

Annual report from DRUID (Danish Research Unit for Industrial Dynamics) 1998

Preface

The report has the same format as the last annual report. Reflecting the evaluation criteria announced by the Board for the Centre of Industrial Economics, the emphasis is on registering outcomes in terms of publications, Ph.D.-activities and communication and interaction with users. It is introduced by a summary and a self-evaluation. In six separate appendices specific activities are documented. Since we are getting closer to the end of the first project period (ends August 1, year 2000) and following the instructions of the Board, some indications of the future direction for a second generation DRUID are given in the introduction to the self-evaluation. As compared to the structure of the last report, Appendix 5 that is a report from the first meeting of the DRUID International Advisory Board has been added.

Appendix 1: The DRUID Working Paper Series

Appendix 2: The DRUID-Conferences

Appendix 3: The DRUID Seminars

Appendix 4: Visiting Scholars

Appendix 5: Report from the Meeting with the International Advisory Board with comments from the Chairman of the Board

Summary

DRUID-activities have been designed with the main objective to support senior scholars and Ph.D.-students in their research through the building of infrastructure and through specific support to activities where it is difficult to find alternative funding. This is reflected in the allocation of finance. Little resources have been used to finance salary and much more to build infrastructure (the Summer and Winter conferences, the data bases, the working paper series, the guest professorships, information infrastructure and administrative co-ordination, see appendices).

New directions of research have been stimulated, for instance through introducing new themes at the Summer Conferences. But no attempts have been made to direct individuals into projects that they do not want to pursue. This strategy has proved successful. The positive interest for contributing to the DRUID-research program remains strong, the activity level of the researchers involved is high, and the output in terms of publications and Ph.D.-activities has been growing over time. DRUID-scholars are increasingly involved in an interaction with users of research in the private and the public sector, in Denmark, as well as abroad.

The major impact of DRUID has been to increase the quality of the Ph.D.-training, to create a high quality international network in the field of industrial dynamics and to establish a science-based interaction with policy makers. Specifically, DRUID has established itself as a leading international forum for developing new ideas on the growing importance of knowledge and learning for industrial dynamics and economic development. In this specific area, DRUID has become an attractive meeting place for advanced thinking in theory and policy.

Plans for a second generation DRUID

A second generation DRUID would reinforce these points of strength and, at the same time, aim at filling out gaps in the current competence pattern and developing new forms of interaction with users.

- A separate but connected DRUID-academy for training Ph.D. students will be established as a collaboration between the two major departments in DRUID (Department of Business Studies at Aalborg University and Department of Industrial Economics and Business Strategy at Copenhagen Business School). Following the advice of the chairman of the CIE Board, we have chosen to establish a separate academy based on permanent units (Departments) rather than on a temporary structure (the DRUID network). But there will be a strong synergy between the two initiatives.
- The analytical work on knowledge and learning in the economy will be strengthened and the present efforts to become the main international node in this area will be followed up. This points to a need to broaden the DRUID-expertise, for instance, to include scholars from other disciplines than economics who are experts on learning and cognitive science.

- This will be complemented by giving more emphasis to the work on performance indicators and, specifically, the analysis of productivity developments at different levels of aggregation. This points to a need for broadening and deepening the expertise in statistical analysis and econometrics.
- Special emphasis will be given to international comparative work exploiting the data bases of DRUID and its excellent international network.
- The next generation of DRUID will establish new permanent fora for interaction with users of research in the private and public sector. One such forum would be composed of representatives for firms operating in knowledge intensive business services and be used for a dialogue on, the knowledge creation and learning impact on the economy and on the conduct of firms.
- Another forum will include policy makers from all the sectors playing an important role in relation to the knowledge based economy as well a few experts from international organisations such as OECD, UNCTAD and European Commission.

These intentions could possibly be realised through a budgetary envelope corresponding to what we have had so far. But in order to attract expertise in the new fields mentioned, and in order to establish a basis for the new fora for user interaction, extra resources corresponding to the salary of two full time professors would be extremely useful. This would imply an increase in the annual budget from 2 million to 3 million Dkr per year.

Assessing the output from DRUID for 1998

The outputs of the DRUID-network in terms of publications, Ph.D.-activities and user interaction reflect the specialisation of the two major research units forming the network. At the CBS-department the analytical focus is on the theory of the firm and the user-interface is primarily with business. The AAU-group is more oriented toward sectoral and macro issues and it has a strong interaction with policy makers in the field of industrial and innovation policy. Both units give high priority to the recruitment and supervision of Ph.D.-students, while the AAU-unit is the one most strongly involved in the international organisation of Ph.D.-training (ETIC).

During 1998 there has been a growing number of activities characterised by direct collaboration between scholars from the two units, including mutual assistance when it comes to give supervision to Ph.D.-students across departments. There has been an upgrading of the formal skill profile of DRUID in the year. From having two professors (Lundvall and Maskell) in the network last year, there are now four (Frøslev Christensen and Foss are the new ones). Maskell has joined the Department of Industrial Economics and Business Strategy at CBS.

Publications

During 1998, DRUID-scholars (these include Danish scholars and the two long term visiting professors, Dieter Ernst and Ron Sanchez) have produced around 150 publications in connection with the DRUID-research themes and about 50 contributions to conferences (see **Section I**). Of the publications, close to 50 articles are in refereed journals and books and 4 are refereed books. The working paper series has grown in importance both quantitatively (from 16 issues 1997 to 30 issues 1998) and in terms of the quality of contributions. It has become well known among scholars in the field of industrial dynamics all over the world.

The new books have received great attention. This is for instance true for the book edited by Nicolai Juul Foss and the book with Peter Maskell as first author. Among the category of refereed articles we find a growing number of contributions from Ph.D.-students and from new Ph.D.s. The publications from the DISKO-project and the Lundvall-Barras report on innovation policy have had a major impact on policy debates in Denmark and abroad.

I find this volume and pattern of publication quite satisfactory.

Ph.D. activities

In the period covered by this report, 4 Ph.D.-students who participated in the DRUID-network have finalised their Ph.D.-studies by successfully defending their theses. At present there are close to 20 Ph.D.-students connected to the network. Of these 8 are expected to finish their theses in 1999 (see **Section II**). In 1998 two new Ph.D.-students financed by DRUID were hired.

The AAU-unit (Andersen, Dalum, Johnson and Lundvall) has for a 3 year period been part of a European consortium, ETIC, regularly organising Ph.D.-courses in the field of 'economics of technical and institutional change' and, individually, DRUID-seniors have contributed to Ph.D. training in other contexts.

An important element in the DRUID Ph.D. training is the active participation of students in the annual DRUID Winter Conference where Ph.D.-students are expected to present work in progress and in the annual DRUID Summer Conference where they are expected to act as discussants on papers by international scholars (See Appendix 2). The Ph.D.-students related to DRUID have been active in all these respects.

As can be seen from the scheme in part II of the report, normally, Ph.D.-students spend some of their time abroad in order to broaden their scientific skills. Most of the DRUID Ph.D.-students are hard-working, mature and act convincingly, in international contexts. Two of those finishing their studies 1998 have been hired as assistant professors (adjunkter) outside the department where they were trained.

Several new initiatives relate to Ph.D.-training. Nicolai Juul Foss has, with the support of DRUID, organised a sub-group called RESPECT specialised in developing theories of the

firm. The group aims at Ph.D.-training and international collaboration in the field. During 1998 the AAU-unit was recognised by the social science faculty as the first local Ph.D.-training site in social science. Dalum, Andersen and Lundvall have been involved in the further development of the ETIC-programme and the aim is to establish it as a Marie Curie training site during 1999.

In 1998 a special scheme to stimulate new Ph.D.s to communicate results from their dissertation in the form of articles to journals has been established in collaboration with the departments and faculty in Copenhagen and Aalborg. When the dissertation has been delivered and a preliminary clearance has been given from the supervisor, Ph.D.-candidates can apply for a 3-month grant to write papers for refereed journals.

I find the Ph.D.-activities, and especially the quality of the Ph.D.-students, most satisfactory.

Interaction with users

There have been different types of user-oriented activities going on within DRUID (see **Section III**).

A major event was the high level workshop on *Innovation systems and Innovation Policy*, organised by DISKO and DRUID and with participation of Richard R. Nelson and of high level policy makers (General Directors) from the ministries of Industry, Research and Environment, Novi, Aalborg, May 11, 1998.

In connection with the different DISKO-reports there have been a number of presentations and meetings involving among others Lundvall, Jesper L. Christensen and Allan Næs Gjerding.

The publication of the Lundvall&Borrás EU-report on innovation policy was followed by a number of talks given around Europe (UK, Portugal, France, Norway and Finland).

Several of the DRUID-members (Dalum, Maskell, Lundvall, Poul Rind Christensen and Jesper Lindgaard Christensen) are involved in regular interactions with users in regional, national and international contexts.

At the international level, there has been a direct interaction between DRUID and respectively EU DG XII, OECD-DSTI and UNCTAD-FDI/ST around different policy issues related to innovation systems and innovation policy (Lundvall, Maskell and J. L. Christensen have been contact persons but a number of DRUIDs have been involved).

At the national level, the different projects connected to DISKO involve an experimental form of interaction with the Ministry of Business. This interaction involves among other elements a construction of Ph.D.-grants financed by the ministry combined with a location of Ph.D. students at the Ministry for part of their study programme. In the annual reports from the Ministry of Industry for 1997 and 1998, analytical results from the DISKO-project have played

a prominent role. In connection with the finish of the DISKO-project there will be a series of user and policy oriented activities in the coming year.

At the local level in Northern Jutland, several DRUIDs have played a key role in connecting the University to the local industrial community especially in the field of mobile communication (Dalum, Præst and Villumsen). Peter Maskell has played a similar role in connection with the regional authorities of Copenhagen and Poul Rind Christensen in Southern Jutland. These activities will be pursued also in the future.

Given the general objectives of DRUID, I find the interaction with users quite satisfactory.

The interaction with the international advisory board

For the first time the Summer conference at Rønne gave an opportunity to gather the international advisory board for a meeting. The outcome of the meeting – a report from the discussions with comments from the chairman, Bo Carlsson - can be found in Appendix 5. The meeting was extremely helpful in focusing the activities of DRUID. This reflected the content of the major debate that was on how and in what respects DRUID makes a difference. DRUID was given a very high rating especially in terms of its network building function and in terms of the quality of its Ph.D.-students. It was also noted that the Summer Conference itself, organised by Nicolai Juul Foss, Jens Frøslev Christensen and Volker Manhke, was a great success in terms of the high level participation of international scholars and the quality of the debates.

Aalborg, February 10, 1999

Bengt-Åke Lundvall

SECTION I

1. Scientific publications

("(p)" indicates Ph.D.-student)

a. Articles in refereed journals

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MADSEN, Poul T. & Plaschke, Henrik (1998). *Den forbudte debat om ØMU'en*, Systime.

SEGURA, Olman (p) (1998). *State of the Art of the Forest Sector in Costa Rica*. SUDESCA Research Papers- ISSN: 1397-5277. Publication of Centro Internacional de Política Económica para el Desarrollo Sostenible, Costa Rica and Aalborg University, Denmark.

SEGURA, Olman (p) and Camacho, Carlos (1998). *Competitiveness and Innovation: The Particleboard Industry in Costa Rica*. SUDESCA Research Papers. Aalborg University, Aalborg, Denmark, 40 p.

VALENTIN, Finn (1998). *The Relationship between Research and Development in EC Projects*. Vol III i forfatterens rapportserie : The Impact of EC-Programmes on R&D decision

making: Survey of a sample of industrial participants, I-III. Commission of the European Communities, MONITOR/SPEAR.

g. Working papers

ANDERSEN, Esben Sloth (1998). *Escaping Satiation in an Evolutionary Model of Structural economic Dynamics*. DRUID, 29 p. 98/9.

ANDERSEN, Esben Sloth (1998). *The Evolution of the Organisation of Industry*. DRUID, 31 p. 98/13.

ANDERSEN, Poul H. (1998). *Organizing International Technological Collaboration in Subcontractor Relationships. An Investigation of the Knowledge-Stickyness Problem*. DRUID, 29 P. 98/11.

CHRISTENSEN, Jens Frøslev & Nielsen, Morten Overgaard (1998). *MD Foods - Strategi, struktur og teknologiledelse*, CISTEMA, Copenhagen Business School, Working Paper 1998-3.

CHRISTENSEN, Jens Frøslev (1998). *The Dynamics of the Diversified Corporation and the Role of Central Management of Technology*. DRUID, 47 P. 98/4.

CHRISTENSEN, Jesper Lindgaard & DREJER, Ina (p) (1998). *Finance and Innovation System or Chaos*. DRUID, 30 p. 98/24.

ERNST, Dieter (1998). *What Permits Small Firms to Compete in High-Tech Industries? Inter-Organizational Knowledge Creation in the Taiwanese Computer Industry*. DRUID, 59 p. 98/3.

ERNST, Dieter (1998). *Catching-Up, Crisis and Industrial Upgrading. Evolutionary Aspects of Technological Learning in Korea's Electronics Industry*. DRUID, 76 p. 98/16.

FOSS, Kirsten (1998). *Technological Interdependencies, Specialization and Coordination: A Property Rights Perspective on The Nature of the Firm*. DRUID, 32 p. 98/10.

FOSS, Kirsten & FOSS, Nicolai J. (1998). *The Market Process and The Firm: Toward a Dynamic Property Rights Perspective*. DRUID, 32 p. 98/14.

FOSS, Nicolai J. (1998). *Firms and the Coordination of Knowledge: Some Austrian Insights*. DRUID, 38 p. 98/19.

FOSS, Nicolai J. (1998). *Austrian Economics and Game Theory: a Preliminary Methodological Stocktaking*. DRUID, 26 p. 98/28.

FOSS, Nicolai J. & MAHNKE, Volker (p) (1998). *Strategy Research and the Market Process Perspective*. DRUID, 30 p. 98/29.

FOSS, Nicolai J., Lando, Henrik & Thomsen, Steen (1998). *The Theory of the Firm*. Institut for Finansiering, Working Paper, 98-10.

FOSS, Nicolai J. (1998). *Edith Penrose and the Penrosians or, why there is still so much to learn from The Theory of the Growth of the Firm*. Institut for Industriøkonomi og Virksomhedsstrategi, Working Paper, 98-1.

FOSS, Nicolai J. (1998). *Real Options and the Theory of the Firm*. Institut for Industriøkonomi og Virksomhedsstrategi, Working Paper, 98-3.

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FOSS, Nicolai J. & FOSS, Kirsten (1998). *The Knowledge-Based Approach: An Organizational Economics Perspective*. Institut for Industriøkonomi og Virksomhedsstrategi, Working Paper, 98-5.

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FOSS, Nicolai J. (1998). *The Theory of the Firm: an Introduction to Themes and Contributions*. Institut for Industriøkonomi og Virksomhedsstrategi, Working Paper 98-7.

GJERDING, A.N. (1998). *Teknologisk og organisatorisk innovation i nordjyske virksomheder* (Technical and organisational innovation in North Jutland firms), NEP Publikationer No.6, Aalborg: Aalborg Universitet, 34 p.

GJERDING, A.N. (1998). *International competitiveness by "orgfensive" means*, International Business Economics Working Paper Series No.26, Aalborg: Aalborg University, 23 p.

GJERDING, A.N. (1998). *Innovation Economics. Part II: The "new" innovation economics*, International Business Economics Working Paper Series No.27, Aalborg: Aalborg University, 29 p.

GJERDING, A.N. (1998). *Technical collaboration as social construction. Some observations on tacit knowledge and shared meanings*, International Business Economics Working Paper Series No.29, Aalborg: Aalborg University, 15 p.

IVERSEN, Mikael (p), CHRISTENSEN, Jens F & Nielsen, Morten O. (1998). *Grundfos - Strategi, struktur og teknologiledelse*. København: Handelshøjskolen i København, Working Papers; CISTEMA , 47 p. 1998-2.

- JØRGENSEN, Kenneth M. (p) (1998). *Information Technology and Change in Danish Organizations*. DRUID, 23 p. 98/8.
- KAISLA, Jukka (p) (1998). *The Market Process and the Emergence of the Firm: Some Indications of Entrepreneurship Under Genuine Uncertainty*. DRUID, 28 p. 98/17.
- LAURSEN, Keld (p) (1998). *Do Export and Technological Specialisation Patterns Co-evolve in Terms of Convergence or Divergence?: Evidence from 19 OECD Countries, 1971-1991*. DRUID, 16 p. 98/18.
- LAURSEN, Keld (p) (1998). *How Structural Change Differs, and Why it Matters (for Economic Growth)* DRUID, 16 p. 98/25.
- LAURSEN, Keld (p) (1998). *Revealed Comparative Advantage and the Alternatives as Measures of International Specialisation*. DRUID, 13 p. 98/30.
- LORENZEN, Mark (p) (1998). *Information, cost learning, and trust. Lessons from co-operation and higher-order capabilities amongst geographically proximate firms*. DRUID, 34 p. 98/21.
- LORENZEN, Mark (p) (1998). *Localised co-ordination and trust: Tentative findings from in-depth case studies*. IVS, 27 p., no. 98-9.
- LORENZEN, Mark (p) (1998). *Localised learning: Why are inter-firm learning patterns institutionalised within particular localities?* IVS, 31 p., no. 98-10.
- LOTZ, Peter & Lee, Kristina (1998). *Noise and Silence in the Hearing Instrument Industry*. CISTEMA Working Paper, No. 98-1, March, pp. 1-75.
- LOTZ, Peter (1998). *Industry Structure Dynamics and the Nature of Technology in the Hearing Instrument Industry*. BRIE Working Paper, UC Berkeley, No. 114, March, pp. 1-30.
- LUND, Reinhard (1998). *Organizational and innovative flexibility mechanisms and their impact upon organizational effectiveness*. DRUID, 30 p. 98/23.
- MAHNKE, Volker (p) & Aadne, John Harald (1998). *Process of Strategic Renewal, Competencies, and the Management of Speed*. DRUID, 40 p. 98/20.
- MAHNKE, Volker (p) (1998). *The Economies of Knowledge-Sharing: Production- and Organization Cost Considerations*. IVS, 28 p., 98-14.
- MAHNKE, Volker (p) & Augier, Mie (1998). *How Do Aspiration Levels come About? Bounded Rationality and Dynamic Search*. IVS, 25 p., 98-8.

NYMARK, Søren (p) (1998). *Billeder af strategi i forandringsrige organisatoriske omgivelser: 3 cases fra DISKO studierne*. DRUID, 23 p. 98/12.

PRÆST, Mette (p) (1998). *An Empirical Model of Firm Behaviour: A dynamic Approach to Competence Accumulation and Strategic Behaviour*. DRUID, 32 p. 98/1.

SORNN-FRIESE, H. (p) (1998). *Mutual Adaptation and Technological Innovation*. Department of Industrial Economics and Strategy, Working Paper 98-11, Copenhagen Business School.

SORNN-FRIESE, H. (p) (1998). *The Genesis and Progress of the Socially Embedded Firm*. Department of Industrial Economics and Strategy, Working Paper 98-12, Copenhagen Business School.

VALENTE, Marco (p) (1998). *Laboratory for Simulation Development*. DRUID, 33 p. 98/5.

VALENTE, Marco (p) (1998). *Technological Competition: a Qualitative Product Life Cycle*. DRUID, 37 p. 98/6.

h. DRUID Working Papers by international scholars

98-2 Ducatel, Ken. *Learning and skills in the Knowledge Economy*. (ISBN 87-7873-038-4)

98-7 Lam, Alice. *The Social Embeddedness of Knowledge: Problems of Knowledge Sharing and Organisational Learning in International High-Technology Ventures*. (ISBN 87-7873-043-0)

98-15 Lorenz, Edward. *Societal Effects and the Transfer of Business Practices to Britain and France*. (ISBN 87-7873-053-8)

98-22 Lam, Alice. *Tacit Knowledge, Organisational Learning and Innovation: A Societal Perspective*. (ISBN 87-7873-060-0)

98-26 Holmén, Magnus & Jacobsson, Staffan. *A method for identifying actors in a knowledge based cluster*. (ISBN 87-7873-064-3)

98-27 Richardson, G. B. *Production, Planning and Prices*. (ISBN 87-7873-065-1)

i. Contributions to conferences

ANDERSEN, Maj M. (p) (1998). *Evolutionary and Resource Based Theories on Interorganisational Learning*. Paper presented at the, *DRUID Winter Conference*, Middelfart, January 8-19, 19 p.

CHRISTENSEN, Jens Frøslev (1998). Pursuing Corporate Coherence in Decentralized Governance Structures. The Role of Technology Management in Multi-Product Companies. Paper prepared for the DRUID Summer Conference, *Competencies, Governance and Entrepreneurship*, Bornholm, juni.

CHRISTENSEN, Poul Rind (1998). Challenges and pathways for SME subcontractors in an era of world wide restructuring of supply chains. Contribution to the International Geographical Union - Commission on the organisation of industrial space, 1998 residential conference: *Small and medium-sized enterprises in a changing world*. Seville, 24-28 August, 23 p.

CHRISTENSEN, Poul Rind & PHILIPSEN, Kristian (1998). Entrepreneurship as Organizing. Contribution to, *the Xth Nordic Conference in Small Business Research*, Växjö, June, 19 p.

DREJER, Ina (p) (1998). Technological Interdependence in the Danish Economy - A Comparison of Methods for Identifying Knowledge Flows, paper prepared for the, *Twelfth International Conference on Input-Output Techniques*, New York, 18-22 May.

DREJER, Ina (p) (1998). Technological Interdependence in National Systems of Innovation - a study of embodied R&D flows in 7 OECD countries, paper prepared for the, *ETIC conference*, Strasbourg, October.

DREJER, Ina (p) (1998). Technological Interdependence in Danish Economy - A Comparison of Methods for Identifying Technology Flows. Paper presented at the, *DRUID Winter Conference*, Middelfart, January 8-10, 23 p.

GJERDING, A. N. (1998). International competitiveness by offensive means, presentation at the *DRUID Winter Seminar*, Middelfart (Denmark), January 8-10, 23 p.

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GJERDING, A. N. (1998). *Energy and Environmental Workshop*, organised by the Department of Development and Planning, Aalborg University, Aalborg (Denmark), October 21-24, (Discussant).

JOHNSON, Björn (1998). Forest Services and Property Rights from an Innovation Point of View' Together with Olman Segura. Paper presented at *the Fifth Biennial Meeting of the International Society for Ecological Economics (ISRR)*, Santiago de Chile, November 15-19, 29 p.

JØRGENSEN, Kenneth (p) (1998). Organizational Learning III - A Foucauldian Approach. Paper presented at the conference at SCANCOR, *Samples of The Future*, Stanford University 20-22 september, 34 p.

JØRGENSEN, Kenneth (p) (1998). Information Technology and Organizational Change - A case study in a Danish subsidiary company, paper presented at the *DRUID Winter conference*, Middelfart, January 8-10, 23 p.

KAISLA, Jukka (p) (1998). Market Process and the Firm: Some Indications of Rule-following and Entrepreneurship Under Genuine Uncertainty, presentation at the, CISTEMA seminar on *Austrian Economics*, Copenhagen, June 22, 27 p.

KRISTENSEN, F. S. (p) (1998). Understanding Learning in Technological Trajectories: Combining Organizational Integration and Industrial Dynamics, paper presented at the DRUID conference *Competences, Governance and Entrepreneurship*, Rønne, Bornholm, Denmark, June, 25 p.

LAURSEN, Keld (p) & DREJER, Ina (p) (1998). Do Inter-sectoral Linkages Matter for International Export Specialisation ? Paper presented at the, *DRUID Winter Conference*, Middelfart, January 8-10, 20 p.

LORENZEN, Mark (p) (1998). Information Cost, Learning, and Trust, paper presented at the DRUID Conference, *Competences, Governance and Entrepreneurship*, Bornholm, June, 24 p.

LOTZ, Peter (1998). Industry Structure Dynamics and the Nature of Technology in the Hearing Instrument Industry. Presentation of paper at, *the Annual EARIE Conference*, København, September.

LOTZ, Peter (1998). The Economics of Industrial Structure and Innovation Dynamics, paper presented at the, *UNU/INTECH International Conference*, Lisboa, Oktober.

MADSEN, Poul T. & Kristensen, Preben S. (1998). Foreign and Danish Collaboration Partners on Product Development in Small Danish Manufacturing Firms, Paper prepared for presentation at, *the 10th Nordic Conference on Small Business Research*, in Växjö June 14-16.

MAHNKE, V. (p), Aadne J.H. & Venzin, M. (1998). The search for inspiration among the ABC's in strategic management, working paper presented at, *the Strategic Management Society Meeting*, Orlando.

MAHNKE, Volker (p) & Augier, Mie (1998). How Do Aspiration Levels come About? Bounded Rationality and Dynamic Search, presented at SCANCOR - Conference, *Samples of the future*, Stanford, 25 p. (Printed in conference proceedings).

PRAEST, M. (p) (1998). Dynamics of Competence Groups: Or Who Perform better in Turbulent Environments? Presented at the *4th International Conference on Competence Management*, Oslo, June.

PRAEST, M. (p) (1998). Demarcation of Technological Competence Groups: Methods, Problems, and Future Opportunities. Presented at the 4th *International Conference on Competence Management*, Oslo, June.

PRAEST, M. (p) (1998). Processes of Technological Competence Accumulation: A Synthesis. Presented at the DRUID conference on *Competences, Governance and Entrepreneurship*, Rønne, Bornholm (Denmark), June.

PRAEST, M. (p) (1998). The Accumulation of Technological Competencies: Or Who Perform Better in Turbulent Environments? Presented at the 7th *International Conference on Management of Technology*, Orlando, Florida, US, February.

PRAEST, M. (p) (1998). An Empirical Model of Firm Behaviour: A Dynamic Approach to the Accumulation of Technological Competencies. Presented at the *DRUID Winter conference*, Middelfart, January, 31 p.

SEGURA, Olman (p) (1998). Forest Services and Property Rights from an Innovation Point of View, Together with Björn Johnson. Paper presented at *the Fifth Biennial Meeting of the International Society for Ecological Economics (ISRR)*, Santiago de Chile, November 15-19.

SEGURA, Olman (p) (1998). Competitiveness and Innovation: the particleboard industry in Costa Rica. Paper presented at the international workshop for the Sustainable Development Strategies for Central America (SUDESCA) project. Conference title, *Competitiveness, innovation and sustainability in Central America, Nicaragua, February 15-18*.

SEGURA, Olman (p) (1998). Una mezcla necesaria: comercio-ambiente. Paper presented in the First Academic Colloquium of the Americas. The topic was: *ALCA, Competitividad Agrícola y recursos naturales renovables*, March 12-14.

SORNN-FRIESE, H. (p) (1998). The Genesis and Progress of Embeddedness in Business Studies. Paper presented at, the SCANCOR Conference *Samples of the Future*, Stanford University, September 20-22.

SORNN-FRIESE, H. (p) (1998). Mutual Adaptation and Technological Innovation. Industrial Dynamics of Embeddedness. Paper presented at, the UNU/INTECH International Conference *The Economics of Industrial Structure and Innovation Dynamics*, Lisbon, October 16-17.

VALENTE, Marco (p) (1998). Technological Competition: a Qualitative Product Life Cycle. Paper presented at the, *DRUID Winter Conference*, Middelfart, January 8-10, 33 p.

VALENTE, Marco (p) (1998). Technological Innovation and Demand-based Market Structure, proceedings of the *ETIC Conference*, Strasbourg.

VALENTE, Marco (p), Frenken, K. & Marengo, L. (1998). Modelling Decomposition Strategies in Complex Fitness Landscapes. Implications for the Economics of Technological Change, proceedings of the *ETIC Conference*, Strasbourg.

VALENTE, M. (p) (1998). Technological Innovation and Market Structure - A Simulation Model, paper presented at the, *International J. Schumpeter Society Conference*, Vienna, June 13 -16, 26 p.

VALENTE, Marco (p), Frenken, K. & Marengo, M. (1998). Modelling Decomposition Strategies in Complex Fitness Landscapes. Implications for the Economics of Technological Change, paper presented at the, *International J. Schumpeter Society Conference*, Vienna, June 13 -16, 23 p.

VALENTE, M. (p) (1998). A History Friendly Approach to Demand and Technological Innovation, workshop, *Division of Labour, Variety and Technological Innovation*, Trento, December 17-18, 25 p.

VALENTIN, Finn (Forthcoming). Knowledge and uncertainty in R&D. Does inter-firm collaboration make a difference? In Proceeding from the 1999 *IAMOT Conference*, Cairo, pp. 1-12.

VEJRUP-HANSEN, Per (1998). The effect of job destruction on worker mobility and unemployment. Paper for, *International Symposium on Linked Employer-Employee Data*, Washington, D.C, May.

Section II: Ph.D-activities

II.A: Ph.D.-Students

There have been 20 Ph.D.-students connected to the DRUID project in 1998. All of them have participated in activities organised by DRUID and all (with the exception of Annemarie Munk-Riis) have had DRUID-seniors as supervisors. Their stage of study and other relevant information has been gathered in the table below.

Table 1: Ph.D-students connected to DRUID (stage of completion, theme of dissertation, participation in training in 1998, affiliation, including international affiliation in 1998 and source of finance).

	Period	Dissertation theme	Participation in training	Affiliation – Stay abroad	Finance
Alfaro, Leiner Vargas	January 1998- March 2000		DRUID- conference S98	IES - AAU	Danida - Foreign Affairs
Andersen, Maj M.	January 95 - November 98	Firm Trajectory Change through Interorganisational Learning	DRUID conf. W98 & S98. EAEPE Summer School, July 1998, Ireland.	IVS - CBS	Ph.D.-stip. FFL
Bonilla, Segura Olman	June 96 – May 1999	Competitiveness and Sustainable Development in the Forest Sector in Central America.	DRUID conference S98. Ph.D.-course: International Knowledge Transfer and Learning Processes: Third World and East European Experiences, Aalborg University	IES – AAU Universidad Nacional de Costa Rica (UNA), Nacional Autónoma de Nicaragua (UNAN), de El Salvador (UES) y el Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) in Costa Rica.	DANIDA
Drejer, Ina	February 96 – October 99*	Aspects of technological interdependence – an analysis of the role of external knowledge and knowledge intensive interaction in technological development and innovative activity	DRUID- conference W98 & S98. Course: Structural equations, Aalborg University.	IES – AAU Visit to University of Western Sydney Macarthur, Australien, 8-16 March 1998.	Ph.D.-stip. FFL.
Husted, Kenneth		Industriell forskning: styring og autonomi		IVS-CBS	CISTEMA & Dept. of Industrial Economics and Strategy.
Iversen, Mikael	December 96 - December 99	Organization of industrial synergies	DRUID- conference S98. Design and Completion of Ph.D. 100 hr. Ph.D. course Empirical Analysis in Business Studies. 200 hr. Ph.D. course	IVS - CBS	Ph.D.-stip. FFL
Jørgensen, Kenneth	May 96-October 99	Organizing new technologies in loosely coupled systems.	DRUID conference W98. Ph.D. course: "Case study Research and	IES – AAU Stanford University April- September 1998	Ph.D.-stip Min. of Ind. .

			Narratology" at Aalborg University		
Kaisla, Jukka	March 98 - March 2001	Studies in the theory of economic organisation	DRUID-conference S98. Participated in 2 international conferences.	IVS-CBS	DRUID
Kristensen, Frank Skov	May 96 – April 99*	Innovation in services – taxonomy and analysis	DRUID conference W98 & S98	IES – AAU SPRU, Sussex University, UK, January 98-May 98.	Kand. stip. Min. of Ind
Laursen, Keld	February 95 - August 98*	A Neo-Schumpeterian Perspective on the Determinants and Effects of International Trade Specialisation (PhD Thesis title)	DRUID-conf. W98 & S98	IES – AAU Sussex University	Ph.D.-stip. FFL.
López, Mario	January 1998-May 2000		DRUID-conference S98	IES - AAU	DANIDA
Lorenzen, Mark	September 95 - September 98	Localised learning and community capabilities: On organisation of knowledge in firms, markets, and communities	DRUID-conference W98, S98	IVS - CBS	Ph.D.-stip. FFL
Mahnke, Volker	October 97 - August 98	Towards a new strategic theory of the firm: the economies of intellectual production.	DRUID-conference S98	IVS - CBS	Ph.D.-stip. CBS/DRUID
Munk Riis, Annemarie	December 94 – November 97	Economic and social aspects of universal service and education policies - An empirical investigation of Denmark, the European Union and the United State		INT - CBS University of Cal. Berkeley	Ph.D.-stip. FFL
Nymark, Søren	February 96 – January 99.	Organizational storytelling; value based management	Course: Philosophy and Theory of Management, Århus Business School.	IES – AAU University of Cambridge; visiting scholar August 1997 – April 1998	Ph.D.-stip. FFL.
Præst, Mette	April 95 – October 98*	Patterns of Technological Competence Accumulation and Performance: Experiences from	DRUID-conference W98 & S98 Course: Structural equations, Aalborg University.	IES – AAU	Ph.D.-stip. FFL.

		Telecommunications.			
Schmidt, Anders McIlquham	May 97 - Maj 2000	Strategy, strategic management and performance.	DRUID- conference W98 & S98	IVS - CBS Stanford University July 1999 - December 1999	Ph.D.-stip, FFL
Sornn-Friese, Henrik	September 96 - August 99	Industrial Dynamics and Business Strategy in the Road Haulage Sector in Denmark	DRUID- conference S98	IVS - CBS Scancor, Stanford University, Californien, USA, July 1997 - March 1998.	Ph.D.-stip, FFL
Valente, Marco	Marts 97 – August 99	Evolutionary modelling of market processes	DRUID- conference W98	IES – AAU University of Milan	Kand. stip. FFL.
Vinding, Anker Lund	October 98- October 2001	Network collaboration at the interfirm level	ETIC: economics of technological and institutional change	IES - AAU	DRUID

ABBREV: IES = Department for Business Studies, IVS = Department of Industrial Economics and Strategy, INT = Department of International Economics and management, FFL= Financing: Ordinary budget

*Includes period of leave from the grant.

II. A1: Dissertations

HUSTED, K.: Industriel forskning: styring og autonomi. Presentation of dissertation October 21, 1998.

LAURSEN, Keld: A Neo-Schumpeterian Perspective on the Determinants and Effects of International Trade Specialisation. Presentation of dissertation November 6, 1998.

PRAEST, Mette: Patterns of Technological Competence Accumulation and Performance: Experiences from Telecommunications. Presentation of dissertation January 15, 1999.

RIIS, Annemarie M.: Economic and social aspects of universal service and education policies - An empirical investigation of Denmark, the European Union and the United State. Presentation of dissertation October 5, 1998.

II.B: Ph.D.-training activities organised by DRUID and DRUIDS

There are two types of activities that are directly and exclusively aiming at Ph.D.-training to be reported here. One is the ETIC Ph.D.-training programme that goes on at a regular basis with

senior DRUIDs as co-organisers and the other is individual contributions to other initiatives in the field of Ph.D.-training. As mentioned in the Summary and Self Evaluation we regard the Annual Summer and Winter conference as an important instance of Ph.D.-training.

II.B1. Activities in the ETIC Programme

1. The ETIC Spring Session in Maastricht, March 30th - April 10th, 1998

'Macrodynamics of Growth and Trade in Open Economies' (first week)

Teaching staff:

Bent DALUM, IKE/DRUID, Department of Business Studies, Aalborg, Denmark (coord.)
Bart VERSPAGEN, MERIT, University of Maastricht, The Netherlands
Katy WAKELIN, MERIT, University of Maastricht, The Netherlands
Thomas ZIESEMER, MERIT, University of Maastricht, The Netherlands

'Systems of Innovation and Technology Policy' (second week)

Teaching Staff:

Aldo GEUNA, BETA, University of Strasbourg, France
Laurent BACH, BETA, University of Strasbourg, France
Dominique FORAY, IRIS, University of Paris IX, France
Patrick LLERENA, BETA, University of Strasbourg, France (coord.)
Frieder MEYER-KRAHMER, ISI, Karlsruhe, Germany
Luc SOETE, MERIT, University of Maastricht, The Netherlands
Ed. STEINMULLER, SPRU, Brighton, UK

2. The ETIC Autumn Session in Strasbourg, October 5th - 15th, 1998

'Micro-Economics of Innovation and Theory of the Firm' (third week)

Teaching staff:

Kristine BRULAND, Oslo, Norway
Carsten DREHER, ISI-FhG, Karlsruhe, Germany
Gilles LAMBERT, BETA, Strasbourg, France
Patrick LLERENA, BETA, Strasbourg, France (coord)
Stéphane ROBIN, Grenoble, France
Bernard RUFFIEUX, IREPD, Grenoble, France
Marc WILLINGER, BETA, Strasbourg, France
Anthony ZIEGELMEYER, BETA, Strasbourg, France

'Evolutionary Modelling of Technical Change and Economic Dynamics' (fourth week)

Teaching Staff:

Esben Sloth ANDERSEN, IKE, Aalborg, Denmark (coord)
Giovanni DOSI, University of Rome, Italy

Patrick LLERENA, BETA, Strasbourg, France
Gerald SILVERBERG, MERIT, Maastricht, The Netherlands
Murat YILDIZOGLU, BETA, Strasbourg, France

II.B2. Individual contributions to Ph.D.-training

CHRISTENSEN, Poul Rind:

"Theories on the internationalization of SMEs and their environment", Contribution to European Doctoral Programme, Växjö, April, 1998.

FOSS, Nicolai J.:

Opponent at Ph.d.-defence (Frederic Sautet) at Université Paris I- Dauphine, June 2.

Member "Scientific Board" for "Ecole d'été de Sophia Antipolis sur la Firme et l'Industrie" organised by IDEFI-LATAPSES, Nice.

LUNDVALL, Bengt-Åke:

Commented papers by Ph.D.s, chaired sessions and gave a talk on research strategy in the field Economics of technical and institutional change, at the ETIC-conference, Strasbourg, October 15-17, 1998.

Chaired the evaluation committee for Annemarie Munk Riis's Ph.D.-dissertation, October 5, 1998,

Gave five lectures for Ph.D. –students on "Economics of innovation and learning", CEFI, Aix en Provence, October 19-23, 1998.

MASKELL, Peter:

Contributions to Ph.D. training at Uppsala University 03-04 April, 1998, Göteborg University Oktober 19, 1998 and at Karlstad University December 02, 1998.

Section III: Communication to users

((p) indicates Ph.D.-student)

III.A: Publications aiming at users

CHRISTENSEN, Jesper Lindgaard, Dyhrberg, Lars, Livoni, Peter & Rygaard (1998). *Jens, Private investors' bidrag til innovation* (Private investors' contribution to innovation), Erhvervsfremme Styrelsen, DISKO Report no. 5, October, 143 p.

DREJER, Ina (p) (1998). *Den vidensbaserede økonomi - en analyse af vidensintensitet og vidensstrømme i det danske innovationssystem* (The knowledge based economy - an analysis of knowledge intensity and knowledge flows in the Danish system of innovation), Erhvervsfremme Styrelsen, DISKO Report no. 4, May, 83 p.

GJERDING, A.N. (1998). *Teknologisk og organisatorisk innovation i nordjyske virksomheder* (Technical and organisational innovation in North Jutland firms), NEP Publikationer No.6, Aalborg: Aalborg Universitet, 34 p.

GJERDING, A.N. (1998). *Fleksibilitet og teknologisk fornyelse. Et socioøkonomisk perspektiv* (Flexibility and technological innovation. A socio-economic perspective), mimeo, Department of Development and Planning, Aalborg University, presented at the conference on *Fleksibilitet i Norden* (Flexibility in the Nordic Countries), organised by Institutt for samfunnsforskning (the Norwegian institute for social research), Oslo, October 29-30, 17 p.

JØRGENSEN, Kenneth (P), KRISTENSEN, Frank Skov (P), LUND, Reinhard & NYMARK, Søren (P) (1998). *Organisatorisk fornyelse - erfaringer fra 24 danske virksomheder* (Organisational Change), Erhvervsfremme Styrelsen, DISKO Report no. 2, March, 101 p.

LUNDEVALL, Bengt-Åke & Borrás, Susana (1998). *The globalising learning economy: Implications for innovation policy*, European Communities, Luxembourg, 177 p.

VOXTED, Søren (1998). *Efteruddannelsessystemets rolle og muligheder i det danske innovationssystem* (The role and possibilities of the system for continuing vocational training in the Danish system of innovation), Erhvervsfremme Styrelsen, DISKO Report no. 3, March, 71 p.

III.B: Events and individual interaction with users

ANDERSEN, Poul H.:

Internet and the international marketing and sourcing of subcontracted goods. (DTI), August 27, 1998.

CHRISTENSEN, Jens F.:

Commentator at the minister of Ministry of Business and Industry's presentation of, *Erhvervsredegørelse 1998*, Christiansborg October 1, 1998.

Contribution to, *Oxford Research's evaluating af Centerkontraktordningen*

CHRISTENSEN, Poul Rind:

Lecture to the Danish Council for Industrial Development, Ministry of Industry on the subject *Perspectives for Danish Subcontractors Development*, Copenhagen, December, 1998.

DALUM, Bent:

The Fairy-Tale of North Jutland: The History of the North Jutland Radiocommunications Industry. Talk at The Danish Telecom Society (part of the Danish Association of Engineers) Conference on the Danish Electronics Industry October 8, 1998.

Member of the Board of NOVI A/S, the Aalborg University science park.

GJERDING, A. N.:

Flexible organisations in the Nordic Countries, NORDFLEX workshop, organised by the Norwegian institute of social research, Oslo, February 19-20, 1998.

Flexible organisations in the Nordic Countries, NORDFLEX workshop, organised by the Finnish labour ministry, Helsinki, June 15-16, 1998.

The flexible firm, presentation at the conference on "The Changing Nature of the Firm", organised by NUTEK, Borgarnes (Iceland), June 25-27, 1998.

Den fleksible virksomhed (The flexible firm), presentation at the conference on "Selvstyrende grupper - hvorfor?" (Self-governing work teams - why?), organised by the Vocational Training and Education Centre of Aarhus, Aarhus (Denmark), August 25, 1998.

Fleksibilitet og integration - tidens trend? (Flexibility and integration - the contemporary pattern?), presentation at the executive briefing on "Implementering af integrerede rammesystemer" (Implementation of integrated mainframe systems), organised by Deloitte & Touche Consulting Group, Copenhagen, September 2, 1998

Flexible organisations in the Nordic Countries, NORDFLEX workshop, organised by the Norwegian institute of social research, Oslo, October 28 & 31, 1998.

Fleksibilitet og teknologisk fornyelse. Et socioøkonomisk perspektiv (Flexibility and technological innovation. A socio-economic perspective), presentation at the conference on "Fleksibilitet i Norden" (Flexibility in the Nordic Countries), organised by the Norwegian institute for social research, Oslo, October 29-30, 1998.

Nye kompetencer - nyt uddannelsesbegreb (New competences - new educational concepts), presentation at the regular meeting for the Danish vocational training and education centres, organised by the Danish labour market directorate, Kolding (Denmark), November 5, 1998.

Lærende organisationer og fleksible virksomheder (Learning organisations and flexible firms), workshop organiser at the conference on “Mennesker i udvikling - virksomheder i forandring” (Humans in progress - changing firms), organised by the Danish labour market directorate, Vejle (Denmark), November 18-19, 1998.

Innovation i Nordjylland (Innovation in North Jutland), presentation at the conference on “Nordjylland i et globalt perspektiv” (North Jutland in a global perspective), organised by the North Jutland export club, Aalborg (Denmark), November 23, 1998.

Fleksibilitet og konkurrenceevne (Flexibility and competitiveness), presentation at the seminar on “Nordjysk Eksportprofil 1998” (North Jutland export profile 1998), organised by the NEP project at Aalborg University, Aalborg (Denmark), December 14, 1998.

LUNDEVALL, Bengt-Åke:

The learning economy – implications for the knowledge base of health and education systems, presentation of paper at the, 2nd High level Forum on Knowledge Production in Learning economies and Societies, CERI/OECD, Paris, May 14, 1998.

Participated in working group to prepare the establishment of, *Human resource management center*, in Northern Jutland. Meetings 31/8, 5/10 and 11/12 1998.

Participated in *the Industry Ministry think-tank on innovation policy* 19/8, 18/11 and 16/12 1998.

Den økologiske udfordring i den lærende økonomi, ØKO-net seminar, Snoghøj Folkehøjskole, January 25, 1998.

Danske virksomheders håndtering af globaliseringen, Europa-konference, Aalborg University, February 2, 1998.

Den fleksible virksomhed – resultater fra DISKO-projektet, Aalborg Industri og Handelskammer, Aalborg, February 4, 1998.

Innovation policy in the learning economy, INSEAD, Fontainebleu, May 13, 1998.

Den vidensbaserede økonomi – myter og realiteter, Erhvervspolitisk Forum, Ingeniørhuset, København June 17, 1998.

The learning economy, 3rd high level Forum on Knowledge Production in Learning economies and Societies, CERI/OECD, Stanford University, Stanford, September 10, 1998.

Den lærende økonomi – nye udfordringer for virksomheder og for samfundet, PLS-workshop on Balanceret rapportering, Hotel d'Angleterre, September 17, 1998.

MASKELL, Peter:

- Member of Danmarks Statistiks Forskningsudvalg.
- Member of Københavns Erhvervsråd.
- Member of The Advisory board for Copenhagen Capacity.
- Member of bestyrelsen for Københavns Havn.
- Member of Byggeriets Udviklingsråd.
- Member of Erhvervsfremme Styrelsens ekspertgruppe for ressourceområdeanalyser (since December 1, 1998).

Erhvervspolitisk Forum, *Boligpolitisk strategi - virker virkemidlerne?* May 5, 1998.

Erhvervspolitisk Forums presentation of *Erhvervsministeriets Erhvervsredegørelse 1998*, October 1, 1998.

Dansk Industri conference on, *Mindre og mellemstore virksomheders rolle i velfærdssamfundet*, December 3, 1998.

OECD conference in Modena on, *Learning and Regional Competitiveness*, May 28-29, 1998.

OECD conference on, *Economic and Cultural Transition Toward a Learning City*, Friedrich Schiller University of Jena, June 25-26, 1998.

EU commissions conference in Manchester on, *Learning Regions and Economic Development*, September 16-18, 1998.

VEJRUP-HANSEN, Per:

Speech at Dansk Management Forum. Seminar on senior policy. *Hvorfor er tilbagetrækningsalderen blevet lavere?* November 1998.

Consultant for Arbejdsmarkedsstyrelsen on data use in AF-regions.

III.C: Events and collective interaction with users

DALUM, Bent:

The Norcom-club, Denmark May 6th. 1998 with Mette Præst and Gert Villumsen:
The Patent Behaviour of the Electronics Cluster 'Norcom' in Northern Jutland.

Member of the NOVI team organising the NorCOM club of telecommunications firms and knowledge institutions. Among the activities are 4 annual meetings, current update of the NorCOM homepage (www.norcom.dk), based on detailed scanning of a variety of information sources and a broad spectrum of outside information tasks.

LUNDVALL, Bengt-Åke:

Participated in meetings in advisory committee for the DISKO-project, January 26, May 12, September 18, October 30 and December 7, 1998.

Organised, *Innovation systems and Innovation Policy*, High Level Workshop on Innovation systems and Innovations policy, Novi, Aalborg, May 11, 1998.

Appendix 1

("(p)" indicates Ph.D.-student)

DRUID Working Paper Series

- 98-1** **Præst, Mette (p):** An Empirical Model of Firm Behaviour: A dynamic Approach to Competence Accumulation and Strategic Behaviour. (ISBN 87-7873-037-6)

- 98-2** **Ducatel, Ken:** Learning and skills in the Knowledge Economy. (ISBN 87-7873-038-4)

- 98-3** **Ernst, Dieter:** What Permits Small Firms to Compete in High-Tech Industries? Inter-Organizational Knowledge Creation in the Taiwanese Computer Industry. (ISBN 87-7873-039-2)

- 98-4** **Christensen, Jens Frøslev:** The Dynamics of the Diversified Corporation and the Role of Central Management of Technology. (ISBN 87-7873-040-6)

- 98-5** **Valente, Marco (p):** Laboratory for Simulation Development. (ISBN 87-7873-041-4)

- 98-6** **Valente, Marco (p):** Technological Competition: a Qualitative Product Life Cycle. (ISBN 87-7873-042-2)

- 98-7** **Lam, Alice:** The Social Embeddedness of Knowledge: Problems of Knowledge Sharing and Organisational Learning in International High-Technology Ventures. (ISBN 87-7873-043-0)

- 98-8** **Jørgensen, Kenneth M. (p):** Information Technology and Change in Danish Organizations. (ISBN 87-7873-044-9)

- 98-9** **Andersen, Esben Sloth:** Escaping Satiation in an Evolutionary Model of Structural economic Dynamics. (ISBN 87-7873-045-7)

- 98-10** **Foss, Kirsten:** Technological Interdependencies, Specialization and Coordination: A Property Rights Perspective on The Nature of the Firm. (ISBN 87-7873-046-5)

- 98-11** **Andersen, Poul H:** Organizing International Technological Collaboration in Subcontractor Relationships. An Investigation of the Knowledge-Stickyness Problem. (ISBN 87-7873-047-3)

- 98-12** **Nymark, Søren (p):** Billeder af strategi i forandringsrige organisatoriske omgivelser: 3 cases fra DISKO studierne. (ISBN 87-7873-048-1)

- 98-13** **Andersen, Esben Sloth:** The Evolution of the Organisation of Industry. (ISBN 87-7873-050-3)

- 98-14 Foss, Kirsten & Foss, Nicolai J.:** The Market Process and The Firm: Toward a Dynamic Property Rights Perspective. (ISBN 87-7873-051-1)
- 98-15 Lorenz, Edward:** Societal Effects and the Transfer of Business Practices to Britain and France. (ISBN 87-7873-053-8)
- 98-16 Ernst, Dieter:** Catching-Up, Crisis and Industrial Upgrading. Evolutionary Aspects of Technological Learning in Korea's Electronics Industry. (ISBN 87-7873-054-6)
- 98-17 Kaisla, Jukka (p):** The Market Process and the Emergence of the Firm: Some Indications of Entrepreneurship Under Genuine Uncertainty. (ISBN 87-7873-055-4)
- 98-18 Laursen, Keld (p):** Do Export and Technological Specialisation Patterns Co-evolve in Terms of Convergence or Divergence?: Evidence from 19 OECD Countries, 1971-1991. (ISBN 87-7873-056-2)
- 98-19 Foss, Nicolai J.:** Firms and the Coordination of Knowledge: Some Austrian Insights. (ISBN 87-7873-057-0)
- 98-20 Mahnke, Volker (p) & Aadne, John Harald:** Process of Strategic Renewal, Competencies, and the Management of Speed. (ISBN 87-7873-058-9)
- 98-21 Lorenzen, Mark (p):** Information, cost learning, and trust. Lessons form co-operation and higher-order capabilities amongst geographically proximate firms. (ISBN 87-7873-059-7)
- 98-22 Lam, Alice:** Tacit Knowledge, Organisational Learning and Innovation: A Societal Perspective. (ISBN 87-7873-060-0)
- 98-23 Lund, Reinhard:** Organizational and innovative flexibility mechanisms and their impact upon organizational effectiveness. (ISBN 87-7873-061-9)
- 98-24 Christensen, Jesper Lindgaard & Drejer, Ina (p):** Finance and Innovation System or Chaos. (ISBN 87-7873-062-7)
- 98-25 Laursen, Keld (p):** How Structural Change Differs, and Why it Matters (for Economic Growth) (ISBN 87-7873-063-5)
- 98-26 Holmén, Magnus & Jacobsson, Staffan:** A method for identifying actors in a knowledge based cluser. (ISBN 87-7873-064-3)
- 98-27 Richardson, G. B.:** Production, Planning and Prices. (ISBN 87-7873-065-1)
- 98-28 Foss, Nicolai J.:** Austrian Economics and Game Theory: a Preliminary Methodological Stocktaking. (ISBN 87-7873-067-8)

- 98-29 Foss, Nicolai J. & Mahnke, Volker (p):** Strategy Research and the Market Process Perspective. (ISBN 87-7873-068-6)
- 98-30 Laursen, Keld (p):** Revealed Comparative Advantage and the Alternatives as Measures of International Specialisation. (ISBN 87-7873-069-4)

Appendix 2

Conferences

Programme for the DRUID Winter Seminar, January 8-10, 1998

Thursday the 8th.

15.30 Arrival on Kongebrogården
Kongebrovej 63
DK-5500 Middelfart
Phone: +45 64 41 11 22
Fax: +45 64 41 11 80

Coffee

16.00 - 18.30 Session 1:
Maj Andersen "Evolutionary and resource based theories on interorganisational learning" -Edward Lorenz and Frank Skov Kristensen
Jens Frøslev Christensen " Building Innovative Assets and Dynamic Coherence in Multi-Technology Companies" - Rod Coombs and Mette Præst
Nicolai Juul Foss "Edith Penrose and the Penrosians - or, why there is still so much to learn from the theory of the Growth of the Firm"- G.B. Richardson and Maj Andersen
19.00 - Dinner
20.30 - 21.30 Introduction on Industrial Dynamics
Bo Carlson and Bengt-Åke Lundvall

Friday the 9th.

9.00 - 10.45 Session 2:
Bent Dalum, Keld Laursen and Gert Villumsen "Is there such a thing as a!good export specialisation pattern? An European Perspective" - Mario Pianta and Lars Gelsing
Ina Drejer "Technological Interdependence in Danish Economy - A Comparison of Methods for Identifying Technology Flows" - Pekka Ylä Antilla and Peter Maskell
Keld Laursen "Do Inter-sectoral Linkages Matter for International Export Specialisation?"- Pekka Ylä Antilla and Dieter Ernst
11.00 - 13.00 Session 3:
Allan Næs Gjerding "International competitiveness by "orgfensive" means. Some observations on technical innovation and organisational change in the Danish private business sector" - Rod Coombs and Kristian Philipsen
Kristian Philipsen and Esben Sloth Andersen "The Evolution of Credence Goods in Customer Markets.Discussants" - Bo Carlson and Jesper Lindgaard Christensen

	Mark Lorenzen "Cultural Learning: What is culture and how Does it matter for learning?" - Edward Lorenz and Allan Næs Gjerding
	Volker Mahnke "Can contractual theories of the firm explain the existence of knowledge-intensive firms?" - Bo Carlsson and Edward Lorenz
13.00 - 14.00	Lunch
14.00 - 16.00	Cultural Arrangement
16.00 - 18.30	Session 4: Kirsten Foss "Technological Interdependencies, Specialization and Coordination: A Property Rights Perspective on The Nature of the Firm" - Bo Carlsson & Peter Maskell Nicolai Juul Foss & Mikael Iversen "Promoting Synergies in Multiproduct Firms: Toward a Resource-based View" - Rod Coombs & Pekka Ylä Antilla Peter Maskell "Outsourcing versus integration: The role of knowledge and space" - Kirsten Foss & Esben Sloth Andersen Sei-Myung Chang "The Semiconductor Technological Systems in Korea and Taiwan" - Dieter Ernst & Keld Laursen
19.00 -	Dinner
January 10th. 9.00 - 10.30	Session 5: Mette Præst "An Empirical Model of Firm Behaviour: A Dynamic Approach to Competence Accumulation and Strategic Behaviour" - Morten Overgaard Nielsen and Nicolai Juul Foss Marco Valente "Technological Competition: A Qualitative Product Life Cycle" - G.B. Richardson and Keld Laursen
10.45 - 11.45	Closing round table on transaction costs and trust introduced by Edward Lorenz: Edward Lorenz, G.B.Richardson, Peter Maskell, Nicolai Juul Foss, and Lars Gelsing
12.00-13.30	Lunch
14.00	Departure

International Guests:

Bo Carlsson
Rod Coombs
Edward Lorenz
Mario Pianta
G.B. Richardson
Mario Pianta
Pekka Ylä Antilla

Title of papers for the DRUID 1998 Winter Seminar

Andersen, Maj Munch: Evolutionary and resource based theories on interorganisational learning. Discussants: Ned Lorenz & Frank Skov Kristensen.

Christensen, Jens Frøslev: Building Innovative Assets and Dynamic Coherence in Multi-Technology Companies. Discussants: Rod Coombs & Mette Præst.

Dalum, Bent; Keld Laursen and Gert Willumsen: Is there such a thing as a good export specialisation pattern? An European Perspective. Discussants: Mario Pianta & Lars Gelsing.

Drejer, Ina: Technological Interdependence in Danish Economy - A Comparison of Methods for Identifying Technology Flows. Discussants: Pekka Ylä Antilla & Peter Maskell.

Foss, Kirsten: Technological Interdependencies, Specialization and Coordination: A Property Rights Perspective on The Nature of the Firm. Discussants: Bo Carlsson & Peter Maskell.

Foss, Nicolai Juul: Edith Penrose and the Penrosians - or, why there is still so much to learn from the theory of the Growth of the Firm. Discussants: G.B. Richardson & Maj Andersen.

Gjerding, Allan Næs: International competitiveness by "orgfensive" means. Some observations on technical innovation and organisational change in the Danish private business sector. Discussants: Rod Coombs and Kristian Philipsen.

Foss, Nicolai Juul & Iversen, Mikael: Promoting Synergies in Multiproduct Firms: Toward a Resource-based View. Discussants: Rod Coombs & Pekka Ylä Antilla.

Jørgensen, Kenneth: Information technology and organizational change - A case study in a Danish subsidiary company. Discussants: Mark Lorenzen & Volker Mahnke.

Lorenzen, Mark: Cultural Learning: What is culture and how Does it matter for learning? Discussants: Ned Lorenz & Allan Næs Gjerding.

Laursen, Keld & Ina Drejer: Do Inter-sectoral Linkages Matter for International Export Specialisation? Discussants: Pekka Ylä Antilla & Dieter Ernst.

Mahnke, Volker: Can contractual theories of the firm explain the existence of knowledge-intensive firms? Discussants: Bo Carlsson & Edward Lorenz.

Maskell, Peter: Outsourcing versus integration: The role of knowledge and space. Discussants: Kirsten Foss & Esben Sloth Andersen.

Præst, Mette: An Empirical Model of Firm Behaviour: A Dynamic Approach to Competence Accumulation and Strategic Behaviour. Discussants: Morten Overgaard Nielsen & Nicolai Juul Foss.

Philipsen, Kristian and Esben Sloth Andersen: The Evolution of Credence Goods in Customer Markets. Discussants: Bo Carlsson & Jesper Lindgaard Christensen.

Valente, Marco: Technological Competition: A Qualitative Product Life Cycle. Discussants: G. B. Richardson & Keld Laursen.

Sei-Myung Chang: The Semiconductor Technological Systems in Korea and Taiwan. Discussants: Dieter Ernst & Keld Laursen.

Programme for the Conference: "Competences, Governance and Entrepreneurship". The DRUID 1998 Summer Conference, Bornholm, June 9-11, 1998.

Tuesday, June 9

- 10.00 Departure from Copenhagen Airport
- 11.00 Arrival at Hotel Fredensborg, Bornholm
- 11.30 - 13.00 Lunch
- 13.00 - 13.15 Opening addresses
Finn Junge-Jensen, President of Copenhagen Business School
Nicolai Foss, organizer of the conference
- 13.15- 14.00 Keynote address (plenary session)
Bo Carlsson and Bengt-Åke Lundvall: "Industrial Dynamics Revisited: What Have We Learned?"
- 14.00 - 15.15 Session A: Fundamental Perspectives
Chair: Bo Carlsson
Sidney G. Winter: "Evolutionary Production Theory: Principles and Elements"
Richard N. Langlois: "Capabilities and Governance: the Rebirth of Production in the Theory of Economic Organization"
Paul Geroski: "The Growth of Firms in Theory and Practice"
Discussants: Ulrich Witt and Giovanni Dosi
Session B: Competences and Technology Strategy
Chair: Bengt-Åke Lundvall
Franco Malerba: "Knowledge Proximity and Technological Diversification"
Mette Præst: "Processes of Technological Competence Accumulation: A Synthesis"
Jens Frøslev Christensen: "Pursuing Corporate Coherence in Decentralized Governance Structures: the Role of Technology Management in Multi- Product Companies"
Discussants: Massimo Colombo and Finn Valentin
- 15.15 - 15.45 Coffee break
- 15.45 - 17.00 Session C: Perspectives on Interfirm Organization
Chair: Peter Maskell
Bart Nooteboom: "Competence in Mutual Dependence"
Massimo Colombo: "The Choice of the Form of Strategic Alliances: Transaction Cost Economics and Beyond"
Anoop Madhok: "Cost, Value, and the Management of Interfirm Collaborations"
Discussants: Steen Thomsen and Henrik Lando
Session D: Competences, Transaction Costs, and Strategy
Chair: Jens Frøslev Christensen

Kirsten Foss and Nicolai Foss: "The Knowledge-Based Perspective: Some Organizational Economics Foundations"
Jack Nickerson: "Toward an Economizing Theory of Strategy"
Nicholas Argyres: "Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into the Transaction Cost Theory of Firm"
Discussants: Torger Reve and Oliver Williamson
17.00 Session E: Competences and Transaction Costs
(plenary session)
Chair: Volker Mahnke
Roundtable with Oliver Williamson, Sidney Winter, Brian Loasby, Bengt-Åke Lundvall, G.B. Richardson, Jay Barney, and Giovanni Dosi

19.00 Dinner

Wednesday, June 10

9.00 - 9.30 Keynote address (plenary session)
G.B. Richardson: "Production, Planning and Prices"
9.30 - 10.45 Session A: Evolution and Industrial Organization
Chair: Rikard Stankiewicz
Esben Sloth Andersen: "The Evolution of the Organisation of Industry"
Martin Fransman: "Analysing the Evolution of Industry: the Relevance of the Telecommunications Industry"
Frank Kristensen: "Towards a Dynamic Theory of Industrial Organisation"
Discussants: Vivien Walsh and Stan Metcalfe
Session B: Evolution and the Firm
Chair: Nicolai Foss
Ulrich Witt: "Between Entrepreneurial Leadership and Managerial Governance - The Contingent Ontogeny of the Firm Organization"
Luigi Marengo: "Interdependencies and Division of Labor in Problem Solving Techniques"
Giovanni Dosi: "Learning to Govern and Learning to Solve Problems"
Discussants: Richard Langlois and Brian Loasby
10.45 - 11.00 Coffee break
11.00 - 12.30 Session C: Empirical Work on the Competence Perspective
Chair: Peter Maskell
Guido Reger: "European Technology Policy and Internationalization: An Analysis against the Background of the International Innovation Strategies of Multinational Enterprises"
Torben Pedersen: "Do MNCs Learn Through Their International Operations?"
Birgitte Andersen and Vivien Walsh: "Co-Evolution of Technological Systems, Blurring of Industry Boundaries, and Broadening of Competences in the Chemical Industry"

Discussants: Keld Laursen and Bo Carlsson
 Session D: Real Options and the Theory of the Firm
 Chair: Steen Thomsen
 Ron Sanchez: "Uncertainty, Flexibility and Economic Organization: Foundations for an Option Theory of the Firm"
 Jay B. Barney: "Transaction Costs, Real Options, Learning and Property Rights"
 Eric Pfaffman: "How Does a Product Influence the Boundaries of the Firm?"
 Discussants: Jack Nickerson and Volker Mahnke
 12.30 - 13.30 Lunch
 13.30 Sightseeing on Bornholm
 18.30 Dinner
 20.30- Session E: Technology and Competence Accumulation (plenary session)
 Chair: Jens Frøslev Christensen
 Keith Pavitt: "Technologies, Products and Organisation in the Innovating Firm: What Adam Smith Tells us and Joseph Schumpeter Doesn't"
 Rod Coombs and Stan Metcalfe: "Distributed Capabilities and the Governance of the Firm"
 Gunnar Eliasson: "The Nature of Economic Change and Management in the Knowledge-Based Information Economy"
 Discussants: Charles Edquist and Bengt-Åke Lundvall

Thursday, June 11
 8.45 - 9.15 Keynote address (plenary session)
 Oliver E. Williamson: "Strategic Management and Core Competences: A Transaction Cost Economics Perspective"
 9.15 - 10.30 Session A: Knowledge, Decisions and the Firm
 Chair: Esben Sloth Andersen
 Brian J. Loasby: "Decision Premises and Economic Organisation"
 Neil Kay: "Some Rude Thoughts on the Growth of Firms"
 Patrick Llerena: "The Theory of the Firm in an Evolutionary Perspective: a Critical Development"
 Discussants: Ron Sanchez and Keith Pavitt
 Session B: Learning, Communication and Internal Organization
 Chair: Kirsten Foss
 Jacques de Bandt: "Competence and Organizational Learning Requirements for Complex Knowledge Production"
 Henrik Lando: "Communication Costs, Individual and Collective Ownership"
 Mark Casson: "An Entrepreneurial Theory of the Firm"
 Discussants: Stan Metcalfe and Nicholas Argyres
 10.30 - 10.45 Coffee break
 10.45 - 12.00 Session C: The Role of Geographical Proximity
 Chair: Bent Dalum

Kristian Philipsen: "The Role of Entrepreneurship in the Development of a Local Industrial Cluster"

Mark Lorenzen: "Information Costs, Learning, and Trust"

Dieter Ernst: "What Permits Small Firms to Compete in High-Tech Industries?"

Discussants: Peter Maskell and Mark Casson

Session D: Extended Views of Governance

Chair: Esben Sloth-Andersen

Steen Thomsen and Torben Pedersen: "Ownership Structure and Economic Performance in the Largest European Companies"

Paul H Andersen: "#Organizing International Technological Collaboration in Subcontractor

Relationships: An Investigation of the Knowledge-Stickiness Problem"

Allan Næss Gjerding: "Technical Collaboration as Social Construction: Some Observations on Tacit Knowledge and Shared Meaning

Discussants: Birgitte Andersen and Massimo Colomo

13.00

Departure for Rønne Airport

Invited participants

Nicholas ARGYRES, University of California, Los Angeles

Robert BURGELMAN, Stanford University

Bo CARLSSON, Case Western University

Mark CASSON, University of Reading

Kathleen CONNER, University of Ohio

Rod COOMBS, Manchester University

Harold DEMSETZ, University of California, Los Angeles

Giovanni DOSI, University of Rome

Sumantra GHOSHAL, London Business School

Jean-Francois HENNART, University of Illinois

Richard N. LANGLOIS, University of Connecticut

Brian J. LOASBY, University of Stirling

James G. MARCH, Stanford University

John Stanley METCALFE, Manchester University

Anoop MADHOK, University of Utah

Luigi MARENGO, University of Trento

Cynthia MONTGOMERY, Harvard Business School

Bart NOOTEBOOM, University of Groningen

George B. RICHARDSON, Oxford

David J. TEECE, University of California, Los Angeles

Oliver E. WILLIAMSON, University of California, Berkeley.

Sidney G. WINTER, The Wharton School

Contributions for the DRUID Summer Conference 1998

Birgitte Andersen and Vivien Walsh: Co-Evolution of Technological Systems, Blurring of Industry Boundaries and Broadening of Competencies in the Chemical Industry

Esben Sloth Andersen: The Evolution of the Organisation of Industry

Poul Houman Andersen: Organizing International Technological Collaboration in Subcontractor Relationships An Investigation of the Knowledge-Stickyness Problem

Nicholas S. Argyres and Julia Porter Liebeskind: Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into the Transaction Cost Theory of the Firm

Jacques De Bandt: Competence, Organisational Learning and Training Requirements for Complex Knowledge Production.

Jay B. Barney and Woonghee Lee: Governance Under Uncertainty: Transactions Costs, Real Options, Learning, and Property Rights

Stefano Breschi, Francesco Lissoni and Franco Malerba: Knowledge Proximity and Technological Diversification

Bo Carlsson and Bengt-Åke Lundvall: Industrial Dynamics Revisited: What have we Learned?

Mark Casson: An Entrepreneurial Theory of the Firm

Jens Frøslev Christensen: Pursuing Corporate Coherence in Decentralized Governance Structures. the Role of Technology Management in Multi-Product Companies

Patrick Cohendet and Patrick Llerena: "Theory of the Firm in an Evolutionary Perspective: A critical development"

Massimo G Colombo.: The Choice of the Form of Strategic Alliances: Transaction cost Economics and Beyond

Rod Coombs and Stan Metcalfe: Distributed Capabilities and The Governance of The Firm

Gunnar Eliasson: The Nature of Economic Change and Management in the Knowledge-based Information Economy

Dieter Ernst: What Permits Small Firms to Compete in High-Tech Industries? The Dynamics of Inter-Organizational Knowledge Creation in the Taiwanese Computer Industry

Kirsten Foss and Nicolai Foss,: The Knowledge-Based Approach: A Perspective From Organizational Economics

Martin Fransman: Analysing the Evolution of Industry: The Relevance of the Telecommunications Industry

Paul A. Geroski: The Growth of Firms in Theory and in Practice

Allan Næs Gjerding: Technical collaboration as social construction Some observations on tacit knowledge and shared meanings

Neil Kay: Some Rude Thoughts on The Growth of Firms

Frank Skov Kristensen: Understanding Learning in Technological Trajectories: Combining Organizational Integration and Industrial Dynamics

Richard N. Langlois and Nicolai J. Foss: Capabilities and Governance: the Rebirth of Production in the Theory of Economic Organization

Brian J Loasby: Decision Premises and Economic Organisation

Mark Lorenzen: Information cost, learning, and trust Lessons from co-operation and higher-order capabilities amongst geographically proximate firms

Anoop Madhok: Transaction Costs, Firm Resources and Interfirm Collaboration

Luigi Marengo: Interdependencies and Division of Labour in Problem-Solving Technologies

Frieder Meyer-Krahmer and Guido Reger: European Technology Policy and Internationalization: An Analysis behind the Background of the Innovation Strategies of Multinational Enterprises

Jack A. Nickerson: Toward An Economizing Theory of Strategy

Bart Nooteboom, Gjalte de Jong, Robert W. Vossen, Susan Helper and Mari Sako: Competence in Mutual Dependence

Keith Pavitt: Technologies, Products & Organisation in The Innovating Firm: What Adam Smith Tells us and Joseph Schumpeter Doesn't

Torben Pedersen: Do MNCs learn through their international operations?

Eric Pfaffmann: How Does a Product Influence the Boundaries of the Firm? A Competence-based Theory of Vertical Integration and Co-operation

Kristian Philipsen: Entrepreneurship as organizing - A literature study of entrepreneurship

Mette Præst: Processes of Technological Competence Accumulation: A Synthesis

George B. Richardson: Production, Planning and Prices

Ron Sanchez: Uncertainty, Flexibility, and Economic Organization: Foundations for an Options Theory of the Firm

Steen Thomsen and Torben Pedersen: Ownership Structure and Economic Performance in the Largest European companies

Sidney G. Winter: Toward an Evolutionary Production Theory Principles and Elements

Appendix 3

DRUID-seminars at AAU and CBS

DRUID/IKE seminar

18/3, 14.00-15.30, Fib. 4, room 33: *Kenneth Jørgensen*, IKE/DRUID: A Foucauldian Approach to Organizational Analysis. Discussants: Jeppe Gustafsson and Ina Drejer.

1/4, 14.00-15.30, Fib. 4, room 33: *Lars Gelsing*, IKE/DRUID: Evaluation of Network Programs. Discussants: Birgitte Gregersen and Kenneth Jørgensen.

22/4, 14.00-15.30, Fib. 4, room 33: *Birgitte Gregersen and Bjørn Johnson*, IKE/DRUID: National Systems of Innovation and European Integration. Discussant: Gert Villumsen .

29/4, 14.00-15.30, Fib. 4, room 33: *Marco Valente*, IKE/DRUID: Technological Innovation and Market Structure: A Simulation Model. Discussants: Stefano Zambelli and Keld Laursen.

11/5, 9.30-11.00, Fib. 4, room 1: *Richard Nelson*, Columbia University New York: Reconciling the Theory and History of Technological Change - Illustrations of History Friendly Modelling.

13/5, 14.00-15.30, Fib. 4, room 33: *Søren Nymark* , IKE/DRUID: Understanding and Misunderstanding of Learning, The Learning Organization, and the Narrativity in the Context of Organization Theory. Discussants: Allan Næs Gjerding and Keld Laursen.

27/5, 14.00-15.30, Fib. 4, room 33: *Mette Præst*, IKE/DRUID: Processes of Technological Competence Accumulation: A Synthesis. Discussants: Bengt-Åke Lundvall and Marco Valente.

28/5, 8.30-10.00, Fib. 4, room 1: *William Lazonick*, INSEAD EURO-ASIA Centre, France: Integrating History and Theory in Industrial Economics.

8/6, 14.00-15.30, Fib. 4 room 1: *Patrick Llerena*, BETA, Université Louis Pasteur, Strasbourg: Institutional Arrangement of Technology Policy and Diversity: The Case of Digital Switching Systems in France and Italy.

23/9, 14.00-15.30 pm, room 33, Fibigerstræde 4: *Gu Shulin* (Institute for New Technologies United Nations University - UNU/INTECH - Maastricht): How to study national systems of innovation - perspectives from developing countries.

30/9, 14.00-15.30, room 33, Fibigerstræde 4: *Olman Segura*: on his PhD thesis.

7/10 13.00-16.00, room 33, Fibigerstræde 4: Joint seminar on systems of innovation.

20/10, 14.00-16.00, room 33, Fibigerstræde 4: *Ron Sanchez* (visiting professor at IVS/HHK, Department of Industrial Economics and Strategy at Copenhagen Business School): Product, Process, and Knowledge Architectures: Foundations for Organizational Learning and Technological Change.

28/10, 14.00-15.30, room 33, Fibigerstræde 4: *Marylin Fillippi* (University of Toulouse, France): Localised cluster analysis: a proximity approach.

5/11, 14.00 until around 17, Fibigerstræde 4, room 106: *Keith Pavitt* on: databases available in the DRUID environment.

6/11, at 10.00 in Fibigerstræde 4, room 1: *Keith Pavitt*: The inevitable limits of EU R&D Funding.

12/11, at 14.00-16.00. Fibigerstræde 4, room 33: *Luigi Marengo*: Landscapes and Organisations.

DRUID/IVS sminar

Week 02,

Tuesday, 06-01-98 Geoff Hodgson: The Future of Evolutionary Economics.

Week 05,

Tuesday, 27-01-98 Paolo Guerrieri (Uni. of Rome)

Week 05,

Wednesday, 28-01-98 Nana Køster (IVS): Acquisitions.

Discussants: Mikael Iversen (IVS), Anders McI Schmidt (IVS)

Week 09,

Wednesday, 25-02-98 Finn Valentin (IVS): Fundamental Research in Corporate Labs

Discussants: Rikard Stankiewicz (IVS), Volker Mahnke (IVS)

Week 13,

Wednesday, 25-03-98 Anders McIlquham Schmidt (IVS): The Measuring of Performance.

Discussants: Nicolai Foss (IVS), Per Vejrup-Hansen (IVS)

Week 15,

Wednesday, 08-04-98 Nicolai Foss (IVS) and Kirsten Foss (IVS): The Capabilities Approach: In Search of Microfoundations.

Discussants: Jens Frøslev Christensen (IVS), Mikael Iversen (IVS)

Week 17,

Wednesday, 22-04-98 Peter Moran (INSEAD): Value Creation by Firms.

Discussants: Volker Mahnke (IVS), Kenneth Husted (IVS)

Week 18

Monday, 27-04-98 Juliana Hsuan: Modularization in NPD - A Case of Windshield Wipers Controller

Discussants: Kirsten Foss (IVS), Jens Frøslev Christensen (IVS)

Week 19,

Wednesday, 06-05-98 Per Vejrup-Hansen (IVS): The Effect of Annual Job Destruction on Worker Mobility and Unemployment.

Discussants: Peter Maskell (IVS), Povl Erik Jensen (IVS)

Week 20

Tuesday, 12-05-98 Richard R. Nelson: The Sources of Industrial Leadership - Results From a Study of Seven High Tech Industries in the US, Europe and Japan.

13.30-15.00

Week 21,

Wednesday, 20-05-98 Gjalt de Jong (Uni. Groningen): Long Term Supply Relationships: Theory and Evidence from the US Automobile Industry.

Discussants: Nicolai Foss (IVS), Richard Stankiewicz (IVS)

Week 22,

Thursday, 28-05-98 William Lazonick: Organizational Learning and International Competition

Week 35,

Wednesday, 26-08-98 Dieter Ernst (IVS): Evolutionary Aspects of Technological Learning
Discussants: Nicolai Foss (IVS), Peter Lotz (IVS)

Week 37,

Wednesday, 09-09-98 Mikael Iversen (IVS): Competitive Advantage and Market Failure
Discussants: Kirsten Foss (IVS), Poul Erik Jensen (IVS)

Week 39,

Thursday, 24-09-98 Shulin Gu

Week 43,

Wednesday, 21-10-98 Volker Mahnke (IVS): Some Economies of Knowledge-Sharing: Production- and Organization Cost Considerations.
Discussants: Finn Valentin(IVS), Nicolai Foss (IVS)
11.00-12.00

Week 45,

Wednesday, 04-11-98 Jens Frøslev Christensen (IVS)

Week 47,

Wednesday, 18-11-98 *Peter Lotz* (IVS): Industry Structure Dynamics and the Nature of Technology in The Hearing Instrument Industry.

Week 49,

Tuesday, 01-12-98 *Edward Lorenz*: Organisational Innovation, Governance Structure and Innovative Capacity in British and French Industry.
Discussants: None

Wednesday, 02-12-98 *Volker Mahnke* (IVS): Some Economies of Knowledge-Sharing: Production- and Organization Cost Considerations.

Abstract

Discussants: Finn Valentin (IVS), Kristian Kreiner (IOA)

Week 51,

Wednesday, 16-12-98 *Nicolai Juul Foss* (IVS): Understanding Leadership: A Coordination Theory.

Discussants: Jukka Kaisla (IVS)

Appendix 4

Guest professors

Professor *Edward Lorenz*, University of Technology of Compiègne, France. 23 November 1998-4 December 1998.

Professor *Luigi Marengo*, Department of Economics, University of Trento, Italy. 11 November 1998-14 November 1998.

Professor *Shulin Gu*, UNU/INTECH Institute for New Technologies, United Nations University, Holland. 22 September 1998-25 September 1998.

Professor *Patrick Llerena*, Faculty of Economics and Management, University Louis Pasteur, Strasbourg, France. 3 June 1998-8 June 1998.

Professor *William Lazonick*, EURO-Asia Centre, INSEAD, France. 27 May 1998-31 May 1998.

Professor *Richard Nelson*, School of International Public Affairs, Columbia University, USA. 10 May 1998-12 May 1998.

Appendix 5

Report from the DRUID Advisory Board Meeting at Rønne, 11-12 June 1998

Rapporteur: Bengt-Åke Lundvall
Aalborg University 10 July 1998

Introduction

The first separate meeting of the International Advisory Board of DRUID was held under the chairmanship of Bo Carlsson to debate the general orientation of the research programme, its implementation and its potential outcome, at Rønne, Bornholm, 11-12 June with the following agenda:

1. *Welcome and presentation of the purpose of the meeting* by Bo Carlsson - Chairman of the Advisory Board

2. *Presentation of the general set-up of DRUID* - organisation, activities, outcomes and plans by Bengt-Åke Lundvall - research manager of DRUID.

3. *Research themes*

Theme A: The firm as a learning organisation
Plans by Theme Co-ordinator Jens Frøslev Christensen
Comments and Research Perspectives by Sidney Winter

Theme B: Competence building and inter-firm dynamics
Plans by Theme Co-ordinator Peter Maskell
Comments and Research Perspectives by Jacques de Bandt

Theme C: The learning economy and the competitiveness of systems of innovation (The 1998 Summer Conference on Innovation Systems and Industrial Dynamics)
Plans by Theme Co-ordinator Esben Sloth Andersen
Comments and Research Perspectives by Keith Pavitt

4. *The Year 2000 DRUID-conference* - some preliminary ideas Bo Carlsson, Bengt-Åke Lundvall, Paul Geroski and Giovanni Dosi.

As a preparation for the meeting up-dated descriptions of the three research themes, preliminary ideas for the 1999 Summer Conference on national systems of innovation and the Annual reports for respectively 1995/96 and 1996/97 had been sent to the Board members.

The following members of the Board and representatives for international research partner institutes attended the board meeting:

Bo Carlsson, Professor, Case Western Reserve University, USA
Jacques de Bandt, Professor, LATAPSES, France

Giovanni Dosi, Professor, University de Roma, Italy
Paul Geroski, Professor, London School of Business, UK
Brian Loasby, Professor, University of Stirling, Scotland
Richard N. Langlois, Professor, University of Connecticut, USA
Franco Malerba, Professor, Istituto Di Economica Politica, E. Bocconi, Italy
Stanley Metcalfe, Professor, University of Manchester, UK
G.B. Richardson, Oxford University, UK
Sidney Winter, Professor, University of Pennsylvania, USA
Patrick Llerena, Professor, BETA, Strasbourg
Massimo Colombo, Professor, Politecnico di Milano, Italy
Keith Pavitt, Professor, SPRU, UK

DRUIDs participating in the board meeting:

Esben Sloth Andersen, Associate Professor, Aalborg University
Jens Frøslev Christensen, Professor, Copenhagen Business School
Bent Dalum, Associate Professor, Aalborg University
Kirsten Foss (item 3B and onwards), Assistant Professor, Copenhagen Business School
Nicolai Juul Foss (item 3B and onwards), Professor Copenhagen Business School
Annelise Klüwer, Head of Section, Copenhagen Business School
Bengt-Åke Lundvall, Professor, Aalborg University
Peter Maskell, Professor, Copenhagen Business School

On the character of this report

Most of the substantial discussion took place under the heading of one of the three themes A, B and C. Some of this debate was of a more general character, however, and in this report these general points have been presented under item 2 in the agenda. At the end of the report, I will list some initiatives that have been taken on the basis of the advisory board meeting and relate these to the debate. The comments from Bo Carlsson have been added to the report.

Report

1. *Welcome and presentation of the purpose of the meeting* by Bo Carlsson - Chairman of the Advisory Board.

Bo Carlson pointed out that DRUID was at an important stage. The present period of grant was ending in the year 2000 and there is a possibility to get funding for another 5-year period. He outlined the general purpose of the meeting as being to give advice to the DRUID research manager and to the theme co-ordinators regarding the direction and organisation of the research programme.

2. *Presentation of the general set-up of DRUID* - organisation, activities, outcomes and plans by Bengt-Åke Lundvall - research manager of DRUID.

Bengt-Åke Lundvall presented the general principles for managing the research network. Basically the research programme reflects an attempt to synthesise the kind of issues that scholars connected to DRUID are interested in analysing. There are strict limits for how far the

work of DRUID-scholars can be channeled in specific directions since the scholars normally have their salary from their ordinary posts.

Emphasis has been given to the building of a strong infrastructure in terms of databases, internet connections, seminars, working paper series, guest professors and the two annual DRUID-conferences. By selecting the themes for the conferences a certain effect on the direction of research can be realised. The infrastructure and the international network building are crucial also for attracting and stimulating the work of Ph.D.-students.

The funding authorities – as represented by the Danish Board for CIE and DRUID - have established three criteria for success as the basis for future evaluations:

- Scientific publication
- Ph.D.-training
- Communication of research to and interaction with users

The DRUID network has been doing quite well in relation to all these three criteria. The greatest success was perhaps in Ph.D.-training where there is now a stock of more than 15 Ph.D.-students connected to the programme. Many of those are doing work of very high quality and at least 5 will be finishing their thesis before Christmas this year. DRUID-scholars and DRUID-projects are involved in policy and practise related activities at the regional, national and international level and the main problem is to meet the demand from policy makers for further analyses. The frequency of publishing is quite satisfactory and growing but it was in this field that the research manager saw the greatest potential for further improvements.

Stan Metcalfe suggested that publication was not an issue to spend too much time on. From now on we should simply take for granted that DRUID researchers do their job with respect to the publishing of papers. Instead the advisory board should discuss what interesting new results the DRUID's have produced and will produce. Stan Metcalfe challenged the general way that the DRUID had been presented. It was too retrospective and too unfocussed. Based on his own experiences, Stan suggested an emphasis on highlights, especially major empirical results, and an explanation why the empirical and theoretical results make a difference. Given such major results, publication would come by itself; a loose discussion of this issue was a sign of weakness.

Still Keith Pavitt thought it an important task of the board to promote the journal publication activity. Franco Malerba pointed out that journals are not the only way of exploiting the national innovation system concept which is a core asset of DRUID. Franco also discussed which journals DRUID should think of. Some DRUID work within the TSER-project that Franco is engaged in falls partially within political science and sociology, and a publication strategy should take that into account.

Several members of the board suggested more result-oriented and future-oriented ways of considering and presenting DRUID. For instance, Brian Loasby suggested that DRUID should answer questions about its major focus with a sentence that also could cover his own work: "What we are concerned with is how to organise the knowledge about the ways in which people in firms organise their knowledge". Paul Geroski suggested that the major answer to the

"so what?"-test of financing agencies was to emphasise DRUIDs results in terms of network-building both internationally and within DRUID. This has created new opportunities for PhD-students as well as for other DRUID researchers. In this context several board members emphasised the strength of the Ph.D.-programme as reflected in the quality of the contributions of DRUID Ph.D.-students at the conference.

In relation to a possible DRUID II, Paul Geroski suggested that one should consider the further institutionalisation of the networking (an International Association for Industrial Dynamics and new journals were mentioned in the debate). Giovanni Dosi and others were sceptical to the specific propositions, given the existing tasks and influence of the group on several associations (Schumpeter Society, EAEPE) and journals. Another proposal by Paul Geroski was that DRUID should define itself in relation to major user groups rather than in relation to a one-sided publication strategy. Finally, Paul Geroski emphasised the possibility of DRUID and its collaborators to exploit, in co-operation, the unique databases that DRUIDs have created or have access to. Keith Pavitt warned, as did Bengt-Åke Lundvall, for de-emphasising the publication strategy of DRUID at the present stage. And Patrick Llerena suggested a combination of publication and networking by e.g. joint papers between DRUIDs and their international collaborators.

George Richardson emphasised the interaction with competent business managers. An important task is to engage the research-oriented managers in a clarification of the concepts. Sid Winter described a model of how to involve business people in research used at the Wharton School. And several other members gave examples on how the interaction with the business community could be organised (Stan Metcalfe and Patrick Llerena).

3. *Research themes*

Theme A: The Economic Organisation of the Firm as a Learning Organisation

Co-ordinator: *Jens Frøslev Christensen*

Commentator: *Sidney Winter*

Several members of the board found that the strong focus on theoretical synthesis and history of thought reflected a strong academic position that is likely to provide important contributions to the development of the theory of the firm (and its strategy). However, it was also noted that the research profile could be strengthened by putting somewhat more effort into original data-gathering (or exploitation of data developed elsewhere in DRUID), hypothesis-building and -testing, and modelling of firm-behaviour.

With respect to publication strategy, attention should be directed at managerial and strategy-oriented journals rather than only economic journals. The "synthesis-orientation" may eventually be well fit for creating a series of books rather than exclusively going for journal articles. In order to raise visibility of the research within theme A it was suggested that the publication strategy should also, to some extent, target semi-popular business journals (à la Harvard Business Review). In the same vein, consultation of business leadership communities could be a more integrated part of some of the research projects.

Finally, it was noted that the heading of the theme ("The Economic Organisation of the Firm as a Learning Organization") did not cover well all the projects within the theme – at least not as currently described.

Theme B: Competence Building and Inter-firm Dynamics.

Co-ordinator: *Peter Maskell*

Discussant: *Jacques De Bandt*

The invited discussant (Jacques De Bandt) opened the debate with comments on theory, methodology and policy prescriptions. He considered the ongoing projects rich and original, but was somewhat disappointed in not finding a more lucid vision of a theory of the role of learning processes in industrial dynamics nor finding a clear procedure for identifying the elements required for building such a theory. The often quite interesting case studies were disadvantaged by the lack of a common methodology emphasising the learning aspects of the inter-firm interaction. He thus favoured a return to the old heading of the theme: "Changes in Competence Patterns and Inter-firm Learning Processes". Finally, he questioned whether the desire to make policy prescriptions were integrated into the projects and procedures of the Theme in a fully sufficient and systematic manner.

In the discussion it was pointed out that Theme B seemed to be somewhat dispersed into a great number of small projects. On this basis the question was raised if it lacked the critical mass to obtain its objectives. Hence, bringing in researchers from outside DRUID into co-operative projects might be worth considering.

Several members of the board commented on the richness of the available data in DRUID. It was suggested that an effort should be made to encourage internal (DRUID) and external scholars to utilise some of these data together and to combine such efforts with formal modelling and comparative studies, in co-operation with some of DRUIDs partner institutions. Some also expressed the hope that Theme B could contribute towards making underlying concepts (learning, routines, capabilities) more operational and usable for, for instance, statistical purposes.

Theme C: The learning economy and the competitiveness of systems of innovation.

Co-ordinator: *Esbjen Sloth Andersen*

Commentator: *Keith Pavitt*

One issue, raised by Keith Pavitt, was the lack of an on-going scientific publication activity on national innovation systems by DRUID researchers. This is an area that has been pioneered by scholars belonging to DRUID and the researchers are missing great chances because of their emphasis on report-making, etc., with the exception of some of the younger researchers who go more systematically for publishing in journals. In areas like innovation systems it is recognised that books are very important, and a major impact of DRUID could come from 2-3 major, thematic books.

Keith Pavitt commented also on the DRUID Conference on national innovation systems, 6-9 June 1999. Users of the concept of innovation systems call for conceptual clarifications, heuristic models (a la Porter's diamond), taxonomies and checklists. Here new growth theory

has not delivered and the DRUID researchers have important but difficult possibilities. Contributions within this realm are much wanted as topics for the DRUID Conference June 1999. Another issue was how to organise the conference. Here very different suggestions were made. Franco Malerba suggested a clear distinction between the different papers, like large state-of-the-art papers, PhD related presentations, and perspectives on future research. If the conference came up with 3-4 vision papers, these could be pretty important for DRUID II. Paul Geroski suggested more radically that 5 large commissioned papers could be enough - the rest could be comments on these papers (in sessions led by the authors), and there would be plenty of time for networking at the conference.

Another conference-related question was whom to invite to the conference. Should for instance researchers with a neoclassical methodology and little interest for innovation systems concepts like Paul Romer (listed in the description of the conference) be invited? Generally it was agreed that it was a good idea to invite open-minded critics of the concept of innovation systems independently of their paradigmatic background.

4. *The Year 2000 DRUID-conference* - some preliminary ideas, Bo Carlsson, Bengt-Åke Lundvall, Paul Geroski and Giovanni Dosi

The debate under this heading was rather brief and some of the specific preferences related to the 1999 conference were reiterated. A possible theme for the conference that would be a follow-up of the Rønne-conference would be to focus on the learning economy and to structure the conference along the three major themes of the research programme. It was agreed to keep the communication going with the advisory board on this point and that it might be a good idea to have a rather well defined concept for the conference already at the end of this year.

Initiatives taken on the basis of the Meeting

1. Regarding the need for a more clear mission statement: The executive committee of DRUID has had a first discussion on sharpening the mission statement of DRUID. This debate pointed toward a focus on the role of learning in the context of industrial dynamics at the level of firms, inter-firm relationships and innovation systems. One specific consequence is that the international network will be strengthened in this direction and that future conferences and publications will be more oriented in this direction in the future. Another part of the mission is to organise high quality Ph.D.-training and networking around this direction of research. This debate will be pursued and widened in the near future.
2. Regarding publication: DRUID will, in collaboration with the departments and faculties involved, offer Ph.D.-students who have finished their thesis an opportunity to apply for getting 3 months paid work to write an article for an international journal on the basis of their thesis. The opportunity will be realised after a procedure of application where support from the supervisor is needed. This proposal is under discussion in the faculties involved.
3. Regarding publication and exploitation of the DRUID data sets: Peter Maskell is coordinating the effort to document the most important data banks in English. On the basis of the resulting report a meeting will be called with international colleagues about

collaboration in analysis and publications as well as about the exchange of data sets and comparative analysis. The meeting might take place in October in Strasbourg or in January in Denmark depending on when the material can be made ready.

4. Regarding the organisation of conferences: We are working with a concept for the 1999 summer conference that tries to balance some of the trade-offs formulated by the Advisory Board. The idea would be to have 3-4 parallel workshops with fixed composition for half of the time and to have a small number of major contribution in the plenary. This would leave ample room for plenary debates as well as for presentation of Ph.D.-contributions in the parallel sessions. Esben Sloth Andersen will send out the call for papers in August.
5. Regarding the interaction with business and other external users: We have decided to organise three workshops directly aiming at involving business, unions and policy makers. The first one will take place in December and link together the developments in Asian electronics industry with the new context for Danish Electronics industry and it will be organised by Dieter Ernst and Bent Dalum. The other two will take place in 1999 and they will be on respectively 'the interaction between research and development – a firm perspective' and respectively 'environmental policy and innovation'.

Comments from the chairman of the Advisory Board to the report

Now I have at last read the report from the Advisory Board meeting at Roenne. I have only a few minor comments. I think the report accurately reflects both the contents and the flavor of the discussion. Having read the report and compared it with my notes, I am impressed with job that you and your colleagues did in putting it together. It is quite a rich document which I think will prove useful in your continued thinking and planning for the future. So while there are a few minor things that could be tweaked and improved a bit, I think it is much more important to think about how to put it in perspective and what the implications are.

It is always difficult to strike a balance between accurately reporting that which was said and sifting through the material in order to highlight the most important things that were implied or intended, even if not clearly stated. Thus, in thinking about how the lessons from the meeting could be presented to an outside audience (e.g. the sponsoring agencies), I would emphasize that even with limited resources, DRUID has managed to create quite an extensive network of scholars in the field of industrial dynamics, probably the best such network in existence. The conferences organized by DRUID have certainly served that function: the summer ones by bringing in a large number of leading scholars in the field, and the winter ones by giving Ph.D. students an opportunity to present their work and get feedback from leading researchers. I think these activities have served to put DRUID and Denmark on the map in a way that I am not aware of in any other field. I also think the benefits of getting the Ph.D. students plugged into the global network will show up more and more strongly over time.

Another theme mentioned in the report but which I think deserves emphasis is the potential for future research created by putting together the data bases that DRUID now has. Exploiting these in creative ways through collaboration with outside scholars is bound to yield

continuing research streams with important, perhaps unique, results. But there are also risks involved, unless there is sufficient econometric capability and research experience on the part of the 'home team' to generate truly original empirical work.

Other ideas that I would highlight are the opportunities that DRUID research creates for interaction with business practitioners and public policy makers. I can't think of any research in other areas of economics or in other research units that opens up a similar range of opportunities for such interaction.

Thus, looking to the future, there is now even more reason than at the beginning of the venture to expect DRUID's work to be of great value in the future! A good foundation has been laid, and much has been learned already. I hope these comments are of value. More could be done along the lines I've suggested, but I think you know better than I how to take this further and do something really significant with it.

Bo Carlsson