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Working Paper Ceris-Cnr, N° 11/2008

ISSN (print): 1591-0709
ISSN (on line): 2036-8216

Public Interventions Supporting Innovation in Small and Medium-Size Firms. Successes or Failures? A Probit Analysis

Serena Novero
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ABSTRACT. The aim of this work is to investigate the probability of success or failure of public interventions, made to support the development of some Italian firms. The great number of small and medium-size enterprises, placed in the Canavese area, north of Turin, Italy, has suffered, in the nineties, of a gap in technological innovation in their production. The Consortium for the Canavese Technological District (CCTD), a public local association established in 1993 specifically to support the firms of the area, has supplied them with some technological, innovative services, sustaining their growth. More exactly, some research centres, named Centres of Competence, were created, with the pre-existing structures of the Polytechnic of Turin and of the firm RTM (placed in Vico Canavese, Province of Turin): their targets were to supply innovative services to the local firms and to place technical machineries at the disposal of the local units, to support their innovation and competitiveness. The present research analyzes a central point: which has been the impact of these services? Which is the probability that a public o private intervention to innovate has success and brings economic growth to the involved firms? This objective is achieved with a Probit Model, built on a panel of 103 firms, that covers a 6-year range (from 1999 to 2004) and contains their balance-sheets data and the technical information regarding their collaborations with the Centres; the results highlight the role of a solid patrimonial stability, of the choice of the right innovations to apply to the production processes as well as the importance of a high previous technological status of the involved enterprises.

KEYWORDS: Innovation probability, Public interventions, Firms growth, Qualitative choice models

JEL-CODES: C35, D92, H71, O31

ACKNOWLEDGEMENTS: Many thanks to Ceris-Cnr and the Department of Ingegneria Gestionale, University of Bergamo, Italy, for the didactical and financial support, to my professors, colleagues and relatives.

WORKING PAPER CERIS-CNR
Anno 10, N° 11 – 2008
Autorizzazione del Tribunale di Torino
N. 2681 del 28 marzo 1977

Direttore Responsabile
Secondo Rolfo

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Distribuzione
Spedizione gratuita

Fotocomposizione e impaginazione
In proprio

Stampa
Grafica Nizza
C.so Francia, 113, 10093 Collegno (TO)

Finito di stampare nel mese di dicembre 2008

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I. INTRODUCTION

The aim of the work is to investigate the probability of success of a public interventions made to support the development and growth of some Italian firms. Since the 1990s, a large number of small and medium-size enterprises, located in the Canavese area, at north of Turin - Piedmont, has been affected, by technological innovation gaps in both their production and productive processes, due to the opening of the markets to the western firms of developing countries.

The public association for the local growth, the CCTD, has organised a set of free services allocated to the firms of the area and aimed to their technological support. The initiative includes the free use of some specific instruments and machineries (lasers, stamps, planning software, etc.) and the endowment of consulting services by the Centres' technicians.

These services have been provided since 1999 and the paper explores, using a Probit Model, their probability of success in terms of economic growth of the involved units. Nowadays, almost all the industrialised Countries spend a considerable amount of money and resources to support commercial R&D and innovation in the manufacturing firms. As stated by Arrow (1962) and Nelson (1959), the economic grounds for these programs lies in the presumed failure of the market to provide incentives to the firms to allocate enough resources to innovative activities. Positive externalities, affecting other firms and consumers, induce a divergence between social and private returns of such activities (Gonzalez *et al.*, 2005). The public sector interventions partly solve this problem, but the effects of these concrete subsidies remain controversial (Klette *et al.*, 2000). Additional investigations are, therefore, necessary to further justify such public efforts.

Several empirical studies investigate the wide range of potential factors that might be linked to a firm's propensity to innovate its productions or its productive processes (Harris *et al.*, 2003; Rouvinen, 2002; Flaig, Stadler, 1994; Pohlmeier, 1992). A number of researches focus on the producers' decisions about whether and how much to adopt some innovations (Dong, Saha, 1998; Dorfman, 1996). Other papers (Gonzalez *et al.*, 2005) explore the effects generated by subsidies allocated by the public sector on the firms' decision to perform R&D, when some government support can be expected. These three groups of works are focalized on important steps of the innovation process but they are the ones before and after the point analysed in the present study. This paper investigates the results, in terms of economic growth, of the introduction of innovations into the productive processes of a firm. The first two sets of works look at the factors that affect a firm's decisions on innovation, whereas the third group investigates the effects of subsidies to innovation on a firm's decision about whether or not to perform R&D. Its conclusions confirm the positive relationship. The present research analyses the central point of this framework: which is the probability that a public o private intervention to innovate succeeds and leads to the economic growth the involved firms? And which are the most important factors in this process, the ones that have a stronger impact on the probability of success?

The results clearly show that most innovations call for high expenditure before economic advantages and profits can be achieved and they also require a solid patrimonial stability. Moreover, choosing the right innovations to apply to the productive processes is a fundamental step, because not all the new methods are appropriate in each situation.

The previous step of this analysis is the study of some balance-sheets values [profit, sales, employment, return on sales (ROS), return on investment (ROI), and return on equity (ROE)], regarding the enterprises involved in the Canavese Consortium interventions, and the separation of them into two groups: the one that has had benefits from public actions, achieving better balance values, and the one that has not.

In the section II, the paper provides a brief review of the literature on the topic, its conclusions, and the most important differences from the present study.

The section III presents a specification of the econometric model that is tested and its characteristics: the present work carries out a microanalysis of the public interventions, outlining a Probit Model and identifying the explanatory variables of their success.

The section IV outlines a description of the analysed dataset and the empirical results obtained through this investigation.

The last section illustrates the conclusions of the research.

II. PUBLIC INTERVENTIONS SUPPORTING FIRMS' INNOVATION: A BRIEF REVIEW OF THE LITERATURE

Several empirical studies investigate the wide range of potential factors that might be linked to a firm's propensity to innovate (Symeonidis, 1996).

The available data make it possible to investigate the role of *firm size*, of *past profitability*, of the *presence of a formal business plan*, of the *incidence of any export activities*, of *R&D activities* and of *inter-firm networks*. Although analysed in several important works, the last aspect has been given little consideration, due to the paucity of the available data, but all the others points have been largely studied in various researches. The role of *firm size* was investigated by Mark Harris, Mark Rogers and Anthony Siouclis in their research in 2003 and the results are that employees, a proxy for firm size, have a positive coefficient: this means that large enterprises are more likely to innovate, in comparison to the small ones. Although this result might be due to a possible mistake in the survey, as it does not reflect the intensity of innovations, so that larger firms may be overrepresented in comparison to the small ones, it is also compatible with the idea of economies of scale in innovative activities. The authors also investigated the effects of *export activities* and of the *time of the firm life*: they both have no significant association with the innovative state and there is also no association with *past profitability*. These aspects mean that firms have not to finance innovation with past profits (capital markets appear able to replay to enterprise needs in every time). Harris *et al*. (2003) also studied the relation between a firm's propensity to innovate and the *presence of a business plan* for it, finding a positive conclusion. Similarly, *R&D activity* and *networking* variables show a significant positive association with innovative processes; these variables can also be used as "control variables", since they are closely linked to the innovation process.

A work by Petri Rouvinen (2002) studies the characteristics of innovative products and processes among Finnish manufacturing firms. The paper starts from some neo-Schumpeterian hypotheses (Scherer, 1980; Kamien and Schwartz, 1982; Cohen and Levin, 1989; Cohen, 1995; Evangelista, 1999) and checks the effects of competition among entrepreneurs in innovative activities, which are positive and significant in the product equation. The authors investigate the effects of a low appropriability of rights, which reduces the probability of an innovation process (there is a smaller protection with patents and trademarks), of an oligopolistic market structure, which is important in promoting innovation, and of capital stock measures, which capture the effects of accumulated embodied technology and are significant in the process innovation equation. The authors also survey the contribution of investments in R&D, which is positive for product innovation. Also the diversification seems to be positive in the case of innovation processes, while the average age of the employees becomes negative and significant in the process equation (this may indicate that the willingness to adapt to work processes changes increases with the age, which reduces the probability of implementing them). The conclusion is that, although product and process innovation are related, they are driven by different factors.

Gebhard Flaig and Manfred Stadler (1994) adopt a probit model to investigate the implementation of private firms' product and process innovations. They find that the probability of innovating depends on elements of market structure, demand, costs expectations, as well as on the unobserved heterogeneity of firms and on the innovations achieved in the previous year. The paper includes a lagged variable and enables the authors to test the hypothesis about whether a positive result in innovation breeds further R&D activity and success, indicating dependence in the innovation process. This is the first study that takes a wider view of innovation processes, based on the decision of optimisation of innovation models (see König, Zimmermann, 1986; Zimmermann, 1989; Pohlmeier, 1992; König *et al*., 1993) and tries to simultaneously account for the effects of production and market structure on them. The results of the investigation are that market structure variables influence innovative behaviour, as suggested by some Schumpeterian hypotheses, and that firm size has a positive significant impact on innovation, whereas relative firm size seems to be relevant only for product innovations. There is a significant and inverted relationship between innovative activity and market concentration and the real wage rate, a proxy for future production costs, seems to be the major determinant for process innovation but it has only a minor importance for product innovation (high values of real wages cause a cost push and induce a substitution of labour input with technological knowledge).

Among the papers that investigate potential factors that might be linked to a firm's propensity to innovate, the one by Pohlmeier (1992) examines the determinants of innovation and market structure within a simultaneous framework. In his work, the innovative activity, either generated by new product developments or by improvements in the technical equipment of firms, is considered to be the major source of structural change, growth, and international competitiveness. According to Schumpeter's earlier works, one of the four most popular hypotheses on the determinants of innovation is the expectation of a temporary monopoly and the ability to enjoy large profits while the monopoly lasts, thus introducing innovations. This hypothesis, sometimes called Schumpeter Mark I, was modified in his later works, where he puts the emphasis on the importance of existing monopolies as pacemakers for innovative activities. A third hypothesis sheds more light on the role of firm size. According to Galbraith (1952), the large firm size is essential for the success of production changes: larger firms can provide economies of scale in production and innovation, which guarantee sufficient resources, necessary for the successful competition of intended improvements. Finally, Schmookler (1966) stressed the importance of the growth in product demand as a determinant of innovative activities.

Before Pohlmeier's research, very few studies focused on the reverse causation from innovation (or R&D) to market structure, which finds its theoretical basis in Schumpeter's notion of "creative destruction", in which market structure is influenced by past and current innovative successes and failures. More precisely, the innovation process generates transient market power which is in turn eroded by rival innovation and imitation.

Several theoretical papers attempted to take into account the simultaneity issue within a more or less neoclassical framework [e.g. Dasgupta and Stiglitz (1980), Futia (1980), Lee and Wilde (1980), Levin and Reiss (1984)], but most of the empirical literature on the determinants of innovation and market structure neglected their findings.

Pohlmeier's paper tries to reduce the gap between the existing theoretical literature and the empirical studies on innovation. His work uses output variables as a measure of innovative performance, instead of R&D expenditures, and supports the idea that market structure is an endogenous variable and does not explain innovation.

A research by Dong and Saha (1998) and a paper by Dorfman (1996) also address the issue of innovation adoption and diffusion. The former focuses on the intensity and timing of adoption of a new innovative technology that involves a portion of a firm's resources. This research provides a complementary perspective and argues that the adoption rates of many new technologies cannot be fully explained by factors such as credit constraints, inadequate firm size or insufficient human capital. The inertia in the adoption process may also stem from the fact that, in the case of new technologies, it often "pays to wait". The pertinent question to the producer is not merely whether to adopt, but often, and more importantly, when to adopt: the value of waiting is directly proportional to the fixed adoption costs, potential reversal expenses, and the likelihood that the new technology will be unprofitable. In fact, the return needs to be high enough to outweigh the value of waiting for more information. The empirical findings also suggest that the role of factors such as innovation-related information, firm size, education, and income undergo marked changes during the diffusion process. These factors are likely to have significant and positive effects on the adoption intensity in the early years of innovation diffusion. In subsequent years their impact weakens considerably. Dong, Saha and Dorfman also show that the relation between adoption intensity and firm size switches from being positive to being negative in less than a decade.

To complete this brief review of the literature, there is another innovation-related theme that needs attention: it regards public interventions to support firm growth. More precisely, the issue in question is the effect of subsidies granted to enterprises by the public sector. The matter is investigated in the paper by Gonzalez, Jaumandreu and Pazo, which explores the consequences of subsidies in a model that analyses a firm's decision about performing R&D when some government support can be expected. The first question is if subsidies generate higher private R&D expenditure and bigger R&D efforts or if there is a crowding-out effect; the authors also observe if firms would cease to perform R&D without subsidies.

In several previous works (Wallsten, 2000) the results are that a full crowding-out effect is present but there is no effort effect; more precisely, Wallsten says that a full crowding-out effect cannot be ruled out for 30% of the firms and that a partial crowding-out effect could also be important. Other authors (Lach, 2002) estimate that there is just a relative increase in R&D expenditure in subsidised firms, in comparison to non-subsidised ones, and that only small firms enjoy a dynamic, total effect of subsidies. Almus and Czarnitzki (2003) compare the average effort of subsidised and non-subsidised firms and find that there is a significant difference of 4 percentage points. Gonzalez, Jaumandreu and Pazo investigate the problem in further depth, analyzing R&D effort (summarised by the ratio of R&D expenditure and sales) and its variation as a result of subsidies allocated by the public sector. Their study tries to explain why and how firm investment might be inhibited and considers the problems of the selectivity of subsidy receivers as well as of the endogeneity of subsidies. Each firm is a product-differentiated competitor, capable of shifting the demand for its products by enhancing product quality through R&D. Demand characteristics, technological opportunities and R&D set up costs interact to determine a spending profitability threshold for expenditure on innovative activities for every firm. Among performing firms, the paper identifies the ones that would cease to carry out R&D if subsidies were eliminated. In the work by Gonzalez, Jaumandreu and Pazo, subsidies are granted by agencies according to the firms' past efforts and performance, hence they are the result of a selection and are endogenous. The conclusions are that:

- A significant portion of non-performing firms is seen as "stimulable" by financing a large fraction of their expenses through public subsidies.
- Some R&D investments heavily depend on the anticipated public support.
- Subsidies seem to induce only a slight change in the level of private expenditure in the case of firms that would, in any case, perform innovative activities.
- The phenomena of crowding-out of private funds or of inefficient use of subsidies are not observed.
- Manufacturing subsidies, which amount to 4-5% of the total R&D expenditure of involved firms, increase aggregate R&D expenditure by 8%, which can be broken down in two parts: 4.4% comes from firms that would perform R&D in any case, 3.6% comes from firms that the model predicts to be non-performers in the absence of subsidies (these stimulated enterprises are mainly small ones).
- Market failures do matter and subsidies play an important role in stimulating R&D activities.

After this brief review of previous researches on the topic of innovation, its causes and its effects, and keeping in mind that the results of the last work might be limited by the fact that subsidies are granted to firms that would have performed R&D anyway, it is clear that all the papers presented here address "innovation" in two different stages, in comparison to the present study. The former works analyse the factors that increase a firm's propensity to innovate production or production processes and the decision about whether and how much to adopt innovations, whereas the latter studies explore the effects of subsidies granted by the public sector and a firm's decision about performing R&D in case government support can be expected. These two groups of researches develop the steps before and after the one analysed in the present work: the results, in terms of a firm's economic growth, of an innovation applied to the production process. The first two works look at the factors that affect a firm's decision to innovate, while the latter paper studies the effects on a firm's decision to perform R&D of subsidies to innovation that, it is presumed, have been successful.

The present research analyses the fundamental point: which is the probability that a public or private intervention to innovate succeeds and brings economic growth to the involved firms?

III. PUBLIC INTERVENTIONS TO SUPPORT FIRM INNOVATION: A BINARY PROBIT MODEL

This section discusses the econometric framework used to analyse the main question of this research: the probability of success of a public intervention supporting the firms' growth. The goal is to determine which factors are associated with positive changes in the balance-sheet values of the enterprises involved in CTDC projects.

In the available panel data, our dependent variable, Y, indicating if public intervention in firm production processes has been successful or not, is a dichotomous, qualitative, binary, dependent variable (Y=1: success; Y=0: failure). It does not lend itself to the familiar type of regression analysis but the main idea is to consider the realisation of Y as explainable and linked to a set of factors, grouped in a vector X, at least in the spirit of regression (Greene, 2003). In order to achieve this goal a binary Probit Model can be written.

The basic notion underlying the model is the existence of a latent, unobserved, variable, Y*, ranging from $-\infty$ to $+\infty$, called *index function model* and indicating the probability of success of public interventions. This *latent variable* is related to the set of explanatory variables X through the relationship:

$$Y^* = \alpha + X\beta + \xi$$

Where vector X collects the qualitative and quantitative variables that explain the result of Y, α are the unobserved and stochastic effects, independent from vector X and from ξ, β is a set of parameters that reflect the impact of change in X on the probability and is estimated with the maximum likelihood method, and ξ is a random error term, drawn from a standard Normal distribution.

The relation between the latent variable and Y is:

$$Y = 1 \quad \text{if} \quad Y^* > 0$$
$$Y = 0 \quad \text{if} \quad Y^* < 0$$

Hence, the probability that Y = 1 is:

$$P(Y = 1 \mid X) = P(Y^* > 0 \mid X) = F(X\beta) = \Phi(x\beta)$$

Where $F(X\beta)$ is a continuous probability function, defined over the real line, and $\Phi(x'\beta)$ is the notation commonly used for the standard Normal distribution, because of the distribution that is assumed for ξ.

IV. PUBLIC INTERVENTIONS TO SUPPORT FIRM INNOVATION: THE DATA

This paper analyses the results of public interventions provided by the Canavese Consortium to some Italian small and medium-size firms in order to support their internal innovation. The collaboration took on the form of consulting services provided by the technicians working at the RTM Centre in Vico Canavese, Piedmont. The services were offered from 1999 to 2004.

The interventions were divided into 5 groups and supplied to different firms in different years (while the evaluation of each firm is usually limited to 2-3 years, sometimes the same enterprise took part to more than one of the five projects, making possible to assess them from 1999 to 2004). The expected outcome is that these services increased the enterprises' income, sales and employment. It would mean that they were successful. On the contrary, if the evaluated firms did not show better balance-sheet values, then the services were obviously a failure.

The estimation was performed using the balance sheet data of the 103 sample firms. The data are available in a panel that covers a 6-year range, from 1999 to 2004, and considers different values, collected by asking the staff of the involved firms to fill in a set of forms. They included some technical questions about the impact of the Consortium's activities on the whole organisation. By means of the database information and notions about the overall development of the Canavese area, it was possible to determine whether public intervention led each enterprise to better or worse balance sheet values and whether the Consortium's activities were a success or not. This information is contained in the dependent variable Y of the Probit Model.

The independent variables of the vector X are collected in the panel and are continuous or dummy variables. They are about:

- The ATECO code: an Italian indicator that states the economic activity carried out by a firm.
- The employment in the firm in the five years under investigation.
- Its operative margin (the difference between the added value and the wages).
- Its income (the result of the accounting period).
- The amount of sales.
- Three leading indicators: return on sales (ROS), return on investment (ROI), and return on equity (ROE).

These data show the economic evolution of each enterprise. We can also find information on the following topics:

- The objectives of the collaborations with the Centre (they are divided into seven groups, indicated by a number ranging form 4 to 10).
- If the collaboration has had a practical nature, like in the project feasibility studies.
- If some results were achieved and which are their consequence on the production process.

These data explain the effects of the Centre's activities and of the consulting services of RTM's technicians in terms of products and processes modifications: the first is a qualitative variable, the others are dummy variables.

Some notations about the interventions technical aspects are also reported, as variables about:

- The technological status of each enterprise, before and after the intervention (the technological status is grouped into 5 types: 1 means a cutting-edge firm while 5 indicates an outdated firm).
- The interventions technical level and their utility (the variables are grouped into 4 types: 1 means high utility, 3 stands for low utility, whereas 4 means no answer).
- The evolution of the relationships with the Centre (dummy variable).
- New or possible recruitments (dummy variable).

This information refers to the impact of the Centre's activity on organisation, as a whole, and to ensuing social advantages.

More precisely, the dataset contains 34 variables that are observed during the 6-year period (from 1999 to 2004) for a total of 618 observations. They are indicated in the table 1 (see enclosed documents).

Looking at some descriptive statistics (see table 2), it is possible to notice that the Income (Profit / Loss) variable has a mean equal to € 123748.7, with a high standard deviation of € 2826527, which could mean a wide range of firms' typology and stability. The operative margin, the amount an enterprise can count on for its future plans, has also a high mean (1738344) and a wide range of variation (Std.Dev.= 6139997) and the same is true for the value of sales (Mean = 19750373.5, Minimum value = 739.24, Maximum value = 666057069). This confirms, once again, the differences among the analyzed firms, that are reaffirmed by the last continuous variable observed in the panel, the number of employees. Its mean value is 155, which would indicate the presence of small-medium size firms, but its range is very wide: from 0 to 9299.

The first important discrete variable, the one representing the object of this research (success or failure of an innovation project) has a mean value equal to 0.620, which means that the 62% of the projects carried out by the Consortium were successful.

If we observe the mean value of the collaboration objectives (see table 5), it is possible to notice that they are highly different, because the required services can either aim at the lasers use (service number 5), at the products certification (service number 7), at collaborations with the Centres (service number 8), or at studies about the feasibility of products (service number 9). Each service has a different impact on the probability of success of the Consortium's actions, but this is analysed in the next section.

Similar remarks can be made on the other qualitative or dummy variables, which show mean values that are far from 1: this indicates low values in the firms.

On the contrary, the firms' technological status is quite high (mean = 0.5, with a range of values from 1= cutting-edge firm to 5 = outdated firm), as are the technical level of interventions and their effects on the productive processes.

The effects on employment are limited (the mean value, equal to 0.021, means a low level of recruitment) and the possibility of future collaborations with the Centre is small, too.

The estimation results of the empirical probit model are displayed in Table 3 and the model is the following:

Y = -25.94 + 0.241 Employees + 9.74e-07 Op.Marg. + 4.28e-06 Income – 1.28e-06 Sales -7.08 Obj.Collab.1 + 7.67 Obj.Collab.2 - 14.47 Obj.Collab.3 + 2.31 Obj.Collab.4 - 26.13 St. Feasibility +19.26 GainedObjective -48.42 Results +172.22 ProcessChanges - 400.15 ProjectDone + 260.68 Obj.Project - 73.56 AdviceRelation + 23.88 Tech.Status + 33.12 Intervention Tech.Level - 7.59 ProductiveResults - 88.72 Centre Collaborations - 98.17 Recruitments Made + 91.75 New Jobs + 237.02 Potential Recruitments

If we consider the structural characteristics of the involved enterprises, it can be noted that the positive coefficient of employees, a proxy for firm size, shows that larger firms are more likely to be successful in public interventions supporting their growth. This agrees to the previous literature findings and can be explained by the installation and the fixed costs that innovations require.

The effects of balance sheet values (operative margin, income and sales) are not so different and very strong indeed: the operative margin (the difference between the value added and the wages) and the income of the period has a positive coefficient, perhaps because they represent the real value produced by the enterprises, before expenditures and taxes, in a specific lapse of time. They implicitly explain the firm stability in innovations financing. On the contrary, the last variable, the value of sales, has a small negative influence on the probability of success; it could be explained by the fact that, if a firm has already high sales values, the interventions for its development could not have strong effects, because the enterprise is already successful.

The objectives of the collaborations with the Centre have different effects on the firms' success and it can be explained by considering the different types of interventions realized. The ones concerning the use of the laser have a negative impact, although they are the most requested. On the other hand, activities related to the certification of the products have positive effects, probably because they have a direct impact on the firms' sales. Generally, the collaborations with the Centres have a strong negative influence, probably because of the costs they imply (although they are actually rather low). Indeed, when they imply more "concrete" services, aimed at improving the quality and implementation of the production, they are more appreciated. For example, it's possible to found positive values when the objectives of the collaborations are achieved and when the Centre's interventions bring changes (presumably improvements) in the production processes.

In this context, the firms' previous technological status has a positive effect on the success of the collaborations and the same is true for the technical level of the services. On the contrary, subsequent collaborations with the Centres and new recruitments do not have positive impacts on the success of the services, probably because they imply other costs. On the other hand, a strong positive effect is generated by future perspectives about sales and recruitments.

The obtained output also includes the additional panel-level variance component: it is parameterised as the log of the standard deviation (labelled Lnstd-dev in the results and equal to 10.05). The standard deviation is also included in the results: it is labelled Std-dev and it is equal to 152.1. Rho is the proportion of the total variance contributed by the panel level variance component: in this case it is equal to 0.99 and it means that the panel variance component is important in order to explain the total variance and the panel estimator is different from the pooled one. The last likelihood-ratio test of rho = 0 compares the pooled estimator with the panel one and the result is that they are surely different.

It is important to stress that some coefficients are not statistically significant, which is surprising. A possible explanation may be the uncertain values of Y, which are not easy to certify because of the ambiguity of the balance sheet data. Another reason might be a not completely correct and effective use of a probit model to estimate the relations among the variables (but this is hardly credible). Finally, the coefficients might not be exact because of the paucity of data.

Undoubtedly, the signs of the coefficients are reasonable and they certainly are an important point of analysis.

In order to complete it, it is now important to focus on the *Quadrature* approximation to test the stability of the results (see Table 4). The ones obtained with 12 *Quadrature* points are much closer to the results achieved using 8 points than to the ones gained using 16 points: this indicates a light sensibility of the convergence points to the number of *Quadrature* and then a limited stability of the model (which confirms the previous conclusions about the low statistically significant values of the data).

V. CONCLUSIONS

Some characteristics elements could be outlined in the present work:

- It is the first inquiry about the effects, on the balance-sheet values, of public interventions aimed at supporting the enterprises' growth.
- The results about the services impact on the firms' size match the previous literature findings: larger firms respond to innovation in a better way.
- The balance sheet values have opposite effects on the probability of success of innovations, but they are always low.
- The type and high technical quality of the collaborations and interventions supporting the firms' development is a fundamental aspect: they should not generate new costs but should aim at improving the quality of the production and, when it's possible, at suggesting new processing techniques.
- The technological status of the involved firms is important too, because those with a higher technological status are probably more able to absorb innovations.
- The most important product or process innovations are the ones that provide opportunities for future growth, not only the ones that cause an immediate improvement in balance values.

These results are quite surprising, because the balance sheet values have opposite and restricted effects on the probability of success of an innovation project: a deeper investigation of this aspect should be the subject of a future research. The originality of this work might lie in the fact that it is the first empirical analysis about this topic; it confirms some expectable aspects and provides some political suggestions about the crucial points of enterprise structure, when an innovation is introduced. It also suggests that attention must be paid to the typology of the granted innovations (it is fundamental that they are chosen in an appropriate way), to their future consequences (this implies the firms' capacity to wait for future profits), and to the technological status of the involved units (which should be quite evolved, in order to ensure a better response to the introduced innovations).

REFERENCES

Almus M., Czarnitzki D., 2003, "The Effects of Public R&D Subsidies on Firms' Innovation Activities: The Case of Eastern Germany", *Journal of Business and Economic Statistics*, vol. 21, n. 2, pp. 226-236.

Arrow K., 1962, "Economic Welfare and the Allocation of Resources for Investments", in R. Nelson (Ed.), *The Rate and Direction of Inventive Activities: Economic and Social Factors*, Princeton Univ. Press, Princeton, pp. 609-625.

Cohen W. M., 1995, "Empirical Studies of Innovative Activity", in P. Stoneman (Ed.), *Handbook of the Economics of Innovation and Technological Change*, Blackwell, Oxford, pp. 182-264.

Cohen W.M., Levin R.C., 1989, "Empirical studies of innovation and market structure", in Schmalensee R., Willig R. (Eds), *Handbook of Industrial Organization*, vol. 2, North Holland, Amsterdam.

Dasgupta P., Stiglitz J.E., 1980, "Uncertainty, Industrial Structure and the Speed of R&D", *Bell Journal of Economics*, vol. 11, n. 1, pp. 1-28.

Dong D., Saha A., 1998, "He came, he saw, and he waited: an empirical analysis of inertia in technology adoption", *Applied Economics*, vol. 30, n. 7, pp. 893-905.

Dorfman J., 1996, "Modelling Multiple Adoption Decisions in Joint Framework", *American Journal Agric. Economic*, vol. 78, pp. 547-557.

Evangelista R., 1999, *Knowledge and investment. The sources of innovation in industry*, Elgar, Aldershot.

Flaig G., Stadler M., 1994, "Success Breeds Success. The dynamics of the innovation process", *Empirical Economics*, vol. 19, n. 1, pp. 55-68.

Futia C., 1980, "Schumpeterian Competition", *Quarterly Journal of Economics*, vol. 94, n. 4, pp. 675–695.

Galbraith J.K., 1952, *A Theory of Price Control*, Harvard University Press, Cambridge, MA.

Gonzalez X., Jaumandreu J., Pazo C., 2005, "Barriers to innovation and subsidy effectiveness", *RAND Journal of Economics*, vol. 36, n. 4, pp. 930-950.

Greene W.H., 2003, *Econometric Analysis*, Pearson International Edition.

Harris M., Rogers M., Siouclis A., 2003, "Modelling firm innovation using panel probit estimators", *Applied Economics Letters*, vol. 10, n. 11, pp. 683-686.

Kamien M.I., Schwartz N.L., 1982, *Market Structure and Innovation*, Cambridge Survey of Economic Literature.

Klette J., Moen J., Griliches Z., 2000, "Do Subsidies to Commercial R&D Reduce Market Failures?, Microeconomic Evaluation Studies", *Research Policy*, vol. 29, n. 4, pp. 471-495.

König H., Zimmermann K.F., 1986, "Determinants of Employment Policy of German Manufacturing Firms: A Survey-Based Evaluation", in Oppenländer K. H. and G. Poser (Eds.), *Business Cycle Surveys in the Assessment of Economic Activity*, Avebury, Aldershot, pp. 632-649.

König H., Laisney F., Lechner M., Pohlmeier W., 1993, "On the dynamics of process innovative activity: An empirical investigation using panel data", *Zentrum für Europäische Wirtschaftsforschung, Discussion Paper*, 8.

Lach S., 2002, "Do R&D Subsidies Stimulate or Displace Private R&D? Evidence from Israel", *Journal of Industrial Economics*, vol. 50, n. 4, pp. 369-390.

Lee T., Wilde L.L., 1980, "Market Structure and Innovation: A Reformulation", *Quarterly Journal of Economics*, vol. 94, n. 2, pp. 429–436.

Levin R.C., Reiss P.C., 1984, "Test of Schumpeterian Model of R&D and Market Structure", in Z. Griliches (Ed.), *R&D, Patenta and Productivity, NBER*, University of Chigaco Press, Chicago.

Nelson R., 1959, "The simple economics of basic scientific research", *Journal of Political Economy*, vol. 67, n. 2, pp. 297-306.

Pohlmeier W., 1992, "On the simultaneity of innovations and market structure, *Empirical Economics*, vol. 17, n. 2, pp. 253-272.

Rouvinen P., 2002, "Characteristics of product and process innovators: some evidence from the Finnish innovation survey", *Applied Economics Letters*, vol. 9, n. 9, pp. 575-580.

Scherer F.M., 1980, *Industrial Market Structure and Economic Performance*, Rand McNally College Publishing Company.

Schmookler J., 1966, *Invention and Economic Growth*, Harvard University Press, Cambridge, Mass.

Symeonidis G., 1996, "Innovation, Firm Size and Market Structure: Schumpeterian Hypotheses and Some New Themes", *OECD Economics Department Working Papers,* n. 161, OECD Economics Department.

Wallsten S., 2000, "The Effects of Government-Industry R&D Programs on Private R&D: The Case of the Small Business Innovation Research Program", *The Rand Journal of Economics*, vol. 31, n. 1, pp. 82-100.

Zimmermann B.J., 1989, "Innovative activity and industrial structure", *Empirica*, n. 16, pp. 85-110.

T A B L E S

TABLE 1: VARIABLES TYPOLOGIES IN THE PANEL

Variables	*Typology*
Firm	103 units
Years	1999 – 2004
Success	Dummy Variable
ATECO Code2002-1 ATECO Code2002-2 ATECO Code2002-3	Discrete Variables
Employees Operative Margin Income Income Changes (%) Sales Sales Changes (%) ROS ROI ROE	Continuous Variables
Objective Collaboration 1 Objective Collaboration 2 Objective Collaboration 3 Objective Collaboration 4	Discrete Variables
Feasibility Studies Objective Gained Results Processes Changes Project Done Objective Project Eventually Results Advice Relations	Dummy Variables
Technologic Status Intervention Technical level Productive Results	Discrete Variables
Centre Collaborations Prosecution Assumptions Done New Works Potential Assumptions	Dummy Variables

TABLE 2: VARIABLES DESCRIPTIVE STATISTICS

Variables	*Means*	*Std. Dev.*	*Min*	*Max*
Income	123 748.7	2 826 527	-17 911 162	25 508 869
Operative Margin	1 738 344	6 139 997	-2 405 728	60 098 053
Sales	19 750 373.5	-	739.238	666 057 069
Employees	155.139	851.392	0	9 299
Success: Yes / No	0.620	-	-	-
Objective Collaboration 1	5.302	2.544	0	9
Objective Collaboration 2	7.168	2.672	0	10
Objective Collaboration 3	8.800	2.191	0	10
Objective Collaboration 4	9.000	1.352	0	10
Feasibility Studies	0.117	-	-	-
Objective Gained: Yes / No	0.107	-	-	-
Results: Yes / No	0.118	-	-	-
Processes Changes: Yes / No	0.050	-	-	-
Project Done: Yes / No	0.040	-	-	-
Objective Project: Yes / No	0.057	-	-	-
Eventually Results: Yes / No	0.032	-	-	-
Advice Relations: Yes / No	0.073	-	-	-
Technologic Status: 1-5	0.552	-	-	-
Intervention Tech. Level: 1-4	0.502	-	-	-
Productive Results: 1-4	0.534	-	-	-
Centre Collaborations: Yes / No	0.117	-	-	-
Assumptions Done: Yes / No	0.021	-	-	-
New Works: Yes / No	0.029	-	-	-
Potential Assumptions	0.010	-	-	-

TABLE 3: THE PROBIT MODEL

Success: Yes / No	*Coef.*	*Std. Err.*	*z*	*P>|z|*	*[95%Conf. Interval]*	
Employees	0.241	164 575.300	-3.09	0.065*	-322 561.4	322 561.9
Operative Margin	9.74e-07	15.152	2.45	0.083*	-29.697	29.697
Income	4.28e-06	64.272	1.80	0.005**	-125.971	125.971
Sales	-1.28e-06	3.613	-2.17	0.006**	-7.082	7.082
Objective Collaboration 1	-7.076	2.46e+07	-2.19	0.003**	-4.82e+07	4.82e+07
Objective Collaboration 2	7.675	2.22e+08	1.70	0.001**	-4.34e+08	4.34e+08
Objective Collaboration 3	-14.470	1.20e+08	-5.82	0.945	-2.35e+08	2.35e+08
Objective Collaboration 4	2.307	2.22e+08	4.36	0.036*	4.34e+08	4.34e+08
Feasibility Studies	-26.135	4.82e+08	-0.89	0.006**	-9.45e+08	9.45e+08
Objective Gained	19.259	1.56e+09	0.36	0.002**	-3.07e+09	3.07e+09
Results	-48.416	1.85e+09	-2.67	0.045*	-3.64e+09	3.64e+09
Process Changes	172.219	1.64e+09	1.34	0.072*	-3.22e+09	3.22e+09
Project Done	-400.152	-	-	-	-	-
Object Project	260.679	1.92e+09	0.56	0.533	-3.75e+09	3.75e+09
Advice Relations	-73.559	7.07e+08	-0.92	0.002**	-1.39e+09	1.39e+09
Technologic Status	23.881	5.97e+07	0.62	0.001**	-1.17e+08	1.17e+08
Interv. Tech. Level	33.117	3.61e+08	0.08	0.024*	-7.07e+08	7.07e+08
Productive Results	-7.592	3.66e+08	-0.03	0.537	-7.17e+08	7.17e+08
Centre Collaboration	-88.720	1.79e+09	-0.02	0.001**	-3.51e+09	3.51e+09
Assumptions Done	-98.176	1.39e+09	-2.43	0.005**	-2.72e+09	2.72e+09
New Works	91.749	1.84e+09	0.92	0.053*	-3.62e+09	3.62e+09
Potential Assumptions	237.017	1.33e+09	4.26	0.005**	-2.61e+09	2.61e+09
Cons	-25.938	1.74e+08	-0.02	0.099*	-3.42e+08	3.42e+08
Lnstd-dev	10.0491	1 361 909	-	-	-2 669 282	2 669 302
Std-dev	152.109	1.04e+08	-	-	-	-
Rho	1.000	58.857	-	-	-	-

Likelihood-ratio test of rho = 0: chibar2 (01) = 115.02 Prob >= chibar2 = 0.000

Log likelihood = -48.564

* Significant level 90%; ** Significant level 95%; *** Significant level 99%

TABLE 4: STABILITY OF THE QUADRATURE

	Fitted quadrature 12 points	Comparison quadrature 8 points	Comparison quadrature 16 points
Log likelihood	-48.564	-53.494	-49.980
	-4.930	-1.416	Difference
	0.102	0.029	Relative difference
Success Yes/No:	0.242	0.242	0.269
Employees	0.000	0.027	Difference
	0.000	0.112	Relative difference
Success Yes/No:	8.170e-07	8.170e-07	-7.472e-07
Operative Margin	0.000	-1.564e-06	Difference
	0.000	-1.915	Relative difference
Success Yes/No:	3.422e-06	3.422e-06	-4.314e-06
Income	0.000	-7.736e-06	Difference
	0.000	-2.261	Relative difference
Success Yes/No:	-1.239e-06	-1.239e-06	-1.156e-06
Sales	0.000	8.336e-08	Difference
	0.000	-0.067	Relative difference
Success Yes/No:	-7.416	-7.416	-7.380
Objective Collaboration 1	0.000	0.036	Difference
	0.000	-0.005	Relative difference
Success Yes/No:	7.862	7.862	7.640
Objective Collaboration 2	0.000	-0.221	Difference
	0.000	-0.028	Relative difference
Success Yes/No:	-14.323	-14.323	-14.383
Objective Collaboration 3	0.000	-0.059	Difference
	0.000	0.004	Relative difference
Success Yes/No:	2.565	2.565	2.402
Objective Collaboration 4	0.000	-0.164	Difference
	0.000	-0.064	Relative difference
Success Yes/No:	-26.022	-26.022	-27.297
Feasibility Studies	0.000	-1.274	Difference
	0.000	0.049	Relative difference
Success Yes/No:	-31.030	-31.030	-29.010
Object Gained	0.000	2.019	Difference
	0.000	-0.065	Relative difference
Success Yes/No:	0.155	0.155	-5.612
Results	0.000	-5.767	Difference
	0.000	-37.169	Relative difference
Success Yes/No:	108.742	108.742	114.158
Processes Changes	0.000	5.416	Difference
	0.000	0.050	Relative difference
Success Yes/No:	-420.210	-420.210	-414.314
Project Done	0.000	5.897	Difference
	0.000	-0.014	Relative difference
Success Yes/No:	230.770	230.770	231.391
Object Project	0.000	0.621	Difference
	0.000	0.003	Relative difference
Success Yes/No:	-62.118	-62.118	-61.455
Advice Relations	0.000	0.663	Difference
	0.000	-0.011	Relative difference

Continue →

Continue Table 4

Success Yes/No :	23.148	23.148	23.283
Tech. Status	0.000	0.134	Difference
	0.000	0.006	Relative difference
Success Yes/No :	37.421	37.421	33.676
Intervention Tech. Level	0.000	-3.744	Difference
	0.000	-0.100	Relative difference
Success Yes/No :	-12.472	-12.472	-8.189
Productive Results	0.000	4.283	Difference
	0.000	-0.343	Relative difference
Success Yes/No :	-24.216	-24.216	-23.338
Centre Collaborations	0.000	0.878	Difference
	0.000	-0.036	Relative difference
Success Yes/No :	-112.882	-112.882	-108.458
Assumptions Done	0.000	4.425	Difference
	0.000	-0.039	Relative difference
SuccessYes/No :	126.707	126.707	128.908
New Works	0.000	2.201	Difference
	0.000	0.017	Relative difference
Success Yes/No :	251.258	251.258	251.258
Potential Assumptions	0.000	0.000	Difference
	0.000	0.000	Relative difference
Success Yes/No :	-23.688	-23.688	-23.764
Cons	0.000	-0.076	Difference
	0.000	0.003	Relative difference
Lnsig2u:	10.038	10.038	10.279
Cons	0.000	0.241	Difference
	0.000	0.024	Relative difference

TABLE 5: COLLABORATIONS WITH THE CENTRE

Type of collaborations with the centre RTM	
1	Planning of shafts to high speed
2	Planning of software, electronic or mechanical components
3	Planning of others
4	Metallographic analysis
5	Technical use of laser
6	Advices and consultations for specific problems
7	Products certifying
8	Center laboratories utilisation
9	Studies of feasibility
10	Eventual future collaborations

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ISSN (print): 1591-0709; ISSN (on line): 2036-8216

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