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**Knowledge-Based Economic Development in Emerging Regions:
Policy Issues and Implications in the Balkan Peninsula**

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Abstract

This paper analyzes the policy implications related to the progression of three key emerging metropolitan regions in the Balkan Peninsula towards the development of knowledge-based economies. The paper suggests that a challenge for these regions is realizing the 'new value' of knowledge. It is found that regional policymaking is a relatively new area of intervention. It is suggested that the problems and barriers found in these emerging regions, and the potential policy solutions, resonate with those of the less competitive regions of advanced national economies. In the case of the emerging regions, however, the policy learning curve remains relatively steep.

Introduction

In recent years, increasing attention has been paid to the processes by which regions with emerging economies are able to make the transition to more knowledge-based and innovation-led development environments (Scott and Garofoli, 2007; Phan et al., 2008). This paper seeks to analyze the policy implications related to the progression of three key emerging metropolitan regions in the Balkan Peninsula towards the development of knowledge-based economies. The Balkan Peninsula has a rich and deep socio-economic history with metropolitan areas being its natural functional regions. These regions tend to enjoy a higher than average proportion of resources due to the influence of urban development processes built up over centuries (Hajdú et al., 2007; Horváth, 2007). This paper focuses on the metropolitan regions of Sofia in Bulgaria, Istanbul in Turkey, and Thessaloniki in Greece. These regions are vital economic components of Europe's most south eastern areas, and provide the basis for the transformation of this area towards a more competitive and innovative economy (Fletcher et al., 2008). This paper suggests that a key challenge for these regions is realizing the 'new value' of knowledge. The common characteristic of these south east European metropolitan regions is their lagging status in comparison to the EU as a whole. The regions are dominated by a large city where there is a relatively high concentration of financial and human capital, with the peripheral districts lagging substantially in terms of competitiveness and innovation. Although the Thessaloniki metropolitan region is the second most evolved region in Greece, it is significantly overshadowed by Athens, and falls behind the national average on most competitiveness and innovation indicators, whereas the Sofia and Istanbul metropolises are national leaders (Figure 1 indicates the location of the three metropolitan regions).

Figure 1 About Here

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The paper is based on a synthesis of the findings of a two-year Framework Programme 6 study funded by the European Commission. The methodology employed by the study consisted of the following activities: (1) desk-based data gathering and analysis - collection of publicly available socio-economic data; (2) stakeholders interviews - including policymakers, the business and higher education sectors; (3) focus groups – regional workshops to identify key demand and supply-side priorities for future knowledge-based and innovation-focused policies; (4) SME survey - designed to generate data on the various facets of the organizations and to present an overall picture of knowledge creation and transfer within each region, with a minimum of 50 responses from each region. The sample of SMEs was generated by the respective research team in each region; and (5) survey of universities – with the aim of capturing data from key knowledge creating institutions within the respective regions.

In this paper we aim to provide an overview of the key policy issues relating to knowledge-based economic development policy in the context of these emerging European regions, highlighting the issues they regions are facing in attempting to overcome their economic dislocation from Europe’s core economies. In the following section we briefly review the main contemporary contextual issues and discourses associated with policy intervention of this nature. This is followed by an analysis focused on two core, and related, areas: the provision of relevant policy infrastructure; and the ‘new’ modes of economic development such as triple helix models (discussed below), which seek to integrate universities as well as government activities with the knowledge-based activities of firms, in order to catalyze innovation. A discussion of the implications for policy, in which – amongst other issues - the apparent requirement for regional cluster initiatives comes to light, is followed by a set of concluding comments concerning the future policy development requirements of emerging regions.

Regional Knowledge-Based Economic Development

The sources of productivity and economic growth are increasingly based on the role that knowledge plays within and across economies. The concept of the knowledge-based economy has emerged from an increasing recognition of the requirement for the production, distribution and use of knowledge within modern economies (Harris, 2001). Endogenous growth theory has placed knowledge at the centre of economic development (Romer, 1986; Romer, 1990; Lucas, 1988). Knowledge is viewed not only as the key to the competitiveness

of a production unit, i.e. a firm (Nonaka and Takeuchi, 1995), but also territories, i.e. regions (Edmonds, 2003), which are increasingly treated as an economic entity with knowledge viewed as the major element in achieving regional competitiveness (Huggins and Izushi, 2007; Huggins et al., 2008).

Whilst endogenous regional growth can be considered the desired outcome of knowledge-based development and innovation, it is the process of endogenous development which underpins the growth trajectories of regions (Maillat, 1998a; 1998b; Garofoli, 2002; Vázquez-Barquero; 2007). The principles of the endogenous development school of regions are rooted in the role that collective learning and cooperative behaviour play in the establishment of an innovative milieu – or what some refer have referred to as ‘technopoles’ (Castells and Hall, 1994), ‘industrial districts’ (Capello, 1999), or ‘clusters’ (Porter, 1998) - facilitating knowledge flow and new knowledge creation. Implicit is the contention that regional development and growth is best promoted through bottom-up activity focused on the enhancement of local production systems, rather than top-down processes of exogenous development focused on seeking to redistribute resources from elsewhere (Maillat, 1998a; 1998b; Garofoli, 2002).

The endogenous school of thought has proved to be of particular relevance in more peripheral and emerging regional environments, such as South East Europe, which as a prerequisite for any form of development need to maximise the effectiveness of particular industrial strengths (Garofoli, 1992; 2002; Vázquez-Barquero; 2007). Many of these strengths are related to relatively traditional areas of economic activity requiring transformation, reproduction and innovation if they are to remain competitive and sustainable within the globalising world (Capello, 1999; Lawson and Lorenz, 1999; Vázquez-Barquero; 2007). As Garofoli (2002) argues, endogenous development primarily concerns the capacity to innovate and produce ‘collective intelligence’ in a localised environment, which explicitly recognises the relevance of diffusing, accumulating, creating and internalising knowledge. In this sense, the region itself acts as an organisational form of coordination facilitating sustainable competitive advantage (Courlet and Soulage, 1995; Maillat, 1998a; Lawson and Lorenz, 1999; Garofoli, 2002).

Urban settings, in particular metropolitan regions, are increasingly considered to be key territorial units within which endogenous forms of development flourish through their

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3 innovative milieu (Maillat, 1998b; Fischer et al., 2001; Revilla Diez, 2002; Vázquez-
4 Barquero; 2007). However, in less-favoured metropolitan settings regional innovation
5 support policy is seen to be of crucial importance, especially focusing on issues relating to
6 knowledge transfer and functional linkages (Morgan and Nauwelaers, 2003; Cornett, 2009).
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8 Asheim and Isaksen (2003) argue that endogenous regional development is unlikely to occur
9 holistically without public intervention to stimulate, for example, cluster creation and
10 network formation. Nauwelaers and Wintjes (2003) classify regional innovation policies
11 according to two core types: (1) firm-oriented – principally access to human capital (e.g.
12 business support and advice), financial capital (e.g. risk capital, loans or subsidies), or
13 physical capital (e.g. incubators, research and technology centres), and (2) system-oriented
14 (regional) – principally network building and brokering, cluster development, innovation
15 system development, building an innovation culture, cooperation and mobility. However,
16 they recognise that both types may operate in tandem with a need for coordination across
17 policies (Nauwelaers and Wintjes, 2003).
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30 Figure 2 summarises some of the key contemporary modes through which endogenous modes
31 of economic development are conceptualised, and policy has subsequently been established.
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33 Cooke (2004), for instance, suggests that regional innovation systems consisting of
34 interacting knowledge generation and exploitation sub-systems, are a vital component for
35 regional economic development and competitiveness, while others have focused on the
36 notion of clusters as the key focus of regional economic theory and policy, with the
37 underlying tenet being that competitiveness is determined by the strength of key
38 concentrations of specific industries (Porter, 1998). Clusters can be defined as geographically
39 proximate firms in vertical and horizontal relationships, involving a localized enterprise
40 support infrastructure with a shared developmental vision for business growth, based on
41 competition and co-operation in a specific market field (Cooke and Huggins, 2003). Clusters
42 are considered as offering a means for creating higher value-added by tapping into and
43 distributing the potential of local strengths as a whole rather than as a series of fragmented
44 firms (Roelandt and den Hertog, 1998; Huggins, 2008; Steiner and Ploder, 2008).
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Figure 2 About Here

Uncompetitive regions usually lag in terms of headline indicators such as economic output per capita and employment levels, as well as knowledge-based indicators such as innovation,

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3 patenting, and the proportion of knowledge-intensive firms (Huggins and Izushi 2007;
4 Huggins and Johnston, 2009). While there may be no “ideal model” for innovation policy,
5 policymakers worldwide have expended considerable efforts in pursuing policies that aim to
6 emulate the conditions in successful regions (Boschma 2004; Hospers 2005, 2006; Tödtling
7 and Trippel 2005; Huggins, 2010). Part of the problem, however, appears to be in developing
8 and utilizing appropriate and differentiated policy tools within less competitive regions to
9 develop the soft and more difficult to measure infrastructure, such as the knowledge networks
10 present within more competitive regions, as means of generating higher levels of innovation
11 and growth (Tödtling and Trippel, 2005).

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14 While views on the prominence of knowledge for regional economic development remain
15 contested (Lagendijk and Cornford, 2000; MacKinnon, et al., 2002), one of the outcomes of
16 both theoretical and policy developments in this area is that universities and other higher
17 education institutions (HEIs) have come to be regarded as key sources of knowledge
18 utilizable in the pursuit of economic growth, with knowledge and technology transfer
19 attaining a more important role within universities (Feldman and Desrochers, 2003). In many
20 advanced regions, universities are portrayed as core knowledge-producing entities that can
21 play an enhanced role in driving innovation and development processes (Cooke, 2004;
22 Fritsch, 2002), acting as key elements of innovation systems, and providing knowledge for
23 business and industry (Huggins et al., 2008; Kitagawa, 2004; Thanki, 1999; Garlick, 1998;
24 Foray and Lundvall, 1996). The triple helix model formalizes this role and views universities
25 as increasingly ‘entrepreneurial’ or ‘generative’ institutions where the spillover of knowledge
26 is the result of strategic internal reorganization that facilitates the development of
27 infrastructure such as incubators or science parks, as well as human capital development
28 programmes (Etzkowitz, 2006; Etzkowitz and Zhou, 2006; Gunasekara, 2006).

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31 Public policy intervention in recent years has drawn on the triple helix model of economic
32 development, which seeks to promote increased interaction across three broad institutional
33 spheres, namely, government, business/industry and higher education (Etzkowitz and
34 Leydesdorff, 2000; Etzkowitz, 2003). Most prominence has been given to the triple helix
35 regime based on overlapping spheres of state–industry–academia through the establishment
36 of the type of hybrid organizations such as intermediaries, innovation and incubation centres
37 and science parks, allowing each sphere to undertake activities from which they were
38 previously excluded. Such overlapping triple helix forms are manifested by industrial

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policies, which seek to develop an industrial structure based on firm engagement in inter-organizational alliances and networks with universities (Etzkowitz and Leydesdorff, 2000; Etzkowitz, 2003). Furthermore, the Triple Helix approach has been promoted by its conceptual originators as policy instrument of relevance to regional environments such as those in South East Europe, where due to the relative lack of knowledge creating enterprises, universities are by default key ‘knowledge actors’ (Etzkowitz and Ranga, 2007).

Overall, the constructs presented above provide a framework for analysing the scope and requirement for policy measures related to contemporary modes of knowledge-based endogenous development. In particular, its provides a means for assessing the extent to which modes of regional economic development mainly associated with relatively developed and advanced regions – such as clusters and the Triple Helix - can be considered as appropriate and of policy relevance in an emerging region environment. Specifically, the framework indicates the importance of knowledge – and its creation by, and flow through, knowledge actors such as universities– as the driver of economic development, and it is the policy issues and implications stemming from the adoption of such an approach to regional economic development in an emerging economy context that is the focus of the remainder of the paper.

The Regions

In this section we present a summary of some of the key relevant characteristics of each region. The metropolitan region of Thessaloniki includes the districts of Central Macedonia (CM) and East Macedonia-Thrace (EMTH), and its role as a growth hub for the region is potentially vital, acting as the harbor and airport gateway to the Balkan and Black Sea regions. The region lags behind the national average regarding economic, infrastructure and social indicators, and the gap with respect to the EU average is even larger. Although earnings in the regional core are close to the national average, EUROSTAT data indicates that in the more peripheral localities of the region they lag the average by 20-30%. The region suffers from a reliance on old manufacturing and labor intensive industries resulting in a low productivity, a low knowledge intensity and less efficient human and physical capital deployment. A lack of highly skilled jobs in the region has led to the out-migration of skilled workers to more prosperous regions. This is related historically to the centralization of power and policy in Athens, which is considered to be the main source of the ‘brain-drain’. On the other hand, there is a strong educational presence in the region in terms of a well-developed higher

education sector with a large number of graduates. The region's peripheral location is considered to contribute to its lack of competitiveness.

The gap is most evident when looking at corporate R&D expenditure, which reflects the relatively unfavorable economic structure of the region and also the fact that many of the major national companies are based in Southern Greece (URENIO, 2002a; 2002b). The same applies to R&D measures such as patents, which are minimal at both regional and national level compared to the EU average. The exception is R&D employment in the higher education sector, and in the case of the regional centre this is actually above the EU average. Nevertheless, based on EUROSTAT data, R&D expenditure in the region equates to only 0.15% of regional GDP. Overall, universities provide around three-quarters of core R&D workers in the region. Furthermore, the share of innovative firms in both the manufacturing and services sectors is low, reflecting the weak economic structure of the region, which implies a demand for knowledge of limited sophistication which constrains the development of supply.

The metropolitan region of Istanbul includes the western Turkish districts of Thrace, covering Istanbul, Tekirdağ, Edirne, and Kırklareli. In Turkey, a major part of the national R&D investment is concentrated in the Istanbul metropolitan region, with Istanbul absorbing the highest share of budgetary revenue, resulting in regional gross monthly earnings being higher than the Turkish average (OECD, 2008). The region is currently experiencing a period of transition and based on EUROSTAT data lags the EU-27 average on indicators such as GDP per capita, and R&D investment. Labour productivity is, in general, low in Turkey due to low levels of industrialization and weak knowledge intensity (OECD, 2008). A key issue undermining regional competitiveness is high unemployment, which is far above the national average. There is a continuing threat of unemployment linked, amongst other issues, to growing Chinese textile industry exports, although on a positive note there are signs of new opportunities arising through improving interaction and connectivity with border regions (OECD, 2008). There is a degree of risk that the economy could be harmed by the return of economic and political instability.

The centre of Istanbul is the industrial leader and driver of the country's competitiveness, whereas the other provinces in the region are predominantly agricultural. The main knowledge creators are four medical schools (Cerrahpaşa, Istanbul, Marmara and Trakya), three public universities (Bosphorus, Istanbul Technical, Yildiz Technical) and two

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foundation universities (Koc and Sabanci), which are engaged in knowledge transfer with regional organisations on an infrequent basis, along with a substantial student population and a growing mass of skilled workers.

The metropolitan region of Sofia comprises those districts principally in the southern parts of Bulgaria, and is the centre of R&D activity, human resources development, and the Bulgarian innovation infrastructure. The region is very much in transition, with the 1990s being a period of unstable inflation, economic contraction and high unemployment (World Bank, 2007). During economic transition from a central to a market oriented economy there were no systematic efforts to develop or reform innovation policy (Stefanov, 2007). A number of Bulgarian scientists and R&D specialists emigrated in the first 2-3 years after the beginning of changes, and most research institutions have existed on the edge of survival, covering only operational costs (European Commission, 1997; Stefanov, 2007). As a result of strongly reduced state funding and the negligible support by private sector the national economy has an underdeveloped R&D infrastructure that does not facilitate contemporary research and innovation. Similarly, continuous underinvestment in science, research and technology has led also to the depreciation of human capital. The regional economy is dominated by low and medium technology sectors, and is characterized by high intra regional disparities with regards to economic development (Bulgarian Ministry of Works, 2006). Both the Sofia and Bulgarian economy are now on a more stable footing and aim to encourage greater levels of R&D and innovation in order to facilitate growth. As a whole, Bulgaria is considered to be benefiting from the recent EU membership, which enables participation in European initiatives encouraging new forms of economic co-operation, such as the formation of regional clusters (World Bank, 2007). However, there is a danger of a brain drain of highly qualified R&D staff due to low levels of R&D in the Sofia region, and a lack of knowledge generating institutions. On the other hand, the region is characterized by a relatively well-developed university sector and a high level of tertiary education among the population (Bulgarian Ministry of Works, 2006).

Innovation and Knowledge-Based Infrastructure

Across all three regions, the current policies for innovation and R&D are, in general, centrally handled by government, which in the case of Sofia and Istanbul may work in their favor, but in the case of Thessaloniki is potentially a negative as many resources are concentrated in the Athens metropolitan region. In Thessaloniki, the policy priority is the

creation of a critical-mass for innovation in terms of infrastructure, engagement of capable skills, entrepreneurship, making the most effective use of all of relevant resources and enabling innovation to be a self-sustained process (EU, 2007). With the exception of the region's three main universities - Aristotle, Democritus and Macedonia - and four higher technological institutes, most regional innovation organisations are relatively new. These include the Thessaloniki Technology Park, which operates as an incubator and acts as an intermediary between supply and demand for R&D, although only a minimal share of its research relates to corporate applications. The Thessaloniki Innovation Pole is at an early stage of development but aims to achieve ICT agglomeration in research and business through the participation of key R&D players in the region, while 'Technopolis' is an initiative of the Association of Information Technology Companies of Northern Greece seeking to establish a high tech industrial area to cluster ICT companies.

The key competitiveness policies impacting on Thessaloniki are mainly derived from the national government, although over the past decade a decentralisation process has taken place. A growing share of national funding has been shifted to the regional level and efforts have been made to strengthen the policymaking mechanisms at the regional level. The key competitiveness policy tools are the Regional Operating Plans (ROP), implemented via the respective regional authorities. This has led to the creation of new institutions such as Regional Development Companies and other intermediaries. Also, the region went through the family of Regional Innovation Strategies (RIS) projects over the late 1990s and early 2000s with most important being the Regional Technology Transfer (RTP) and RIS+ (supported by DG Regions) for Central Macedonia and Regional Innovation and Technology Transfer initiatives RITTS (supported by DG Enterprise) for East Macedonia-Thrace (URENIO, 1997; 2002a; 2002b).

Generally, European Union projects were aimed at supporting regional innovation and optimizing regional innovation policy, infrastructures and co-operation between key actors within the innovation system. These projects had a top-down approach and an added focus on enhancing the technological capacity of SMEs, with an emphasis at sector level on both traditional and technology intensive sectors. Evaluation of these projects motivated a switch towards a new generation of projects that have a bottom-up, multi-theme and strategic clustering approach. Although there are a relative plethora of stakeholders with some form of

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responsibility for knowledge transfer and flow within the region, the majority are new and lack embeddedness.

The findings from the SME survey in Thessaloniki revealed that the cost of R&D is the major barrier to innovation, followed by a lack of specialized personnel and rigid regulations. There is considered to be a need to upgrade the level of entrepreneurship through the dissemination of technological developments, training in new technologies, and improving the institutional environment for firms. The major barriers are these institutional and cultural bottlenecks, which require policy action in order to alleviate. There is an apparent problem of ‘isolation’ specified by a lack of access to national and international networks - fairs, foreign companies for cooperation, conferences etc - often amplified by poor physical infrastructure, particularly the transport network. There is further considered to be a need to shift primary production towards greater specialization combined with the introduction of agri/biotechnologies and the development of synergies with life-sciences and environmental technologies, towards the integrated promotion of pharmaceuticals, specialized foodstuff, and healthcare activities. The weakness of the traditional sectors in the region requires investigation to understand the possibility of developing new areas within these sectors where innovation can flourish, and capitalize on new technological advancements.

New firms and newly emerging innovation structures in Sofia are tending to respond to international competitiveness pressures and have established some innovation efforts, but these are usually isolated and small scale. SMEs form increasingly important components of both the national and regional economic structure, and are responsible for rising shares of output and employment. However, they face particular difficulties in innovating, mainly due to the lack of economies of scale. In the Sofia the importance of innovations among SMEs is not generally recognized, which can be explained by low demand on one hand, but on the other hand is also caused by a lack of financial resources. In total, 44% of Bulgarian R&D expenditure takes place in the public sector, 28% in the higher education sector, 27% in the business sector and 2% non-profit organizations, with private sector research and innovation infrastructure remaining rudimentary (President of the Republic of Bulgaria, 2006). Insufficient funding for R&D activities is a cause of insufficient training opportunities for R&D staff, and the capacity for generating technological advances such as the patents is also very low.

The national innovation strategy was adopted in 2004, with its main feature being the establishment of the National Innovation Fund, with the task of financing market-oriented R&D activities among enterprises (Council of Ministers of the Republic of Bulgaria, 2004). The Bulgarian government has recently declared that reforming education would be a key priority, recognising that the innovation system remains deeply underdeveloped and is a critical stumbling block in shaping Bulgaria's competitiveness on world markets. The National Development Plan (NDP, 2005) of Bulgaria defines two strategic goals for the country. The first goal is to reach and sustain high economic growth rate, and the second is to increase its human capital potential. The key stakeholders involved in innovation policy in Sofia are the national government, although there is increasing decentralisation through the introduction of Regional Development Councils, and regional and district innovation commissions. These new bodies are tasked with the development of regional innovation strategies for each of the six planning regions. However, the national innovation strategy (Council of Ministers of the Republic of Bulgaria, 2004) and the national strategy for research and development (Council of Ministers of the Republic of Bulgaria, 2005) remain the key source of innovation policy. At the EU level, previous RIS projects identified three major strategic priorities: to improve the competitiveness of the regional SMEs through innovation; to enhance innovation culture in the region; and to develop further and to optimize regional innovation infrastructure (Petrov and Stefanov, 2006).

The development of innovation policy is a relatively new concept in Turkey. However, there are now a substantial number of government and public sector agencies set up to facilitate and implement innovation. The Vision 2023 initiative aims to develop technological competence assessment, research information systems and knowledge systems as part of improvements to the research infrastructure. The initiative also aims to develop high technology sectors and create a high technology society with specific targets to increase: the number of researchers, research expenditure per person and business investment in R&D, with policymakers setting an ambitious target of expenditure on R&D reaching 2% of national GDP (from 0.6%) (TUBITAK, 2004).

In Istanbul the key innovation stakeholders are KOSGEB (the SME Industry Development Organization) and TUBITAK (the Scientific and Technological Research Council of Turkey), both focusing on the implementation of national policies. Innovation policy mainly resides with TUBITAK, which works as an advisory agency to the Turkish Government, in charge of

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promoting, developing, organising and coordinating research and development in line with the national targets. Regional development policies are based on the innovation strategy declared in the 9th National Development Plan (Oner and Saritas, 2005), with most of the regional activities assigned to KOSGEB, which has become the information and access centre for all the European research programmes concerning SMEs. KOSGEB is also adopting a strategy to establish Technology Development Centres, as well as the internationalisation of SMEs. Despite the relative success of KOSGEB, there are remaining problems with the bureaucratic nature of the system, which prevents the effective flow of knowledge from the universities to firms, an issue which others have found to be replicated at the national level (Mittelstädt and Cerri, 2008).

The regional government in Istanbul is in the process of establishing a regional innovation agency focused on clustering activities. It also intends to treble the rate of investment with respect to R&D, innovation and knowledge transfer by encouraging venture capital. However, the innovation infrastructure and culture among SMEs has to first be developed, mainly by encouraging business and higher education collaboration. As industrial analysis in Turkey is conducted on national basis, regional differences in demand by SMEs for different forms of support remain relatively unrecognized. However, a regional council has recently been established by public and private organizations, including university representatives, to define more focused and effective regional policies to remove cultural barriers. So far, a clustered approach has only been adopted for textile exporters. However the research findings show that forming clusters will be potentially beneficial in order to define business focus.

A summary of relevant indicators based on EUROSTAT data for the Thessaloniki region highlight improvement in regional infrastructure and positive trends in economic indicators over recent years. Improvements in sectoral allocation together with the economic recovery in the broader region of South East Europe may provide significant opportunities for regional synergies, although these are likely to be undermined by global recession that commenced in 2008. The role of the three regions as a whole for a knowledge-based growth hub for the wider Balkan region could be vital, and forming synergies in the future with neighboring countries might prove productive. The fact that the three regions basically border each other also emphasizes the potential for cross-border cluster creation in particular sectors, which can enable them to reap the advantages of agglomeration and lead to increased trade between the countries. Despite problems, some SMEs are increasingly willing to develop technological

capacity and product development. However the process of developing and infusing innovation as well as the transition of the corporate sector towards modern methods is still at a relatively early stage.

The Triple Helix: The Role of Universities

In Thessaloniki, the universities, particularly Aristotle and Democritus, are the main knowledge creators within the region. There is growing awareness of the potential economic impact of universities and technical institutes, although this is largely undeveloped. The survey and interview findings document the relatively high importance of ‘university-business relations’, which demonstrates an awareness of the need for regional research performers to improve knowledge commercialization and to create knowledge that is applicable to the needs of the economy. However, if there is an awareness of the need to become embedded, in practice there is a requirement for a change in the legal framework regulating research and encouraging knowledge commercialization. The outdated administrative structures of universities in the region are reflected in weak administrative powers, and a generally poor environment for research geared significantly towards the regional economy. Synergies need to be built between research performers and corporations to break the self-contained nature of private and public sector innovation, in order to achieve cooperative and open outcomes. Fundamentally, the higher education system needs reforming, as currently it is the major weak link in achieving R&D skills that can be linked to research that is responsive to the needs of the economy.

In the Sofia, a two-tier system of innovation persists. Operating in parallel are the old state funded research institutes and universities on the one hand, and numerous newly-established private universities, non-governmental institutions and firms on the other. Universities still play a traditional role and are viewed as a source of human capital development rather than a source of knowledge for private sector. The higher education system is very much centralized, with the state still playing a dominant role. The two tiers are not integrated and the old innovation infrastructure has not been reformed to address the new and emerging needs of the economy, remaining primarily government financed without private sector support. The survey and interview highlighted an existing potential to further exploit the R&D capabilities by commercialization of higher education and research institutions. However the main issue in terms of regional intervention is the dependency on national

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institutions and decision-making authorities, which are the main source of funding for higher education and research.

In Istanbul, there is a lack of private sector demand for the innovation services provided by the government and universities. R&D investment policies impacting on the metropolitan region are very much dependent on the national policies, and SMEs in the region are not aware of the existing national innovation intervention. Policies relating to knowledge demand and absorption are being redesigned as explicit policies at the private sector level. Recently, more industrial companies have started working actively with the universities to share the benefits of graduate studies. A new law is expected to support innovation-based collaboration across industrial companies. Universities in Istanbul are generally transferring or commercializing knowledge through training or projects developed in cooperation with larger industrial firms. In particular, engineering is seen as the most important field of knowledge supply, which is mainly facilitated through training practices. Knowledge creators often play a passive role rather initiate the demand for their services. The findings from the study underlined a lack of innovation culture within the universities except a few foundation universities such as Sabanci University, although by default they are key players in the development of regional innovation policy (Lenger, 2008). The bureaucratic and administrative difficulties of changing the curricula seem to be one of the barriers for initiating new knowledge-based courses.

Market forces may impose a new innovation system but without intervention this is likely take much more time, effort and resource. For instance, the knowledge creation and transfer system in Sofia traditionally has been highly centralized with the dominant role of the state in governing the process. This model resembles the characteristics of the “Triple Helix I” (Etzkowitz, 1998), which can also be observed in other former socialist economies. During the transition period the role of the state has been reduced and the national research and innovation system has shifted from a Socialist type of a triple helix model to a more “laissez-faire” type of model. However, there is still little evidence of direct knowledge transfer between the higher education and business communities. Traditional forms of academic-industry relations still prevail, focusing on participation in liaison programmes. In general, the regions lack a highly progressive innovation culture across national and regional institutions or sophisticated enough co-ordination measures. The regions also lack R&D investment from the business sector. Innovation is still viewed in a very narrow sense, in

most cases solely on an R&D basis. A lack of access to relevant collaborators and networks highlights a weak or non-existent relationship between knowledge creators and SMEs, and a lack of effective intermediary organizations. Knowledge supply is dominated by training activities rather than new technology and or new product/process development, followed by IT support.

The role of universities and other higher education institution is limited in terms of collaboration, but where transfer does occur key academic disciplines are engineering technology, computer science and information systems, and business and administration. Knowledge related to business and administration is also ranked highly, in particular in Sofia and Thessaloniki, highlighting the growing importance of this discipline as a potential source of commercial knowledge. In general, universities in the regions are not focused on the needs of the economy or the corporate sector, in terms of knowledge applicability or developing long-term relationships with the sector. Across all three regions, the higher education institutions mainly source knowledge from within their own sector i.e. from other universities or research institutions, rather than sourcing it from SMEs or the private sector. International organisations, such as donors, also play an important role for the higher education sector, supporting a range of projects and activities. There was found to be no match between university knowledge creation and transfer and the potential demand from SMEs, and it is apparent that higher education institutions are of a self-contained nature characterized by a dependence on public sector finance. In general, universities recognise the relative inapplicability of knowledge they create for regional SMEs, which they attribute to the limited sophistication of regional SMEs, but lack the autonomy and authority to trigger change.

Policy Discussion

According to the SMEs surveyed in the regions, future regional policy targeted at improving competitiveness should be focused on three keys areas: (1) making finance available to firms to expand R&D and other knowledge-based activities; (2) improving the physical infrastructure allowing companies to locate in better equipped premises, and (3) creating better networks with universities and R&D performing organizations. Similarly, there is a perceived lack of financial resources and human capital allocated to knowledge transfer activities in the higher education sector. A lack of access to relevant collaborators and networks highlights a weak relationship between knowledge creators and SMEs and the

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inefficient role of intermediary organizations in this process, as well as there being a general reluctance by firms to enter into collaboration with potential competitors.

In general, policymakers should support intermediary organizations to become aware of their own capacity to induce more active innovation collaborations between knowledge creators and SMEs, as well as to initiate such collaborations by themselves. The common impression in the regions is that intermediaries such as regional development agencies, chambers, regional trade associations, technology transfer centers, business innovation centers, and other organizations supporting SMEs intermediaries should promote knowledge flow more intensively.

Table 1 About Here

Overall, the findings of the research indicate that across all three regions only a very small proportion of the workforce is involved in creating new knowledge, and do not possess a critical mass of knowledge workers. Across the regions there seem to be a considerable lack of R&D activities, coupled by a lack of IP management. Key linkages between higher education and government lack coordination and effective initiatives are limited at both national and regional level, although there is some evidence of direct knowledge transfer between higher education and business in the regions. The utilisation of membership to local and regionally-based business and professional networks, such as chambers of commerce, trade or business associations, and business clubs to source collaborative innovation partners is limited, although in Istanbul there is a higher level of awareness of chambers due to the regulatory requirement for membership. Nevertheless, in all three regions the level of ‘real’ engagement is limited, and suggests the necessity for intervention.

Most of the strengths and opportunities in the regions lie in the increasing awareness of the need to open up the ‘innovation system’ in terms of regional-global networking, building upon the relative strengths of the university sector. The key weaknesses and threats lie in the slow domestic response in reforming education systems and facilitating the commercialisation potential of current and latent innovation activity. In general, there is a requirement for a dual focus in the regions: encouraging the growth of firms in knowledge-based sectors; and improving the innovation and knowledge capabilities (e.g. use of new technologies and improved skills) of firms in more traditional sectors. Given the comparative

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advantage in traditional sectors and small market size, a policy focus towards innovation agglomeration – innovative milieu - in these sectors might be required rather than attempts to shift the economy towards high-tech industry, an example being the agriculture-tourism-ecology-life sciences sectors in Thessaloniki. This will further require a need to formalize the informal knowledge networks operating within the ‘hidden’ economy in many of these sectors, if the benefits are to be captured, along with addressing the main underlying barriers relating to a lack of finance resources and access to skilled labour. An improved system of business support and access to training and workforce development seems to be crucial for the improvement of the innovation capacity of firms. A targeted (cluster) approach to the development of regional sectors, with a strengthening of the system of business support to enable access to suitable and appropriate resources came through strongly from the research as a key policy lever.

Policies stimulating the creation of sustainable clusters can potentially generate new jobs and innovations and drive the competitive position in the industry. However this requires forming an appropriate infrastructure to introduce relevant clustering policies, and increased provision of innovation and knowledge management services available to SMEs. In order to achieve this, the building of efficient institutional links and coordination is required at both national and regional levels amongst ministries, and private-public sector synergies and regional-level activities has to be further advanced (this has not been generally practiced despite the presence of institutional forums). There also needs to be a targeted allocation of financial resources, maximizing impact through strategic focus, rather than the fragmented use of financial resources based on general criteria, availability of funds, or ease of implementation.

This suggests that cluster policies should be implemented to stimulate innovation activities, focusing on strengthening the role of intermediaries in this process. Policy initiatives may be best aimed at increasing the efficiency of firms in order to increase their competitiveness. In Thessaloniki and Istanbul there appears to be more of a milieu effect in the regions, with local customers and suppliers are rated as important sources of knowledge. In this case, it would be logical for policy initiatives to build on this and encourage the further sharing of knowledge. In Thessaloniki, policies may be best centred on the creation of appropriate conditions for knowledge spillover effects around emerging innovation infrastructures, such as the innovation pole. Such an endogenous knowledge creation approach will be crucial in expanding the innovation momentum being established in the region. Also, the surveyed

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evidence showed that chambers of commerce are relatively well trusted and should be given more important roles in developing innovation. In Sofia, the structure of the regional economy is such that more emphasis should be given to matching the requirements of SMEs with those of larger firms, which are the drivers of the regional and national economy.

In Istanbul, there is recognition of the need to speed up the adaptation process from a “traditional economy” to a “learning economy” focused on increasing the knowledge flows among universities, R&D institutes and enterprises, and increasing the mobility of personnel between enterprises and universities. The lack of an innovation culture and intellectual property development is the biggest weakness of the region, and Turkey as a whole, restraining this progression. Initiating an innovation culture in the secondary education system and the universities, as well as establishing communication networks among regional actors will be paramount if these aims are to be achieved. More generally, there is a need to create an innovation culture based on a broader understanding of innovation beyond the R&D framework, by encouraging networks and promoting entrepreneurship among the community of young scientists. However this requires the removal of the institutional and cultural barriers the regions face in attempting to establish a knowledge-based environment.

Across the regions there is an urgent need for leadership, and regional chambers of commerce together with industries are probably best placed to take this role. The leadership of professional networks is critical for economic development since the joint power of these organizations will enable the creation and accessibility of regional knowledge resources. Also, international venture capital may be attracted if the level of dynamism is increased through regional collaboration and international trading. There is a need for commercial and industrial chambers to support their members, which will bring benefits to SMEs. A more integrated approach to development should combine support and advisory services through the whole innovation process, and promote more sector-specific support policy focused on regional SMEs. Future regional innovation policies should be designed to fulfill both ‘quantitative’ and ‘qualitative’ - related to improving the overall organization of innovation systems - targets. Quantitative developments will manifest themselves through the changing role of different actors in the innovation process, as well as through encouraging networks between them.

Clearly, the important step is to convince SMEs, intermediaries and knowledge creators that innovation investments have to be accepted as important factors affecting their medium and long-run growth and competitiveness. In such a context, it has to become transparent that the trade-off between short-run economic performance (related to the cost-benefit ratio) and long-run economic development is almost unavoidable in emerging regional economies. More qualitative development should target universities, which are traditionally viewed as a source of human capital, future employees, and only secondarily as a source of knowledge useful to the firms. As far as the education system is concerned, the next step could be redesigning the curricula in order to better meet corporate demand, since the current (national) education system operating in these regions is not flexible enough to adapt to a continuously changing technological and economic environment.

National curricula may be too slow to respond to change; however this barrier can be alleviated at the regional level by engaging educational bodies and firms in the joint development of specialized courses. It will be necessary to implement awareness raising activities across both the public and private sectors concerning the importance of intellectual property right protection (patents, copyrights, trademarks), particularly as a means of leveraging risk capital as well as more generally the notion of innovation. There is a need to assess the need for changes to the legal framework underlying the commercialization of knowledge. For instance, in Sofia the majority of the research institutions are still fully subsidized by the state, and therefore rely on public support rather than initiating knowledge transfer activities. In general, inappropriate legal frameworks continue to hamper knowledge transfer activities and are in need of upgrading. Furthermore, the impression from the interviews was that intermediary organisations have no clear understanding of their role in transfer of knowledge and innovations to the enterprise sector.

In summary, returning to Nauwelaers and Wintjes' (2003) differentiation between innovation policies that are either firm-level or system-level oriented, the requirements of the regions case-studied here indicate there is considerable overlap between these types. In particular, firm level requirements, such as access to various forms of resource and capital, may only be facilitated through more regionally (or nationally) systemic changes in the socio-economic business culture within which these firms are positioned and operate. This differs from more advanced regions, where firms may face barriers to resource access despite relatively progressive cultural attributes. As indicated by Figure 3, it is clear that strong and effective

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regional leadership and coordination is a basic necessity in ensuring the success of these policies, echoing the focused placed on such factors by the endogenous school of regional development Maillat, 1998a; 1998b; Garofoli, 2002; Vázquez-Barquero; 2007).

Figure 3 About Here

Concluding Remarks

In all three Balkan regions regional policymaking - in terms of both process and content - is a relatively new and novel area of intervention. In many ways, the problems and barriers found in these emerging regions – lack of innovation culture and resource restrictions – and the potential solutions – cluster development and integration of universities into the regional economic infrastructure – resonate with those made apparent in the less competitive regions of advanced national economies (Harding et al, 2007; Huggins et al., 2008; Huggins and Johnston, 2009; Rutten and Boekema, 2009). In the case of the emerging regions, however, the policy learning curve remains relatively steep and is coupled with an industrial structure dominated by traditional sectors and activities. There is a lack of regional level awareness of the importance of innovation as a means of competing, and the regions do not currently possess an innovation culture relating to technological, entrepreneurial, learning and network capabilities (although it can be said to exist in segments and fragments within each region). A key part of this culture relates to ‘risk-taking’, with many regional stakeholders – both public and private – still averse to investing time and resources in innovation, with a resulting lack of risk capital.

There is, however, a growing concentration of innovation infrastructure within these metropolitan regions upon which to establish the future growth of knowledge-based activities, but there is a necessity to effectively network this infrastructure. Future development may rely on alleviating a continuing gap between the scientific community and the business community. At present, there is a lack of transparency concerning mutual learning benefits and also disjointed systems of business support, which lack a regional emphasis in term of both strategy and delivery (resulting in an apparent lack of demand for services). A lack of awareness of the potential value of intellectual property, and the lack of a legal framework to manage and protect this property, further hinders knowledge-based development in these regions.

Nevertheless, emerging regions such as those studied here will continue to upgrade towards more knowledge-based economies through sustained exposure to international practices in other regions, particularly through regionally focused projects, such as those supported by the European Commission (Huggins, 2010). Although lessons can be learned from other regions in Europe, there is also scope to learn from successful policies implemented elsewhere in South-East Europe where, for example, Slovenian policy makers have focused their activities towards the importance of networks and cluster building in order to build social and economic ties between businesses (Bartlett et al., 2002). Such efforts contribute to cultivating the right culture amongst economic and innovation actors for creating awareness of the trends in the globalizing economy and the place of regions in this process - especially concerning the requirements of economic actors and institutions in achieving sustainable competitiveness. At a wider level, efforts are required to promote cultural change toward innovation and entrepreneurship, especially in the community of the young generation of scientists and future human capital including school students. Clearly this is a long-term process, but policy agendas are emerging, and in the UK – for example – a range of initiatives have been introduced into the education system at a number of levels seeking to facilitate such change (Huggins and Williams, 2009). Finally, regional economic development, competitiveness and innovation policies, and the manner in which such policies are implemented, form part of the institutional architecture through which regions learn, and regional collaboration initiatives clearly inform this learning (Huggins, 2010). Therefore, policy activities in these regions should be directed toward building cumulative learning through networking activities that will positively impact not only on firms and intermediary organizations but society as a whole.

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Figure 1: Location of the Three Metropolitan Regions



Figure 2: Knowledge-Based Modes of Endogenous Regional Development

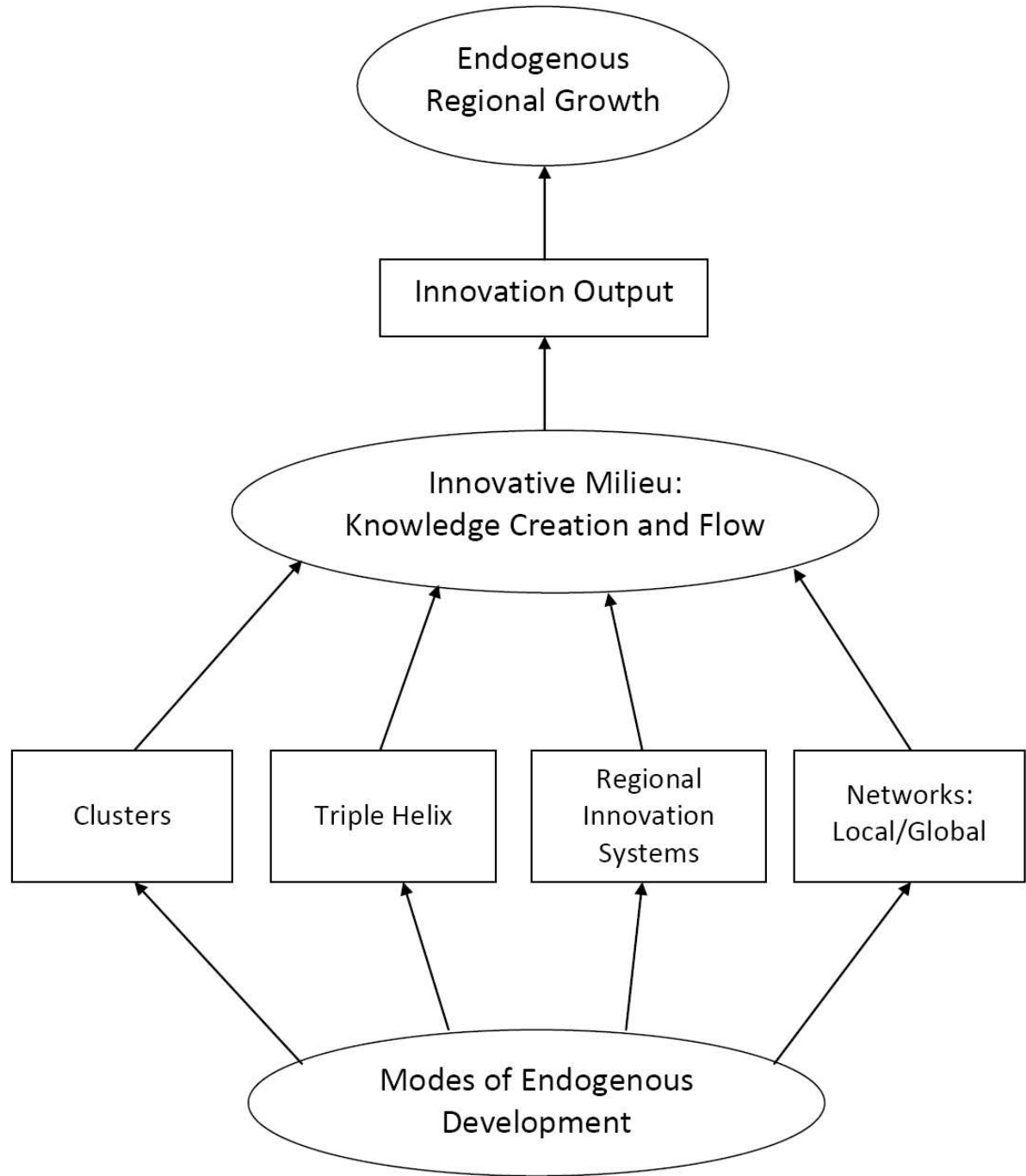
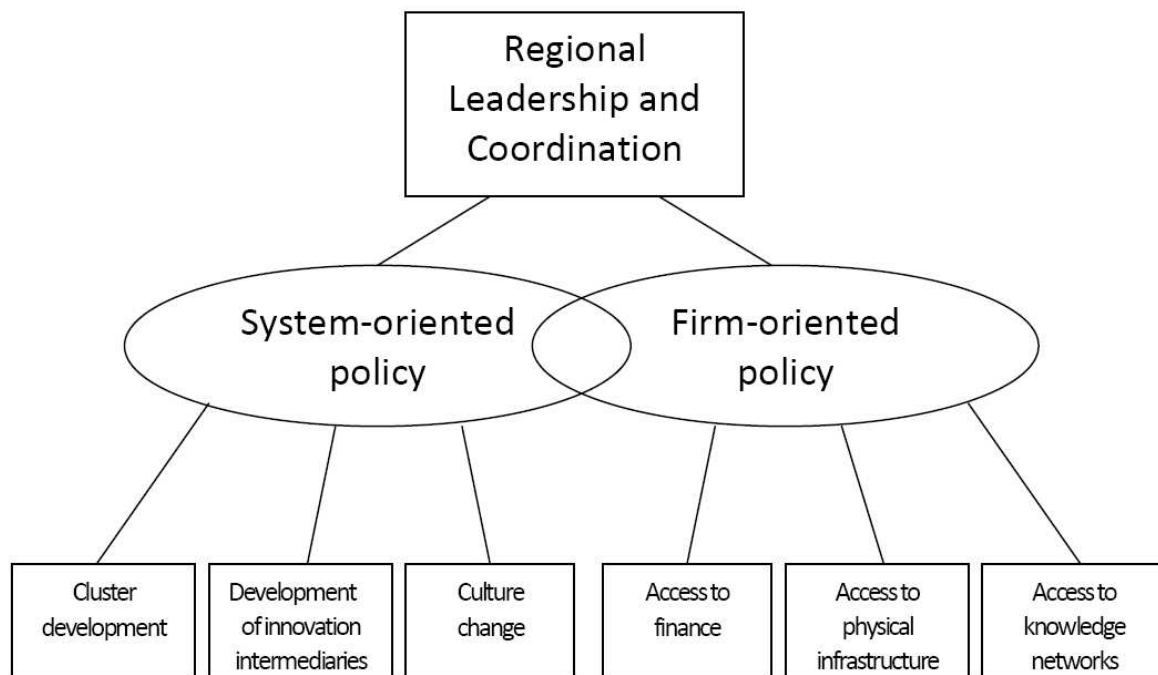


Figure 3: Knowledge-Based Economic Development Priorities in Emerging Regions



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Table 1: Key Focus of Future Regional Policy (% of Responding SMEs)

	Should form the core policy (%)			
	Thessaloniki	Istanbul	Sofia	All
Make finance available to companies for R&D	69	54	77	67
Improve the physical infrastructure	63	46	62	57
Support companies to access new markets	50	56	49	52
Stimulate better supply and demand for knowledge through FDI	53	56	39	49
Create networks that link companies with universities and R&D performers	61	39	47	49
Create system of business support and advice	67	11	62	47
Create access to training and development	50	35	51	45
Stimulate creation of new start-up companies	66	42	27	45

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