



European
Research Area

EUROPEAN POLICY BRIEF



SEARCH
SHARING KNOWLEDGE ASSETS:
INTERREGIONALLY COHESIVE
NEIGHBORHOODS

**Sharing Knowledge Assets: InteRegionally
Cohesive Neighbourhoods (SEARCH) Project**

Ongoing project (01/08/2011- 31/07/2014)

**KNOWLEDGE DIFFUSION BETWEEN EUROPEAN
NEIGHBORING COUNTRIES AND THE EUROPEAN
UNION**

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November 2013

INTRODUCTION

KNOWLEDGE FLOWS BETWEEN ENC AND EU

The ability to diffuse knowledge and to access external knowledge has long been recognized as a crucial mechanism for knowledge accumulation and economic growth. Due to the public nature of knowledge, diffusion of ideas produces increasing returns that are at the root of growth dynamics. In this perspective, knowledge flows from European Union (EU henceforth) towards European Neighboring Countries (ENC henceforth) is likely to help these countries to catch up.

Moreover, theoretical as well as empirical studies (Jacobs, 1969, Reagens and Zuckerman, 2001, Nooteboom et al., 2007) have pointed out that new knowledge creation benefits from cross-fertilization. Scientific, technological, cultural diversity is recognized as a key driver for innovation. To this regard, knowledge flows among EU and

its neighbors could benefit to the whole area.

This policy brief aims at describing main findings, and related policy implication, about quantifying the intensity of knowledge flows between EU countries and ENC countries, and to assess the channels through which this diffusion occurs.

Three main issues are addressed:

- To what extent ENC and EU exchange their knowledge?
- How are these knowledge flows structured?
- How is this knowledge diffusion evolving over time?

The aim concerning policy is to contribute to build the Neighboring Knowledge Space.

This policy brief forms part of SEARCH's policy brief series. It contains key observations on the innovation diffusion process among EU countries and ENC.

EVIDENCE AND ANALYSIS

The results provide original insights in the analysis of the different mechanisms of knowledge diffusion between EU and ENC. The insights provided by the study are original. To the best of our knowledge, no systematic analysis has been provided so far to measure the intensity and structure of knowledge diffusion between EU and ENC.

THE RESEARCH FRAMEWORK

The information about technological and scientific relationship between EU and ENC is scarce. **The analysis focuses on five variables: patents, publications, FP projects, student mobility and IPR.** To this regard, it allows to cover different aspects and channels of knowledge diffusion. However, this cannot provide us with a complete overview of the scientific and technological linkages existing between the two areas.

Results highlight the differentiated role played by the different knowledge diffusion channels. **Scientific and technological collaborations build upon historical and commercial linkages due to proximity and are favored by common languages while for intellectual property** that is to say the nationality of offices where patents are filled, the geographic dimension plays a lesser part. Europe is therefore less central. For student's mobility, the origin of student is mainly driven by the continent where the country is located.

KNOWLEDGE FLOWS CHANNELS

In any case, **the channels for knowledge diffusion appear as weakly developed.** This is especially the case for **IPR collaboration and student mobility, whereas co-authorship and co-inventorship are stronger channels for knowledge flows between the two areas. R&D cooperation taking place in FPs program is really important for only one ENC, namely Israel.**

The study points to various countries' profile among ENC according to their orientation towards the EU :

COUNTRIES' FEATURES

1. The **more Europe-oriented countries:** Algeria, Tunisia, Morocco and Lebanon. For these, more than 75% of scientific and technological collaborations associate a European country (especially France and in a lesser extend Germany). The number of FP6 participations is also relatively high compared to other countries. By contrast, the European orientation is weak for intellectual

property.

2. The **medium high Europe-oriented countries (especially towards Germany)**: Armenia, Belarus, Moldova, Libya and Ukraine. For all these countries, the European orientation is relatively high for scientific cooperations (between 50% and 75% of them associate at least one European country). Europe is also well represented in technological cooperation except for Libya (missing data) and Ukraine. For this last country, the number of FP6 participations is high contrary to others. Europe is well represented in intellectual property only for Libya and in students' mobility for Belarus and Moldova. Beyond Europe, these countries (except Libya) are generally well oriented towards Russia and Asia.
3. The **medium low Europe-oriented countries**: Syria, Georgia, and Egypt. For these countries, Europe is fairly well represented for one indicator only: scientific cooperations for Syria and Georgia, technological collaborations for Egypt. When these countries are not Europe-oriented, they are generally US-oriented.
4. The **low Europe-oriented countries**: Israel, Jordan and Azerbaijan. The two first are mainly US-oriented while the third is mainly Russia and Asia oriented. Israel has a specific profile given the very high number of FP6 participations. The scientific relations between Israel and European countries thus mainly take place under the influence of the EU research policy.

In spite of their relatively **weak orientation towards Europe, Israel, Ukraine and to a lesser extent Egypt take a central place in the knowledge networks due to their higher technological potentials.**

The ability to diffuse and to access knowledge are also **heterogeneously distributed over EU and ENC** giving rise to hierarchical networks in which some countries play a central role.

But the Neighboring Knowledge Space is changing. **Collaborations between EU and ENC are becoming more intense and the influence of the EU is increasing relatively to the one of the US.** Moreover, even if most collaboration networks remain strongly centered on few countries (mainly Israel and Ukraine due to their potential compared to others ENC), the network structures tend to some extent to become more homogenous. Notably, FPs promote a very different knowledge network, in which ENC are more homogeneously

involved, and in which ENC countries collaborate with each other.

POLICY RECOMMENDATIONS

PROMOTING KNOWLEDGE FLOWS CHANNELS

In order to participate in building a Neighboring Knowledge Space, public policies should be developed following two complementary directions.

Firstly, **the channels through which knowledge diffuses should be reinforced.** Since scientific and technological collaborations, built upon historical and commercial linkages due to proximity, are favored by common language, **policy makers should promote mutual knowledge of cultures and languages among EU countries and ENC** in order to encourage the intensification of partnership. For these collaborations, European countries given their public and private research potential on the one hand, and higher physical proximity than USA on the other hand, can offer large cooperation opportunities for neighboring countries.

A mean to favor the mutual knowledge of cultures and languages is to develop students' mobility. This type of flows is mainly determinate by the continent of residence. **Policy makers should encourage a balanced mobility of students from ENC to Europe and vice versa.** The mobility should not only take place in the "academic" courses but also in internships in firms. Of course, the feasibility of balanced mobility can be very different according to countries and more specifically according to the standard of living (studying in Europe often represents for the families a highly cost and this asks the question of reception conditions). This feasibility depends also on the political context (the current situation in Syria for instance prevents balanced mobility).

Another mean to enhance sharing language could be based on the promotion of one specific language throughout the neighboring area. The specific role played by French in several ENC clearly favors their integration within EU knowledge networks. Compared to other areas, and especially US, the EU does not only benefit from its spatial proximity to NCs. EU also holds a comparative advantage based on Francophone. **Policy makers should strengthen this advantage by promoting Francophone.** In this perspective, the development of new technologies opens new opportunities to teach and exchange knowledge with ENC in a common language. **Massive Open Online Courses (MOOC) could in particular be used as strategic tool** to reinforce Francophone and hence knowledge sharing in the area.

For intellectual property, eg. the nationality of offices where

patents are filled, the geographic dimension plays a lesser part than for the scientific and technological collaborations. Compared to cooperation dynamics, the intellectual protection is more in the downstream phase of the research and innovation process and it is closely related to markets and exports dynamics which follow a different logic in terms of geographical dimension. Indeed, the geography of production and export is less concentrated than the one observed for scientific and technological collaborations. **Policy-makers should therefore also develop intellectual property collaboration.** A broader question then arises however on how scientific and technological cooperation could generate other economic dynamics (like export, production and more indirectly employment) which could be favorable for ENC and European countries. Besides, the Europe-oriented IPR depends on the firm's structure in ENC in terms of the nationality of shareholders and subsidiaries. This dimension still requires further investigation.

Secondly, **the actors through which knowledge can be spread should be promoted.** In particular, among ENCs inventors and scientists, those coming from **Israel, Ukraine and to a lesser extent Egypt often appear as central agents** within the knowledge networks. At the same time, these countries are among the less Europe-oriented NCs. **Improving their orientation towards the EU would therefore help fostering knowledge exchanges** both directly and indirectly (since they create indirect ties between other ENCs and between ENCs and EU countries).

From the European side, **the specific role played by Germany and France should be relied on** to develop additional collaborations and foster knowledge diffusion. As French and German inventors and scientists are strongly connected to both EU and ENC countries, they could act as knowledge spillovers agents between the two areas.

The potential role played by the New Member States should not be neglected. Due to their geographical, cultural and sometimes linguistic proximity to certain ENCs, they may collaborate more easily with partners from ENCs. Reinforcing their ability to collaborate and exchange knowledge with their closest neighbors should therefore help to create a Neighboring Knowledge Space.

RESEARCH PARAMETERS

Introductory statement

This policy brief aims at describing main findings, and related policy implication, about quantifying the intensity of knowledge flows between EU countries and ENC countries, and to assess the channels through which this diffusion occurs.

Objectives of the research

The main objectives of the research were to:

- Understand to what extent ENC and EU exchange their knowledge;
 - Clarify how are these knowledge flows structured;
 - Analyse how is this knowledge diffusion evolving over time.
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Methodology

The approach is mainly descriptive. Based on theoretical and empirical past studies, the use of different variables is suggested, each of them enlightening a specific aspect of the scientific and technological relationships between EU and ENC. Special emphasis is given to mobility, collaboration, and knowledge networks.

Using classification methods, groups of neighboring countries are identified that are similar with regard to their degree of orientation towards the EU.

Based on Social Network Analysis, the network structure and the network centrality of each country are described.

This analysis is carried out at the country level, with a comparison of different periods of time over the last 25 years.

PROJECT IDENTITY

Sharing Knowledge Assets: Interregionally Cohesive Neighborhoods
(SEARCH)

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Duration

1st August 2011 and ends the 31st July 2014

**Funding
scheme**

European Community's Seventh Framework Programme FP7-SSH-2010-2.2-1
(266834), 2011-2014
Collaborative Projects

Budget

EU contribution: 2,636,942.00 €

Website

www.ub.edu/searchproject

**Further
Reading**

Autant-Bernard C., Chalaye S. "Knowledge diffusion between European
Neighboring Countries and the European Union" SEARCH WP4.13
