



Национальный исследовательский университет «Высшая школа экономики»
Программа дисциплины «**Научно-техническая и инновационная политика**» для направления
38.04.02 «Менеджмент» и «Управление в сфере науки, технологии и инноваций», подготовки
магистра

**Федеральное государственное автономное образовательное учреждение
высшего образования
"Национальный исследовательский университет
"Высшая школа экономики"**

Институт статистических исследований и экономики знаний

**Рабочая программа дисциплины
«Научно-техническая и инновационная политика»**

для направления 38.04.02 «Менеджмент» подготовки магистра

Авторы программы:

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Утверждена Академическим руководителем магистерской программы

«Управление в сфере науки, технологий и инноваций»

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Академический руководитель образовательной программы

Д. Майснер

Москва, 2017

*Настоящая программа не может быть использована другими подразделениями университета
и другими вузами без разрешения подразделения-разработчика программы*

Science, Technology and Innovation Policy

1. Introductory note

Program authors: Dirk Meissner

General Description of the Program:

The course is delivered to master students. It is a part of general scientific curricula unit, and it is delivered in modules. The course length is **228** academic hours in total of which **70** hours are class room hours.

Academic control forms are one written exam, one essay and one colloquium.

Course Objective

The course spans 1 academic module. Students are assessed with a written exam. The teaching is based on selected writings and experiences of faculty members. In addition selected reputed scholars and experts are invited bringing together views from different perspectives on the meaning of intellectual property for science, technology and innovation to provide in-depth learning opportunities for all students.

Lectures are designed to deliver theoretical frameworks and international experiences. The course is accompanied by a seminar, and some sessions will feature additional foreign experts. Accompanying seminars introduce and develop new approaches to understand and further develop different facets of innovation thinking and to provide participants with ready to use state of the art knowledge as well as academic training.

Course Language: English.

Abstract

Science, Technology and Innovation (STI) Policy is a key pillar of government strategy to promote sustainable socio-economic development. An area in which decisions today have an important and long lasting impact on the future competitiveness and prosperity of nations. After a brief introduction on the past, current and prospective place of STI policy within the overall economic development policy agenda, the course starts with the definition of the basic concepts, including that of a national innovation system as an integrative analytical framework. It then reviews in detail how STI policy main objectives are defined and specific STI measures to achieve them are designed and implemented in different national contexts and through international co-operation. Then, it reviews the general approaches and specific methodologies that are used to evaluate the efficiency and impact of individual policy measures, as well as of the overall STI policy.

Training Objectives

- How innovation is generated and impact on socio-economic performance
- What main influences have public policies on STI dynamics

- How governments can best boost national innovation performance
- How to derive useful lessons from an international comparison of STI policies

Target audience

- Master students

Competences

- Ability to analyze STI policy mixes
- Ability to understand the relationships between different policy measures
- Ability to interpret policy measures in a national context

2. Thematic Plan

a) Lectures

Module	Topic	Course hours, Total	Class room hours	Self study hours
STI policy making and mix	Subject overview and definition of basic concepts and their interrelations	4	2	4
	Knowledge Triangle – the concept	4	2	4
	STI policy making process	4	2	4
	STI policy mix	4	2	4
	<i>total</i>	<i>16</i>	<i>8</i>	<i>16</i>
Framework for STI	Framework conditions for STI development: link-ages with other public policies	8	4	8
	Public sector research	5	2	4
	Business Enterprise Research	5	2	4
	STI policy - responses to global challenges	5	2	4
	Strategic intelligence for policy and planning	5	2	4
	STI policy in transition countries	10	4	8
	<i>total</i>	<i>38</i>	<i>16</i>	<i>32</i>
Evaluation of STI policy	STI policy effectiveness and efficiency	8	4	8
	Principles of STI policy evaluation	8	4	8
	Global governance of STI	8	4	8
	<i>total</i>	<i>24</i>	<i>12</i>	<i>24</i>
	Looking forward: the future of STI policies	4	2	6
	<i>total</i>	<i>4</i>	<i>2</i>	<i>6</i>
	total	116	38	78

b) seminars

The seminar consists of an introductory session which highlights the phenomena in discussion, introduces the theoretical background and practical applicability. Supervision of students will be offered using a mid term interim presentation of additional information and facts by the supervisor and individual consultations during the seminar. Following these introductory session students will develop a practical applicable concept for a given problem which is based on sound scientific grounds. The session ends with the introduction of core themes for which the students are asked to prepare a presentation. Finally these concepts are introduced in a concluding session which is devoted to presentations of concepts developed by students and a concluding discussion of these concepts from both a scientific and a practical view. Students will develop concepts in teams and be supervised during development of their concepts

Topic	Course hours, Total	Class room hours	Self study hours
Introductory presentation	24	8	16
Interim presentation / individual consultations	36	12	24
Presentations	52	12	40
Total	112	32	80

3. Basic literature

Books:

- Organisation for Economic Co-operation and Development: OSLO MANUAL - THE MEASUREMENT OF SCIENTIFIC AND TECHNOLOGICAL ACTIVITIES: PROPOSED GUIDELINES FOR COLLECTING AND INTERPRETING TECHNOLOGICAL INNOVATION DATA
- Edquist, C. 1997 (edt.), Systems of Innovation: Technologies, Institutions and Organizations, London 1997
- Freeman, C.: Technology and Economic Performance: Lessons from Japan, Pinter, London.1987
- Lundvall, B. A. (edt.): National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning. London, NewYork: Pinter 1995
- OECD: Managing National Innovation Systems. Organisation for Economic Co-Operation and Development, Paris 1999
- Nelson, R. N. 1993: National Systems of Innovation: A Comparative Analysis. NewYork: Oxford: Oxford University Press 1993
- Schibany, A.; Jörg, I.; Polt, W.: Towards realistic expectations: The science system as contributor to industrial innovation. Seibersdorf: Österreichisches Institut für Wirtschaftsforschung 1999

Articles

- Atkinson, R. D.: Innovation policy making in a federalist system: Lessons from the states for U.S. federal innovation policy making. Research Policy 20, 1991, S. 559-577

- Bartholomew, S.: National systems of biotechnology innovation: complex interdependence in the global system. *Journal of International Business Studies*, 1197, 2nd quarter, Vol. 28, issue 2, S. 241-267
- Conceicao, P.; Heitor, M. V.; Gibson, D.; Shariq, S. S.: The emerging importance of knowledge for development: Implications for technology policy and innovation. *Technological Forecasting and Social Change*, Vol. 58, 1998, S. 181-202
- Debackere, K.; Rappa, M. A.: Technological communities and the diffusion of knowledge: an application and validation. *R&D Management* 24, 4, 1994, S. 355-371
- Etzkowitz, H.; Leydesdorff, L.: The dynamics of innovation: From national Systems and "Mode 2" to a Triple Helix of university-industry-government relations. *Research Policy* 29 (2000), S. 109-123
- Gregersen, B.; Johnson, B.; Kristensen, A.: Comparing National Systems of Innovation: The Case of Finland, Denmark and Sweden. in: Vuori, S.; Vuorinen, P. (Hrsg.): *Explaining Technical Change in a Small Country: The Finnish National Innovation System*. Heidelberg 1994, S. 116 ff.
- Hahn, Y.-H.; Yu, P.-I.: Towards a new technology policy: the integration of generation and diffusion. *Technovation*, 19, 1999, S. 177-186
- Lundvall, B.: National Business Systems and National Systems of Innovation. *International Studies of Management and Organization*, Summer 99, Vol. 29, Issue 2, S. 60-78
- Myers, M. B.; Rosenbloom, R. S.: Rethinking the role of research – leadership in innovation requires mastering 'radical incrementalism'. *Research, Technology, Management*, May / June 1996, S. 14-18

4. Education control forms

Final control (F): written exam (90 minutes exam)

Seminar: Essay (E) and Defence (D) at the end of the seminar.

The overall course grade (10-point scale) is calculated as a sum of

$$G = 0,5 F + 0,5 (0,5E + 0,5 D)$$

The overall course grade G (10-point scale) includes results achieved by students in their exam F , seminar (S); it is rounded up to an integer number of points.

Summary Table: Correspondence of ten-point to five-point system's marks

Ten-point scale [10]
1 – unsatisfactory 2 – very bad 3 – bad
4 – satisfactory 5 – quite satisfactory
6 – good 7 – very good
8 – nearly excellent 9 – excellent 10 – brilliant

6 Programme Contents

Module 1 - STI policy making and mix

Topic 1 subject overview and definition of basic concepts and their interrelations

Topic outline:

- science; technology; innovation; knowledge;
- research and development
- national, regional and global innovation systems

Main references/books/reading:

- OECD Oslo Manual
- Kline S. J., Rosenberg N. (1986). An overview of innovation. In: Landau R., Rosenberg N. (Eds). *The Positive Sum Strategy* // Washington, D.C.: National Academy Press, pp. 275–305
- Kotsemir, Maxim; Abroskin, Alexander; Meissner, Dirk (2013): Innovation concepts and typology – an evolutionary discussion, Series: Science, Technology and Innovation, WP BRP 05/STI/2013, <http://ssrn.com/abstract=2221299>
- Jensen, Morten Berg; Johnson, Björn; Lorenz, Edward; Lundvall, Bengt Åke (2004): *Absorptive Capacity, Forms of Knowledge and Economic Development*. Groupe de Recherche en Economie, Droit et Gestion, Centre National de la Recherche Scientifique, Université de Nice – Sophia Antipolis, Décembre 2004, Document de travail n° 2004 – 2

Topic 2 Knowledge Triangle - concept

Topic outline:

- Elements of Knowledge Triangle – Research, Education, Commercialisation
- Instruments to connect elements
- Interaction of elements
- Interfaces between elements
- Instruments to connect elements

Main references/books/reading:

- Maassen P.; Stensaker B. (2011): The knowledge triangle, European higher education policy logics and policy implications. *High Educ* (2011) 61:757–769, DOI 10.1007/s10734-010-9360-4
- Adomssent M (2011): In search of the knowledge triangle for regional sustainable development: the role of universities. In Barton A.; Dlouhá J. (editors): *Multi-Actor Learning for Sustainable Regional Development in Europe: A Handbook of Best Practice*. Grosvenor House Publishing, Guildford, Surrey, 2011

Topic 3 STI policy making process

Topic outline:

- science, technology and innovation strategy – definitions and scope
- elements of STI strategy
- Communication of national STI strategies
- Implementation rules and guidelines for implementing actors

Main references/books/reading:

- Chaminade, C.; Lundvall, B-A.; Vang, J; Joseph, K.J.; (2009): Designing innovation policies for development: towards a systemic experiment based approach. in: Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (edt): Handbook of Innovation Systems and Developing Countries – Building Domestic Capabilities in a Global Setting. Edward Elgar, Cheltenham 2009, pp. 380-385
- Cooke, Philip (2001): Strategies for Regional Innovation Systems: Learning Transfer and Applications. Report prepared for UNIDO World Industrial Development Report (WIDR) 2001
- Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (2009): Epilogue: Which way now? in: Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (edt): Handbook of Innovation Systems and Developing Countries – Building Domestic Capabilities in a Global Setting. Edward Elgar, Cheltenham 2009, pp. 380-385
- Lundvall, Bengt-Åke; Johnson, Björn; Andersen, Esben Sloth; Dalum, Bent (2002): National systems of production, innovation and competence building. Research Policy 31 (2002) 213–231
- Morgan, Kevin (1997): The Learning Region: Institutions, Innovation and Regional Renewal. Regional Studies, Vol. 31.5, pp. 491± 503

Topic 4 STI policy mixTopic outline:

- Science, technology and innovation policies and STI strategy
- Objectives and goals of STI policies
- Interdependence and interrelation of STI policies

Main references/books/reading:

- Lundvall B.-Å.; Borrás S. (2005), ‘Science, Technology, Innovation and Knowledge Policy’, in Fagerberg, J., D. Mowery and R.R. Nelson (eds.), The Oxford Handbook of Innovation, Norfolk, Oxford University Press
- OECD: Managing National Innovation Systems. Organisation for Economic Co-operation and Development, Paris 1999

Module 2 - Framework for STI**Topic 1 Framework conditions for STI development: linkages with other public policies**Topic outline:

- Public policies – tax, labor, IP, migration, economic development
- Interfaces between policy fields
- Coordination of policies

Main references/books/reading:

- Chaminade, C.; Lundvall, B-A.; Vang, J; Joseph, K.J.; (2009): Designing innovation policies for development: towards a systemic experiment based approach. in: Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (edt): Handbook of Innovation Systems and

Developing Countries – Building Domestic Capabilities in a Global Setting. Edward Elgar, Cheltenham 2009, pp. 380-385

Topic 2 Public Sector Research

Topic outline:

- Missions and visions for public research
- Organization and forms of public research
- Public research infrastructures

Main references/books/reading:

- Lundvall B.-Å.; Borrás S. (2005), ‘Science, Technology, Innovation and Knowledge Policy’, in Fagerberg, J., D. Mowery and R.R. Nelson (eds.), *The Oxford Handbook of Innovation*, Norfolk, Oxford University Press
- OECD: *Managing National Innovation Systems*. Organisation for Economic Co-Operation and Development, Paris 1999

Topic 3 Business Enterprise Research

Topic outline:

- Role of business enterprise research

Main references/books/reading:

- Lundvall B.-Å.; Borrás S. (2005), ‘Science, Technology, Innovation and Knowledge Policy’, in Fagerberg, J., D. Mowery and R.R. Nelson (eds.), *The Oxford Handbook of Innovation*, Norfolk, Oxford University Press
- OECD: *Managing National Innovation Systems*. Organisation for Economic Co-Operation and Development, Paris 1999

Topic 4 STI policy responses to global challenges

Topic outline:

- meeting the requirements of new emerging technologies
- impact of globalization of STI markets and networks on national STI policy

Main references/books/reading:

- OECD: *Managing National Innovation Systems*. Organisation for Economic Co-Operation and Development, Paris 1999
- Carlsson, B; Jacobsson, S.; Holmén, M.; Rickne, A. (2002): *Innovation systems: analytical and methodological issues*. *Research Policy* 31 (2002) 233–245
- Carlsson, Bo(2006):*Internationalization of innovation systems: A survey of the literature*. *Research Policy* 35 (2006) 56–67

Topic 5 Strategic intelligence for policy and planning

Topic outline:

- Designing and developing national STI strategies considering the specific framework conditions of transition countries
- Implementation of national STI policies in transition economies
- Governance of national innovation systems in transition countries

Main references/books/reading:

- Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (2009): Innovation systems research and developing countries. in: Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (ed): Handbook of Innovation Systems and Developing Countries – Building Domestic Capabilities in a Global Setting. Edward Elgar, Cheltenham 2009, pp. 1-33

Topic 6 STI policy in transition countries

Topic outline:

- Designing and developing national STI strategies considering the specific framework conditions of transition countries
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Main references/books/reading:

- Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (2009): Innovation systems research and developing countries. in: Lundvall, B-A.; Joseph, K.J.; Chaminade, C.; Vang, J (ed): Handbook of Innovation Systems and Developing Countries – Building Domestic Capabilities in a Global Setting. Edward Elgar, Cheltenham 2009, pp. 1-33

Module 3 - Evaluation of STI policy

Topic 1 STI policy effectiveness and efficiency evaluation

Topic outline:

- Introductions of effectiveness and efficiency concept
- Effectiveness and efficiency of policies

Main references/books/reading:

- Wang E.C., Huang W. (Relative efficiency of R&D activities: A cross-country study accounting for environmental factors in the DEA approach. Research Policy, Volume 36, Issue 2, March 2007, Pages 260–273
- Teirlinck P.; Delanghe H.; Padilla P. ; Verbeeck A. (2013): Closing the policy cycle: Increasing the utilization of evaluation findings in research, technological development and innovation policy design Science and Public Policy June 1, 2013 40: 366-377
- Koch T. (2011): Implementing the National Dementia Strategy in England: Evaluating innovative practices using a case study methodology Dementia November 1, 2011 10: 487-498

- Hansen M.B.; Vedung E. (2010): Theory-Based Stakeholder Evaluation American Journal of Evaluation September 1, 2010 31: 295-313
- Trochim W.M.; Marcus S.E.; Mâsse L.C.; Moser R. P.; Weld P.C. (2010): The Evaluation of Large Research Initiatives: A Participatory Integrative Mixed-Methods Approach American Journal of Evaluation March 1, 2008 29: 8-28

Topic 2 Principles of evaluation

Topic outline:

- Evaluation methods and instruments
- Defining scope and objective of evaluation
- Comparability of evaluations
- evaluation methodologies
- evaluation metrics

Main references/books/reading:

- Glasgow, Russell E.; Linnan, Laura A. (2008): Evaluation of Theory-Based Interventions. In: Glanz, K.; Rimer, B.K.; Viswanath, K. (Editors): Health Behaviour and Health Education - Theory, Research, and Practice, 4TH EDITION, Wiley 2008, pp487-508
- Georghiou L Impact and additionality of innovation policy pp57-66 in: Boekholt P. (edt. 2002): Innovation policy and sustainable development: can public innovation incentives make a difference? Institute for the Promotion of Innovation by Science and Technology in Flanders, IWT Studies 40, available at http://www.6cp.net/downloads/02brussels_review.pdf#page=57
- Schibany, A.; Jörg, I.; Polt, W.: Towards realistic expectations: The science system as contributor to industrial innovation. Seibersdorf: Österreichisches Institut für Wirtschaftsforschung 1999
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Topic 3 STI policy governance

Topic outline:

- overall governance models
- prioritisation and other major decision making processes
- institutional frameworks for monitoring and evaluation

Main references/books/reading:

- Edquist, C. 1997 (edt.), Systems of Innovation: Technologies, Institutions and Organizations, London 1997
- Nelson, R. N. 1993: National Systems of Innovation: A Comparative Analysis. New York: Oxford: Oxford University Press 1993

- Lundvall B.-Å.; Borrás S. (2005), ‘Science, Technology, Innovation and Knowledge Policy’, in Fagerberg, J., D. Mowery and R.R. Nelson (eds.), *The Oxford Handbook of Innovation*, Norfolk, Oxford University Press
- Amin A. and Thrift N., 1995: Institutional issues for the European regions: from market and plans to socioeconomics and powers of association. *Economy and Society*, 24 (1): 41–66
- Park, Sam Ock (2001): Regional innovation strategies in the knowledge-based economy. *GeoJournal* 53: 29–38, 2001
- Storper M., 1996: Institution of the knowledge-based economy. In OECD: 1996: *Employment and Growth in the Knowledge-based Economy*, Paris, pp. 255–283

Module 4 Looking forward: the future of STI policies

Topic outline:

- public private partnerships to promote science-industry linkages
- measures for human resource development, incentives and regulations (e.g. IP) to promote business R&D and innovation
- increase public awareness and public procurement to stimulate demand for innovations
- development of infrastructures to foster innovative networks and clusters, etc

Main references/books/reading:

- OECD: *Managing National Innovation Systems*. Organisation for Economic Co-operation and Development, Paris 1999
- Lundvall, B. (2007): National Innovation Systems—Analytical Concept and Development Tool, *Industry and Innovation*, 14:1, 95-119

Programme Contents

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Topic 3 Business Enterprise Research

Topic outline:

- Role of business enterprise research

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Topic outline:

- meeting the requirements of new emerging technologies
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- OECD: Managing National Innovation Systems. Organisation for Economic Co-Operation and Development, Paris 1999
- Carlsson, B; Jacobsson, S.; Holmén, M.; Rickne, A. (2002): Innovation systems: analytical and methodological issues. Research Policy 31 (2002) 233–245
- Carlsson, Bo(2006):Internationalization of innovation systems: A survey of the literature. Research Policy 35 (2006) 56–67

Topic 5 Strategic intelligence for policy and planning

Topic outline:

- Designing and developing national STI strategies considering the specific framework conditions of transition countries
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Topic 6 STI policy in transition countries

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- Implementation of national STI policies in transition economies
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Module 3 - Evaluation of STI policy

Topic 1 STI policy effectiveness and efficiency evaluation

Topic outline:

- Introductions of effectiveness and efficiency concept
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Topic outline:

- Evaluation methods and instruments
- Defining scope and objective of evaluation
- Comparability of evaluations
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Main references/books/reading:

- Glasgow, Russell E.; Linnan, Laura A. (2008): Evaluation of Theory-Based Interventions. In: Glanz, K.; Rimer, B.K.; Viswanath, K. (Editors): Health Behaviour and Health Education - Theory, Research, and Practice, 4TH EDITION, Wiley 2008, pp487-508
- Georghiou L Impact and additionality of innovation policy pp57-66 in: Boekholt P. (edt. 2002): Innovation policy and sustainable development: can public innovation incentives make a difference? Institute for the Promotion of Innovation by Science and Technology in Flanders, IWT Studies 40, available at http://www.6cp.net/downloads/02brussels_review.pdf#page=57
- Schibany, A.; Jörg, I.; Polt, W.: Towards realistic expectations: The science system as contributor to industrial innovation. Seibersdorf: Österreichisches Institut für Wirtschaftsforschung 1999
- Koch T. (2011): Implementing the National Dementia Strategy in England: Evaluating innovative practices using a case study methodology Dementia November 1, 2011 10: 487-498
- Hansen M.B.; Vedung E. (2010): Theory-Based Stakeholder Evaluation American Journal of Evaluation September 1, 2010 31: 295-313
- Trochim W.M.; Marcus S.E.; Mâsse L.C.; Moser R. P.; Weld P.C. (2010): The Evaluation of Large Research Initiatives: A Participatory Integrative Mixed-Methods Approach American Journal of Evaluation March 1, 2008 29: 8-28

Topic 3 STI policy governance

Topic outline:

- overall governance models
- prioritisation and other major decision making processes
- institutional frameworks for monitoring and evaluation

Main references/books/reading:

- Edquist, C. 1997 (edt.), Systems of Innovation: Technologies, Institutions and Organizations, London 1997
- Nelson, R. N. 1993: National Systems of Innovation: A Comparative Analysis. New York: Oxford: Oxford University Press 1993
- Lundvall B.-Å.; Borrás S. (2005), 'Science, Technology, Innovation and Knowledge Policy', in Fagerberg, J., D. Mowery and R.R. Nelson (eds.), The Oxford Handbook of Innovation, Norfolk, Oxford University Press

- Amin A. and Thrift N., 1995: Institutional issues for the European regions: from market and plans to socioeconomics and powers of association. *Economy and Society*, 24 (1): 41–66
- Park, Sam Ock (2001): Regional innovation strategies in the knowledge-based economy. *GeoJournal* 53: 29–38, 2001
- Storper M., 1996: Institution of the knowledge-based economy. In OECD: 1996: *Employment and Growth in the Knowledge-based Economy*, Paris, pp. 255–283

Module 4 Looking forward: the future of STI policies

Topic outline:

- public private partnerships to promote science-industry linkages
- measures for human resource development, incentives and regulations (e.g. IP) to promote business R&D and innovation
- increase public awareness and public procurement to stimulate demand for innovations
- development of infrastructures to foster innovative networks and clusters, etc

Main references/books/reading:

- OECD: *Managing National Innovation Systems*. Organisation for Economic Co-Operation and Development, Paris 1999
- Lundvall, B. (2007): National Innovation Systems—Analytical Concept and Development Tool, *Industry and Innovation*, 14:1, 95-119