate probit

JEL Classification :

- G31
- C35
- O31

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Notes

¹The CIS is a survey conducted by the French Ministry of Economy and Finance, in partnership with the European Commission, to collect data on the innovative activities of firms. The survey is conducted annually and covers a wide range of innovative activities. The data are used to analyze the impact of innovation on the economic performance of firms. The survey is also used to monitor the progress of innovation in France. The survey is conducted by the French Ministry of Economy and Finance, in partnership with the European Commission, to collect data on the innovative activities of firms. The survey is conducted annually and covers a wide range of innovative activities. The data are used to analyze the impact of innovation on the economic performance of firms. The survey is also used to monitor the progress of innovation in France.

²This qualitative information is then similar to the one used by Angelini and Generale [\(2005\)](#) to examine the effect of financial constraints on firm size. Guiso [\(1998\)](#) and Piga and Atzeni [\(2007\)](#) focus on the determinants of credit rationing and they also adopt a direct indicator of financing constraints taken from a survey. They consider that firms are financially constrained when they applied to bank credit but failed to obtain it.

³Our dataset is presented in the appendix.

⁴See the details of the identification of innovative, non-innovative firms in the appendix.

⁵Firms were allowed to provide multiple answers.

⁶More recently, Aghion et al. [\(2005\)](#) proposed a model with an inverted U-shape relationship between innovation and competition. In this model, competition may increase innovation profit margin but strong competition may also reduce incentives to innovate for laggards.

⁷The importance of technological opportunities is given by a qualitative measure issued from the FIT survey. The same indicator was used in previous works such as Crépon et al. [\(1998\)](#) or Barlet et al. [\(1998\)](#). In the survey, the firms are asked: “Do You consider that Your market is technologically: not innovative? weakly innovative? moderately innovative? highly innovative?” as reference for the other levels.

⁸See the appendix for details. It is important to remind that in the survey, firms are asked to provide possible reasons for the constraints they face. This consistency in the definition of the constraints is taken at their value.

⁹In the FIT survey, the indicator as it was done by the surveyors. We have introduced a new indicator that we did not obtain a specific demand.

¹⁰There is some confusion about this question because of Maddala's assertion (1983, p. 222). He states that the parameters of the first equation are not identified if there is no exclusion restriction on the exogenous variables (as in the linear case). But Wilde (2000) shows that this is only true in the simple example of Maddala's book, where x_{2i} and x_{1i} are both constants. Wilde shows that identification in the simultaneous probit case is achieved as soon as both equations of the model contain a varying exogenous regressor. However, as examined by Monfardini and Radice (2004), without instruments, the identification of the parameters of the first equation strongly relies on the functional form of the distribution of errors and in practice, availability of instruments help to obtain results which are more robust to distributional misspecification.

¹¹See the details of these definitions in the Appendix.

¹²The univariate probit regression on the subsample of 'potentially innovative' firms is given in the Appendix (Table I).

¹³Such a test have been made with cash flow or profit margins and the results can be obtained from the author.

¹⁴We have also checked for nonlinear effects by introducing the square of firm size but it does not change the results.

¹⁵The 'C

¹⁶The model has been deleted. In addition, the firms with zero sales have been excluded.



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