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### **Special Issue IJEBR (Open Innovation and Knowledge Exchange)**

#### **Open Innovation and SMEs: Exploring Policy and the Scope for Improvements in University Based Public Programmes through a Multidisciplinary Lens**

**Keywords:** SME policies, street-level bureaucracy, innovation systems, university and SME association roles, SME information systems

#### **Abstract**

*Objectives:* The objective of this paper is through the use of a multidisciplinary lens to explore the policy context and the scope for improvements in university based public programmes focused on improving innovation in small and medium enterprises (SMEs).

*Design/Methodology/Approach:* We use the street-level bureaucracy (SLB), combined with the systems of innovation approach (SIA) and diagnostic analysis (DA) to understand the context components that impact on public programme services. The study is part of a research programme oriented to the diffusion of information systems in SMEs and which used original interview based programme support case studies, interviews with regional policy managers, and documentation relating to the policy system and different public programmes. Although the empirical work was United Kingdom (UK) and European Union centric the results of the research have wide applicability.

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*Findings:* We establish the importance of programme contexts for diagnosing and providing a basis for public programme improvements. We further demonstrate the robustness of our context analysis framework to provide insights into proposed policy changes. The responsibility of improving programme contexts relies on actors that operate outside programme organisations, for instance European Union funding bodies, government departments in charge of SME policies, public-private partnerships, and private evaluators. Given this complexity it is suggested that SME associations have a potentially important role in increasing participation by SMEs in the public programme for innovation and knowledge support policy. Despite possible policy changes the requirement for public programme support for innovation and hence the role of universities as programme providers is confirmed and expanded.

*Research Implications:* The results demonstrate the value of a multidisciplinary framework to analyse programme interventions at both macro and micro levels and provide a basis for programme policy and policy implementation improvements.

*Originality/Value:* This research is a novel attempt to use the SLB, SIA and DA to public programme university based interventions in SMEs and SME policies in general. It complements extant research on open innovation and knowledge exchange by extending the concept of public programme contexts. Beneficiaries of the findings include policy-makers, programme organisations, universities, SME associations, and researchers.

## **Introduction and the Research Context**

Small and medium enterprises (SMEs) are lagging behind their corporate counterparts in the adoption of innovations. An important example is the application of information systems that are frequently the major drivers of innovation (e.g. UNCTAD, 2009; EC, 2010). This reluctance, or inability to innovate, impacts not only on SMEs but acts as a constraint on the productivity of larger firms since both co-exist within wider networks. Governments have been attempting to address this and related problems with a series of public initiatives. The wisdom of such support for SMEs has been the subject of vigorous debate over the last decade. In 1998 Hoffman et al. drew attention to the growth in the extensive innovation support infrastructure across the European Union at regional and local levels and the difficulties of understanding their effectiveness. Curran (2000) and Kaufmann and Todtling (2002) specifically identified the public support initiatives as ineffective in reaching SMEs. In 2008 Massa and Testa in a highly relevant article linking academics, policy makers and entrepreneurs argued that the misalignment of various public initiatives was embedded and long lasting. Most recently Vega et al (2010b, 2011) highlighted the poor performance of public programmes as a result of problematic programme contexts. Similarly, Lee et al. (2010), van de Vrande et al. (2009) and Perkmann and Walsh (2007) have all made important contributions to our understanding of open innovation in the context of SMEs, including the role of universities.

Despite these reservations governments continue to support SMEs in the quest for innovation and increased productivity through public programmes. The issue of government intervention vs. non-intervention for innovation diffusion is part of a wider debate but in the main 'selective intervention' has emerged as a viable option (Altenburg and von Drachenfels, 2006; Brown and Thompson 2011). Moreover Baskerville and Pries-Heje (2003) drew a useful distinction between technology diffusion, which is organic in nature, and innovation and technology transfer that occurs through purposeful policies. It is the latter which is highly relevant to SMEs and the justification for the public programme initiatives.

Included in these programme initiatives is the support delivered by universities and other programme organisations to facilitate the innovation of products, services or processes in SMEs (e.g. Lambert, 2003; Sainsbury, 2007; PACEC/CBR, 2009; HESA, 2010). Such support is an example of classic open innovation which comprises 'the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively' (Chesbrough et al., 2006, p. 1). In the case of facilitating innovation within SMEs it is the outside-in transfers that are

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especially important and can derive from licensing-in, venture investing, external research and value networks including strategic alliances and inter-firm networks. The latter can be complex and vary from geographical clusters, through trade association linkages to highly integrated customer-supplier networks (Brown and Lockett, 2004). Such group, club or cohort based initiatives can be facilitated by universities. Often these groups can be brought together to share expertise or intelligence or to focus on a key subject or theme such as marketing or leadership. The LEAD programme at Lancaster University Management School is a successful example (Wren and Jones, 2006).

In order, however, to tackle specific situations in SMEs, (e.g. the implementation of an information system or the internationalisation of the firm) targeted, purposive support can also be provided on one-to-one basis by universities and related institutions. The services provided aim to bring relevant expertise, sometimes, but not always, utilising recent academic research, to bear on the problematic situation. This can be done, for example, via simple business advice, focused consultancy, market research, project management and through technical inputs such as web design or database development. This vehicle for support, which has grown significantly, is often embedded within a funded initiative. It is generally known as consultancy or advisory services but in this paper is termed 'conventional' support to capture not only the business and organisational services but the technical and research capabilities that universities traditionally possess. In the specific case of universities in the United Kingdom, the practice of conventional support has been consistently increasing in the last decade in line with the constant increase of public funding. According to the Higher Education-Business and Community Interaction Surveys, the income generated by universities from the practice of conventional support increased from £124 million in 2000-2001 to £332 million in 2008-2009 (HEFCE, 2010). The Higher Education-Business and Community Interaction Stakeholders Group has been responsible for defining and commissioning these surveys. The Stakeholders Group calls consultancy to what we identify as conventional support (HESA, 2010, p. 23):

"Innovative application of existing knowledge (for example across industry sectors) is defined as 'consultancy'. The knowledge itself may not be new, but it can often provide more immediate innovation. Indeed, this may be a useful route for the development of 'open innovation' practice where intellectual property rights are less important than the usefulness of the knowledge to a particular situation or problem."

Correspondingly, the Higher Education Funding Council for England commissioned the Public & Corporate Economic Consultants and the Centre for Business Research of the University at Cambridge to map and analyse the evolution of the knowledge exchange structure in England. An important finding of this survey is the percentage of academic staff that has been engaged in knowledge exchange activities related to conventional support. For instance, 35% of the academics were involved in advice and 17% in consultancy in 2008. The report of the survey highlights this increasing tendency as follows (PACEC/CBR, 2009, p. 2):

"What is striking about the evidence ... is the diversity of modes of engagement for knowledge exchange and the fact that significant amount of activity occurs well beyond the traditional 'technology transfer' modes of engagement (licensing and spin-outs)."

Typically for SMEs the university based interventions require funding support. Government policies have provided this in the form of 'named programmes' to deliver individual firm based or sector based improvements. The implementation of these policies is achieved through 'programme workers'. Often, intermediate agencies liaise with the SMEs to diagnose the issues and determine the services needed and act as brokers to facilitate the engagement of relevant expertise from accredited 'programme organisations', such as universities or similar institutions. This interaction of policy and policy implementation through third party intermediaries and expert provider institutions provides an important context for understanding the open innovation and knowledge transfer phenomena. This context can be problematic and is central to this paper.

According to Lipsky (1980, 2010), the provision of public services can be surrounded by contexts that are harmful. These negative contexts are composed of evaluation mechanisms, power relationships, resource

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access, programme demand, and worker alienation. Any or all of these components can affect the efficiency, effectiveness and efficacy of the public funded policy programmes. In situations where these contexts present problems, the programme or personal agendas can prevail over policy goals. Vega et al. (2010b) found that in the ambit of SME innovation such harmful contexts can be a pattern, and not exceptions to the rule. This confirms similar policy implementation results in numerous countries and public service areas such as social services, health, education, legal services, and policing. Lipsky terms this reality of policy implementation as the influence of 'street-level bureaucracy'.

Following directly from the above the aim of this paper is through the use of a multidisciplinary lens to explore the policy context and the scope for improvements in university based public programmes focused on improving innovation in SMEs. To do this, the paper is structured into five further sections. In the first section we discuss the theory framework which informs the study. We use theories from the public administration and innovation areas. Following the theory frame, in section two we introduce and extend the method of diagnostic analysis (DA) as a way to organise the research. In section three, with the guidance of the theoretical framework and extended DA, we revisit the problematic contexts for public programmes and identify the underlying 'system' failures. In section four we develop this analysis further through a detailed consideration of the activities and actors leading some initial suggestions on policy initiatives to improve programme contexts. Finally, in section five we discuss these policy initiatives further in the light of recent developments, and present our conclusions and research implications. The empirical work reported here derives from both the authors' primary research and the review of secondary literature. We used diverse methods and sources of information, such as interviews to regional policy managers and the managers of different public programmes, reading policy initiatives and policy implementation manuals from different countries and sectors as well as detailed and original programme support case studies.

## **Theoretical Framework**

To begin, we explain two contrasting policy implementation theories, namely the street-level bureaucracy (SLB) and new managerialism (NMG), with the aim of discussing the nature and contexts of public services. Following this, we introduce two widely used frameworks to understand innovation and to develop innovation policies, namely the systems of innovation approach (SIA) and neoclassical economics (NEC). Using this combination of theories we define factors, activities and actors relevant to improving programme contexts. These factors provide a departure point for a fine-grained analysis leading to a discussion of policy improvements.

### *Policy Implementation*

The SLB theory (Lipsky, 1980, 2010) explains the nature of the job, context, and behaviour of the workers who interact with the beneficiaries of public services, for instance police officers, judges, and programme consultants. One characteristic in the job of bureaucrats, termed by Lipsky as 'street-level bureaucrats', is the significant 'discretion' that they use. Discretion may lead to public workers altering, ignoring, extending, or interpreting policies, which would signify a change in their role from policy-implementers to policy-makers (e.g. Lindblom and Woodhouse, 1993; Ellis et al., 1999; Maynard-Moody and Musheno, 2003). Discretion can be rooted in the political decisions taken at the highest levels of government. One reason for discretion could be that policy-makers tend to set high targets and provide restricted resources for public services. This makes policy-makers focus the design of the evaluation mechanisms on numerical indicators directly related to these political imperatives e.g. costs, programme reach etc., and not on the content and quality of the services (e.g. Lipsky, 1980, 2010). Policy-makers could also design extensive and ambiguous policies as a strategy to distance themselves from the consequences of the complicated decisions to balance demand, needs, and resources, which creates room for discretion (e.g. Ellis et al., 1999). Finally, auditors may have conflict of interests given their connection with the policy-making teams or the public organisations, which could make them ignore the evidence of discretion (e.g. Curran et al., 1999; Matlay and Addis, 2003; Storey, 2006).

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On the other hand, there are the advocates for a shift in the distribution of power in favour of policy-makers and public managers over bureaucrats. They are the NMG proponents (e.g. Howe, 1991; Jones, 1999; Langan, 2000). According to the NMG, this shift has occurred as a consequence of the centralisation of strategic political direction and the introduction of competition in the delivery of public services. This challenging structure had generated an important cultural change in terms of management responsibilities and accountability. The NMG defenders argue that due to this market-oriented scheme the fundamental drivers of the public service activity are the public policies and procedures, the commands of public managers, the allocation of resources, the evaluative indicators, as well as the statutes and legislation that create both agencies and clients. Therefore, the practice at street level is more readily aligned with a context of political, managerial, and legal authority.

In a multiple case study research, Vega et al. (2010a) reported excessive discretion and confirmed the causes for this in SME innovation policy contexts. Discretion is the variation from the scope of action defined in the programmes compared to the actual delivery of services. Programme workers radically changed the programmes' scope of action that was contractually agreed with the policy administrators, which did not contribute to either the quality of the services or the innovation processes of the SMEs. For this reason, it is important to understand in detail the work context and potentially competing priorities of programme workers, as well as the constraints in controlling their job with conventional mechanisms.

In his SLB theory, Lipsky suggests that the contexts of public services tend to be problematic and affect bureaucrats in the execution of their work. There are five public service components. The first is 'evaluation', which embraces the method and data sources used to assess each public intervention. Second, there is the potential imbalance of 'power' between public workers and clients. The third is the availability of 'resources' in terms of time, knowledge, information, and budget. The fourth is the level of 'demand' for public services in terms of number of clients, types of services, and time per intervention. Finally, there is the prospect of the 'alienation' of public workers caused by the offering of incomplete public services and the disconnection with the rest of the innovation process of the clients. Importantly, social, client, or bureaucratic objectives could be in conflict given the existence of competing 'goals' arising from potentially challenging contexts and the priority of subsistence of programmes.

Despite the a priori relevance of SLB there are very few papers that apply the theory to enterprise innovation. In addition to Vega et al (2010a) we have identified only one study that used basic concepts to highlight the issue of discretion in a national programme oriented to SMEs (Mole, 2002). In this research, we will use the public service components of the SLB as a starting point for the recommendation of innovation policies oriented to improve programme working conditions. In the following sub-section we discuss the most established frameworks to explain innovation and to develop innovation policies.

### *Innovation Policy*

The Systems of Innovation Approach (SIA) (e.g. Freeman, 1987; Lundvall, 1992; Nelson, 1993) was developed on the basis of innovation research and institutional and evolutionary economics (e.g. Lundvall and Borrás, 2005). It is also related to general systems theory (e.g. Edquist, 2005). The SIA is a conceptual framework, which includes "all important economic, social, political, organisational, institutional, and other factors that influence the development, diffusion, and use of innovations" (Edquist, 1997, p. 14). Under the SIA, innovation is defined as an open, interactive, and non-linear learning process, which is determined by the capabilities (e.g. trust, power distribution, and cooperative relations) and accumulated knowledge in organisations, firm networks, and communities. The capabilities and accumulated knowledge vary locally as a result of learning trajectories (Asheim and Isaken, 2000). All this complexity creates uncertainty around innovation processes, particularly open innovation and knowledge exchange. The SIA uses the concept of 'system failure' to explain the malfunctioning of innovation processes, which is the missing or inappropriateness of activities, actors, institutions, or linkages.

The neoclassical economics (NEC) stance on innovation states that social agents take rational and autonomous decisions among identified outcomes and their values, in order to maximize utility. There is the presumption of complete information and equilibrium, and that knowledge is created mainly via

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research and development by one agent and is easily distributed in a linear direction using market transactions. Under the NEC view, the malfunctioning of innovation processes responds to market failures which basically affect the optimum work of agents. The most common policy instruments are economic ones, specifically the protection of the creators of knowledge via intellectual property rights (e.g. Andersen, 2006) and the fostering of competition via agglomeration (e.g. Porter, 1998). The simplified view on optimality and equilibrium is the reason why neoclassical economists argue that ideal innovation contexts can be reverse-engineered and replicated in other geographical areas (Storper, 2001). Under this stance, the distinction between knowledge diffusion and knowledge transfer highlighted earlier in the opening paragraphs by Baskerville and Pries-Heje, (2003) is not made.

There have been many critics from the SIA side to the innovation stance of NEC. In principle, NEC overlooks that firms behave differently (e.g. Metcalfe and Georghiou, 1998) and does not give relevance to the interaction among suppliers, users, competitors, and non-market agents for the development, diffusion, and use of tacit knowledge (e.g. Lundvall and Borrás, 2005; Metcalfe and Georghiou, 1998). In their work, Vega et al. (2010b) confirmed the usefulness of the SIA in the analysis of different types of adoption contexts surrounding the adopter. However, to make a more comprehensive use of the SIA there is a need to study not only the micro-environmental influences but the effects of even more distant activities, actors, institutions, or linkages on the adoption of innovations in SMEs. We address this concern later in the discussion about improvements to public programme contexts.

## **Diagnostic Analysis**

Edquist (2002) defines Diagnostic Analysis (DA) as the sequence to follow in order to design innovation policies. In general terms, DA embraces the identification of a 'problem', its associated 'system failures', and the determination of the corresponding 'policies'. For example, the low diffusion of an information system in the SMEs of a given sector, compared to another sector or region, may constitute a 'problem'. To be confirmed as such the problem must also be an enduring one, in the sense that the market forces could not resolve it by themselves.

The second stage is the identification of underlying system failures, which give rise to the problem. For example, we could determine that there are some initial barriers for the diffusion of an internet collaborative information system in SMEs, such as the lack of project management skills available for SMEs, the lack of data communication standards to connect different systems, and the lack of trust in the supply chain. Together they represent SME, innovation, and micro-environmental characteristics respectively. Moreover, these characteristics denote the existence of complementary adoption processes e.g. the supply chain partners would have to adopt and connect their internet collaborative information systems too. The identification of barriers and complementary adoptions are relevant entry points to get immersed even more in the system of innovation in order to identify system failures. For instance, the lack of project management skills could be a consequence of the lack of relevant consultants in the region, inability to find skilled project management people, or the lack of money to employ them. In the example, a system failure could be corrected by applying several policy instruments. For instance, subsidising project management support programmes in universities, redesigning academic courses, or creating consultancy accreditation schemes would all constitute policy improvements.

According to Edquist (2005) innovation processes are affected by a series of activities, where some will be more important than others, and can reinforce or offset one another. He suggests trying to establish a hierarchy of causes, taking into account not only activities, but also the actors that perform them, the institutions that affect them and the linkages amongst them. Edquist (2002) also pointed out that governments and agencies should intervene only if they have the ability to solve or mitigate system failures.

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## Revisiting the Problematic Situation and System Failures

We consider the difficult situation of the contexts of the public programmes in question as the problem domain. As evidenced above, these challenging contexts can affect the work of programmes. Vega et al. (2010b) researched this context effect in terms of the outcome of the adoption processes in the SMEs and the contributions of the programme services to this. As mentioned, the nature and consequences of these contexts are confirmed in similar results in numerous countries in other public service areas such as social services, health, education, legal services, and policing. It underlines the widespread nature of the difficulties of public programme interventions arising from different contexts.

In general, these failures confirm Lipsky's arguments about contexts and support the conclusion that these failures are systemic. To begin, many of the evaluation methods used by the funding bodies are misdirected. The European Regional Development Fund (ERDF), the Regional Development Agency Fund (RDAF), and the Higher Education Innovation Fund (HEIF) use numerical indicators that do not adequately address either qualitative or content aspects. For example, they focus on number of SMEs assisted or the increase in sales in the SMEs. The attribution of most of these indicators to the specific programme interventions is questionable and difficult to assess by the owner-managers (Storey, 1998). Clearly, variations in sales and jobs could be consequence of diverse developments not connected to the public programme support, such as an economic crisis, competitor initiatives, or a new strategy in the SME. Additionally, there could be a conflict of interests created by the connection between the evaluators and either the policy-making teams or the programme organisations. There also exists an inherent imbalance of power in favour of the programme actors over the SMEs, because SMEs tend to depend on external support to carry out their business initiatives.

The low provision of resources could also be catalogued as a generic situation. This happens essentially because there is a political imperative at the highest levels of government to provide limited resources relative to the setting of too ambitious targets for public services (e.g. MacDonald, 1990). In contrast, potentially low demand for the services can be explained by the fact that the programmes are oriented to support innovation processes and, by definition, both the innovations and their associated services are hard to transfer and expectation by SMEs for access to resources is pessimistic. Indeed many SMEs may well be unaware of the programme's existence. A relatively low demand can also be explained by the delayed start of many programmes and the slow administrative procedures to edit and sign contracts between the stakeholders in the funding agencies, policy administrators and programme provider organisations. Alienation of programme workers can be a constant risk as well as a consequence of the provision of insufficient resources and the use of poor evaluation mechanisms. Programme workers could feel, with justified reasons, that their work will be incomplete and irrelevant for the SMEs (Lipsky, 1980, 2010). Finally, the dominance of these negative contextual components can influence the choice of goals and priorities of the programme workers, which may not coincide with the original programme goals (Vega et al. 2010b).

In the next section we complete the cycle of DA oriented to public programmes through a consideration of the activities and actors within the programme support system. In turn, this leads to a suggested set of policy initiatives to improve the contexts of programmes.

## Activities, Actors and Recommendations

Our DA approach embraces the identification of a problem, describing the systems failures and suggesting improved innovation policies. To provide the linkage between these three stages we modify Edquist's DA and introduce our theory framework explained before – a combination of SLB theory (evaluation, power, resources, demand, alienation and goal conflict) and the SIA (system failures in terms of malfunction of innovation processes and the inappropriateness of activities, actors, institutions or linkages). Having understood the system failures affecting programme contexts, we carried out an explorative study to determine examples of the type of policy recommendations which could improve the

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programme context components (Vega and Brown, 2011)<sup>1</sup>. Actually, each recommendation could affect many context components but we focus only on the component most directly affected. For instance, although SME empowerment could affect different contextual components, we basically suggest that SME associations could improve their participation in the policy process in order to balance the power between programme organisations and SMEs. In addition, we do not comment on the institutions or systemic linkages that could have been negatively affecting this fundamental role of the SME associations. This is a yet wider study and, what is more, SME associations would probably need further complementary policies to properly accomplish some of their functions. In reality, each of our recommendations uncovers a relevant and rich research agenda that would require further iterations of DA sequencing.

It is important to mention that the correct implementation of our recommendations does not guarantee that programmes will operate properly. For example, the correct use of accredited personnel could improve the resources of programmes, but there could still be problems related to the other programme context components, namely evaluation, power, demand, and alienation. As one might expect, only the appropriate provision of all the programme context components could ensure the effective operation of public programmes.

Finally, we define the kind of actors who would have the responsibility for these activities, rather than specific named institutions. For instance, the national entity in charge of the SME policies in the UK in 2011 is the Department for Business, Innovation and Skills. Clearly, the kind of actor will always remain the same but the specific named organisation in charge of the activities could change over time and space without affecting the contributions of this study. For example, in the UK context our research is independent of an eventual merger or split of this Department since the responsibility for SME policies is a government constant.

Our research suggests ten recommendations that span the five programme contexts within the SLB theory. Each is introduced briefly below.

#### *Adoption and Assistance Process Evaluations*

This activity is oriented to improve the context component 'evaluation'. In order to improve the evaluation design, this function should include qualitative approaches as a complement to the use of quantitative methods (e.g. Curran and Storey, 2000). The focus should be on the outcomes of the innovation adoption by the SMEs, as well as on the analysis of each programme action and inaction that could have affected the SME adoption processes. The qualitative evaluations should be employed when the participation of different stakeholders is required or when the policies or areas of application are unknown (e.g. McDavid and Hawthorn, 2006). Evaluators would need to carry out prior research on the programme, the individual SMEs and assistance files in order to overcome any bias or inaccurate information given by the SME personnel. The actors responsible for defining the evaluation design are the funding bodies, e.g. in the UK the Directorate-General Regional Policy for the ERDF, Her Majesty's Treasury for the RDAF (to be replaced by the Regional Growth Fund in 2011), and the Higher Education Funding Council for England for the HEIF.

#### *Third-Party Evaluators*

This activity is also aimed at improving the context component 'evaluation'. In order to avoid conflict of interests, evaluators and auditors must not be connected to the policy-making teams or the programme organisations, or contracted by any of these parties (Curran et al., 1999; Matlay and Addis, 2003; Storey, 2006). The evaluator organisation could be a non-departmental public body in order to remove any political interference. This organisation could be in charge of evaluating all the programmes oriented

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towards enterprise innovation. The organisation proposed here could have its own pool of evaluators or contract private specialist companies, for example the Centre for Public Program Evaluation ([www.evaluationcenter.net](http://www.evaluationcenter.net)) and The Evaluation Partnership ([www.evaluationpartnership.com](http://www.evaluationpartnership.com)). The actors in charge of defining the national evaluator should be the funding bodies.

### *SME Empowerment*

This activity seeks to improve the context component 'power'. In order to have an influencing presence at all levels and offset other group interests, SME representatives must improve their participation and decision-making in the design, administration, implementation, and evaluation stages of the policy process. From a reading of the literature it appears that SMEs have been systematically excluded from the political scenario (Storey, 1994; Coen, 1998; Dannreuther, 1999). For this reason, we believe that the SME associations themselves need to be more effective protagonists in the policy arena. SME empowerment is a pivotal activity in the system of innovation, which would positively affect all the other recommendations to improve innovation programme contexts and SME policy generally. In the context of information systems led innovation an example of enhanced empowerment is the role for SME associations as 'trusted third parties' advanced by Brown and Lockett (2004).

### *Market Competition Simulation for Programmes*

This activity is the second oriented to improve the context component 'power'. To avoid the dependency of SMEs on a single programme provider, such as a university, ideally more than one programme organisation should offer similar services in the same geographical area (Vega et al. 2010b). The selection process of programmes should take into account not only the appropriateness of individual programmes but also the balance of the total regional support. The political actors responsible for proposing this general competitive environment would be the European Union and national entities in charge of SME policies, e.g. in the European Union the department of SMEs and Entrepreneurship of the Directorate-General Enterprise and Industry and in the UK the Enterprise Directorate of the Department for Business, Innovation, and Skills. However, the implementation of this suggestion would be the responsibility of the funding agencies and their regional delegates. Examples of the regional delegates are the Government Offices for the English Regions (to be dismantled in 2011), and the Regional Development Agencies (to be replaced by the Local Enterprise Partnerships in 2012).

### *Sector and Functional Area Focused Services*

This activity aims to improve the context component 'resources'. In order to get experience and knowledge, programme providers wherever possible should continually deliver services to the same sectors and functional areas to build up context expertise. The selection process of programmes should contemplate this requirement. This accords with Martin and Matlay (2001), who articulated the need of a more discriminating approach in UK Government support to information systems innovation in SMEs. The likely actors responsible for proposing this general level of specialisation in the programme providers would be the national entities in charge of SME policies.

### *Professional Accreditation*

This activity is oriented to improve the context component 'resources'. In order to acquire experience and knowledge, or to expand the resource capacity, programme providers could opt to work with accredited personnel (Morgan et al., 2006). Accreditation is a professional certification awarded by an expert body, which is aimed at endorsing a certain level of knowledge and experience of people or organisations on a given subject. To get accredited, a practitioner is assessed in terms of past performance and theory. Programme organisations can accredit their practices if they have a minimum number of accredited employees. Accreditations focus on continual professional development, for which it is necessary to have periodic re-accreditations. The actors that are in charge of awarding accreditations can be organisations

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created by industry such as the Institute of Business Consulting ([www.ibconsulting.org.uk](http://www.ibconsulting.org.uk)), or public-private partnerships such as Technology Means Business ([www.tmb.org.uk](http://www.tmb.org.uk)). Technology Means Business was specifically created for the accreditation on information systems for SMEs. The initiator, one of the founders, and main public partner of Technology Means Business was the E-commerce Ministry of the Department of Trade and Industry, subsequently part of the Department for Business, Enterprise and Regulatory Reform, and now a role of the Department for Business, Innovation, and Skills.

#### *Awareness Campaigns*

This activity is focused on improving the context component 'demand'. In order to increase the demand in SMEs for specific innovations and their associated programme services, the suite of innovation policies should include a greater emphasis on awareness campaigns (Papazafeiropoulou et al., 2002; Beckinsale and Ram, 2006). The actors in charge of this inclusion are the partnerships that formulate the integrated economic frameworks. For instance, the Regional Development Agencies in the UK have been taking the leadership role for the development of the Regional Economic Strategies.

#### *Simplification of Contractual Procedures*

This activity is oriented to improve the context component 'demand'. In order to start programme operations on time and have better chances to reach targets, the procedures to edit and sign contracts between the funding bodies, policy administrators and programme organizations need to be shortened. Delays of many months, even more than a year, in all the ERDF and RDAF funded programmes that were approached in the authors fieldwork were evidenced (Vega et al, 2010b). This administrative issue hinders demand for access to the public innovation programmes. The actors in charge of designing and implementing this process reengineering are the funding bodies and their regional delegates.

#### *More Comprehensive Set of Services*

This activity looks to improve the context component 'alienation'. In order to make programme workers participate more in each SME adoption process, programmes should deliver services that covers most of the SME needs. For instance, the programme services could embrace strategic assessment, planning of the implementation, selection of providers, design and development of information systems, as well as training in the use of the systems. Chapman et al. (2000) and Wolcott et al. (2008) proposed a similar end-to-end approach. The advantage of this is that programme workers would not be frustrated by the partial solutions that many interventions provide. The selection process of programmes should include this criterion. The implementation of this requirement would again be responsibility of the funding bodies and their regional delegates.

#### *Modification and Reduction of Numerical Targets*

This final recommendation is also oriented to improve the context component 'alienation'. In order to increase engagement by programme workers in each SME adoption process, the targets must be more qualitative and reasonably ambitious. As explained, qualitative targets would be more connected to the success of the entire SME adoption processes. A reduction in the magnitude of the targets would automatically increase the time and other resources that could be assigned to individual interventions. This is a selection and quality issues and related to an understanding of productivity in public service provision (Hamilton, 1972). The actors responsible for proposing these general evaluative modifications should be the national entities in charge of SME policies as well as the funding bodies.

All the above proposals derive from an in depth analysis of the authors primary research combined with a critical review of relevant extant literature on public programme initiatives to foster innovation in SMEs, including university sourced innovation. SMEs by definition receive government assistance and hence are subject to policy changes. In the final section, therefore, we first introduce a discussion on policy changes and the likely robustness of our proposals before we summarise the paper's contribution and draw our conclusions.

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## Discussion and Conclusions

During the execution of this research, and subsequently, national governments have faced extreme financial pressures, which in turn have presented formidable challenges to public service quality. This is not a new phenomenon – writing 30 years ago Lipsky (1980, 2010 p. 173) explained it in this way:

“In a financial crisis the imperatives for service development are subordinated to the demands of perceived revenue limitations ... The fiscal crises of the cities provide a focus and an apparently benign rationale for attacking and injuring the provision of public services.”

In the specific context of the UK, the planned public sector reforms relevant to supporting SMEs appear radical. Six main reforms have been signalled which directly impact on the support to SMEs:

(i) The abolition of the Regional Development Agencies (RDAs). These will be superseded by Local Enterprise Partnerships (LEPs) in 2012 and constitutes the cornerstone reform. The core objective is to prioritise a more responsive approach to local business needs (HM Government, 2010a).

(ii) To give autonomy to the new LEPs to define their priorities and strategies in contrast to the RDA practice of top-down Public Service Agreement and Local Area Agreement targets imposed by the government departments (BERR & CLG, 2009).

(iii) To require LEPs to play a central role in coordinating and assisting bids for their areas as well as directly bidding for the newly created Regional Growth Fund. This fund will require a better balance between public and private investments (HM Government, 2010b).

(iv) Central government is also restructuring the support to SMEs with a focus on standardised services (BIS, 2010). There will be a significant reduction in the number of public-funded schemes. The new schemes will have national scope and will address strategic aspects such as starting a business, the adoption of information systems, and accessing international markets. Each scheme could have providers that operate in several geographical areas, which would have contracts and service level agreements already negotiated with the funding bodies. The branded name for these services is Solutions for Business (BERR & CLG, 2009).

(v) LEPs will have a prominent role in the definition of their particular Solutions for Business portfolios and in bringing together public, private, and other potential participants to constitute the growth hubs (HM Government, 2010a).

(vi) There will be a special emphasis on the government as a facilitator for the delivery of public-funded services by different kind of organisations such as businesses, universities, and the third sector (HM Government, 2010). The face-to-face national public service brokerage service called Business Link will be abolished and replaced by a call centre, an improved national website and a business-led national mentoring network (HM Government, 2010a).

An issue for this paper is how robust our analysis framework is in the light of these changes. We will analyse the proposals for change from a system of innovations perspective and the contexts that characterise public programmes. Public programmes will not cease - in the main they will be more standardised and selective – but the relevance of the programme contexts will remain.

Applying this framework the ‘evaluation’ context looks to remain unchanged. The new Regional Growth Fund will use the standard Treasury Green Book rules, and as such is likely to place emphasis on the existing quantitative measures of sales increases and job growth. ‘Power’ will be impacted by the reduced number of programme providers aimed at speeding up contractual arrangements and achieving economies of scale. The risk here is that few providers could institutionalise the dominance of programme organisations over the SMEs. With regard to the context component “resources”, we can say that there

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are two measures that could favour programmes and one that could be harmful. The first positive initiative is the reduced number of service schemes and the role of the LEPs to adequacy them according to local needs. If well done, the design of the public services should address specific sector and functional area needs. The second is the procurement model that the government is proposing. Under this model, few programme organisations would deliver specific service schemes. This centralisation would give to programme workers better possibilities to acquire knowledge and information on their services. However, the government will continue awarding public funds to programme organisations based on the Treasury Green Book rules. It means that the criterion 'value for money' will stay as a crucial factor in the selection processes. As the time used in each public assistance directly impacts the value for money proposition, and the traditional quantitative evaluation mechanisms remain, we could expect that programme organisations will continue using very reduced times to serve SMEs which would counter the positive factors.

For the context component 'demand', there are three government changes. The first is the simplified scheme of Solutions for Business to be shaped by the LEPs. Ideally, this would create set of services that will be aligned to local needs. The reduction in the number of schemes could also make it easier for the SMEs to understand the public offer. A useful and simple service portfolio could favourably impact the demand for public services. The second initiative that could positively affect the demand is the new procurement model. Under the new practice, programme organisations could have pre-agreed contracts with central government, which would make it quicker to start operations at local levels. This would give programmes valuable time in order to reach the targets. The third measure that could increase the demand for public services is the creation of the Regional Growth Hubs. The centralisation of most of the public services in these Hubs should make it easier for the SMEs to find the public services they need. All three changes have the potential to improve service delivery to SMEs, but it would be partial since the scope of assistance will be reduced. Missing from the changes are any explicit initiatives, or defined responsibilities, to raise awareness which is an important element of programme contexts. Without this the other changes to stimulate demand are likely to be undermined.

Finally, we consider that the context component 'alienation' of programme workers is at risk as a consequence of the potential reduced time to be employed in each intervention and the use of inappropriate evaluation mechanisms. This combination could make programmes to deliver incomplete services and be disconnected from the rest of each of the SME innovation processes, which are some of the most important reasons for the generation of alienation in public service workers.

On balance, reviewing the new radical UK Government changes for SMEs underscores the robustness of the systems context perspective. Although our original research and the policy analysis above are UK centric, the programme contexts are not and have applicability in any situation. In all economies SMEs are important for employment and growth but at the same time SMEs are hampered by the shared difficulty of accessing innovative technologies and knowledge exchange. As indicated earlier, weaknesses in SMEs also limit the progress of larger firms because of supply chain dependencies. Whilst this remains the case, the task of governments and institutions to facilitate a munificent support environment for SMEs will be a priority. Individual governments and actors will inevitably change but the functionality required by programme support system remains.

### *Conclusions*

Turning to our conclusions, the aim of this paper was to explore the policy and practice of open innovation and knowledge exchange for SMEs and the scope for improvements using a novel multidisciplinary lens. Although open innovation can occur in many ways, the focus and the empirical data in this research relate to university based public programmes. From the analysis and discussion, there are two main contributions to theory and practice respectively.

The first contribution is the learning from the use of a multidisciplinary frame. In this research three main areas of theory have informed the analysis of open innovation and knowledge exchange. Street Level Bureaucracy (Lipsky, 1980, 2010) provides important insights into the behaviour of workers who interact

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with beneficiaries of public services. Context and discretion are significant elements in the theory and it is especially helpful in linking policy to the realities of policy implementation. Although arguably underused, this research work affirms the relevancy of this theory. The Systems of Innovation Approach (e.g. Freeman, 1987; Lundvall 1992) is the second main concept in the research which uses the concept of systems failures to explain the malfunctioning of innovation mechanisms. Again our research supports the usefulness of the concept but recognises absence of causal micro-environmental influences which are important and which SLB provides. The third theory frame is Diagnostic Analysis (Edquist, 2002) linking activities, actors and institutions to examine innovation processes. This proved helpful but the research highlights the need for multiple levels of analysis and the need to repeat the diagnostic analyses in different systems failure settings i.e. providing a link into SIA.

Although the research provides useful insights into the individual theories a significant contribution is the combination of the concepts – SLB, SIA and DA. This provides the basis of a framework to better understand public programme interventions for facilitating innovation and knowledge exchange for SMEs. This is novel. The emphasis on the importance of context and the extension of DA to explore these are notable elements. The fact that no single theoretical frame can cope with the juxtaposition of micro and macro level analyses is not a criticism of the individual theories but underlines the importance and legitimacy of multidisciplinary work. The context based framework used in this research provides not only a means to interpret the empirical work but provides a template to review the impact of proposed policy changes.

The second contribution is to policy design and implementation in the specific context of public programme support. Arising from the analysis, the overarching requirement is to recognise the crucial importance of programme contexts and their basis as source of identifying and prioritising improvements. Within the body of the paper, ten specific improvements have been proposed covering the five main programme context components. Through an analysis of proposed radical policy changes, the paper demonstrates that irrespective of these changes the importance of contexts as a diagnostic is not diminished but enhanced. There are two context components singled out as especially important – evaluation and power. Evaluation determines what is taken to be important. Under present arrangements, the metrics used by European Union and national funding bodies are predominately quantitative. For example, the setting of targets for job creation or increased sales whilst appearing logical for measuring value-for-money of policy initiatives introduces distortions in the selection of SMEs and the reported benefits. This research argues for a more explicit qualitative analysis of benefits and the introduction of independent third-party evaluators.

In the case of the power context, it is this area that potentially SMEs can take the lead and make improvements. SMEs have been consistently under-represented in the policy arena (Coen, 1998; Dannreuther, 1999). As public programmes become more locally focused and selective, SME associations are in a position to play a key role. Brown and Lockett (2004) refer to this as the 'trusted third-party' role, able to act on behalf of SMEs in their sector and increase participation in the policy process. Proper political participation plays an enormous role in the empowerment of groups (e.g. Deneulin and Shahani, 2009). For example, SME involvement is highly desirable in the policy process stage of evaluation, which is a highly politicised practice (e.g. Curran et al., 1999; Curran and Storey, 2000). Improved participation would give SMEs a voice not only in evaluation but in the wider design, administration and implementation of public policies such as innovation programme support.

We recognise that the above and previous proposals for improved public programmes are politically situated. Absolute levels of funding will impact on the ability to implement improved context conditions. However, as argued above public programme support meets a real need for innovation and knowledge transfer into SMEs even if the form of that public support changes as a result of political imperatives. For example, universities as major sources of innovation will remain even if the process of their engagement changes. This continued relevance requires a further research agenda. From our work, there is clearly scope to refine the multidisciplinary frameworks and to test them through in depth case studies. The combination of SLB and SIA, which together span micro and macro considerations, is an obvious starting point. A second research need emerging from this work is to research and extend the SIA to take into account the complexity of interacting interest groups such as universities, programme organisations,

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private evaluators, professional bodies and multiple suppliers to better understand the scope for reform to public programmes for SMEs. A political economy approach could be a starting point for this agenda. Finally, we recognise the limitations of this study. The focus on universities as the programme innovation supplier does not recognise the other sources of open innovation available and used by SMEs. This is important and would need to feature as a consideration in both research agendas above.

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