Brain competition policy as a new paradigm of regional policy: A European perspective

Christian Reiner

Abstract. The emerging knowledge economy has led to an increase of demand and locational competition for highly-skilled labour. Brain competition policy (BCP) is the reaction from national and regional policymakers. In short, BCP refers to the attraction, education and circulation of talent in and between regional and national economies. This new focus on human capital instead of physical capital indicates a paradigmatic shift in innovation policy and regional policy. While most of the contributions to this new policy approach come from the US, it can be demonstrated that different institutions in Europe prevent the simple copying of those strategies. The article contributes to the ongoing paradigmatic shift by conceptualizing a coherent framework for BCP from a European perspective.

JEL classification: R58, 032

Key words: Brain competition policy, human capital, innovation, Europe

1 Introduction

Highly-skilled individuals are one of the key factors for innovation and knowledge-driven economic development (Lucas 1988; Florida 2002). They have become more and more mobile in the last decades, thereby functioning as ‘knowledge spillover agents’ (Bergman and Schubert 2005). They transfer valuable knowledge from one region to another and contribute to the upgrading of regional knowledge pools by means of their mobility, triggering positive static and dynamic externalities (Döring and Schnellenbach 2006; Saxenian 2006). As a consequence, there is hardly any current sectoral or territorial innovation strategy without some recommendations to increase the attraction of talent (ILO 2006; OECD 2009). Concomitantly, a new body of regional and innovation policy research is emerging that proposes a new paradigm centred on human capital as the main driver of knowledge economies (Florida 2002; Markusen 2008; van Dijk et al. 2009).

Alas, compared to the US and Canada or Australia, Europe seems to have a rather weak position in the competition for global talent (Table 1). It shows two deficiencies: on the one side,
there is a brain drain of European talent to the US; on the other side, a weakness concerning the attraction of non-European talent can be observed (EC 2000, 2007; Peri 2005; Goldstein and Cervantes 2008). According to Tritad (2008), the European brain drain can hardly be interpreted as a form of beneficial brain circulation because return rates to Europe are rather – even increasingly – low and returnees are relatively old, which lowers the possible gains for European source countries. Due to comparatively high percentages of tertiary educated people living abroad, European states have a quantitatively large diaspora. Ageing, an undersupply of native graduates in science and technology and a fall back in productivity growth compared to the US, further aggravate the prospective performance of Europe (Sapir 2007). Europe risks constraining future economic growth and the relocation of knowledge intensive businesses if the latter cannot hire human capital according to their needs (Reinstaller and Unterlass 2008). As a response, the Presidency Conclusions of the Lisbon Summit (2000) claim “to ensure that Europe offers attractive prospects to its best brains... and to attract and retain high-quality research talent in Europe”.

Concomitantly and as a result of the new policy orientation under the Lisbon strategy, the EU and several member states started to launch policy programmes with the aim of curtailing the European brain drain and to pull foreign talent to Europe (for overviews see e.g., Boeri and Brücker 2005; Mahroum 2005; ILO 2006; OECD 2008). As a result of the complex bundle of factors that drive the mobility of highly-skilled workers, policy actions encompass a wide array of policy fields ranging from taxation issues to university reforms; anyway, the political debate rather concentrates on migration legislation. They are implemented at different spatial scales following the multilevel governance scheme of the EU and the specific degree of devolution in different member states. Contrary to the US or Canada, which launched their first legislation in favour of highly-skilled immigration as early as 1952 and 1967 respectively, European states and the EU started to set policy actions in favour of the highly skilled only recently. These measures can be interpreted as a delayed policy spillover from the US or other immigration economies such as Canada or Australia to Europe and a catching-up process of the EU in the competition for talent. Some of these measures show a striking similarity with US institutions and regulations. For instance, the US green card was imitated, *inter alia*, by an EU-proposed ‘blue card’ and a German ‘green card’. The US talent magnet, the Massachusetts Institute of Technology (MIT) was copied for example, by the EU with the setting up of the European Institute of Innovation and Technology (EIT). Eventually, the European Commission initiated the creation of a common labour market for researchers (European Research Area) and a harmonized entry scheme for non-European researchers (scientific visa) to be competitive with the US in terms of critical masses and labour market size (EC 2000). Besides some similarities between the policy actions taken in the EU countries, there are also remarkable differences depending on the country-specific context.

Table 1. Brain drain or brain gain? Canada and the US in comparison with the ‘big four’ EU economies

<table>
<thead>
<tr>
<th>Share of foreign population with tertiary education</th>
<th>Percentage of people with tertiary education, living abroad</th>
<th>Migration balances for star scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>38.0</td>
<td>4.9</td>
</tr>
<tr>
<td>United States</td>
<td>26.1</td>
<td>0.5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>34.8</td>
<td>16.7</td>
</tr>
<tr>
<td>France</td>
<td>18.1</td>
<td>3.9</td>
</tr>
<tr>
<td>Germany</td>
<td>14.9</td>
<td>8.8</td>
</tr>
<tr>
<td>Italy</td>
<td>12.2</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Notes: 1 Data: OECD (2008); 2 Data: World Bank (2008); 3 Star scientists are defined according to the ISI Highly-Cited.com database, Data: Maier et al. (2007).
Spain, for example, focused on a reform of its university system which was characterized by several unfavourable conditions for young researchers (Morano-Foadi 2005). The Spanish government launched the ‘Ramón y Cajal’ programme in 2001 which targeted researchers with a PhD (Cruz-Castro and Sanz-Menéndez 2005). This programme should, inter alia, facilitate the return of Spanish researchers working abroad and attract foreign researchers to Spain. An evaluation in 2005 concluded that the goals of the programme were achieved rather well (Cruz-Castro and Sanz-Menéndez 2005).

The United Kingdom emulated Canadian and Australian examples and established a point-based system that favoured the highly-skilled. Additionally and contrary to Germany or Austria, for example, the UK opened the borders for workers from the new EU member states in Eastern Europe right after their date of accession without any transition period or restrictions. Taken together, the result of this policy change has been a shift of the UK’s position in the competition for talent from brain exchange, namely, inflows more or less equal outflows, to a remarkable brain gain.

As mentioned above, Germany tried to follow the US example and offered a so-called ‘green card’ to attract foreign, namely, non-EU IT professionals (Kolb 2005). The number of applicants under this entry scheme remained below expectations, for various reasons. Yet, the green card and the surrounding political discourses served as a vehicle to reform the restrictive German immigration regime into a system with explicit selection mechanisms in favour of highly-skilled individuals (Hoffmann 2009).

As these examples demonstrate, there is no systemic and comprehensive policy framework that might inform and support European policy agents in the competition for talent. Following a new stream of empirical and conceptual research, the argument is that the already existing policy approaches from the US such as those proposed by Florida (2002, 2007) or Saxenian (2006) are not easily applicable to the European context (Asheim 2009; Boschma and Fritsch 2009; Hansen and Niedomysl 2009). European economies differ from the US in their migration history and legislation (Hermann and Hunger 2003; Martin 2006; Schmidtke 2009), their socioeconomic system (Hall and Soskice 2001; Aiginger and Guger 2006), and their business and university sector structure and performance (Dosi et al. 2005; Peri 2005; Aghion et al. 2008). To name just a few vital differences, the following examples may illustrate that these differences are nothing but ephemeral: compared to the US, EU immigrants have been relatively low skilled triggering negative network-effects regarding the skill composition of foreign immigrant workers (Zimmermann 1995; Locher 2003; Elrik 2008; Waldorf 2009); EU labour markets remain segmented along different regulatory regimes and language barriers (Weizsäcker 2006; Zimmermann 2008); European economies have a more compressed and egalitarian wage structure with smaller wage premiums for the highly skilled (Peri 2005; Sinn 2008); European firms are less technology-intensive and becoming an innovative entrepreneur in Europe remains cumbersome (EC 2007; Veugelers 2009); universities in Europe are outperformed by their US competitors in terms of excellent research and career opportunities for young researchers (Bauwens et al. 2007; Aghion et al. 2008; Pottelsberge 2009). Yet, as a qualification of these arguments, it has to be stressed that there are big differences even between the EU member states. The UK is a prominent outlier especially, in the European context (Table 1).

Hence, this paper proposes a framework that acknowledges the distinctive structures and institutions of the EU and its member states in the competition for talent. The proposed concept is denoted as brain competition policy (BCP). BCP is defined as attraction, retention, education, circulation and utilization of talent functioning as knowledge spillover agents in and between regional, national and supranational economies. The concept of BCP was formulated on the basis of encompassing case studies on related policy actions, instruments and actors on various spatial scales in a number of European countries with a special focus on Austria (Reiner 2009).
Thus, the elaborated framework and typologies are analytical not empirical, even though they have been partly derived from empirical research. Talent or highly skilled refers to four occupational groups of outstanding importance for the competitiveness of European regions: engineers, corporate researchers, students and academic researchers. The contributions of the BCP-framework to the related literature are as follows: First, a common terminology is established to capture the relevant aspects of highly-skilled mobility in a systemic manner. Second, the framework conceptualizes the importance of the regional level and regional clusters in shaping global flows and stocks of knowledge spillover agents. Third, a European perspective is adopted which contextualizes BCP in order to account for institutional differences between the US and European states.

The paper is organized as follows: Section 2 presents the main elements of the BCP framework. Section 3 delineates the concept of complementarity as a key principle of successful BCP actions. The fourth section concludes and draws some policy implications for the EU.

2 Conceptualization of BCP

Brain competition policy is about the attraction, retention, education, circulation and utilization of talent functioning as knowledge spillover agents in and between regional, national and supranational economies. BCP is based on the complexity of factors that shape the mobility and location decisions of highly-skilled workers. While the mobility of students and academic researchers is heavily influenced by the structure and performance of the university sector, locational choice of engineers and corporate researchers is affected by the structure and performance of the business sector. Due to the convergence of migration regulations via policy spillovers (race to the bottom for highly skilled workers and race to the top for low skilled workers), industrial structure and university performance gradually gain importance (Boeri and Brücker 2005; Peri 2005, 2007; OECD 2009). The theoretical basis is mainly made up of the following concepts: varieties of capitalism, knowledge base, knowledge spillover, learning, proximity, chain migration, human capital and clusters. It proposes a multi-level and multi-policy field approach as an appropriate policy model for the European context. Several cases revealed a lack of coherence between different policy actions and strategies (OECD 2006, 2009). According to Angenendt and Parkes (2008, p. 1): labour migration policies in the EU “have been unco-ordinated, self-contradictory and geared to short-term priorities”. Hence, the main building blocks of BCP are conceptualized around the notions of co-ordination and complementarity, stressing the relevance of coherence in this emerging policy field.

The relation of BCP to other policy fields can be explained by the main factors that influence stocks and flows of talent according to Table 1. Usually, each of these factors (migration and mobility, socioeconomic context, university and business sector) is associated with specific policy fields (Figure 1). BCP is a cross-sectional matter which has to be addressed in different policy fields. Comparable with other emerging policy issues such as innovation policy, an increasing complexity of policy actions and strategies, cross-cutting several formerly rather isolated policy fields, can be observed (Lundvall and Borrás 2006; Laranja et al. 2008). Subsequently, the main building blocks of BCP are presented and a common terminology is suggested to facilitate a common understanding, to induce coherence in a quite complex and fragmented policy field and to address the relevant issues systematically.

Mobility and location decisions of the highly skilled are shaped by policy actions implemented at various spatial scales. Moreover, a variety of policy fields organized quite differently in the EU member states are relevant in providing attractive conditions for highly-skilled workers. As a result of this multidimensional policy approach, a strong case is made for taking...
Three co-ordination issues emerge as relevant preconditions for efficient and effective policy designs: vertical, horizontal and lateral policy co-ordination.

### 2.1 Vertical policy co-ordination

Vertical policy co-ordination refers to the co-ordination of policy actions at different spatial levels. Pointing out a broad-brush picture of the European situation reveals substantial differences to the US. Several policy fields depicted in Figure 1 are subject to the specific European scheme of multi-level governance (Heywood 2007). Vertical co-ordination tasks depend on two factors: the policy field and the distribution of political power between the different geographical scales. The importance of the regional level in BCP is strongly influenced by processes of devolution or centralization. In the following, vertical co-ordination is discussed from a positive and a normative perspective. The discussion of normative issues will be restricted to migration policy.

Which policies are implemented at which spatial scale? Migration policy and the university and business sector related policies are quite different regarding the division of political competences at different spatial scales. Migration policy is traditionally one of the core competences of the national level. Regional policy-makers have no or only minor competences. However, as the example of Canada demonstrates, this is not always the case: The ‘Provincial Nominee Program’ enables regional policy-makers to select immigrants according to specific regional needs. Regions can attract highly-skilled workers even if they are not allowed to enter the

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**Fig. 1.** BCP as a multi-level and multi-policy field approach. Actors and policy actions
country according to the criteria of the national point-based system (Schmidtko 2009). There are no comparable examples of a regional migration policy in Europe. Instead, there is a weak tendency to shift political power from the national to the supranational level of the EU.

The role of the regional level in BCP is much more important in university and business sector-specific policy fields. Empirical research on residential choice of foreign highly-skilled workers in Germany showed a strong influence of labour-market conditions and university performance (Burkert et al. 2007). Cluster policies as part of a proactive industrial policy, for instance, are typically sub-national policy issues with a potentially decisive impact on regional labour market dynamics. Yet, Europe has relatively few globally visible clusters (EC 2008). National borders and excessive federalism in small states lead to the proliferation and duplication of small and fragmented clusters below the critical size necessary to become effective attractors for foreign talent. Hence, fostering co-ordination between regional clusters to achieve critical masses and stronger centripetal forces to pull talent to Europe is an important task for the EU countries and regions. Establishing external linkages (‘global pipelines’) via the mobility of engineers and scientists, in turn, is an essential prerequisite for the enduring innovativeness of regional clusters (Bathelt et al. 2004; Saxenian 2006; Gertler 2008).

While cluster and innovation policies are frequently decentralized policy fields with some co-ordination at the EU level, university policy is rather different. Comparing a decentralized university system in Germany with a centralized system in Austria shows substantial differences in the possibilities of regional policy-makers to set BCP policy actions via university policy. In Germany, universities are regulated by the federal states. For example, North Rhine-Westphalia, a federal state in Germany, established, inter alia, a programme to lure back German junior post-doc nanotechnology researchers who stayed abroad for at least 24 months. The regional government offers the respective junior researchers tenure track positions and the possibility to build up new autonomous research groups. The funding amounts to a maximum of 1.25m Euros for five years per research group. To launch such a programme would be challenging for Austrian regional policy-makers. The competences for university policy are concentrated on the national level. For instance, Austrian regions finance just a few endowed professorships or visiting professorships to attract academics with region-specific research foci to the region. As a result, Austrian regions are only minor players in BCP-related university policy.

Which spatial level is best suited for European migration policy to attract foreign talent? This normative perspective on spatial level migration policy assignment can be analysed by applying fiscal federalism theory (Oates 2005). Two arguments can be derived and both point to the advantages of a stronger centralization. First, in the case of star scientists, knowledge spillovers are not restricted to the region of residence. Especially small states like Austria or Denmark may not have the size to capture all positive externalities. Following the argument of fiscal congruency, this leads to suboptimal investment in the attraction of star scientists (Bretschger 1999). Thus, there is a case for a policy agenda on the supranational, namely, the EU level (Schiller and Revilla-Diez 2008). Second, the division of the European economy into separate labour market areas for non-EU highly-skilled workers calls for centralization because of the following reasons: small labour markets are less attractive for highly-skilled migrants than large ones (Weizsäcker 2006). In addition, the allocation of foreign highly-skilled individuals will be more efficient if they can move freely within the EU. Finally, an inflow of labour in one country affects the labour market equilibrium not only in the receiving country but also in other EU countries; if immigrants are not allowed to move between them, non-migrants have to move instead (Zimmermann 1995).

Taken together, national migration policies are potentially damaging in a spatial economy with the free flow of factors and goods (Zimmermann 2008). The advantages of a large labour market for researchers – an essential prerequisite for competing with the US – can be realized only by harmonizing parts of the migration legislation at the EU level. Alas, given the substantial
differences in country-specific preferences in migration matters and the unanimity criterion of the European Council for migration legislation, decisions towards enhanced efficiency of the EU labour migration policy are rather unlikely (Bendel 2008). Nevertheless, there is also an argument in favour of the regional level. Fiscal federalism suggests that decentralized decision-making may be better suited to regional needs. Regional policy-makers have a superior knowledge about skills needed in the regional economy. Hence, centralized EU immigration policy should be complemented by the decentralized formulation of needs on the regional level. Alas, both EU initiatives to centralize highly-skilled immigration policy, namely, the blue card and the scientific visa, failed to create an integrated and homogenous EU labour market for non-EU highly-skilled workers. They both started with ambitious initiatives from the European Commission but failed to overcome national economic protectionism and cultural differences between the EU member states.

2.2 Horizontal policy co-ordination

Horizontal policy co-ordination denotes the co-ordination of policy actions between different policy fields, typically associated with different ministries. Besides migration policy Figure 1 depicts eight additional policy fields that are of increasing relevance in shaping the competitiveness of Europe as a location for talent. Four crucial horizontal co-ordination tasks are presented. First of all, university policies foster exchange between researchers and students, but migration policies inhibit short-term visits of academic scholars due to a highly-restrictive granting of visas for academics in a number of EU countries (OECD 2006). Second, a number of European mobility programmes support a stay abroad for European academics; the location typically chosen is the US. While this is in principle a wise strategy to tap foreign knowledge pools, it has to be ensured that these scientists have the possibility to return and to apply their new knowledge in Europe. Sending students and scholars abroad without concomitantly upgrading European universities and providing attractive return possibilities fosters harmful brain drain of students and academics instead of benign brain circulation. ‘Network-based competition’ with advantages for national, immobile talent as opposed to ‘excellence-based competition’ (Pottelsberghe 2009) for tenure positions at European universities systematically impedes the reintegration of national talent residing abroad into national innovation and university systems (Morano-Foadi 2005). Third, despite the free mobility of labour inside the Common Market, legally guaranteed since the Treaty of Rome in 1957, mobility is still low and the associated costs are frequently prohibitive. One reason for this is the limited portability of social security claims such as pension rights between different countries (Boeri and Brücker 2005). Hence, co-ordination between mobility and social policy would be necessary to reduce mobility penalties. In this respect, Pottelsberghe (2009) suggests a pension scheme for academic researchers valid throughout the EU. Fourth, policies to attract foreign talent have to be co-ordinated with developing policy if the source regions are located in developing countries. For example, the EU blue card was heavily criticized by Kancs and Ciaian (2007, p. 36): “Blue Cards (BC) will harm the innovative capital and hence long-term growth in the less developed sending countries considerably more than other forms of labour migration, because both migration incentives are higher and the adverse selection of migrants is higher under BC”. Yet, recently published research results like the ‘new economics of brain drain’ suggest a much more nuanced view on brain drain from developing countries, emphasizing the possible gains from brain circulation and the positive externalities on human capital investment accruing from the prospect of emigration (Stark 2005; Saxenian 2006; Agrawal et al. 2008). Hence, there is a need to carefully co-ordinate attraction policies with development policies to avoid adverse distributional effects between sending and receiving regions and to ensure win-win outcomes for developed and developing countries (OECD 2006).
2.3 Lateral policy co-ordination

The success of BCP depends, *inter alia*, on the co-ordination between structural issues and technical issues (Mahroum 2005). While the former are factors shaped by tradition and culture (e.g. meritocracy, xenophobia, attitudes towards technology and research, etc.), the latter include issues that are directly linked to legislation (e.g. immigration regimes, taxation, etc.). The influence of policy on structural issues is only indirect and change may take a long time. By contrast, technical issues are under the direct influence of the state. Quite a few BCP initiatives lack the proper balance between developments in structural and technical issues and thus, fail to achieve the proposed policy goals (Mahroum 2005; OECD 2006). Among others, the following two lateral co-ordination issues are relevant for the European context. First, a number of European countries, including Austria, display a very and increasingly restrictive asylum and immigration policy for low-skilled workers, which, together with the questionable results of integration policy increases xenophobia (Zimmermann 1995). Nevertheless, these countries concomitantly hasten to open the borders for highly-skilled workers. Besides the question of humanity, such restrictive policies may produce negative spillovers, giving those countries a bad image and lowering the prospects of attracting highly-skilled individuals by increasing the entry barriers because of negative attitudes towards foreigners (Haas 2008). Such images and attitudes as typical structural issues can only be changed in the long run. Second, language is a typical structural feature of states. Europe has many languages; most of them are hardly taught outside Europe and most of them are rather irrelevant for cutting-edge research. Hence, states like the UK, the US or Sweden, where the university system turned to English as lingua franca several decades ago, have an important linguistic advantage based on two factors: First, English is taught in a large number of countries and it is the main language of science. The importance of English language skills is underlined by the empirically results from Bauwens et al. (2007): If France improved its proficiency in English by 10% (i.e., approaching the level of the Netherlands), the number of highly-cited French researchers would increase in the long run by 25%. Graduate teaching and publishing ought to be done in English if reforms of technical issues (e.g. lowering immigration barriers for foreign academics) will be successful (Bauwens et al. 2007; Zimmermann 2008). An additional positive outcome of such reforms would be the creation of a more homogenous European labour market for academic researchers and a boost for the European research area.

3 Complementarities in BCP

Policy-makers face a fundamental decision in designing BCP: should the region rely on internal human resources and enhance their education and utilization, or should the region attract external human resources (Straubhaar 2000). Accordingly, internal brain competition policy is defined as all policy measures which aim at fully utilizing intraregional human capital. External brain competition policy comprises all policy actions supporting the utilization of extraregional human capital. Whereas current policy measures are predominantly external BCP measures, it is important to acknowledge the strategic role of internal BCP. Catching-up processes and demographic ageing in traditional labour source countries such as Central and Eastern Europe and the ‘BRICs’ (Brazil, Russia, India and China) result in a growing number of countries that compete to attract the same pool of human capital. Hence, it becomes increasingly risky to solely rely on a permanent inflow of external human resources (EC 2007; OECD 2009).

The specific relevance of internal BCP in the European context consists of four factors. First, European economies fail to adequately utilize foreign talent residing in Europe according to their educational level significantly more often than non-EU OECD countries. Italy, for
example, has a twice as high over-qualification rate as the US or Canada (OECD 2008). Since part of this brain waste might be attributed to the high level of labour market protection in Europe, this is a specific European problem (Boeri and Brücker 2005; Sapir 2007). Second, brain drain of European talent demonstrates that even natives are unsatisfied with their situation. This is a clear indication of the relatively unfavourable conditions inside the European university and business sector. Third, European labour markets are characterized by lower mobility levels, even among the highly skilled (Asheim 2009). Hence, European policy-makers, especially on the regional level, cannot rely as much as their American counterparts on external human capital as suggested by Florida (2002); the utilization of internal human capital relatively gains in importance (Hansen and Niedomysl 2009). Fourth, the accumulation and utilization of regional human capital is crucial for those regions whose industrial base is made up of industries with a synthetic knowledge base. Such industries rely more heavily on path-dependently accumulated tacit knowledge, embedded in a specific industrial and regional setting frequently characterized by strong social ties and social propinquity (Asheim and Gertler 2004). Following the varieties of capitalism approach and the knowledge base literature, the industrial core of European co-ordinated market economies is based on diversified quality production and a synthetic knowledge base whereas Anglo-Saxon liberal market economies are based on high-tech and project-oriented industries with an analytical knowledge base (Hall and Soskice 2001; Høgni Kalsø, Vang and Asheim 2005; Asheim 2009). Hence, intraregional human capital formation organized by region- and firm-specific education and training institutions and stability of the regional labour force is relatively more important in the European than in the US context. Eventually, internal and external BCP are interrelated because of a number of crucial complementarities between them. There are three outstanding complementarities: a knowledge complementarity, an attraction complementarity and a retention complementarity.

3.1 Knowledge complementarity

On the one hand, an effective internal BCP in the sense of a well-trained and integrated regional workforce increases the absorptive capacity of the regional innovation system and the utilization of external knowledge spillover agents. On the other hand, regional economies may face some knowledge gaps if the knowledge of foreign talent systematically differs from the intraregionally produced knowledge. In this case, the knowledge of extraregional talent complements the knowledge of intraregional talent. Several cases can be mentioned: first, institutional knowledge about foreign markets or language skills is essential for export-oriented industries and the opening of new markets (Sauter 2009). Second, different universities or research institutes produce different qualities in output. For instance, it may be very difficult for a small peripheral university in Europe to educate students who can be regarded as substitutes for graduates from MIT or Harvard University. Third, taking into account that invention activities are a spatially highly uneven phenomenon, it is clear that some regions have a head start due to the accumulation of new and unique knowledge. It is impossible to replace a highly-skilled professional who received working experiences in the leading region by national or regional professionals.

3.2 Attraction complementarity

An effective internal BCP, results in a higher competitiveness in attracting extraregional talent. This is due to a number of factors: first, Europe fails to efficiently utilize foreign talent (see above). From a microeconomic perspective of migrant networks, this will result in suboptimal outcomes: as long as foreign talent systematically fails to reap their expected returns from human capital investments, rational migration and diaspora networks will communicate these
suboptimal labour market outcomes, and positive externalities from chain-migration may be forestalled (Locher 2003). Second, a region without a substantial stock of foreign talent has to start from scratch in order to become an attractive location. Markusen (2008) suggests a human capital strategy which initially focuses on high-quality education and training institutions matching with the demand of the regional labour market. “The goal is to build a regional identity around key occupations that allows it to be known as a ‘place to be’ for that occupation” (Markusen 2008, p. 59). Based on this specialization, namely, regional occupational and industrial clusters, the attraction of external talent may become possible. This points to the relevance of establishing visible and viable regional clusters with a close co-ordination between industry and universities (Bramwell and Wolfe 2008). Regions will not succeed in the attraction of specific skills if there are no sufficient relations between potential incomers and regional universities or firms. In other words: “Instead, regions may have to pay more attention to the human resources already present in the region (or with social links to the region) and base planning policies upon them” (Hansen and Niedomysl 2009, p. 203).

3.3 Retention complementarity

An effective internal BCP is an important factor inhibiting brain drain. A large part of the brain drain results from insufficient conditions and opportunities in the home region. Individuals facing the danger of brain waste and seeing better academic or economic opportunities abroad will ‘vote with their feet’ in order to reap the benefits of their human capital investment or to make an additional human capital investment, for example, by working together with star scientists in the respective field. Hence, one way to retain talent is to provide and facilitate attractive labour market conditions and possibilities to upgrade their knowledge. A case in point is the differences in university governance and structure between Europe and the US. A negative net-migration outflow of European PhD students to US universities, with a concomitantly low ability to attract non-European PhD students to Europe, raises the question of political countermeasures (Moguerou 2006; Goldstein and Cervantes 2008). While the concentration of star scientists in the US provides an important pull factor for European PhD students, the design of European PhD programs also acts as a substantial push factor. The traditional European PhD program is based on the ‘apprenticeship model’, while the Anglo-Saxon universities offer a ‘professional model’ for their PhD students. While the former consists of an individualized professor-student relationship, the latter is a structured programme where the whole institute or department is responsible for the education of the PhD students. Contrary to the European apprenticeship model, professional models provide students with a number of courses tailored to their specific needs and with a wider range of advisers supporting research endeavours. Hence, the promotion of competitive graduate schools along the lines of the ‘professional model’ in European universities would enhance the attractiveness of European PhD programmes and foster the retention of European graduate students (Aghion et al. 2008).

Taken together, external and internal BCPs are intrinsically tied together. The efficiency and effectiveness of the former fundamentally depend on the proper-functioning of the latter. Increasing Europe’s competitiveness in the competition for talent should include external as well as internal BCP.

4 Conclusions and policy implications

In the course of the emerging knowledge economy and the implementation of policy strategies such as the European Lisbon Strategy, highly-skilled individuals have become much more important in national, regional and sectoral development strategies. This paper developed a
policy framework from a European perspective in order to systematically address the main factors that are relevant in formulating policy strategies in the competition for talent. Brain competition policy (BCP), as the framework is denoted, is based on the concepts of co-ordination and complementarity as prerequisites to achieve the positive externalities frequently associated with the mobility and circulation of knowledge spillover agents.

Summarizing the main policy implications derived from the BCP framework, European policy-makers may consider the following policy tasks: first, mobility of talent is shaped by a complex set of factors, crossing traditional divisions, for example, between industrial or university policy and migration legislation. Hence, policy agents have to co-ordinate policy actions implemented at different spatial scales and in different policy fields. Second, policy-makers should signal to society that foreign talent is an essential ingredient for economic development instead of abusing non-native workers or even asylum seekers as scapegoats for unemployment or growing inequalities. A positive and adaptive attitude towards foreigners should figure more prominently on the policy agendas of European states. Third, removing or attenuating regulatory or language barriers which inhibit the free circulation of foreign and European talent inside the EU, namely, achieving a critical labour market size for highly-skilled workers, is recommended. A centralization supplemented by a concomitant regionalization of certain mobility policy issues may be a progressive approach to reach this goal. Fourth, facilitating the return migration of European expatriates and their re-integration into the university and business sector ought to lower brain drain rates and foster brain circulation. Policy agents who act as mediators and boundary-spanners due to the set up of networks connecting the European highly-skilled diaspora and the European science base can support such beneficial mobility patterns substantially. Fifth, internal and external BCP are interrelated but internal BCP is relatively more important for European countries and regions than for the US. It would be misleading to concentrate political efforts on the attraction of the foreign highly skilled without a strong commitment to the development of regional and national talent.

Despite all the efforts of European countries and regions to become more attractive locations for highly-skilled workers, there are good reasons to be cautious concerning their immediate success. The creation of effective migration channels for the influx of foreign talent requires time and resources; governments have to invest in these networks with a long-term perspective (Zimmermann 2008). Once such networks have been established, they work in a self-reinforcing manner. Nevertheless, the situation for implementing such policies can be advantageous, because of a policy change in the US after the terrorist attack in 2001 and the beginning of recession in 2008 (Zucker and Darby 2007; Wadhwa 2009). Both events triggered nationalistic responses, weakening the US as a global talent magnet due to strongly decreased quotas for the H-1B visas and stimulus packages favouring natives to foreigners in the job market. Yet, the EU seems to be rather ill-prepared to capitalize on this window of opportunity by redirecting global knowledge flows and human capital from the US towards European regions. The discussion of and resolution on the EU blue card demonstrated that the EU is, as far as immigration policy is concerned, rather a bunch of nation states separated by tight borders than a space for the free movement and circulation of knowledge spillover agents fostering innovation and growth in Europe.

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Las políticas de competencia por talento como un nuevo paradigma de política regional: una perspectiva europea

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Abstract. La emergente economía del conocimiento ha llevado a un aumento de la demanda y competencia en localización de mano de obra altamente especializada. Las políticas de competencia por talento (PCT) son la reacción nacional y regional de formuladores de políticas. En resumen, PCT se refiere a la atracción, educación y circulación de talento dentro de, y entre, economías regionales y nacionales. Este nuevo enfoque en cuanto a capital humano en lugar de capital físico indica un cambio paradigmático en políticas innovadoras y políticas regionales. Aunque la mayoría de aportes a este nuevo enfoque de políticas proviene de los EE.UU., se puede demostrar que las diferentes instituciones europeas impiden el copiar simplemente dichas estrategias. El artículo contribuye al cambio paradigmático continuo mediante la conceptualización de un marco coherente para PCT desde una perspectiva europea.

JEL classification: R58, 032

Palabras clave: Políticas de competencia por talento, capital humano, innovación, Europa