4. THE REGIONAL DIMENSION OF SUBSIDIES, INNOVATION AND JOB GROWTH IN EUROPEAN FIRMS

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ABSTRACT

The analysis in this chapter reflects on subsidy provision across a sample of European countries from 2005 and assesses the impact of subsidies on the performance outcomes of recipient firms. A key objective of the paper is to explore the regional dimension to identify if firms in rural areas are more likely to receive subsidies and whether performance outcome disparities exist for firms in less urbanized locations. The results of the analysis indicate that subsidies are leading to improvements in firm innovation. The counterfactual analysis indicates that a world without subsidies would result in lower levels of innovation. Subsidized firms are located in less urbanized areas, are larger, foreign, offer training to employees, are better educated, are more high-tech and they export. Regional disparities are evident for subsidized firms that product innovate, however, they are absent for process innovation, pointing to product life cycle regional effects.

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INTRODUCTION

Industrial policy is centre stage of Europe's 2020 new growth model strategy (European Commission, 2010). Cohesion policy is the main EU investment tool, with over one third of the total EU budget. In the 2014-2020 programming period, evaluation is a corner-stone of the new result-orientation proposed by the EU Commission. With this in mind, the purpose of this paper is to reflect on the effectiveness of firm subsidies in promoting growth at the level of the firm in Europe. In particular, the analysis reflects on what type of firms received subsidies? What impact did the subsidies have on the performance of firms? Is there a regional story in terms of subsidy allocations and in terms of performance outcomes? Do firm subsidies eliminate or exacerbate regional disparities? To explore these questions, a treatment effects model was employed using firm level data from five European countries. The conclusions of these results are subsequently discussed with future considerations for research in the context of Smart Specialization Policy.

This paper proceeds with brief sections on the theoretical and empirical backgrounds of the contribution. This is followed with a case analysis of firm data from the BEEPS (Business Environment and Enterprise Performance) survey. This is followed by a brief results section. A conclusion and policy lessons section completes the contribution.

THEORETICAL BACKGROUND

Many argue that there is a place for government intervention when there are market distortions (Rodrik, 2009). Market failures arising from externalities, monopolies, capital market imperfections and incomplete markets are some of the arguments underlying the rationale for policy intervention (McCann and Ortega-Argilés, 2013). The partial-appropriability problem (public good nature of knowledge) may result in an underinvestment by entrepreneurs and investors in infant industry ideas, innovation and human capital externalities. Firms can suffer from an organizational thinness in economic systems (Camagni, 1995) leading to coordination failures, institutional failures, transition and lock-in problems (Boschma 2009). These market failure, system failure and policy-related issues tend to be related in different ways to questions of geography (McCann and Ortega-Argilés, 2013). Many argue that there are economic geography justifications for subsidy intervention as a result of systems failures at a regional level (Boschma, 2009) or market failure as a result of agglomeration effects (World Development Report; 2009). Hence, for these reasons, it is extremely easy to make the case for industrial policy and the real question that needs to be addressed is not why we need industrial policy but how to implement industrial policy (Rodrik, 2009).

However, it is far from clear if government subsidies are good or bad in achieving long term growth. The analysis of subsidy intervention suffers from the problem that it is difficult to measure the counterfactual case of what would have happened if there was no policy intervention? The majority of studies in the literature has investigated the links between R&D industrial policies on enhancing the firms spending on innovation inputs (see for example; Gonzales and Pazo, 2008). Less developed are the connections between industrial subsidies and firm outcomes (Bergstom, 2000). For the empirical studies that do exist,

the conclusions to date indicate that there is both a positive/negative relationship between government intervention and firm performance (Catozzella and Vivarelli, 2011; Koski and Pajarinen, 2013).

Some see industrial policy as an invitation to rent seeking activities (Rodrik, 2009). The 'true' intentions of policymakers may be to allocate subsidies towards industrial sectors that will win votes or towards politically influential groups (Bergstrom, 2000). Or, particular sectors of the economy and regions are chosen as targets for intervention known as 'picking winners' (Boschma, 2009; Foray et al., 2012). Much of the focus of European industrial policy of the 60's, 70's and 80's was on applications to specific sectors and supporting structural adjustment driven by mainly political and social motivations, rather than economic motivations (Mosconi, 2007). The European Investment Bank (EIB) has used regional disparities as a rationale for its primary remit in the late nineties to devote on average more than two thirds of its financing to the development of regions facing structural or industrial redevelopment problems. To date, the level of investment in EU regions has been related to the level of development and this is to continue in the 2014-2020 programming period.

BACKGROUND TO DATA AND METHODS

This paper employs the use of data from the Business Environment and Enterprise Performance Survey (BEEPS). The data contains information on firm characteristics, the location of the firm and the business environment of the firm. The data in this analysis stems from the 2005 third wave edition of BEEPS. This data stems from five countries in the 2005 edition: Germany; Ireland; Spain; Greece; and Portugal. These countries are members of the European Union since at least 1981.

TABLE 1. SAMPLE COUNTRIES AND SAMPLE SIZE

Country	Sample
Germany	1196
Ireland	501
Spain	606
Portugal	505
Greece	546
Source: BEEPS, 2005	

The sample size employed for the analysis is 3,354 firms (Table 1). Of these, 14 per cent received a subsidy in the previous three years. 73 per cent of the subsidized firms stated they had received the subsidies from EU or regional sources[2]. 23 per cent of firm's product innovated. 30 per cent of firm's process innovated and 30 per cent of firms experienced employment growth. 46 per cent of firms were located in an area with a population below 50, 000.

[2] Regional sources were co-funded with EU funding..

TABLE 2. DESCRIPTION OF VARIABLES AND MEAN STATISTICS

Variable	Variable Description	Mean
Product Innovation	=1 if the firm introduced new to firm or market product innovations in the previous 3 years, 0 otherwise	23.37
Process Innovation	=1 if the firm introduced new production technology in the previous 3 years, 0 otherwise	30.12
Employment growth	=1 if the firm experienced employment growth between 2003 and 2005, 0 otherwise	30.12
Subsidies	=1 if the firm received a subsidy in the previous 3 years, 0 otherwise	14.10
EU Subsidies	=1 if the firm received a subsidy from the EU or a regional source, 0 otherwise	10.25
R&D active	=1 if the firm is spending on R&D activity, 0 otherwise	13.02
Firm size	no of employees (logs)	2.57
University Education	percentage of the workforce in the firm with a third level qualification	15.34
Services	=1 if the firm is categorised as a service firm, 0 otherwise	61.49
Manufacturing	=1 if the firm is categorised as a manufacturing firm, 0 otherwise	22.65
Construction	=1 if the firm is categorised as a construction firm, 0 otherwise	15.86
Age of the firm	Since year first established	20.40
Training	=1 if the firm provides training for staff, 0 otherwise	38.31
Domestic	=1 if the firm is a domestic firm, 0 otherwise	89.02
Exporting firm	=1 if the firm exports, 0 otherwise	19.26
Capital or city greater than 1 million	=1 if the firm is located in an area with a population greater than 1 million, 0 otherwise	22.05
City 250k to 1 million	=1 if the firm is located in an area with a population between 250k to 1 million, 0 otherwise	12.28
City 50k to 250k	=1 if the firm is located in an area with a population between 50k to 250k, 0 otherwise	20.12
City under 50k	=1 if the firm is located in an area with a population less than 50k, 0 otherwise	45.55

Source: BEEPS, 2005

To analyse the data a treatment effects model was employed[3][4]. The vector of determinants included in the subsidy assignment model and in the innovation and employment models are outlined in Table 2, and the results are reported in the following Section.. The results of the analysis[5] are discussed in the next section.

RESULTS

Not surprisingly, given the nature of Cohesion Policy to reduce regional disparities, firms located in less urbanized areas are more likely to receive subsidies, relative to most urbanized areas. It is clear from the Average Treatmeant Effect (Table 4) estimations that subsidy intervention is having a positive effect on product and process innovation, but not job growth. In terms of the counterfactuals**: a world without subsidy intervention is a worse off world in terms of firm innovation**. The finding for job growth is surprising as usually subsidies are allocated based on firm employment growth assurances. From the perspective of Cohesion Policy and the overall aim to reduce regional disparities in GDP per capita differences – it is clear that subsidized firms located in less urbanized regions are less likely to introduce product innovations, but there are no urban differences for process or employment growth. In fact, non-subsidised firms located in rural areas are more likely to process innovate and have job growth.

[3] For a more technical description of the methodology used here, please see (STATACORP, 2015)

[4] With inverse-probability-weighted-regression-adjustment. For more information please see STATACORP (2015).

[5] Note that endogenous treatment effects could be used when the variables that effect both outcome and treatment are not observable. The endogeneity test indicated that the standard treatment effects method would be robust for the analysis of this data. The results were also compared with propensity score matching and remain robust – the differences in marginal effects are small.

TABLE 3. WHAT TYPES OF FIRMS RECEIVE SUBSIDIES?

Variable	Effect
R&D active (high-tech bias)	0.190**
	0.091
Firm size	0.216***
	0.021
University	0.005***
	0.001
Manufacturing	0.032
	0.079
Construction	0.089
	0.081
Age of the firm (infant industry bias)	-0.001
	0.003
Domestic	-0.427***
	0.12
Domestic*Age (domestic and infant bias)	0.003
	0.003
Training (partial-appropriability bias)	0.241***
	0.069
Exporting Firm (exporting bias)	0.156**
	0.079
City 250k to 1 million (urban bias)	0.321***
	0.107
City 50k to 250k (urban bias)	0.529***
	0.095
City under 50k (urban bias)	0.535***
	0.087
Notes: Variables with *** are significant at 1% level, ** are significant at 5% level. The reference categories are service firms, capital city and cities with population over 1 million. Country effects are controlled for in the models but not reported.	

TABLE 4. AVERAGE TREATMENT EFFECTS (ATE)

Treatment Effect	Innovation	Process	Employment
Subsidies (1) ATE	0.147***	0.136***	0.014
*Note: Coefficients with *** are significant at 1% level.*			

TABLE 6. PERFORMANCE RETURNS IN THE REGIONS

Firm Type	Subsidised Firms			Non-Subsidised Firms		
Urban Classification	Product	Process	Employment	Product	Process	Employment
City 250k to 1 million	-1.121***	0.04	0.079	-0.068	-0.093	0.023
	0.37	0.398	0.403	0.105	0.099	0.104
City 50k to 250k	-1.078***	-0.004	-0.342	-0.101	0.004	0.214***
	0.373	0.368	0.368	0.088	0.083	0.084
City under 50k	-0.701*	0.176	-0.202	0.024	0.163**	0.205***
	0.369	0.354	0.344	0.075	0.072	0.074
*Note: Variables with *** are significant at 1% level, ** are significant at 5% level and * are significant at 10% level. The reference category is capital city and cities with population over 1 million. All other variables are controlled for as identified in treatment stage and Country effects are also controlled for in the models but are not reported.*						

In terms of vertical targeting (Table 3): **firms that are larger; more high tech; have more educated workers; are foreign; export to international markets; and firms that invest in training are more likely to receive subsidies.** There is no evidence that policymakers engage in infant industry protection i.e. the interaction variable between age and domestic firm is insignificant. Additionally, one would expect infant firms to be of a smaller size and the results in this analysis indicate that larger firms are capturing more of the funding. Furthermore, more technologically intensive (R&D indicator) firms are more likely to receive subsidy help from the government. As Foray (2013) outlined high technology companies are more attractive targets for government funding and they are more likely to capture government subsidies as they are perceived to be creating exciting products and services. Firms that are more likely to offer training to their employees are more likely to receive subsidies. Again, this is not surprising when reflecting upon the partial-appropriability concept. Firms that offer training are not likely to capture all the benefits of their investment as employees may leave their company and move to other companies, hence they may require compensation in the form of subsidies to encourage investment in training. It is also not surprising to see exporting firms getting help as governments may employ a strategic trade policy to increase a country's share in international export rents.

CONCLUSIONS AND POLICY LESSONS

In terms of the new architecture of Smart Specialization Policy (SSP) - what empirical patterns would we have liked to have emerged from this analysis? Most definitely, we would like subsidies to have a positive effect on firm outcomes. Notably, this was the case with product and process innovation. Further, considering the overall goal of Cohesion Policy is to reduce income disparities between more urbanized and less urbanized regions, it is not surprising to see firms in more rural areas, more likely to receive subsidies. However, regional disparities still exist for subsidized firms that product innovate. The possible economic geography disadvantages of a firm being located in rural areas appear to be negligible for process innovation and employment growth (and indeed positive for non-subsidised firms). There appears to be product life cycle effects at play here. Firms that product innovate may need the advantages of agglomeration effects that key urban centres provide (McCann, 2007). Directing subsidies in greater propensity to firms in less urbanized areas may be undermining growth in this particular firm outcome, particularly for high technological sectors.

Returning to SSP and in the context of vertical targeting – what patterns (in a cross country study) would a researcher expect to emerge? If policy is focusing on entrepreneurial discovery in activities, technologies or sectors, where a region has a comparative advantage to develop wide ranging and large-scale growth, it is logical to think targeted firms will differ at the regional and national level. Perhaps, no pattern should be emerging, other than subsidies having a positive effect on firm outcomes. It would be surprising if a common pattern emerged across countries that consisted of assistance to large, high tech and foreign firms (unless knowledge linkages to Foreign Direct Investment were clearly absent from related industries in all regions). It perhaps would not be so surprising to see a pattern towards young firms, SME's, domestic firms, firms with labour enhancement programmes and skills training. In this sense, the results should indicate that policy is taking a broader systems perspective (McCann and Ortega-Argilés, 2015), making connections towards locally related industries that are embedded in the region.

ABOUT AUTHOR

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