
**The determinants of firm participation
in public incentive programmes for outward internationalisation**

Mariasole Bannò
Università degli Studi di Brescia
Department of Mechanical and Industrial Engineering
Via Branze, 38 - 25123 Brescia (Italy)
mariasole.banno@unibs.it
Tel. +39.030.371.5563 Fax +39.030.370.2448

Francesca Sgobbi
Università degli Studi di Brescia
Department of Mechanical and Industrial Engineering
Via Branze, 38 - 25123 Brescia (Italy)
francesca.sgobbi@unibs.it
Tel. +39.030.371.5563 Fax +39.030.370.2448

Abstract: Based on an analysis of the behaviour of firms applying for outward FDI (foreign direct investment) incentives, this study explores firm participation processes in policy programmes. This paper identifies and empirically tests the determinants of self-selection as firms apply for outward FDI incentives while controlling for the guidelines followed by the agencies that allocate incentives. Using firm-level data, this paper shows that the opportunity costs of applying, the financial constraints and the riskiness of FDI projects significantly affect firm behaviour in applying for public incentives, thereby suggesting the existence of self-selection mechanisms among eligible firms.

Key words: public policy, process evaluation, outward FDI.

1. Introduction

The outward internationalisation of firms is an increasingly important object of public intervention in most OECD countries (UNCTAD, 1993, 2003) since internationalisation is acknowledged as a determinant of national economic growth (Wright *et al.*, 2007). Since the 1990s, governments have encouraged this process by promoting measures such as financial support, investment insurance, fiscal incentives, databases on foreign markets and technical assistance (UNCTAD, 1998). The implementation of measures to support outward FDIs is usually carried out by public agencies working under guidelines issued by central governments or local public administrations (UNCTAD, 1996b).

Given the rising importance of such policy tools (UNCTAD, 1997; 2003), we know surprisingly little about either their effects or their allocation processes. On the one hand, incentives and policy measures have often been criticised as ineffective (Farrel, 1985; UNCTAD, 1998; Lim, 2005; Markusen and Nesse, 2006), yet systematic and rigorous analyses are still lacking. On the other hand, no evidence exists on the processes that drive the allocation of public incentives to outward FDIs. There is a general push for collecting evidence about the effectiveness of different policy tools, but the focus on the outcome of those tools has somehow diverted attention away from the problems surrounding incentive allocation. However, the understanding of the participation processes that drive incentive allocation represent a compulsory promise in order to collect reliable evidence of both direct effects, indirect effects and overall effectiveness of a policy tool (Heckman and Smith, 2004).

Few studies analyse participation processes at the firm level as the outcome of agency selection processes (for a review, see Blanes and Busom, 2004), and even less attention is paid to the application behaviour of firms. We know surprisingly little about how potential applicants decide whether or not to apply. To the author's knowledge, the only paper that studies the application process for a public industrial incentive is Blanes and Busom (2004), who estimate reduced-form models of joint applications and granting decisions for R&D subsidies.

Consequently, the main aim of this paper is to analyse firm behaviour in applying for public incentives by identifying the determinants of self-selection and controlling for eligibility, acceptance and enrolment. This paper represents one of the first attempts to provide a theoretical interpretation and a rigorous evaluation of public incentive allocations as concerns outward internationalisation programmes. The proposed methodological approach draws on the extensive treatment effects and labour supply literature (for a survey, see Blank and Rugless, 1996; Heckman *et al.*, 1999; Blundell and Costa Dias, 2002; Blundell and MaCurdy, 1999).

The empirical analysis in this paper is based on data on internationalised Italian firms that received at least one financial incentive for international growth outside the European Union during the period 1992-2007 and on a sample of potential applicants that have not obtained such an incentive.

The paper is structured as follows. The next section surveys the existing literature and formulates the hypotheses that drive the empirical analysis. The following sections present the data and the methodology. The fifth section describes the variables used in the empirical analysis. Section six illustrates the results of the econometric estimates, while final comments are reported in section seven.

2. Literature background and research hypotheses

Public policy evaluation includes process (or implementation) evaluation and outcome (or impact) evaluation (Freeman *et al.*, 2004). In the present paper, we will not discuss the impact of public financial incentives to outward internationalisation (Bannò and Piscitello, 2008), but we will take a closer look at the public incentives application process, which represents a significant part of the implementation of a policy tool.

Process evaluation, a particular form of *ex post* or *in medias res* public policy evaluation, is a procedure that verifies whether or not a support program is delivered as intended to the target subjects (Scheirer, 1994). Unfortunately, implementation processes are often unforeseeable and difficult for governments to monitor.

However, thanks to repeated measures over time, program process monitoring can assess whether public intervention is operating as intended and according to appropriate standards.

It is worth noting that early literature framed implementation processes simply as administrative routines that would occur of and by themselves once policy measures were brought into effect by legislation and agencies mandated with administrative authority (Corbett and Lennon, 2002; Vedung, 1997). However, this view has been undermined, as a growing body of literature, also known as implementation research, has focused on comparing policy implementation with the original intentions of policy makers and on identifying the obstacles to successful policy execution (Wallman, 2007; Holcomb and Nightingale, 1999).

Implementation is not simply an administrative problem (Corbett and Lennon, 2002). On the contrary, it is a complex process involving distinct actors, namely, governmental bodies, public agencies and firms. Policy implementation is in fact inevitably the result of the interaction among multiple players with contrasting goals due to their different objectives, power and capabilities.

Understanding the role of each participant in the development of a public policy is a key factor in implementing incentive structures that will achieve the policy maker's objectives in the most efficient way (Schilder, 2000; Mudambi, 1999). Heckman and Smith (2004) assert that understanding the process of participation in public programmes is important for at least three reasons. First, it allows to identify the sources of inequality in the allocation of public services. Overall, differences in participation may result in very different distributions of the wealth function. In particular, studying the determinants of participation can reveal the existence of unexpected barriers to participation itself (Blanes and Busom, 2004). Second, participation patterns can reveal useful information about the functioning of support programmes by separating the roles of the agencies in charge of incentive allocation from the participation initiated by firms. Third, information on participation processes strongly affects program evaluation strategies only when observing counterfactual conditions. Public policy evaluators can un-

derstand whether the observed outcomes are effectively caused by a particular public policy (Marschak, 1956). The two major sources of problems, also known as threats to validity (Bartik and Bingham, 1997), are represented by omitted variable bias and selection bias¹. As it is impossible to determine exactly what would happen in absence of incentive, we need a methodology that allows to identify the causal relationship between the incentive and the outcome while controlling for other possible determinants of the outcome itself (Bartik and Bingham, 1997). Additionally, one must account for possible selection biases, there may be systematic differences between benefiting and non-benefiting firms that may affect the impact of the incentive but do not depend on the access to the incentive itself. In particular, selection bias may occur due either to firm self-selection or agency selection. In the first case, firms that apply for the incentive may not be representative of the total population of eligible firms, while in the second case the agency may accept only the applications that meet specific selection criteria.

Several methods have been proposed in the literature to address selection bias, including, for example, propensity score matching methods, instrumental variables, and control function methods. In any case, these methods always require the clear specification of the reference group and different types of identification strategies (Heckman and Robb, 1985; Heckman and Navarro-Lozano, 2004). Nevertheless, the literature on matching provides no guideline on the choice of the conditional variables that generate selection (Heckman and Navarro, 2004), even if various analyses stress the importance of selection bias (Heckman *et al.*, 1998).

Within the context of public incentives for outward internationalisation, the allocative problem can be decomposed into five steps, each one involving different actors. These steps are: eligibility, awareness, application, acceptance and enrolment (Heckman and Smith, 2004). Three main actors are involved in the participation process, namely, policy makers, firms and public agencies. Policy makers set the criteria of eligibility, which will be interpreted by the agencies in charge of

¹ Heckman (2001) provides an extensive treatment of selection bias

incentive programme management. Based on their awareness (i.e., the extent to which a firm is informed about the existence of a public incentive), firms decide whether to apply or not. Thus, firms self-select to participate in the allocation process. Finally, public agencies make granting decisions by choosing which applications will be accepted and which companies will be enrolled in the incentive programme.

An important part of the participation process consists of two decisions made by two different subjects: self-selection behaviour by firms (i.e., awareness and application) and grant allocation by public agencies (i.e., acceptance and enrolment). With the first decision, firms choose if and when they will apply for a public incentive, while in the second case public agencies decide which applicant firms will be granted. Literature has paid little attention to these last two steps (i.e., acceptance and enrolment) and virtually no attention to firm self-selection processes.

Studies investigating participation in public programmes often indicate that many subjects eligible to participate on the basis of the selection criteria proposed by policy makers do not in fact participate (Blank and Ruggles, 1996). Assuming that firms are aware of the existence of an incentive and that eligibility rules are not too restrictive, several reasons may drive a firm to not apply. The decision depends on the expected benefits of participation compared to monetary and non-monetary costs. In particular, we identify application costs, financial constraints and the riskiness of the eligible projects as significant drivers of the application decision.

Even if the eligibility conditions set by policy makers are not particularly restrictive *ex ante*, an application still involves significant costs. Information gathering, reporting and other non-monetary costs are important obstacles to actual program participation (Ashenfelter, 1983). Consequently, we expect that experience and managerial capability reduce the costs of applying and increase the likelihood of self-selection in applying. Consequently, the first hypothesis tested by our empirical analysis can be detailed as follows.

HP 1: Managerial skills, experience and informational barriers induce self-selection by affecting the cost of applying.

The second hypothesis concerns the relationship between firms' financial constraints and the decision to apply for a public incentive. The actual cost of going abroad may vary across firms as a result of differences in the availability and cost of existing financial resources (Maseneire and Clayes, 2006; Bellone *et al.*, 2008; Desai *et al.*, 2006). As discussed in recent literature on SMEs, the market for FDI financial support is subject to considerable imperfections, which often result in financial constraints (De Maeseneire and Clayes, 2006). For these reasons, financial market imperfections can curb outward investment projects and can limit a firm's capability to engage in FDIs. Consequently, we expect a positive relationship between the financial constraints perceived by a firm and the probability of self-selection to apply for public funds (Hyytinen and Toivanen, 2005).

HP 2: Financial constraints affect self-selection by reducing the cost of the project.

Besides firm-specific characteristics, project characteristics are also expected to affect the decision to self-select. As for incentives specifically addressed to (inward and outward) FDIs, some papers have demonstrated that different kinds of inward incentives do not equally appeal to all types of investors. On the contrary, the characteristics of the foreign project determine which incentives are preferred by firms (Rolfe *et al.*, 1993; Mudambi, 1999). In fact the granting agency takes risks to the full extent of the loan in case of project failure, while in case of project success, the MNE's returns are lower, as it must repay the loan. Thus, we expect that firms submit the most risky projects to public agencies and finance the least risky ones internally or through the private capital market.

HP 3: The riskiness of an FDI project affects the propensity to apply for a public incentive by increasing the benefit of participation.

3. The Data

3.1 Italian Agencies: Simest and Finest

Most of the OECD countries have promoted outward FDIs since the early 1990s by providing public venture capital, public grants and public insurance at preferential rates. These incentives are generally managed by national development financial institutions, which are increasingly involved in supporting outward foreign direct investments (UNCTAD, 1993, 1996a; Gergely, 2003).

In 2007, Italy invested about 3 percent of total industrial policy expenditures in promoting exports and inward and outward internationalisation. Italian firms investing abroad are supported by two public agencies: Simest and Finest.

Business Needs	Tools provided by Simest
Investment in a foreign company	<ul style="list-style-type: none"> • SIMEST participation in the equity of foreign companies • Reduced interest rates • Venture capital fund • Venture capital fund for start-up firms (Law 100/90; Law Decree 143/98; Law 35/40; Law 19/91)
Scouting of business opportunities	<ul style="list-style-type: none"> • Business scouting and matchmaking (Law 100/90)
Advisory services and funding support	<ul style="list-style-type: none"> • Consultancy and support services in setting up investment initiatives (Law 100/90)
Analyses of foreign market	<ul style="list-style-type: none"> • Financial support to feasibility studies and technical support (Law Decree 143/98; Law 35/05; Ministerial Decree 136/00)
Market penetration in non-EU countries	<ul style="list-style-type: none"> • Financial support to the establishment of long-term initiative (Law 394/81)
Participation in international tenders	<ul style="list-style-type: none"> • Financial support to the tender process (Law 304/90)
Export of capital goods	<ul style="list-style-type: none"> • Interest rate stabilization on export credits (Law 143/98)

Table 1: Tools provided by SIMEST (Source: www.simest.it)

Simest, the largest institution supporting Italian businesses abroad, was set up as a limited company in 1990 (Law 100/1990). It is a public-private partnership controlled by the Ministry of International Trade and Commerce (76%), while private shareholders include banks and industrial business firms. The primary objective of Simest is to promote the competitiveness of the Italian industry and service sector by providing funding and advice to outward investors. In order to achieve these goals, Simest provides Italian companies with several tools to support foreign business in all phases of development (Table 1).

The other Italian agency in charge of distributing public incentives to outward FDIs is Finest. The agency was founded in 1992 pursuant to Italian National Law 19/1991 as an investment company that promotes economic cooperation with Eastern European countries. The main shareholders of Finest are the Regional Governments of Friuli Venezia Giulia and Veneto, the Autonomous Province of Trento² and Simest. Finest provides assistance to all companies located in the North East of Italy (i.e., the Friuli Venezia Giulia, Veneto and Trentino Alto Adige regions). Finest collaborates with companies to create or expand their business in foreign countries or to set up industrial and commercial relations with firms in target areas. In particular, Finest acquires shares in foreign companies and provides assistance to entrepreneurs.

This paper focuses on Law 100/1990, executed by Simest, and Law 19/1991, executed by Finest, which provide examples of public financial incentives that encourage outward internationalisation. The examined business incentives consist of capital loans at interest rates below the market rates. Moreover, in case of failure of the foreign project, loans need not be paid back (Law 394/1981).

According to Law 100/1990, Simest can directly invest up to 25% of the equity of the foreign venture, for a maximum of 8 years. Since 2005, the public agency can acquire up to 49% for a longer period. Simest can evaluate investment proposals presented by firms, partners of cooperative agreements, cooperatives,

² All these institutions are local public administrations of North Eastern Italy.

consortia and business associations. Moreover, according to Law 100/1990, priority should be given to initiatives by Italian SMEs investing in Eastern Europe. Projects in the same sector of their parent company are encouraged; however, no sector is excluded. Projects that entail the divestment of R&D, sales or production activities in Italy are excluded (Law 80/2005). Applications have to detail the objectives and the business plan of the foreign investment. Every year Simest receives between 100 and 200 applications.

Between 1992 and 2006, Simest supported 863 investment projects outside the European Union and acquired shareholdings in 469 Italian foreign affiliates for a total amount of 7.543 million euros and 189.560 employees. Minority shareholding accounts for about 10% of total investment. In the same period Simest also subscribed 150 equity increases for a total of 412 millions of euro and sold 253 shareholdings for a total of 193,4 millions of euro. In 2006 minority stakes and dividends generated 12,6 million euros of return with a return on equity of 5.2%.

Like Simest, Finest co-invests as a minority shareholder in foreign partners of companies located in North East Italy³.

3.2 The Dataset

The dataset used in the empirical analysis combines four different sources of data:

- (a) the database Reprint, which provides a census of outward and inward FDI in Italy since 1986. Reprint is updated yearly and it is sponsored by the Italian Institute for Foreign Trade;
- (b) Simest's balance sheets, which provide information about the financial incentives granted by Simest under Law 100/1990 between 1992 and 2006;
- (c) Finest's balance sheets, which provide information about the financial incentives granted by Finest under Law 19/1991 between 1994 and 2007;

³ Finest can directly invest in foreign ventures up to 25% for a maximum of 8 years. Since 2005 it is entitled to acquire up to 49% of foreign equity for a longer period.

-
- (d) the database AIDA, developed by Bureau van Djick, which provides structural and financial data for Italian public limited companies.

The dataset obtained by integrating of the above sources includes information on 568 firms that received public incentives and 991 internationalised firms that did not receive any public financial support from Simest or Finest.

The sampled firms represent 98 percent of funded firms and 10 percent of the control group. As the eligibility condition for funding is an FDI destination outside the European Union, any firm based in Italy can apply for the public incentives examined in this study.

4. Methodology

Depending on the type of program under evaluation and the specific objectives of the process analysis, several methods can be used. Qualitative analyses are the most frequently used methods, including reviews of existing documents, management information systems, interviews, focus groups, surveys typically conducted through structured questionnaires, and participant and non-participant observations (Potuček *et al.*, 2003). Nevertheless, the rising demand for quantitative methods in public policy evaluation reflects the desire of elected officials to define better policies, to assess performance, to evaluate the implementation process and to ascertain impacts (Mosselman and Prince, 2004; Lenihan *et al.*, 2007; Yang, 2007). The designers of policy tools look at econometric analysis with increasing expectations; see, for example, the 2008 Special Issue of the *Journal of Econometrics* on the use of econometrics in informing public policy makers. Typical econometric studies focus on the average impact of the public tool under evaluation. However, the empirical analysis of the implementation process and, in particular, the allocation process are attracting growing interest.

The allocation process is particularly difficult to analyse, because researchers can seldom separately observe application behaviours by firms and grant allocation decision by public agencies. (Blanes and Busom, 2004). The most frequent

limitation faced by researchers is the impossibility of identifying unsuccessful applications and the characteristics of rejected projects. Consequently, it is often impossible to identify the impact of the agency selection criteria from other factors driving firm behaviour, such as self-selection.

In order to solve the above problem, previous studies focused on a single step, e.g. the allocation process (Feldman and Kelley, 2006), or jointly considered the application and allocation processes (Blanes and Busom, 2004).

Also the present empirical analysis had to cope with missing information on rejected applications. Data do not consequently allow for separate estimates of the effects of application decisions by firms and granting decisions by the public agency. As in most studies, data limitations forced us to combine application and allocation processes into a single step. However, we try to relax this limitation by including determinants of self-selection as well as variables accounting for the allocation of funds by agencies as control variables.

The empirical analysis is based on a probit regression of the determinants of firm application and agency acceptance processes. Combining these two stages in the participation process means that the patterns reflect the joint influence of a firm's decision to apply for an incentive and an agency's decision to accept or reject an application.

The dependent variable, $D_Incentive$, is a dummy variable equal to 1 if a firm has launched an FDI project with the support of a public financial incentive and zero otherwise.

It must be noted that if a firm correctly anticipates the selection criteria as stated by the act that institutes the public incentive, the determinants of the application process overlap with those of the granting decision, and no identification problem exists (Busom, 2000). For these reasons, we identify two sets of independent variables: firm behaviour variables and control variables that explain the agency selection criterion.

The model is:

$$D_Incentive_i = \alpha Firm_behaviour_i + \beta Control_variables_i + \varepsilon_i$$

5. The empirical variables

Hypothesis 1 argues that managerial skills and other related factors affect the propensity to self-selection. The proxies employed to assess managerial skills include firm size (Buckley, 1989; Blanes and Busom, 2004) and age (Merito *et al.*, 2007). We expect that larger and older firms and firms belonging to a group will be more likely to apply for an incentive, as their higher managerial competences reduce application costs.

Because of the existence of asymmetric information between the agency and the firms, the cost of revealing information about the project should be lower for firms located close to an agency.

With reference to the second hypothesis, which focuses on the relationship between a firm's financial constraints and the choice to apply for a public incentive, we proxy a firm's financial constraints by its solvency ratio. As financial market imperfections can limit a firm's chance to engage in FDIs, we expect a positive relationship between the existence of financial constraints and the probability of going abroad thanks to a public incentive (Hyytinen and Toivanen, 2005).

An outward FDI often involves fixed, non-recoverable set-up costs (Bellone *et al.*, 2008). A minimum volume of revenues is consequently necessary to move abroad with commercial and, above all, productive FDIs. In fact, manufacturing investments often require much larger investments in fixed assets, such as land and equipment, than service operations (Rolfe *et al.*, 1993). For this reason, we expect that foreign initiative in the service industry will be less likely to apply for a public financial incentive.

Investors acquiring existing operations may be more interested in incentives that depend upon the generation of profit rather than in reducing their initial investment (Rolfe *et al.*, 1993). We consequently expect that firms investing in greenfield projects have a higher propensity to apply for financial incentives than firms investing in expansion or acquisition projects (Rolfe *et al.*, 1993; Mudambi, 1999).

The third hypothesis suggests a positive relationship between a firm's decision to apply and the riskiness of the FDI project. Past experience in international markets, proxied by the number of previous FDIs, makes a firm more diversified in term of risk and thus less bounded by risk diversification. Moreover, past experience in countries characterised by high political hazard reduces a firm's sensitivity to this type of risk in subsequent entry decisions (Henisz, 2004), consequently reducing the propensity to apply for a public incentive.

The mode of entry in foreign markets is likely to differ on key dimensions, such as the amount of committed resources, the extent of a project's risk and the potential return. Modes of entry involving higher levels of commitment, higher transaction costs and higher investment costs (i.e., a foreign majority stake) positively influence a firm's decision to apply for public financial incentives.

Institutional differences between domestic country and host country amplify the difficulties in gathering, organising and interpreting the information necessary for successful entry. Investors are consequently more likely to enter countries characterised by a stable policy system, similar culture and similar institutional structures (Henisz, 2004). Where the above conditions are not met, public aid is perceived as a means to lower systematic, country-level risk. Moreover, firms sensitive to contracting and political hazard⁴ will take mitigating actions (Henisz, 2000, 2004) and partner with home country institutions endowed with a comparative advantage in interacting with the host country institutions. In summary, we expect investments in developing countries to be more likely to ask for public aid.

As previously mentioned, Simest and Finest allocate incentives according to a selective funding practice that follows specified criteria. According to policy objectives, agencies should favour SMEs, investments in Eastern Europe and projects that generate larger spillovers. According to the institutional guidelines, firms operating in the same sector as the parent company should be favoured.

⁴ Henisz (2004) defines political hazard as the probability that a policy change by the host country government will either directly (seizure of assets) or indirectly (adverse changes in taxes, regulations or other agreements) diminish the expected return on assets of FDIs.

Intertemporal effects caused by different availability of public funding should also be taken into account. For this reason, we include a cohort dummy that captures the growing availability of public found from 2002 onwards. We also include industry dummies as control variables⁵.

All independent variables, whether related to structural, financial or project characteristics, refer to the year before the FDI start-up in order to appreciate the impact of these variables on the probability of going abroad with the support of an incentive supplied by Simest or Finest.

The explanatory and dependent variables are summarised in Table 2. Table 3 displays the descriptive statistics of the explanatory variables for the entire sample, while Table 4 provides preliminary test of the difference between firm-specific and project-specific features of companies which internationalise with and without public financial support.

The high significance of differences between the two groups provides preliminary evidence of the opportunity to investigate the likeliness of obtaining an incentive based on firm-specific and project-specific variables.

The correlation matrix, reported in Table 5, reveals the correlation indices between the examined variables.

⁵ Ten industry dummies have been considered: services, wood products, raw materials, chemical and pharmaceutical, building and construction, electronics, industrial machinery, automotive, food tobacco and beverages, textile and the baseline plastic and rubber

Variable	Description	Source
Dependent Variable		
D_Incentive	Dummy variable taking the value of 1 if the firm launched an FDI project backed by an incentive in t_0 , and zero otherwise	SIMEST and FINEST balance sheets
Independent Variables		
Experience	Age of the firm (years) in t_{0-1}	AIDA
International_experience	Number of outward FDIs held in t_{0-1}	REPRINT
Location	Dummy variable taking the value of 1 when the firm is located in the same province of the agency and zero otherwise	SIMEST and FINEST balance sheets, REPRINT
Solvency_ratio	Ratio between equity and total assets in t_{0-1}	AIDA
Services	Dummy variable taking the value of 1 when the firm is active in the service industry, and zero otherwise	REPRINT
Greenfield	Dummy variable taking the value of 1 if the foreign affiliate is a greenfield, and zero otherwise	REPRINT
Majority	Dummy variable taking the value of 1 if the foreign affiliate is majority-owned by the parent company in t_{0-1} , and zero otherwise	REPRINT
Developing_countries	Dummy variable taking the value of 1 for FDI targeting developing countries, and zero otherwise	REPRINT
SME	Dummy variable taking the value of 1 when the firm has less than 250 employees in t_{0-1}	AIDA
Group	Dummy variable taking value 1 if firm belongs to a group	AIDA
East_Europe	Dummy variable taking the value of 1 when the FDI destination country is Eastern Europe, and zero otherwise	REPRINT
Diff_industry	Dummy variable taking the value of 1 when the foreign firm is not active in the same sector as the parent company	REPRINT, AIDA
Cohort_2002_2006	Dummy variable taking the value of 1 when the FDI is realised between 2002 and 2006, and zero otherwise	SIMEST and FINEST balance sheets, REPRINT
Industry dummies	Dummy variable taking the value of 1 when the firm is active in the specific industry, and zero otherwise	REPRINT

Table 2: Descriptions of the variables and sources of data

	Minimum	Maximum	Mean	Std. Deviation
Experience (years)	1	400	27.40	39.63
International_experience (FDIs)	1	515	37.95	74.17
Solvency_ratio (%)	-25.08	99.78	32.51	18.89

	Minimum	Maximum	%
D_Incentive	0	1	36.96
Location	0	1	18.00
Services	0	1	41.22
Greenfield	0	1	47.77
Majority	0	1	87.17
Developing_countries	0	1	72.14
SME	0	1	40.20
Group	0	1	48.40
East_Europe	0	1	38.93
Diff_industry	0	1	43.76
Cohort_2002_2006	0	1	42.36

Table 3: Descriptive statistics

	Benefiting Firms (568)	Non-Benefiting Firms (991)	Sign.
Firm characteristics			
Experience ^a	30	26	**
International_experience ^a	10	54	***
Location ^c	30%	11%	***
Solvency_ratio ^b	26.31%	36.15%	***
Services ^c	25%	51%	***
SME ^c	46%	27%	***
Group ^c	40%	53%	
Project characteristics			
Greenfield ^c	57%	42%	***
Majority ^c	91%	85%	***
Developing_countries ^c	87%	63%	***
East_Europe ^c	64%	24%	***
Diff_industry ^c	29%	53%	***

a t-Test between the two categories; (mean)

b Mann-Witney Test between the two categories; (mean) (%)

c Proportion Test between the two categories; (median) (%)

Table 4: Comparison between benefiting firms and non-benefiting firms

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Experience	1												
2 International_experience	0.073	1											
3 Location	-0.052	-0.048	1										
4 Solvency_ratio	0.045	0.210	-0.077	1									
5 Services	0.103	0.139	-0.026	0.077	1								
6 Greenfield	0.106	-0.067	0.093	-0.135	-0.095	1							
7 Majority	-0.009	-0.045	-0.001	-0.073	0.054	-0.059	1						
8 Developing_countries	0.060	-0.118	0.044	-0.072	-0.318	0.214	-0.048	1					
9 SME	-0.133	-0.344	0.055	-0.297	-0.128	0.126	0.012	0.154	1				
10 Group	0.074	0.277	-0.040	0.334	0.172	-0.115	-0.007	-0.176	-0.794	1			
11 East_Europe	0.081	-0.178	0.118	-0.141	-0.200	0.082	0.080	0.357	0.242	-0.199	1		
12 Diff_industry	-0.094	0.107	0.004	0.145	0.371	-0.116	0.041	-0.247	-0.221	0.254	-0.244	1	
13 Cohort_02_06	0.032	-0.020	0.185	-0.034	0.153	0.111	0.061	-0.024	-0.026	0.038	0.036	0.105	1

Table 5: Correlation matrix

6. Results of the empirical analysis

Estimated results of the probit regression are shown in Table 6 which reports two distinct specifications (respectively, Model 1 and Model 2). The columns of coefficients show the estimates obtained for a model that includes 568 firms that received incentives and a control group constituted by 991 firms.

First of all, we note that the eligibility rules had a substantial effect on access to public incentive (i.e., no benefiting FDIs are present in European Union), while the proxies for application costs, financial constraints and project riskiness support the existence of self-selection.

According to the first hypothesis, overall experience increases the probability of receiving an incentive: the coefficient of variable Experience is positive and significant at $p < 0.05$ in Model 1 and at $p < 0.01$ in Model 2. Moreover if a firms belong to a group increases the probability of receiving an incentive: the coefficient of variable Group in Model 2 is positive and significant at $p < 0.05$. This evidence supports the intuition that when application costs are not negligible, managerial capabilities are needed to overcome them.

The proximity to the premises of an agency in charge of allocating public funds increases the probability of receiving an incentive, since the coefficient of variable Location is positive and significant at $p < 0.01$ in both models. This findings supports the hypothesis that information barriers are a significant determinant of participation status.

Firms with high financial constraints are more likely to participate, in accordance with hypothesis two. *Prima facie*, the higher the total amount of debts, the higher the likelihood to apply for and obtain a public incentive (Solvency_ratio is negative and significant at $p < 0.01$ in both Model 1 and 2).

The regression confirms the existence of significant industry-specific effects, as manufacturing firms have a higher probability of receiving a financial incentive (Services is negative and significant at $p < 0.05$ in both Model 1 and 2). This confirms that the level of financial commitment in foreign projects positively influ-

ences a firm's self-selection as well as the willingness to invest in greenfield projects (Greenfield is positive and significant at $p < 0.01$ in both Model 1 and 2).

Probit Regression						
Dependent Variable: D_Incentive						
	Model 1			Model 2		
	Coeff.	Std. Err.	e^β	Coeff.	Std. Err.	e^β
Cons	-0.071	0.439	0.931	-0.070	0.440	0.931
Firms' self selection variables						
Experience	0.002**	0.001	1.002	0.002***	0.001	1.002
International_experience	-0.658***	0.123	0.518	-0.631***	0.126	0.532
Location	0.624***	0.100	1.866	0.615***	0.101	1.850
Solvency_ratio	-0.292***	0.060	0.747	-0.015***	0.002	0.985
Services	-0.851**	0.386	0.427	-0.828**	0.395	0.437
Greenfield	0.299***	0.101	1.349	0.309***	0.101	1.362
Majority	0.2327***	0.116	1.262	0.295**	0.117	1.343
Developing_countries	0.261***	0.099	1.298	0.322***	0.100	1.380
Control variables						
SME	0.075	0.083	1.078			
Group				0.232***	0.084	1.261
East_Europe	0.736***	0.082	2.088	0.784***	0.082	
Diff_industry	-0.291***	0.085	0.748	-0.311***	0.088	0.733
Cohort_02_06	0.517***	0.080	1.677	0.512***	0.080	1.669
Industry_dummies	Yes			Yes		
Number of obs = 1572			Number of obs = 1572			
LR chi ² (22) = 587.72			LR chi ² (22) = 608.27			
Prob > chi2 = 0.000			Prob > chi2 = 0.000			
Pseudo R2 = 0.284			Pseudo R2 = 0.294			
* Significance at the 10% level						
** Significance at the 5% level						
*** Significance at the 1% level						

Table 6: Probit model, participation in National public incentives

In accordance with the third hypothesis, a firm's international experience reduces the odds of receiving an incentive (at $p < 0.01$ in both Model 1 and 2); firms with past FDIs are less bounded by risk diversification and consequently less interested in asking for public aid. As the coefficient of `International_experience` is negative and significant in both models, the incentive is not used against the intentions of policy makers to support further internationalisation by already-experienced firms.

The mode of entry also positively influences the probability of obtaining a public incentive. A higher capital appropriation (`Majority` is significant at $p < 0.01$ in Model 1 and at $p < 0.05$ in Model 2) is linked to requesting incentives, revealing that the higher is the commitment, the higher is the phenomenon of firm self-selection.

Firms investing in developing countries are more likely to enjoy financial incentives (`Developing_countries` is significant at $p < 0.01$ in both Model 1 and 2), confirming that the riskiness of FDI projects significantly affects firm behaviour in applying insofar as public aid is perceived as a means to lower systematic, country-level risk.

Interestingly and contrary to expectations, as the selection guidelines favour initiatives by small firms, the coefficient of the dummy `SME` is not significantly different from zero. Moreover, size might also signal a need to ask for public incentives, because small firms may be more credit constrained (Buckley, 1989). Thus, public agencies may be willing to favour them. In both cases, the expected net effect may again be the result of a variable affecting both types of decisions in the same direction.

Consistent with the guidelines stated by the laws that instituted the incentives here under consideration, the regression in both two models shows a significant coefficient for initiatives in Eastern Europe (`East_Europe` is positive and significant at $p < 0.01$) and in the same business sector as the parent company (`Diff_industry` is negative and significant at $p < 0.01$).

The cohort dummy shifts intertemporal effects caused by different availability of public funding, indicating that firms had a higher probability of receiving incentives after 2002 (Cohort_02_06 is positive and significant at $p < 0.01$ in both Model 1 and 2)⁶.

7. Conclusions

This article provides new evidence regarding the process evaluation of participation in public incentives. This is the first paper that explicitly addresses the participation process in public incentives with regards to outward internationalisation and yields substantial insights on program equity and on the design of non-experimental program evaluation.

The evidence on the incentives allocated by the public Italian agencies Simest and Finest has been used to analyse the determinants of firm participation processes and reveals their complex nature. In particular, based on a probit model, our study suggests that after controlling for agency selection criteria, differences in participation status caused by firm self-selection are due also to differences in application costs, financial constraints and riskiness of FDI projects.

First of all, the results presented here suggest that improperly structured incentives may generate unsatisfactory responses by firms that self-select in applying, generating adverse selection.

On the one hand, firm size is a barrier for some firms, and thus incentives do not succeed in attracting smaller firms. Hence, public incentives are only partially attracting projects and firms with greater potential for growth and spillovers (Bannò and Piscitello, 2008). On the other hand, considerations about risk-shifting suggest that if the government absorbs too much risk, the investing firm may be tempted to further increase the risk of the foreign project, and so careful consid-

⁶ The only industry dummy with significant coefficient are automotive and electronics (both negative and significant at $p < 0.10$)

eration regarding incentive assignments is necessary to reduce the incentive for more risk (Giebe *et al.*, 2006).

Westhead *et al.* (2007) suggest the need for more balanced policy support towards the outward internationalisation of private SMEs. We add that policy towards outward internationalisation must appreciate firm heterogeneity. The spectrum of firms ranges from those that do not and cannot internationalise to those that have internationalised from their inception. Policy measures should differentiate according to the characteristics of specific target groups.

The analysis also denies that the idea that merely increasing the amount of funds promoting outward internationalisation will inevitably lead to greater program benefits. Increased benefits may only partially affect self-selection mechanisms in the eligible population.

In summary, we believe that additional efforts in the *ex ante* assessment of both firm and project characteristics may provide agencies in charge of incentive assignment with better operative tools. We suggest that incentives should be project specific, since the source of positive spillovers is likely to differ across FDIs. Ideally, incentives should induce firms to grow internationally by undertaking projects that they would not realise on their own. At this stage, we cannot conclude that firms are not substituting government funds for projects that they intended to pursue anyway (i.e., additionality). However, the positive and significant effects generated by financial constraints in firm self-selection suggest that the incentive is moving in the right direction of additionality, and public tools should limit any crowding-out effects (Busom, 2000). Moreover, incentives seem to be more effective for self-selecting firms that never went abroad, as they seem to induce a change of behaviour in non-internationalised firms.

Of course, better data would allow to improve the proposed analysis. First of all, observations on the same firms across all stages characterising the participation process (Heckman and Smith, 2004) would permit a better analysis of the self-selection process. It would also be helpful to have more variables related to project risk.

The analysis also suggests a rich agenda for further research. The study of outward FDI promotion is still an underdeveloped area of research in international business. Nevertheless, the increasing role played by national governments in relation to MNE investment promotion entails that more study in this area is necessary.

7. References

- Ashenfelter, O. (1983). Determining participation in income-tested social programs, *Journal of the American Statistical Association*, 78 (383): 517-525.
- Bannò, M and Piscitello, L. (2008). The effectiveness of incentive to firms' outward internationalisation. AIB, Academy of International Business Annual Meeting Milan, Università Bocconi, June 30- July 3, 2008.
- Bartik, T.J. and Bingham, R.D. (1997). Can Economic Development Programs Be Evaluated? In *Dilemmas of Urban Economic Development: Issues in Theory and Practice*, R. Bingham and R. Mier, eds. Thousand Oaks, CA: Sage Publications, pp. 246-277.
- Bellone, F., Musso, P., Nesta, L. and Quéré, M. (2008). The U-Shaped productivity dynamics of French Exporters, *Review of World Economics*, forthcoming, June 2008.
- Blank, R.B. and Rugles, P. (1996). When do women use aid to families with dependent children and food stamps? The dynamic of eligibility versus participation. *The Journal of Human Resources*, 31 (1): 57-89.
- Busom, I. (2000). An empirical evaluation of the effects of R&D subsidies, *Economics of Innovation and New Technology*, 9: 111-148.
- Blanes J.V. and Busom, I. (2004). Who participates in R&D subsidy programs? The case of Spanish manufacturing firms, *Research policy*, 33, 1459-1476.
- Buckley, P.J. (1989). Foreign direct investment by small and medium sized enterprises: the theoretical background, *Small Business Economics*, 12 89-100.

-
- Corbett, T. and Lennon M.C. (2002). *Implementation analysis: an Evaluation approach whose time has come*, Washington, DC: The Urban Institute Press.
- De Maeseneire, W. and Clayes, T. (2006). SMEs, FDI and financial constraints, *SSRN Working Paper*, 968694.
- Desai, M.A., Foley, C.F. and Forbes, K.J. (2006). Financial constraints and growth: multinational and local firm responses to currency crises, *Review of Financial Studies*, 19: 1433-1464.
- Feldman, M. P., & Kelley, M.R. (2006). The ex ante assessment of knowledge spillovers: government R&D policy, economic incentives and private firm behaviour, *Research Policy*, 35: 1509-1521.
- Journal of Econometrics, 2008. Special Issue 145.
- Freeman, H.E., Lipsey, M.W. and Rossi, P.H. (2004). *Evaluation: a systematic approach*, Sage Publications, Thousand Oaks, CA.
- Gardner, W.D. (1978). *Government finance*, Englewood Cliffs, Prentice Hall.
- Gergely, J. (2003). Trends in Foreign Direct Investment incentives, *European Communities Studies Association Working Paper*, 5.
- Giebe, T., Grebe, T. and Wolfstetter, E. (2006). How to allocate R&D (and other) subsidies: an experimentally tested policy recommendation, *Research Policy*, 35: 1261-1272.
- Heckman, J.J. (2001). Micro data heterogeneity, and the evaluation of public policy: Nobel lecture, *The Journal of Political Economy*, 109(4): 673-748.
- Heckman, J., Ichimura, H., Smith, J. and Todd, P. (1998). Characterizing Selection Bias Using Experimental Data, *Econometrica*, 66 (5): 1017-1098.
- Heckman, J.J. and Navarro-Lozano S. (2004). Using matching, instrumental variables and control function to estimate econometric models, *Review of Economics and Statistics*, 86: 30-57.
- Heckman, J. J. and R. Robb (1985). Alternative methods for evaluating the impact of interventions. In J. Heckman and B. Singer (Eds.), *Longitudinal Analysis of Labor Market Data*, Volume 10, pp. 156-245. New York: Cambridge University Press
-

-
- Heckman, J.J. and Smith J. (1999). The Pre-Program Earnings Dip and the Determinants of Participation in a Social Program: Implications for Simple Program Evaluation Strategies, *Economic Journal*, 109: 313-348.
- Heckman, J.J. and Smith J. (2004). The determinants of participation in a social program: evidence from a prototypical job training program, *Journal of Labor Economics*, 22 (2): 243-298.
- Henisz, W.J. (2000). The institutional environment for multinational investment, *Journal of Law, Economics, and Organization*, 16(2): 334-364.
- Henisz, W.J. (2004). The institutional environment for international business. In P.J. Buckley (eds.), *What is international business?*, New York: Palgrave, 85-109.
- Holcomb, P. and Nightingale D., (1999). *Theoretical and substantive dimensions in process and implementation studies of welfare*, The urban institute, Washington.
- Hyytinen, A. and Toivanen, O. (2005). Do financial constraints hold back innovation and growth?: Evidence on the role of public policy, *Research Policy*, 34(9): 1385-1403.
- Lenihan H., Hart M. and Roper S. (2007). Introduction to the Special Issue on Industrial Policy Evaluation: Theoretical Foundations and Empirical Innovations: New Wine in New Bottles, *International Review of Applied Economics*, 21: 313-319.
- Marschak, J. (1953). Economic measurements for Policy and Prediction, in *Studies in Econometric Method* (Ed.) W.C. Hood and T.C. Koopmans, Wiley, New York, pp. 1-26.
- Merito, M., Giannangeli, S. and Bonaccorsi, A. (2007). Gli incentivi per la ricerca e sviluppo industriale stimolano la produttività della ricerca e la crescita delle imprese? Evidenza sul caso italiano, *L'Industria*, 28(2): 221-241.
- Mosselman, M. and Prince, Y. (2004). *Review of methods to measure the effectiveness of state aid to SMEs*. Final Report to the European Commission, EIM Business & Policy Research, Brussels.
-

-
- Mudambi; R. (1999). Multinational investment attraction: principal-agent considerations, *International journal of the economics of business*, 6(1): 65-79.
- Potuček, M., Leloup, L. T., Jenei, G. and Váradi, L. (2003) *Public Policy in Central and Eastern Europe: Theories, Methods, Practices*. Bratislava: NISPAcee.
- Rogers, P.T., Hacsí, T.A., Petrosino, A., and Huebner, T.A. (2000). Program Theory in Evaluation: Challenges and Opportunities, *New Directions for Evaluation*, 87.
- Rolfe, R.J., Ricks, D.A., Pointer, M.M. and McCarthy, M. (1993). Determinants of FDI incentive preference of MNEs, *Journal of International Business Study*, 24(2): 335:355.
- Schilder A., (2000). *Government failures and institutions in public policy evaluation*, Van Gorcum & Comp. B.V., Assen.
- United Nations Conference on Trade and Development (1993). *World Investment Report*. New York and Geneva: United Nations Publications.
- United Nations Conference on Trade and Development (1996a). *World Investment Report*. New York and Geneva: United Nations Publications.
- United Nations Conference on Trade and Development (1996b). *Incentives and Foreign Direct Investment*. New York and Geneva: United Nations Publications
- United Nations Conference on Trade and Development (1998). *World Investment Report*. New York and Geneva: United Nations Publications.
- United Nations Conference on Trade and Development (2003). *Investment promotion and development: issues and questions*, Geneva: United Nations publication.
- Vedung, E. (1997). *Public Policy and Program Evaluation*. New Brunswick (USA) and London (UK): Transaction Publisher.
- Westhead, P., Wright, M., and Ucbasaran, D. (2007). Internationalization of Small and Medium-sized Enterprises (SMEs) and International Entrepreneurship: A Critique and Policy Implications, *Regional Studies*; 41(7): 1013-1030.
- Wollman, H. (2007). Policy evaluation and evaluation research. In F. Fischer, G.J.
-

-
- Miller and M.S. Sidney (eds), *Handbook of public policy analysis*, Boca Raton: CRC Press, 393-404.
- Yang, K. (2007). Quantitative methods for policy analysis. In F. Fischer, G.J. Miller and M.S. Sidney (eds.), *Handbook of public policy analysis*, Boca Raton: CRC Press, 349-368.
- Zaheer, S. (1995). Overcoming the liability of foreignness, *Academy of Management Journal*, 38: 341-63.