
The effects of incentives to firms' outward internationalisation on their domestic growth and competitiveness

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Abstract: While few studies have analysed public incentives to attract inward foreign direct investment (FDI), almost no evidence has been so far provided on public incentives to firms' internationalisation. The present paper aims at filling this gap, by providing an empirical analysis on their effects on the firm's growth. Specifically, the analysis is conducted on 237 Italian firms that received an incentive in the period 1991-2007 vs. a counterfactual sample of firms that internationalised their activity in the same period without any incentive. The econometric results, stemming from a two step treatment effect model, reveal that selection for getting the incentive tended to be not a random event, and that incentives to firms' internationalisation cause domestic growth especially when targeted towards smaller companies.

Key words: public policy, ex-post evaluation, incentives, outward FDI.

1. Introduction

Measures and incentives to internationalisation of firms have been traditionally investigated mainly from the host country perspective. Indeed, almost all developed and developing countries believe that inward FDI is beneficial for their local economy and, as a consequence, they offer a wide variety of incentives (Carlsson and Mudambi, 2003; UNCTAD, 2003). However, as most of the OECD countries has started to promote also outward FDI from the early 1990s (UNCTAD, 1993; 1998; 2003), policy makers are increasingly concerned with their role and effectiveness. Incentives and measures have been often criticised for being ineffective (Farrel 1985; UNCTAD 1998; Lim 2005; Markusen and Nesse, 2006), but specific rigorous analyses are still lacking, and most of the empirical analyses have focused exclusively on the effectiveness of the attraction of inward FDI (Guisinger, 1992; Brewer and Young, 1997; Oxelheim and Ghauri, 2004), while no evidence has been so far provided on the role and the effects of financial incentives for outward FDI (at least to the Authors' knowledge).

Our conceptual framework relies on the institutionalist approach (North, 1990, 1994, 2005), which suggests that outward internationalisation crucially depends not only on the home country's economic characteristics, but also on its institutional environment (Henisz, 2004). Specifically, we claim that home country's institutions, and particularly their enforcement mechanisms (Dunning and Lundan, 2008; Sethi *et al.*, 2002), are important ingredients of national and international competitiveness of firms. Accordingly, public incentives are designed to allow firms to reduce the uncertainty related to the foreign markets and to the "liability of foreignness" (Zaheer, 1995). Hence, they have been directed mainly to three crucial dimensions of the firm's internationalisation process: information on the foreign markets and technical assistance, investment insurance, fiscal incentives and financial support, and they should positively impact on the firm's national and international growth.

The issue is challenging also from a methodological perspective, as there is an increasingly perceived need for improving and developing adequate methodolo-

gies for public policy evaluation (see, for example the Special Issue of the *International Review of Applied Economics*, 2007). In fact, only rarely existing empirical studies¹ do apply methodologies which address the effects of selection bias and incorporate appropriate counterfactual scenarios (Lenihan *et al.*, 2007). We develop an empirical analysis using information on the population of Italian firms that received (at least) an incentive for international growth in the period 1991-2007. Data come from Simest, the Italian development finance institution², and refer to financial incentives addressed to promote Italian companies' FDI outside the European Union. Then, comparing firms that received the incentive with "similar" firms that never received it (our counterfactual sample), we find that the former do actually perform better.

Therefore, the paper offers both a conceptual and an empirical contribution. On the conceptual side, we relate the effects of public incentives to firms' outward FDI to the home country's institutional context, while on the empirical side, we construct an original longitudinal dataset on incentives granted by Simest to Italian companies. Specifically, this is (one of) the first attempts to develop a rigorous evaluation of a policy for the firms' outward internationalisation exploiting the availability of detailed information on the functioning of the program.

The paper is structured as follows. The second Section illustrates our conceptual framework and puts forward the research question that drives the empirical analysis. The third Section presents the methodology, while the fourth one describes the data set and the variables employed in the econometric model, it illustrates the model and the estimated results. Concluding comments are reported in Section Five.

¹ However, it is worth noting that empirical exercises concerning the evaluation of public policies have mainly concerned fields like training programs, R&D, marketing programs, support for exporting (DeLeon and Vogenbeck, 2007).

² <http://www.simest.it>

2. The conceptual framework

According to North (1990; 1994), institutions are defined as a set of rules, compliance procedure, and moral and ethical behavioural norms designed to constrain the behaviour of individuals in the interest of maximizing the wealth or utility of principals. Additionally, they are made up of formal constraints (e.g. rules, laws, constitutions), informal constraints (e.g. norms of behaviour, conventions, self-imposed codes or conduct) and their enforcement characteristics.

Within this context, Dunning and Lundan (2008) classify incentives as formal enforcement mechanisms and define them as measurable economic advantages offered to specific enterprises or categories of enterprises by or at the direction of a government, in order to encourage them to act in a definite way (Brewer and Youg, 1997; UNCTAD, 1998; Sheti *et al.*, 2002). Government intervention is justified by reasons related to market failures, imposition of social values and distribution of income and wealth (Lipsey, 1997; Blomstrom and Kokko, 2003; Lim, 2005).

Accordingly, home governments must provide institutional preconditions in order to promote outward FDI because the institutional content and form might affect the cognition, behaviour and motivation of firms in their decision on whether or how to go abroad. The principal elements are a stable economic environment and the rule of the law and regulations; nevertheless, incentives, penalties, agencies, projects, self regulation, fear, retaliation, blackballing, specific instruments negotiated directly with firms or other measures can aid in promoting outward FDI. Specifically, financial incentives to outward FDI aim at overcoming firm's financial constraints and at compensating the firm for uncertainty and risk related to the foreign unfamiliar context and to the firms' "liability of foreignness" (Zaheer, 1995).

There are two main motivations that make public policy evaluation necessary (Wollman, 2007). First of all it is necessary to report about the exploitation of the incentive and the efficiency and effects of public intervention because information

asymmetries take place among subjects involved in the exploitation of public aid. Indeed, the successful government intervention implies that the attended social benefits will exceed the financial and administrative costs, stemming from potential economic distortions. Second, public incentive evaluation permits to understand if they should be modified, preserved, enlarged or removed.

As far as incentives specifically addressed to (inward and outward) FDI, some works examined the effects of inward investment incentives (Guisinger, 1992), other investigated the role of host country policy and non policy determinants (Loree and Guisinger, 1995; Olibe and Crumbley, 1997) and many others analyzed the role played by investment agencies in attracting foreign investors and initiatives. On the contrary, notwithstanding the range of incentives to outward FDI and the number of countries that offer these incentives have increased considerably in the past decade, no studies have analyzed the equivalent role of incentives in promoting outward FDI.

The impact of incentives to firm's international growth may be associated to both direct and indirect effects. The former relate to the explicit and declared intent of the government, while the latter refer to the possible spillovers generated by the firm's internationalisation on the other firms and their local context. Specifically, we aim at testing the direct impact of public incentives upon the firms' growth (i.e., we focus on the ex post stage). Previous empirical works find mixed evidence on the impact of public financial support upon firms' growth (see for example Lerner, 1999, Wallsten, 2000; Merito *et al.*, 2007).

Although we agree on the largely acknowledged issue that outward incentives normally play a less crucial role in determining FDI than the fundamental determinants do (for a survey, see Barba Navaretti and Venables, 2004), our hypothesis is that they generally benefit granted firms. Indeed, incentives help internationalising firms to overcome their financial constraints and to gather the needed information to reduce uncertainty and risks related to foreign markets.

3. The methodology

The demand for quantitative methods in public policy evaluation reflects the desire of elected officials to define better policies, to understand how they have performed and to ascertain what impacts they have generated (Mosselman and Prince, 2004; Lenihan *et al.*, 2007; Yang, 2007). During last years public aid evaluation was influenced by the methodological development of other disciplines, above others econometrics in economics (Heckman, 2001) and, more recently, qualitative projective techniques already widely used in psychology and consumer studies (Ramsey and Bond, 2007).

The fundamental need for all public policy evaluation is to observe the counterfactual conditions, in order to answer the causal question as to whether the observed outcomes are effectively caused by the public policy and not by other determinants (Marschak, 1956). Because it is impossible to determine exactly what would happen in absence of incentive, as a firm cannot be observed among participants and non participants at the same time, we need a methodology that allows us to compute an average effect of incentive comparing data on participants and non-participant firms, and to identify the causal relationship between the incentive and the outcome, controlling for other possible determinants of the outcome itself (Bartik and Bingham, 1997). Additionally, one has to account for the possible selection bias, for the fact that besides the effect of the incentive there may be systematic differences between benefiting firms and not benefiting firms that may affect the impact of the incentive. A selection bias may occur as a result of two different causes: firm self-selection and agency selection. In the first case, firms that apply for the incentive may not be representative of the total population of eligible firms, whilst in the second one, the agency accepts only the applications of projects that meet selection criteria. Therefore, the selection bias could positively prejudice the effect of the incentive because firms applying for public aid are often firms that are aggressively seeking to expand and they would have grown more rapidly even without the incentive. However, selection bias may be also negatively related to the public aid's effects when, as for some development

programs, stimulating firms located in depressed areas through incentives is particularly difficult (Bartik and Bingham, 1997).

Hence, to overcome threats of validity, omitted variables and selection bias, it is necessary to impute an appropriate counterfactual outcome for the sample of benefiting firms is (Moffit, 1991). A variety of different methods have been proposed for estimating the counterfactual; all methods compare a group of benefiting firms, often called treatment group, with a group of not benefiting firms, called control group. Discussion about pros and cons of different evaluation methods is focused on the extent to which the control group is a truly mirror of the benefiting firms. The only design where this hypothesis of correspondence between the treated group and the control group is guaranteed is the experimental design. In this case both the first and the second group are constituted exclusively by firms that have been randomly assigned to either the two groups. Nevertheless in most case, we are in a quasi experimental design, where the benefiting firms are not randomly assigned, but follow a criterion of selection and self selection.

Several methods have been proposed in literature to take into account both selection bias and causality, but the most utilised are: matching methods, difference in difference and treatment effect models (Blundell and Costa Dias, 2000; Heckman, 2001). In matching methods eligible firms are divided in two groups, i.e., benefiting and not benefiting firms, where the second group of firms is the “control group”. The rationale is that the not benefiting firms are “identical” to their matched benefiting firms in all relevant aspects, with the only difference that the latter have obtained the public incentive. In the difference in difference approach, the two groups of firms are compared before and after the incentive. Therefore, the change experienced by the benefiting group vs. the control group can be associated to the public aid³.

The treatment effect model is a two-stage econometric model where the first step aims to account for the selection and self selection bias, while the second step

³ The implicit hypothesis that the change for the two groups would be the same without the incentive is often strengthened by selecting the control group through a matching method.

evaluate the impact of the incentive on the firm's growth. Namely, two regressions are estimated simultaneously (Myoung Jae, 2005): the first one is a probit regression predicting the probability of receiving the incentive; the second one is a linear regression for the outcome (i.e., firm's growth) as a function of the treatment variable (i.e., the incentive), controlling for other observable explanatory variables. Theoretically the solution is to propose and estimate a model of the selection and self-selection decision, that is to define an incentive assignment equation where x_i is the set of exogenous covariates that affect the incentive assignment and that could explain different attitudes between benefiting and not benefiting firms. In particular the treatment effect model assumes that D^*_i is a linear function of the observed covariates x_i and the random component ε_i . Specifically we assume that the incentive assignment is determined by:

$$D^*_i = x_i \beta + \varepsilon_i \text{ (Selection equation)}$$

And the endogenous binary variable D_i is modelled as the outcome of the unobservable latent variable D^*_i and the observed decision is:

$$\begin{aligned} D_i &= 1, \text{ if } D^*_i > 0 \\ D_i &= 0, \text{ if } D^*_i \leq 0 \end{aligned}$$

The second step is made of a linear regression for the outcome of the treatment variable (i.e., firm growth), where w_i is the set of exogenous control variables, different from the unobservable latent variable D_i , which can influence the response:

$$y_i = \delta w_i + \gamma D_i + u_i \text{ (Valuation equation)}$$

where w_i and x_i may include common variable.

Hence we use the treatment effects method to estimate the incentive assignment equation and the evaluation equation together. In the first step we use a probit estimation, while in the second step we evaluate the net impact of the incentive (D_i) and the estimated sign of γ can be used to assess the effectiveness of the public aid. Specifically, when $\gamma > 0$ the public incentive stimulate the benefiting firm's growth.

4. The empirical analysis

4.1. Data

Outward public policy measures include a panoplia of financial supports, going from government grants to cover part of capital, to production or marketing investment costs; subsidised loans; loan guarantees; public founded venture capital participation and government insurance at preferential rates (UNCTAD, 1996; Gergely, 2003). In the Italian case, almost the whole set of incentives are provided (see Table 1 for a detailed description).

INSTRUMENTS OBJECTIVES	Law De- cree 143/98	Law 227/97 Law De- cree 143/98 Law 24/03 Law 35/03	Law 394/81	Law 100/90 Law De- cree 143/98 Law 35/05 Law 19/91	Law De- cree 143/98 Law 35/05 Ministerial Decree 136/00	Law 304/90	Venture Capital Funds
Export and commercial FDI							
Feasibility studies, technical as- sistance							
Export Guarantees							
Trading FDI outside the EU							
Productive FDI in EU							
Productive FDI outside the EU							
Productive FDI in DCs							
Productive FDI Guarantees							
Tenders outside the UE							

Table 1: Italian public instruments aimed at promoting outward FDI

In order to provide additional support to investment by Italian enterprises in especially important non-EU markets, Simest operates the venture capital funds set up by the Government to support investments in areas such as the Far East, Eastern Europe, the Balkans, Africa, the Middle East and Central and South America. For direct investment abroad, Simest also assists Italian firms in the following areas: scouting for partners and investment opportunities; technical and financial assistance and advice in the preparation and implementation of projects.

However, in this paper we focus on the Law 100/1990, according to which Simest can invest directly in foreign ventures and acquire up to the 25% of the Italian foreign affiliate's equity. Although Simest can, in principle, evaluate investment proposals from companies, partnerships, cooperatives, consortiums and business associations, its priority concerns initiatives by SMEs to Eastern Europe. Simest prefers to acquire interests in foreign firms which are active in the same business sector as the home firm proposing the project; no sector is excluded. The duration of equity shares is in principle up to a maximum of 8 years, within which the pre-agreed reacquisition of Simest shares with partner firms is established. Simest examines proposed investments after having acquired information on the investment project and its partners. From the beginning of the activity up to the end of 2006, Simest acquired shareholdings in 469 Italian foreign affiliates⁴.

Our empirical analysis, aiming at evaluating the effects of Simest's participation on the firm's growth relies on two groups of firms:

- (i) the benefiting firms (i.e., those that have received the incentive to grow internationally); and
- (ii) the control group (i.e., firms that internationalised their activities in the same period, in the same foreign countries, but without participation by Simest).

⁴ It may be interesting to add that in the same period, Simest subscribed also 150 capital increases for a total of 412 millions of euro and sold 253 shareholdings for a total of 193.4 millions of euro.

Therefore, the dataset employed for the empirical analysis combines three different sources of data:

- (a) Simest's balance sheets, which provide the information about assignments of incentives to Italian firms, throughout the period 1991-2007;
- (b) the database Reprint, which provides a census of outward and inward FDI in Italy, since 1986. It is yearly updated, and it is sponsored by the Italian Institute for Foreign Trade.
- (c) AIDA (Bureau van Djick), which provides balance sheet data for Italian firms.

In summary, our sample includes two groups of multinational firms: those which set up their foreign initiative utilising the public incentive, and those which instead did not utilise any public incentive to go abroad. Complete information are available for 237 benefiting firms and for 307 not benefiting firms (our control group).

4.2. The model and the variables

Our evaluation model aims at assessing the effects of the incentive, i.e., Simest's participation, once it has been completed. Therefore, it refers to a classical ex-post evaluation (Wollmann, 2007), where the dependent variable has to do with one of the goal attainment. Although public policies tend to have multiple, tacit and conflicting objectives, in this case the declared policy maker's intent is to promote SMEs growth. However, this is also in line with most of the empirical literature that recognizes growth at the firm level as a good proxy for the effects of industrial policy measures (e.g. Fisher and Reuber, 2003).

As far as the model, we adopted a traditional treatment effect model (Myoung Jae, 2005), which allows us to assess whether the public support affects the growth of benefiting firms vs. not benefiting ones. In particular, as previously il-

lustrated, in order to evaluate the impact of public intervention, it is necessary to take into account self selection and selection biases, and then causality.

Therefore, our dependent variables are the followings:

- (1) *D_Incentive* is a dummy variable that equals 1 if the firm has received the incentive, and zero otherwise. This is the dependent variable used in the first stage (i.e., the probit model);
- (2) *Firm_growth* is measured by the rate of growth of the turnover of the Italian parent company between $(t_0 - 1)$ and $(t_0 + 2)$, where t_0 is the year of the foreign initiative.

As far as the first stage (i.e., the likelihood of obtaining the incentive), explanatory variables include firm's structural characteristics, firm's financial constraints and project's features related to the country of destination (Simest should favours investments toward Eastern European countries) and project's size which can affect policy outcome.

Therefore, our selection model (i.e., the selection equation) is:

$$D_Incentive_j = \text{Strucural_characteristics}_j + \text{Financial_constraints}_j + \\ + \text{Project_characteristics}_j + \varepsilon_j$$

Specifically, as far as explanatory variables are concerned, the proxy employed (for a detailed description of the variables and the data source, see Table 2) refer to size (Blanes and Busom, 2004) and age (Merito *et al.*, 2007), which have been traditionally considered as a proxy for managerial skills, thus affecting the firm's ability to obtain external resources. Therefore, we expect bigger and older firms to be more likely to obtain the incentive. Previous experience in international markets may also increase the likelihood to both apply and obtain the incentive. Additionally, as the effective cost of going abroad may vary across firms as the result

of differences in the availability and cost of financial resources (Desai, 2004; Masureire and Clayes, 2006; Bellone *et al.*, 2007), we proxied the firms' financial constraints by the ratio between their banks debt and turnover. Specifically, as financial markets imperfections can limit the firm's strength of engaging in FDI, we expect a positive relationship between variables proxying the existence of firm's financial constraints and the probability of going abroad thanks to the public incentive (Hyytinen and Toivanen, 2005). As in the process of project selection, Simest evaluates Italian firm's success, we also included a firm's profitability index.

The second stage of the analysis, i.e., the causality between the endogenous binary treatment and the firm's growth, estimates the effect of the incentive on a continuous, fully observed variable which identify the effects ($Firm_growth_j$), conditional on the firm's structural variables, firm's financial constraints and specific features of the initiative. Therefore, the linear regression function (i.e., the valuation equation) is:

$$Firm_growth_j = D_Incentive_j + Structural_characteristics_j + \\ + Financial_constraints_j + Project_characteristics_j + u_j$$

Variables considered refer again to firm's structural characteristics, financial constraints and other specific features of the initiative undertaken abroad by the Italian firm, namely the entry mode. Therefore, we included dummies allowing for its nature (greenfield vs. acquisition), the share held by the Italian parent company in the foreign affiliate (majority vs. minority), and the size of the foreign affiliate in terms of employees⁵ ($Empl_affiliate$).

⁵ We also tried sales of the foreign affiliate. However, as it is highly correlated with employemnt (the correlation being 0.859), we decided to keep only the former, as it comes out more significant in the econometric estimates.

Variable	Description	Source
Dependent variable		
Firm_growth	Turnover of the Italian firm between t_{0-1} and t_{0+2}	AIDA
D_incentive	Dummy variable taking the value of 1 if the firms obtained the incentive in t_0 , and zero otherwise	Simest
Independent Variables		
Firm's structural variable and firm's financial constraint		
Log_Sales	Logarithm of annual turnover (thousands €) in t_{0-1}	AIDA
Empl	Number of employees in t_{0-1}	
Firm_Age	Age of the firm (years) in t_{0-1}	REPRINT
Int_experience	Number of previous outward FDI in t_{0-1}	REPRINT
ROI	Return on Investment (%) in t_{0-1}	AIDA
North	Dummy variable taking value of 1 when the firm is in North Italy, and zero otherwise	REPRINT
BanksD_Sales	Ratio between Banks debt and turnover in t_{0-1}	AIDA
Project characteristics		
East_Europe	Dummy variable taking value of 1 when the FDI destination country is Eastern Europe, and zero otherwise	REPRINT
North_America	Dummy variable taking value of 1 when the FDI destination country is North America, and zero otherwise	REPRINT
Greenfield	Dummy variable taking the value of 1 if the foreign affiliate is Greenfield, and zero otherwise	REPRINT
Majority	Dummy variable taking the value of 1 if the foreign affiliate is majority-owned in t_{0-1} , and zero otherwise	REPRINT
Empl_affiliate	Number of employees of the foreign affiliate, in t_{0-1}	REPRINT
Sales_affiliate	Turnover of the foreign affiliate, in t_{0-1}	REPRINT

Table 2: Description of the variables and sources of data

Finally, to control for possible differences in opportunities in different areas and sectors, we inserted dummies for the firm localisation by Italian regional area (North, Centre, South) and for the industry of the parent company⁶.

The dependent and the explanatory variables are described in Table 2, while their statistical characteristics and the correlation matrix are reported respectively in Table 3 and 4. Table 5 reports instead the average values of the variables considered, and the significant differences, for the two groups of firms considered, i.e., benefiting and not benefiting firms, respectively.

	Minimum	Maximum	Mean	Std. Deviation
Dependent variables				
Firm_growth (%)	-1.12	198.28	1.71	13.92
Firm's structural characteristics				
Log_sales (thousands €)	4	9	7,22	0,69
Firm_age (years)	-1	101	22.15	15.12
Int_experience (.)	1	70	4.37	9.18
ROI (%)	-27	30	8.28	8.19
Firm's financial constraints				
BanksD_Sales (%)	0	90	22.84	22.10
Project's characteristics				
Empl_affiliate (employees)	5	5000	83.03	248.88
Sales_affiliate (thousands €)	0.5	320	7.13	17.16

Table 3: Descriptive statistics

⁶ Ten industry dummies have been considered: services, wood products, raw materials, plastic and rubber, chemical and pharmaceutical, building and construction, electronics, industrial machinery, automotive, food and tobacco and beverages, textile.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Log_sales	1														
2 Empl	0.077	1													
3 Firm_age	0.251**	0.059	1												
4 Int_experience	0.362**	0.028	0.148**	1											
5 ROI	0.076	0.004	0.016	-0.096**	1										
6 North	0.016	0.030	0.074	-0.014	-0.018	1									
7 BanksD_Sales	0.130**	0.040	0.115**	0.022	-0.200**	0.034	1								
8 East_Europe	-0.196**	-0.075	-0.140**	-0.112**	-0.017	0.052	-0.029	1							
9 North_America	0.113**	-0.026	-0.015	0.057	-0.011	0.068	0.038	-0.312**	1						
10 Greenfield	0.168**	0.040	0.024	0.199**	0.110*	0.031	-0.063	0.020	0.025	1					
11 Majority	-0.035	-0.085	0.012	0.037	0.000	0.033	0.045	0.077	0.115**	0.000	1				
12 Empl_affilite	0.019	0.026	0.033	0.235**	0.027	-0.067	-0.024	0.081	-0.050	0.154**	0.038	1			
13 Sales_affiliate	0.067	0.054	0.064	0.271**	0.016	-0.078	0.006	0.004	0.046	0.189**	0.024	0.859**	1		
14 D_incentive	0.329**	-0.001	0.150**	0.361**	-0.076	-0.029	0.182**	0.095*	-0.027	0.072	-0.028	0.134**	0.147**	1	
15 Firm_growth	-0.199**	0.048	0.033	0.222**	-0.024	-0.083	-0.062	-0.070	0.078	0.089*	0.001	0.365**	0.382**	0.75	1

Legenda: ** significant at $p < .01$; * significant at $p < .05$

Table 4: Correlation matrix

	Benefiting Firms (237)	Not Benefiting Firms (307)	Sign.
Dependent variable			
Firm_Growth ^b	2.9	0.8	**
Firm's structural variable and firm's financial constraint			
Sales ^a	90.6	33.4	***
Empl ^a	406	138	***
Firm_Age ^a	33	33	n.s.
Int_Experience ^a	9	2	***
ROI ^b	7.53	8.82	*
North ^c	74%	76%	n.s.
BanksD_Sales ^b	27.44	19.32	***
FDI characteristics			
East_Europe ^c	46%	55%	**
North_America ^c	7%	9%	n.s.
Greenfield ^c	73%	67%	n.s.
Majority ^c	91%	84%	**
Sales_affiliate ^a	10.01	4.92	***
Empl_affiliate ^a	121.10	53.77	***

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

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

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

Table 5: Comparison between benefiting firms and not benefiting firms (control group)

4.3. Econometric findings

The results of the empirical estimates for the treatment model are reported in Table 6. First of all, it is worth observing that, as the correlation between the error terms of the two equations (i.e., the coefficient ρ ⁷) is significantly different from zero (at $p < 0.01$), and so it confirms that both the firm and the project characteristics affect incentive assignment and the latent outcome, therefore in estimating the effects of the incentive a selection bias arises.

As far as the selection model is concerned, results confirm that both the parent company's characteristics and the FDI features explain the likelihood of receiving the incentive. Namely, as already revealed by the descriptive statistics of the two samples (see Table 5), bigger firms with previous international experience are more likely to get the incentive (both *Log_Sales* and *Int_Experience* are positive and significant at $p < 0.05$ and $p < 0.01$, respectively). Likewise, results support also the idea that market imperfections give rise to financial constraints and make firms more likely to apply for (and to get) public funding (*BanksD_Sales* is positive and significant at $p < 0.05$). Interestingly, notwithstanding the selection procedure should *a priori* favours initiatives to Eastern European countries, the relevant dummy (*East_Europe*) does not come out significantly different from zero, while the affiliate size does contribute positively to the incentive assignment (*Sales_affiliate* is significant at $p < 0.01$).

As far as the valuation equation, that is our second stage, results confirm the positive and highly significant effect (at $p < 0.01$) of the financial incentive on the firms' growth. However, smaller and less indebted companies grow more rapidly (*Log_Sales* and *BanksD_sales* are negative and significant respectively at $p < 0.01$ and $p < 0.10$) while all the other firm's specificities do not seem to impact on growth.

⁷ STATA provides an estimate of ρ (the correlation between the error terms of the two equations), σ (s , the standard error of the outcome regression if linear) and λ ($l = r*s$). Namely, STATA automatically tests whether $r=0$ (or equivalently, whether $l=0$, since $s>0$).

Treatment effects model		Coeff.	Std. error
Two steps estimates			
Dependent variable: Firm_growth			
D_incentive		12.05***	3.03
Firm's structural variable and firm's financial constraint			
Log_Sales		-7.99***	1.05
Firm_age		-0.00	0.00
Int_experience		0.06	0.07
ROI		0.06	0.07
North		-1.77	1.26
BanksD_sales		-0.05*	0.03
Industry_dummies		Yes	
FDI characteristics			
East_Europe		-2.53**	1.23
North_America		4.78**	2.10
Greenfield		2.81	1.79
Majority		0.02	0.79
Empl_affiliate		0.02***	0.00
Cons		53.16***	7.48
Dependent variable: D_incentive			
Log_Sales		0.24**	0.11
Firm_age		-0.00	0.00
Int_experience		0.27***	0.04
ROI		-0.01	0.01
BanksD_Sales		0.01**	0.00
Sales_affiliate		0.02**	0.01
East_Europe		0.13	0.13
Cons		-2.92***	0.78
Hazard	lambda	-6.87***	1.94
* Significance at the 10% level	rho	-0.54	
** Significance at the 5%	sigma	12.78	
*** Significance at the 1% level			

Table 6: Treatment effect model

Heckman selection model – Two steps estimates		Coeff.	Std. error
Regression model with sample selection			
Dependent variable: Firm_growth			
Firm's structural variable and firm's financial constraint			
Log_Sales		-10.40***	1.95
Firm_age		-0.00	0.01
Int_experience		0.04	0.06
ROI		-0.18	0.18
North		-1.56	2.54
BanksD_sales		-0.13**	0.54
Industry_dummies		Yes	
FDI characteristics			
East_Europe		-0.73	2.38
North_America		10.33**	4.78
Greenfield		6.53*	3.97
Majority		1.04	1.96
Empl_affiliate		0.02***	0.00
Cons		83.07***	16.61
Dependent variable: D_incentive			
Log_Sales		0.21**	0.11
Firm_age		-0.00	0.00
Int_experience		0.27***	0.04
ROI		-0.00	0.01
BanksD_Sales		0.01*	0.00
Sales_affiliate		0.02***	0.01
East_Europe		0.15	0.13
Cons		-2.74***	0.78
	lambda	-9.03***	3.02
* Significance at the 10% level	rho	-0.54	
** Significance at the 5%	sigma	16.53	
*** Significance at the 1% level			

Table 7: Heckman selection model

On the contrary, the parent's growth crucially depends on the characteristics of the foreign initiative: indeed, the estimated coefficients confirm that FDI size contributes positively to the firm growth (*Empl_affiliate* is significant at $p < 0.01$), as well as the FDI's localisation in developed countries (*North_America* is positive and significant at $p < 0.05$).

It may be worth observing that the same results have been obtained from the estimation of an Heckman model (see Table 7), where the second stage is run only on the benefiting firms.

5. Conclusions

Summarising, our model confirms the positive effects of the financial incentive on the benefiting firm's growth as compared to the counterfactual sample of not benefiting firms. Although some previous empirical studies (e.g. Lerner 1999) already had found that firms that obtained government financial support did actually perform better, causality could not be taken into account due to the absence of a proper counterfactual sample. Therefore, companies that obtained the incentive would have done just as well even without government financial assistance. On the contrary, taking into account the selection and self-selection issue, we can detect the net positive effects of the public incentive. Specifically, our results show that financial incentive does help smaller companies to grow also on the home country, thus confirming that the FDI finance gap hinders SMEs in their internationalisation strategy and negatively affects their economic performance, as recently pointed out by De Maeseeneire and Clayes (2006). Additionally, the government involvement in FDI may contribute to reduce the uncertainty and risk associated to the unfamiliar host country (Henisz and Zelner, 2003), which is obviously more critical for smaller companies that have less financial and management resources to spend for research and analysis prior to embarking into a foreign market (Wright *et al.*, 2007).

At the best of our knowledge this paper is the first systematic evaluation of public incentives addressing firms' outward internationalisation. However, the agenda for future research is quite rich. The specification of the model presented above should be improved by introducing more adequate measures of certain phenomena. First of all, a better understanding of the selection and self-selection process would benefit from the possibility of accessing data on firms' applications that were not selected for the incentive. Second, firms' internationalisation processes should be modelled taking into account motivations underlying each FDI initiative, although that would require additional data gathering based on surveys and questionnaires. Finally, the effects of public incentives may be also evaluated as far as their indirect impact (associated to externalities and spillovers) is concerned, for example on social welfare. Moreover, our results concern a single type of incentive addressing firms' internationalisation, while a comparative analysis of alternative mechanisms would certainly provide useful suggestions to policy makers for the design of appropriate tools and the improvement of the existing ones.

The findings of this paper seem to justify greater research efforts in the directions indicated.

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