



Project n°: CIT5-028519

Project acronym: U-Know

Project title: Understanding the Relationship between Knowledge and Competitiveness in the Enlarging European Union

Instrument: Specific Targeted Research Project (STREP)

Thematic Priority: CITIZENS-2004-1.2.2 Understanding knowledge

SECOND PERIODIC ACTIVITY REPORT (12 MONTHS) - EXECUTIVE SUMMARY -

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Project coordinator name: Johannes Stephan

Project coordinator organisation name: Halle Institute for Economic Research (IWH)

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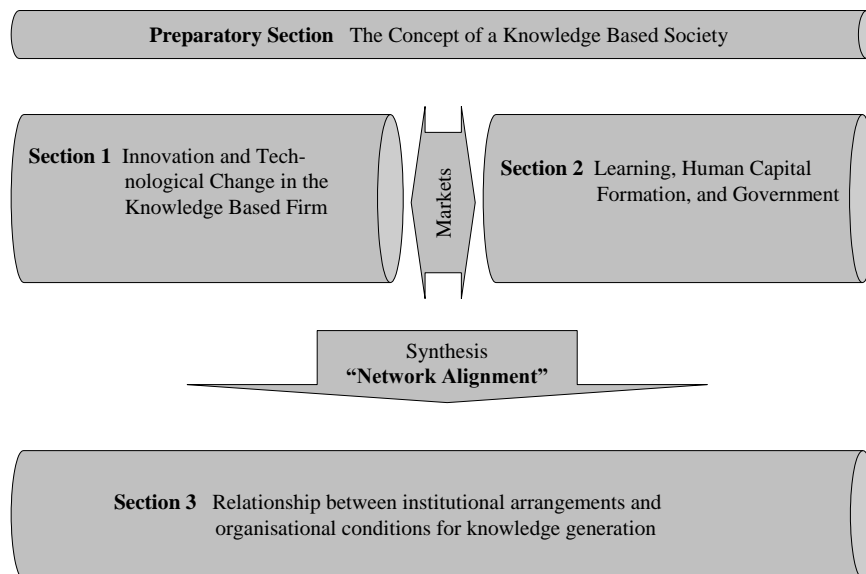
EXECUTIVE SUMMARY

PROJECT OBJECTIVES

The overarching research question, underlying the U-Know project, is to what extent are factors such as specific types of knowledge, institutional arrangements, organisational conditions, incentive systems, cognitive flexibility, as well as network alignment:

- a source of the public and private good properties of knowledge,
- fostering or hindering knowledge creation and use
- drivers or barriers to knowledge transfer and innovation
- and finally shaping new understandings of knowledge itself

The project focuses on the interrelatedness of the enterprise, public science/higher education, and governmental spheres. We apply the 'Network Alignment' approach as a tool to understand the role of knowledge for European competitiveness. Network alignment has arguably been a key ingredient for economic growth in some East Asian countries. Building on this experience, the research team undertakes comparative studies to identify missing, anti-developmental or mis-aligned networks in selected European economies as well as South Africa. Thereby, we take sectoral, regional, as well as economy wide perspectives. This constitutes a key underpinning for extensive policy development.



The overall structure of the project

The research is implemented by a three-year project (March 2006 to February 2009) involving thirteen participants from the EU and South Africa. The project is organised in three sections and twelve interdependent workpackages.

WORK PERFORMED DURING THE FIRST AND SECOND YEAR

Preparatory Section Paradigms, Knowledge Concepts, and the Network Alignment Approach (March 06)

With respect to the analytical framework for the project, the first objective is to map the variety of existing knowledge concepts and their underlying rationalities, as well as their limitations and potential impacts on policy making. It is demonstrated how the 'network alignment' approach can be applied as a tool to understand 'knowledge' in its varieties across the enlarging EU in a context of its growing complexity. With respect to the management of the project, the objective is to proactively target the academic community. This task was accomplished with conceptual work by researchers from CEE, SPRU, and NIFU-STEP that form the philosophical basis of the U-Know project. Those were presented and discussed at the first project kick-off meeting. At this meeting, the workpackage leaders coordinated working sessions on cooperation and common research methods.

Section 1 Innovation and Technological Change in the Firm (April 06 – February 08)

In the enterprise sphere, the *first objective of section* is to increase our understanding of the relative impact of internal and external determinants on knowledge creation in the enterprise sphere and the effects of knowledge creation on firms' competitiveness. The *second objective of section* one is to generate a better understanding of mechanisms/channels, determinants, and intensities of knowledge flows via foreign direct investment (FDI). Particular emphasis is placed on FDI-activity involving new member states. Research linked to the first and second objective contributes towards policy development at the cross roads of national/regional FDI, R&D, and innovation policy. The *third objective of section one* aims to establish, how market structures are determined by market-specific knowledge processes, and in particular, what market structures are typically found in knowledge-intensive product markets.

The most important objectives for the first year included (i) to browse the available empirical and theoretical literature on the functioning and organisation of knowledge creation at the level of the firm to develop the state-of-the-art reports, and (ii) to determine in the terms of references (TORs) how best to organise the planned empirical research. The TORs for the deliverables and their respective sub-units were developed and then presented and discussed at the kick-off meeting in Halle. Following this discussion, the terms of cooperation were agreed upon and the complete TORs readily delivered. The participants and researchers involved in this section of the project included the IWH, the IER, NIFU-STEP, SPRU, UoT, GEA, BC, and since January 2007 also the new partners HSRC and UCT. The development of state-of-the-art reports was coordinated by the workpackage leaders (Mark Knell for WP 1.1, Boris Majcen for WP 1.2, and Ulrich Blum for WP 1.3) and the reports were finalised on time. Apart from developing the state-of-the-art reports for each workpackages, the researchers in this section started the original work on selected themes.

The first objective of section one is concerned with the innovation process at the firm level. This research is implemented by workpackage 1.1 under the guidance of M. Knell (NIFU-Step). The partners HSRC and UCT jointly implemented research on the

Objectives

Objectives for the 1-st
reporting period and
achievements

Objectives for the 2-nd
reporting period and
achievements

determinants in firms' innovation activity in South Africa. HSRC looked also at the role of absorptive capacity, technological trajectories, as well as the origin and nature of external sources of knowledge for South Africa. The IWH looked at relation between human capital and innovation by using a German firm level data set. The participant IER addressed the question of innovation determinants and the impact of innovation on firms' performance in an integrated approach using firm level data for Slovenia. Participant in NIFU-Step focuses on the link between innovation and firms' productivity growth using firm level data from the Czech Republic. In a related contribution, the participant NIFU-Step looks at the determinants innovation collaboration between firms and other organizations innovation within a cross-section of thirteen countries. The participant UoT analysed the character of knowledge in external/internal sources used in the innovations process of firms. Apart from the above issues, the workpackage also scrutinised sectoral differences in the innovation process. The first policy briefing took place in form of a workshop targeting innovation policy makers in Germany.

The second objective of section one deals with international transfer of knowledge and technology via foreign direct investment (FDI). This research has been conducted in the framework of workpackage 1.2 led by M. Rojec (IER). Participant IER scrutinised the incidence of horizontal and backward spillovers from FDI using the most comprehensive firm level panel data set available for transition economies. Furthermore, the participants IER, GEA, and IER implemented a survey of foreign subsidiaries in Slovenia, Croatia, Romania, Poland, and East Germany. This created to our knowledge the most comprehensive database of foreign subsidiaries across transition countries. In terms of subsequent analytical work, the IWH researchers scrutinised linkages to the regional innovation system at the example of East Germany and addressed the role of absorptive capacity and IPR in international technology transfer by employing the cross-country database. The IER and IWH jointly drafted a paper on how policy measures could maximise technological diffusion and spillovers effects from FDI. The first policy briefing took at the investment promotion agency "Invest in Germany (IIG)" with participants from the Federal Ministries of Economics and Technology as well as the Transport, Building and Urban Affairs.

The third objective of section one is concerned with the relationship between market structures and knowledge intensity and is conducted within WP 1.3 led by J. Stephan (IWH). Prior work was further refined by econometric analysis using industry data from eight European countries. The authors attempted: (a) to econometrically determine the shape of the relationship between market structure and knowledge intensity as knowledge intensity gradually increases; (b) to find out whether the result of the descriptive analysis hold controlling for other determinants of market structure; and (c) to scrutinize what influence public or private knowledge characteristics have on the relationship. The participant UoT conducted a further study of IPR regimes in an innovation-based economy. The authors consider the opposite effect of IPRs on market structure, i.e. increasing concentration or reducing competition, by way of patent blocking. A conceptual paper addresses the economic value and legal implications of IPRs as well as firms' infrastructural requirements and the role of entrepreneurial universities with regard to IPRs. This conceptual work was complemented by a case study of Estonian biotech spin-offs. Finally the participants IWH and GEA reviewed the implications of these results for competition policy.

Section 2 Learning, Human Capital Formation, and Government

(April 06 – February 08)

Objectives

In section two of the project, the *first objective* is to increase our understanding of the link between the public funded science systems and industry, and to develop a characterisation of such a link in a knowledge based society. *The second objective of section two* is to explore the supply of entrepreneurial education and other specific skills in selected European higher education institutions, as well as the demand for entrepreneurial skills in the industry of selected European countries. *The final objective of this section* assess the interrelatedness of policy making in the fields of research, education, and innovation, with different understandings of what knowledge is and how knowledge is functioning in economies.

The most important objectives for the first year included (i) the development of state-of-the-art reports, and (ii) to develop and agree upon the TORs for deliverables and sub-units of deliverables. The TORs and their respective sub-units were presented and discussed at the kick-off meeting in Halle. Following this discussion, the terms of cooperation were agreed upon and the complete TORs readily delivered. The participants involved in this included NIFU-STEP, SPRU, the IWH, GEA, UoT, and since January 2007 also the new partners HSRC, UCT, CSIR, and PGWC. The development of state-of-the-art reports was coordinated by the workpackage leaders (Antje Klitkou for WP 2.1 and Olaf Spilling for WP 2.2) and the reports were finalised on time. First efforts directed at the implementation of research were made.

Objectives for the 1-st reporting period and achievements

During the second project year, the *objective one of section two* – research aiming at link between the public funded science systems and industry – was implemented in the framework of workpackage 2.1. NIFU-Step and SPRU finalised a meta-analysis of co-authorship and co-inventorship between science and industry across countries, sectors, technologies, and time. The partner HSRC assessed to which extent public universities a resource for innovation in South Africa. The above mentioned contribution analyse the outcomes of science-industry linkages, NIFU-Step and SPRU also implemented research on funding and organisational conditions in a cross-country comparative setting. In addition NIFU-Step and IWH paid particular attention to the impact of patenting and IPR regulation at European universities on the knowledge diffusion. Again, this research has been complemented with work by HSRC on conditions for sustaining competitive university spin-off firms in the ICT sub-sector in South Africa. Finally, the partner NIFU-Step prepared a draft paper on the policy implications from evidence on funding, organisational conditions, and characteristics of research outcomes of the science industry link in selected EU countries, which was presented and discussed at the project workshop in Oslo.

Objectives for the 2-nd reporting period and achievements

Objective two of section two addresses the issue of entrepreneurial education and has been implemented in workpackage 2.2. Here, the participants NIFU-Step, GEA, IER, IWH and UoT contributed to a very comprehensive survey on the provision of entrepreneurship education in Norway, Germany, Romania, Estonia as well as Slovenia. While this contribution analysed the supply side of entrepreneurial education and related programs, the participant GEA and NIFU-Step look also at the 'demand' for entrepreneurial education in Norway, Germany, Romania, Estonia as well as Slovenia. In the final contribution GEA and NIFU-Step assess the appropriateness of current policy approaches in the field of entrepreneurial education against the background of evidence that emerged from the work in this workpackage so far.

The final objective of section two is concerned the relationship between belief systems, perceptions of knowledge, and innovation policy at the national and European level. This issue is at the heart of workpackage 2.3 under the joint leadership of P. Koch (Norwegian Research Council) and M. Knell (NIFU-Step). Both organised a European open workshop on policy learning. Here conceptual and analytical insights were contrasted with firsthand experience with national level R&D and innovation policy. The South African partners assessed network (mis)alignments across theory, policy, and implementation. In particular, HSRC traced the way in which the concepts of 'knowledge' and the 'learning economy' have been represented and implemented in South African policy. CSIR focused on the alignment of the science councils and the private sector to national technology missions and R&D strategies. Further UCT focused on the question of institutional network alignment in the context of formulating and implementing industrial policy at the regional. The final contribution by CSIR focused on an evolving set of policy interventions aimed at improving the technology transfer activity of South African public research organisation.

Section 3 Relationship between institutional arrangements and organisational conditions for knowledge generation

(December 06 – February 09)

The first objective focuses of section three is concerned with the matching of demand for and supply of human capital and skills in the evolving knowledge based society. *The second objective* examines the form and function of intellectual property rights regime in terms of their role to support the knowledge process. This serves to consolidate and augment our current knowledge of the changing IPR systems and the implications for the knowledge-based society. *The third objective* is to develop our understanding of the impacts of socio-cultural attitudes and non-economic motivations on the knowledge process and how these impacts differ for different knowledge characteristics. *The fourth objective* is to analyse network alignment in innovation systems. *The final objective of section three* is to conclude all policy-relevant results generated in the project to contribute to the development of knowledge- and innovation policy for building the advancement of the knowledge based society.

The intention of section 3 of the project is to synthesize the research from sections 1 and 2. However, some original research is required as well. Therefore, the objectives for the first year were the development of common research methods at the meeting in Brighton. The meeting for WP 3.3 was conducted under the responsibility of UTN and CEE compiled the report for this meeting. The meeting for WP 3.4 was conducted under the responsibility of SPRU.

During the second year, the implementation of research objectives of section three progressed substantially. *The first objective of section three* focuses on the demand for and supply of human capital as well as the appropriateness of existing governance mechanisms. This objective is implemented by workpackage 3.1 led by D. Dyker (SPRU). SPRU prepared a review of EU-wide and British experiences in the job-matching, which was complemented with a case study on the supply and demand of labour in Hungary. The study focuses on graduates with tertiary education as a specific segment of the labour market that is highly important to the knowledge economy.

Objectives

Objectives for the 1-st reporting period and achievements

Objectives for the 2-nd reporting period and achievements

The second objective of section three examines the form and function of intellectual property rights regime in terms of their role to support the knowledge process. This workpackage started in November 2007. The workpackage leader B. Andersen (BC) prepared two contributions as part of the explorative analysis of the form and function of IPR regimes in normative and empirical terms. Furthermore, she coordinated the collaboration amongst the participants in order to implement the survey the changing relationship between IPR regimes and the underlying institutional arrangements for knowledge creation and utilization during the fourth project workshop in Asker/Oslo (Norway).

The third objective of section three is to develop our understanding of the impacts of non-economic motivations and socio-cultural attitudes on the knowledge process. This is implemented in WP 3.3 under the leadership of D. Paier (CEE). UTN dealt with the issue of non-economic motivations and the knowledge process. The participant finalised a summary on state-of-the-art. In subsequent work the partner focused employed empirical evidence from controlled experiments complemented with survey evidence of social cooperatives in the Italian no-profit sector. Finally open source projects were analysed as an example of relationship between policy and non-economic motivations. With regard to the role of social-cultural attitudes in the knowledge process, the participant CEE provided a conceptual outline on science-industry links and a matrix for the document. Based on this, the partners CEE, IWH, NIFU-Step, and IER carried out a corresponding analysis of selected policy documents and presented the interim results the Ljubljana meeting.

The fourth objective of section three is the analysis of network alignment in innovation systems in workpackage 3.4 under the leadership of N. Von Tunzelmann (SPRU). The participant (CEE) produced a paper on network analysis methodology which serves as starting point for the subsequent implementation of the research looking at knowledge characteristic in networks. In addition, participant SPRU in cooperation with UoT finalised a contribution that indicates the main directions of the development of national innovation systems in the new EU member-states as catch-up economies emerging from a period of systemic change.

THE CONSORTIUM AND THEIR CONTACT PERSON

- Halle Institute for Economic Research - IWH (as coordinator)
- Birbeck College – BC
- Zentrum für Bildung und Wirtschaft, Forschungs- und Beratungsges. mbH – CEE
- Grupul de Economie Aplicata – GEA
- Institute for Economic Research – IER
- NIFU STEP – NIFU STEP
- Science and Technology Policy Research, University of Sussex – SPRU
- University of Tartu – UoT
- Human Sciences Research Council – HSRC
- University of Cape Town – UCT
- The Council for Scientific and Industrial Research – CSIR
- Western Cape Provincial Treasury – PGWC