

Annual Report 2008

Dynamism in Innovation (DVI)

A joint research programme of
the Dutch Ministry of Economic Affairs and
the Netherlands Organisation for Scientific Research (NWO)

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Annex

1. General information

Dynamism in Innovation (Dutch: *Dynamisering van Innovatie, DvI*) is a research programme that was developed in 2004 by the Dutch Ministry of Economic Affairs in association with the Netherlands Organisation for Scientific Research (NWO).

The DvI programme is based on the observation that because of a lack of dynamism in the innovation system, knowledge developed in universities and research establishments is being used inadequately. The causes that bring about this limited scale of dynamism and the consequential under-utilisation of available knowledge are often unclear. The aim of the DvI programme is to obtain an understanding of the forces that bring about dynamism in the innovation system.

The main question asked in DvI programme is: How are different kinds of knowledge that can lead to innovation in products, processes, services or organisations, produced and disseminated? Is this done effectively and efficiently?

The DvI programme includes two themes :

- 1) innovation and knowledge transfer, with labour mobility as the sub-theme;
- 2) innovation, markets and hierarchy.

The emphasis in the first theme is on the structure of the knowledge transfer process and its effectiveness. The behaviour of individual players could also be relevant, as well as their mutual relationships and group efforts, and the environmental factors that influence them. One separate point of interest is the impact of the institutional setting on the process and *vice versa*. The sub-theme of labour mobility focuses on knowledge transfer. The starting point here is not the organisations involved in the process, but the individual. One of the aspects here is the contribution of labour mobility towards the production and dissemination of knowledge in innovation.

In the second theme attention is focused on how competition influences innovation: is competition conducive to innovation and *vice versa*? Attention is also devoted to the efficiency of the structure of the knowledge transfer process in relation to the two organisational forms of markets and hierarchy: in which cases is the market more able to organise these processes, and in which cases should preference be given to more hierarchically structured processes?

The goal of the DvI programme is to obtain a better understanding of the workings of the knowledge transfer process and the effectiveness and efficiency thereof. The focus is primarily on (international) empirical studies at the micro and meso level which allows us to systematically detect similarities and differences between the various forms of knowledge transfer that can lead to innovation.

2. The DvI programme in 2008

Medio 2005 the selection procedure of research proposals was finished and the following projects were granted (named in alphabetical order).

- Market Structure, Innovation and Productivity: An Empirical Approach

Project leader: Prof. dr. J. Boone, University of Tilburg

- The Influence of Team Mobility on Knowledge Transfer and Innovation Processes within Teams

Project leader: Prof. dr. N. Ellemers, Leiden University

- Dynamics of Innovation R&D Cooperation, Competition, and Productivity: A Simultaneous Panel Data Study

Project leader: Prof. dr. J.E.J. Plasmans, University of Tilburg

- The impact of M&A-driven market dominance on innovation dynamics

Project leader: Prof. dr. E.J.J. Schenk MBA, University of Utrecht

- The diversity of knowledge transfer in public-private knowledge networks

Project leader: Prof. dr. H.H.G. Verspagen, Technical University Eindhoven

The total budget for the DvI programme amounts to € 1.5 m. However, in order to be able to finance all these projects both NWO and the Ministry of Economic Affairs (EZ) have put up some additional funds. Some of the research projects started early in 2006 due to difficulties in the labour market.

In June 2008 a conference was organised where all DvI programme leaders presented the (preliminary) results of their research projects for an audience of policymakers and members of the PC and the Steering Group. This meeting was especially focussed on the policy relevance of the research outcome so far. A paper with a number of questions relevant for innovation policy was prepared by the EZ and discussed during the meeting. It appeared to be difficult to translate the research results directly into policy practice, but the exchange of information between scientists and policymakers was very fruitful and interesting.

3. The DvI projects

In this section the summaries of the five granted projects are presented together with a report about the progress of the research, i.e. the scientific and policy relevance of the preliminary results and the dissemination of research results.

During 2008 two of the above mentioned DvI projects led by prof. Schenk respectively by prof. Verspagen have come to an end. The final reports are included in the next paragraph. The three remaining projects will come to an end in 2009.

Market Structure, Innovation and Productivity: An Empirical Approach.

Code: 472-04-031

Project leader: prof.dr J. Boone, University of Tilburg

Other applicants: ---

Budget: € 312.347

Starting date: 01-09-2005

Final date: 01-09-2009

Summary of the project

The research proposal addresses the intriguing relationship between competition and innovation for the Netherlands. Recent findings for the UK suggest that the relationship is shaped like an inverted U. As empirics for the Netherlands are missing, the research fills in this gap by using Dutch firm-level data. Applying econometric techniques, it controls for the endogeneity problem between innovation and competition. Moreover, the research explicitly focuses on what is meant by 'competition' and how policy can affect productivity (growth) through competition policy and/or innovation policy. Finally, the importance of market structures and size of firms are also taken into account.

Scientific relevance

In 2008 we have met serious data problems which has halted our progress in terms of results. As we have said in the July (2008) workshop this does not imply that we will not deliver the promised results; however the bulk of the results will come after the grant has expired. However, we have made sure that all people working on this project can continue to do so even after the DvI grant has expired.

Dealing with the data problems has proved to be a frustrating experience. After beginning to suspect there were problems, in March we could clearly show CBS that their data were inconsistent. We also suggested ways in which we could identify what the root of these problems was. However, CBS wanted to follow their own strategy. This went on till after the summer we received an email explaining that they hoped to solve the problem in March 2009. This was clearly unacceptable.

At this point we have talked to George Gelauff. George has helped us to make the point to CBS that this had to be resolved a lot sooner. This has increased the priority of our problem at CBS. We now hope to have the consistent dataset in February. With a bit of luck we will still be able to present new results in the next DvI-workshop. Although not everything is resolved yet, at the moment it seems that the solution suggested by us in March 2008 is indeed proving useful.

In the mean time we have arranged remote access at UvT. So once the data is ready, we can work full time (without worrying about opening times at CBS) to get new results before the workshop. We also hope to have a first draft of a paper by then.

The paper by Erik Brouwer and others on the Innovation Threshold discusses a model for analysing the sales of new products. This model accounts for the fact that, even among

those companies with permanent R&D activities, a fraction of the firms did not have sales of innovative products over a two-year observation period. We propose a model in which the fixed costs of introduction are a major concern in the decision-making process. We apply a censored regression model, extended by a firm-specific threshold. We use a structural model to estimate the fixed costs of introducing new products to the market, and explain subsequent sales of innovative products. We examine an indicator of innovative output, i.e. the sales of products 'new to the firm'. We estimate fixed cost thresholds by using data from the Dutch section of the Community Innovation Survey (CIS) of 1998. R&D intensity, competition, and market structure all have a positive impact on the sales of new products. The most important factors that reduce the fixed cost threshold of introduction are product-related R&D investments, R&D subsidies, and knowledge spillovers.

Lapo Filistrucchi's paper on the SSNIP test for two-sided markets starts from the observation that in economics there is a substantial consensus that the benchmark test for assessing substitutability between products in traditional markets is the so called "small significant non-transitory increase in price test" (SSNIP test). However, many of these new products and new firms belong to what economic theory has recently identified as two-sided markets. In these markets firms act as platforms and sell two products or services to two distinct group of consumers and recognise that the demand from one type of consumers depends on the demand from the other type of consumers and vice versa, while consumers on the two sides of the market do not internalise these indirect network effects, which are, therefore, to these extent, externalities. For instance in a media market a firm typically sells content to the readers/viewers/listeners while selling advertising slots to advertisers. It knows that the higher is the audience the higher the demand from advertisers for a given price or the higher the price it can charge for a given advertising space. Similarly it knows that the quantity of advertising might affect the reader/viewer/listener willingness to pay for a given content. Yet neither the advertisers nor the readers/viewers/listeners take into account their effect on the other side of the market when they decide if and how much to platform. The paper discusses the design and implementation of a SSNIP test in order to identify the relevant market in such a two-sided market as the media one. It argues that in such a market the traditional SSNIP test cannot be applied as it is usually conceived but rather should be modified in order to take into account the indirect network externalities. It discusses the issues of which price the hypothetical monopolist should be thought of as raising, of whether we should look at profits changes on only one side or on both sides of the market and of which feedback among the two sides of the market we should take into account.

It then derives the relevant formulas for Critical Loss Analysis. These look much uglier than in a single-sided market but in fact they are easy to calculate as they are still expressed in terms of elasticities and of current observed markups, prices and quantities. Data requirements are however higher as one needs to estimate the matrixes of the own and cross price elasticities of demand on the two-sides of the market and the matrixes of the network effects.

The paper fills a gap in the economic literature, so much more as market definition in media markets is at the centre of many recent competition policy and regulation cases around the world, such as the merger between Google and DoubleClick in the US or the merger between De Gouden Gids and the Telefoon Gids in the Netherlands.

Policy Relevance

The policy relevance of the innovation threshold paper is the following. According to the estimated coefficients, the relationship between competition and innovation is U-shaped, particularly when we looked at the coefficients of number of employees and the Herfindahl-equivalent index. We concluded that the smaller and larger firms are more likely to innovate. And we could then say that Schumpeter (1934) was right, after all. The small firms are the real innovators (Mark I) and if they are not innovative then the larger firms will be the innovators (Mark II). According to the simulation we see a slightly different picture - the curve is not a complete U-shaped curve. We see that the smaller firms are the most innovative firms, and the probability of being innovative diminishes with size. We also see that the slope will diminish, but the curve will not increase. That means that there is more empirical evidence for Mark I than for Mark II. With our model and the indicators we use for innovation and competition, we do not see an inverse U-curve like Aghion et al. (2005) found in the UK.

Our results also show that firms face a threshold when deciding whether or not to introduce new products into the market. The fixed costs of introduction are an obstacle to the introduction of new products. Firms focus on means to lower these costs. Factors that are important to decrease the fixed costs include knowledge spillovers and R&D related subsidies. It is not surprising that R&D related subsidies decrease the fixed costs. More interesting, however, are the differences between knowledge spillovers and sources of information and their effect on the fixed costs. These differences reveal much about the know-how of management strategies in innovating firms. In general, spillovers of public knowledge have a profound effect on the fixed costs, but interestingly, knowledge spillovers originating from the firm itself (technology initiator) or from suppliers and customers (technology follower) have an equally decreasing effect on the fixed costs, albeit a lower one. The results show that both strategies of technology initiator and technology follower appear to be equally effective, which endorses the view of a distributed innovation process, as exposed by von Hippel (1988).

Technological progress has brought about many new products in the media field, such as online news, videos, music and advertising, ebooks. It has also brought about many new firms and business models, such as those of Google, DoubleClick or Skype. Policy makers often wonder to what extent these new products are substitutes to old ones (e.g. is video on demand a substitute for commercial TV?) and to what extent these new firms are competing with traditional ones (e.g. is Google competing with the New York Times in the collection of advertising?) Such a question is highly relevant also for competition policy and regulation, as being able to define the relevant market is crucial to any decision. Lapo Filistrucchi's paper on the SSNIP test in two sided markets addresses these issues. With this expertise, Lapo has advised the NMa in some cases involving two sided markets.

Dissemination of research results

Lapo Filistrucchi gave the following presentations:

- "6th International Industrial Organization Conference" at Marymount University in Arlington on May 17.
- "35th EARIE Conference" at the Toulouse School of Economics on September 4.
- "Microeconomics Seminar" at the University of Groningen on October 1.

- "Economics Seminar" at the University of Florence on October 14
 - "4th SIDE-ISLE conference" at the University of Bologna on November 7.
 - On June 11, Jan Boone, Erik Brouwer and Henry van der Wiel have taught the Bofeb class on Competition and Innovation
 - On October 9, Jan Boone gave a presentation on a workshop for lawyers on mergers, competition and innovation in new economy sectors.
 - On November 20 and December 4, Jan Boone and Lapo Filistrucchi have taught classes at Nza on the effects of competition, defining relevant markets and measuring competition intensity.
 - On December 15, Jan Boone and Erik Brouwer were discussants at a Tilec conference on the law and economics of innovation.
- Henry van der Wiel gave the following presentations:
- Competition, Regulation and innovation, Seminar Federal Planning Bureau (Brussels, Belgium), 27 June 2008
 - Market incentives and innovation, OECD, WPIA-meeting, Paris, 28 October 2008

Output

Academic publications in refereed journals

- Jan Boone and Jacob Goeree, forthcoming, 'Optimal privatization using qualifying auctions', *Economic Journal*.
- Jan Boone, 2008, 'Competition: Theoretical Parameterizations and Empirical Measures', *Journal of Institutional and Theoretical Economics* , 164(4), 587--611.
- Jan Boone, 2008, 'A new way to measure competition', *Economic Journal*, Vol. 118, pp. 1245-1261.
- Brouwer, E, T. Poot & K van Montfort (2008), 'The Innovation Threshold', *De Economist*, (154-1), pp. 45-71.

Publications in other journals and other scientific output

- Lapo Filistrucchi, A SSNIP Test for Two-Sided Markets: The Case of Media, NET Institute Working Paper No. 08-34, 2008

Chapters in books

- Jan Boone, Moeten fusies in de "nieuwe economie" anders behandeld worden? in *Ontwikkelingen Mededingingsrecht 2008*
- Jan Boone, (2008), Mededinging en Innovatie, in *Trust en antitrust*, Beschouwingen over 10 jaar Mededingingswet en 10 jaar NMa. Kalbfleish P., et al., Den Haag
- Brouwer, E., W. Meester (2008), "De boete ontleed: op zoek naar balans", in: *Trust en antitrust; beschouwingen over 10 jaar mededingingswet en 10 jaar NMa*, editors: Kalbfleish P., et al., Den Haag pp, 257-264
- Wiel, H.P. van der (2008) Marktwerking energiemarkten geen 'mission impossible', in *Trust en antitrust*, Beschouwingen over 10 jaar Mededingingswet en 10 jaar NMa. Kalbfleish P., et al., Den Haag

Other output

Dynamics of Innovation, R&D Cooperation, Competition, and Productivity: A Simultaneous Panel Data Study.

Code: 472-04-019

Project leader: Prof. dr J.E.J. Plasmans, University of Tilburg

Other applicants: prof.dr B. Melenberg and prof.dr P. Kort

Budget: € 225.559

Starting date: 01-12-2005

Final date: 01-11-2009

Summary of the project

The research proposal involves four stages utilizing firm-level data, spanning a period from the early 90s to 2003:

- (a) an appropriate measurement of indicators for competition, innovation, cooperation, productivity, and other determining factors in the Netherlands,
- (b) an extensive exploratory data analysis of these (combinations of) indicators involving tests on endogeneity,
- (c) the estimation and testing of an econometric simultaneous equations panel data model for the resulting endogenous variables, and
- (d) a detailed discussion of the implied policy measures.

Scientific Relevance

As mentioned to NWO, we had to replace Dr. R.S. Marinov after some months by Mrs. Sara Amoroso from 'La Sapienza' University in Rome. Sara started on the 15th of May 2008.

In 2008 we extended our research in three basic directions.

Firstly, we introduced imperfect competition in labour markets under varying returns to scale (next to the already assumed imperfect competition in output markets) and derived the corresponding complete theoretical model.

Secondly, we utilized new data vis-à-vis the original Papers 1, 2, and 3, mentioned in our Progress Report 2007. We switched to detailed firm-level data for Papers 1 and 2 in 2008. Analyzing about 100,000 observations is a time-consuming activity but may deliver a much more detailed and reliable picture. Therefore, a lot of time was invested to conduct a careful data analysis and adequate panel data estimation with time-varying parameters. This resulted in completely new versions of Papers 1 and 2, i.e., Paper 1': "Total factor productivity under varying returns to scale and imperfect competition in labour and output markets – An application to firms in the Netherlands" and Paper 2': "Innovation, competition and productivity of enterprises in the Netherlands: A panel data analysis", respectively.

More specifically, in the new Paper 1' we switched our econometric research from industry-level analysis to firm-level analysis by considering a representative unbalanced panel of various thousands of firms in the Netherlands for the sample period 1990-2005. The data is extracted from the annual Production Statistics (PS). In the new Paper 2', we used two complementary R&D data resources. On the one hand we extracted data from the Community Innovation Survey or CIS waves (CIS2, CIS2.5, CIS3, CIS3.5, and CIS4) and the R&D surveys collected at Statistics Netherlands, where it should be noted that the R&D

data for each of the individual firms in these data sources was allocated to the parent firm, a time-consuming process. On the other hand we use new data on patent counts (USPTO and EPO) delivered by the "Nederlands Octrooicentrum" . This data allows us to use citation-weights from the examiner for each patent. These citation-weights are matched to our list of individual enterprises in the Netherlands (about 2000 enterprises). Paper 2' is one of the very first papers using such data.

The originally proposed Paper 3 ("The Patterns of Inter-firm and Inter-industry Knowledge Flows in the Netherlands") contained only backward USPTO citations, measuring knowledge utilization of firms in the Netherlands. In 2008 also forward USPTO citations, measuring knowledge diffusion by firms in the Netherlands, have been introduced. Joseph Plasmans presented such an extended version of Paper 3 at the Ninth International Scientific Conference on 'Innovation and Patent' in Tokyo on the 19th of December 2008 (see <http://www.aea-eu.com/UK/conferences/index.asp>). Moreover, since USPTO patent data does not possess the same characteristics as EPO patent data, the analysis was also extended with European (EPO) backward and forward patent citations of and to firms in the Netherlands for the sample period 1993-2006, resulting in the new paper: "Inter-firm and inter-industry knowledge flows in the Netherlands using backward and forward EPO and USPTO patent citations".

Thirdly, R&D cooperation was introduced into the theoretical and empirical analyses. We started with an extensive literature study and data collection, as preparation for the next stage of this project.

Report to the Programme Committee

a. changes in the research plan

The (original) research plan for 2008 indicated that the dynamic simultaneous system of equations, consisting of equations for innovation, TFPG, competition, and research cooperation and based on panel data for firms in the Netherlands, would also be analyzed in a separately planned Paper 5. We decided to postpone this analysis to the final year. This could not be fully achieved. First, we had to replace Dr. R.S. Marinov after a very short time of occupation, then we decided to focus on the inclusion of adequate firm-level data (certainly for Paper 1) and, finally, we considered it as useful to analyze research coordination much more in detail than originally suggested. Anyway, the econometric inference of the dynamic simultaneous panel data model, including a detailed discussion of the implied policy measures and some international benchmarking, will be performed later this year.

b. progress of the research

As mentioned in our letter of the 13th of March 2008 we unexpectedly had to put an end to the labour agreement with Dr. R.S. Marinov and we were able to attract Mrs. Sara Amoroso from the University of Rome 'La Sapienza'. She started on the 15th of May 2008.

As mentioned under 5a) we extended our research in three basic directions. Firstly, we introduced imperfect competition in labour markets under varying returns to scale and derived the corresponding complete theoretical model. Secondly, we utilized new datasets for the sample period 1990-2005, resulting in completely alternative versions of papers I, II, and III. Thirdly, R&D cooperation was introduced into the theoretical and empirical analyses.

Since the latter topic is new and not discussed before, we shall treat its provisional results not mentioned in previous contacts in more detail.

Our research on R&D cooperation focuses on two research topics:

Research Topic I: analysis of the determinants of the formation of four types of R&D cooperation (Paper 4A) and

Research Topic II: empirical analysis to determine whether cooperative R&D affects firm productivity growth (Paper 4B)

Regarding Research Topic I, an increasing number of studies have focused on the effects on welfare and R&D investments of R&D cooperation between competing firms.

One of the first contributions to attempt to fill the gap between theoretical and empirical analyses in this area is that of Röller *et al.* (1998).¹ Their model contains four key Research Joint Venture (RJV) formation determinants: spillovers, R&D cost-sharing, firm asymmetries, and product market complementarities. For example, they show in a duopoly framework that asymmetries between firms decrease the probability for a firm to form an RJV, while complementarities on the product market enhance the likelihood of a research agreement. Hernan *et al.* (2003)² build further on this model, making an additional contribution to the empirical assessment of RJV formation using a large firm-level database ("STEP to RJV" database, which pertains to RJDs formed under the Eureka and EU Framework Programs). Their results can be summarized as follows:

- industry R&D intensity appears to be positive;
- the more an industry is concentrated the easier it is to form an RJV;
- large firms have a stronger incentive to participate in cooperative alliances;
- the spillover coefficient appears as being not significantly different from zero.

New and sharper results dealing with the relationship between R&D cooperation, spillovers, and productivity appear in recent papers by Belderbos *et al.* (2006) and Lokshin *et al.* (2007).³ They explore differences in the determinants of innovating firms' decisions to participate in four distinct types of partner-specific innovation strategies (cooperation with competitors, suppliers, customers, and universities and research institutes). With a large dataset of firms in the Netherlands (consisting of 627 firms with R&D cooperation of some type), evidence of a positive impact of R&D cooperation on labour productivity growth is found, but with distinct differences depending on (the combination of) cooperation types. Nevertheless, competitor & supplier cooperation seems to have the most positive significant impact on productivity growth. The results for the other variables show that incoming spillovers and R&D intensity are statistically significant in explaining R&D cooperation with firms from the same industry.

¹ Roller, L.-H., M.M. Tombak, and R. Siebert (1998), "The incentives to form research joint ventures: Theory and evidence", Wissenschaftszentrum Berlin Discussion Paper FS IV 98-15.

² Hernan, R., P.L. Marin, and G. Siotis (2003), "An empirical evaluation of the determinants of research joint venture formation", *Journal of Industrial Economics*, 51(1), pp. 75-89.

³ Belderbos, R., M. Carree, and B. Lokshin (2006), "Complementarity in R&D cooperation strategies", *Review of Industrial Organization*, 28, pp. 401-426 and Lokshin, B., M. Carree, and R. Belderbos (2007), "Testing for complementarity and substitutability in the case of multiple practices", Katholieke Universiteit Leuven Working Paper MSI 0708.

Following the Belderbos *et al.* (2006) and Lokshin *et al.* (2007) approaches, we started to investigate the determinants of R&D co-operation decisions of firms in the Netherlands in general, focusing in particular on the role of incoming and outgoing knowledge spillovers. To enhance our analysis we do not only explore firms' decisions to cooperate with research institutes and suppliers/customers, but we also take the endogeneity of the variables into account. Moreover, as we suspect that specific features of certain industries might not be captured by the variables included in our set of determinants, although they are likely to have an influence on the probability to cooperate in R&D as well, we allow for unobserved effects to be correlated with some of the R&D cooperation determinants. Using firm-level data from the very recent 5th wave of CIS (CIS5, reported in 2009), we aim to fully depict a robust setting enabling us to identify the motives behind the probability to cooperate in R&D. The results will be reported in Paper 4A.

Regarding Research Topic II, Cincera *et al.* (2003)⁴ provide evidence on the important role of internal, external, and cooperative R&D in explaining performance at the firm level, by augmenting the classical productivity growth approach, not only with a firm's own R&D expenditures, but also with R&D cooperation. They provide a theoretical explanation for those mechanisms through which R&D spillovers may impact firms' output growth: R&D cooperation is considered as an innovation activity that provides access to external know-how. Therefore, firms can get access to knowledge by cooperating with partners and hence internalize R&D spillovers.

We started this line of research by measuring the contribution of R&D and innovative activities (such as R&D cooperation strategies) to economic growth in the Netherlands. When using the theory of (endogenous) economic growth, we also utilize the already worked out imperfect competition framework in Amoroso *et al.* (2009), "Total factor productivity under varying returns to scale and imperfect competition in labor and output markets – An application to firms in the Netherlands". Theoretical and empirical results in the research area of Research Topic II will be assembled in Paper 4B.

Policy relevance

As already mentioned in the previous Progress Report 2007, in Paper I we investigate the measurement of productivity, competition, and its application with particular reference to Dutch industries, generating important policy implications in the original Paper 1. Productivity indicators are used as a main tool for policy makers to bring economic growth in perspective. Our data suggests that partial productivity, such as labor productivity, constitutes only a small proportion of total production costs, especially in capital-intensive sectors which have now become very important in the Dutch industry. Therefore, it is better to look at multiple factors contributing to production. The Total Factor Productivity Growth (TFPG), which relates the growth of output to the growth of inputs, indicates to what extent industries can produce more efficiently. TFPG should also take into account the positive contribution of (cyclical) scale economies and market power. Furthermore, for a relatively small open economy, such as the Netherlands, scale economies, competition, capital and

⁴ Cincera, M., L. Kempen, R. Veugelers, B. van Pottelsberghe de la Potterie, and C. Villegas Sanchez (2003), "Productivity growth, R&D and the role of collaborative agreements: Some evidence for Belgian manufacturing companies", *Brussels Economic Review*, 46(3), pp. 106-139.

labor growth are all interrelated. This is important for society because it is only on the basis of a consistent measure of productivity growth and competition that policy makers can make the right decisions in order to improve or maintain the same welfare at all levels of the economy. Empirically, we find that perfect competition in the output market is rejected in some sectors (textiles, machinery & equipment, electrical equipment,...), we find some variability of markups across sectors and time periods, but no systematic time patterns of markups, and we find some heterogeneity in considerable workers' negotiation (power) elasticities (smallest in construction and highest in motor vehicles and other transport equipment).

As an extension to the policy relevance outlined above, differences between the impact of competition in the input and output markets on productivity growth measurement have become more apparent in the new Paper 1'. Also different TFPG observations between small and medium size enterprises (SMEs) and large firms in the Netherlands are presented.

In the original Paper 2, we find that relatively small size firms take a very important role in the innovation debate for two reasons. We find that the decreasing part of the inverted U-shape is more dominant and that the peak of the curve is flat. This suggests that at high levels of competition, applying to a very large number of small firms, innovation incentives are low. Second, we find that a very large proportion of these small firms take a substantive role in explaining the link between innovation and productivity of the TOP 5000 Dutch firms. Based on some market characteristics, we find that these firms -classified as zero/low patenting firms- are the most competitive, less diversified, and less capital and labor intensive. Nevertheless, their commercial success (expressed in terms of average sales) is comparable with other firms that are relatively more patent intense. This raises important questions for the innovation debate. What are the driving factors behind the economic performance of these firms? Why do these firms sporadically appear in the patent database? Is their success related to one-time technological activities, difficulties in the R&D process, too much competition in small-scale markets? What instruments (fiscal, subsidies) can the government provide for them so that their innovation activities can be facilitated?

In the new Paper 2', particular attention is given to the different innovation behaviour of SMEs and large firms in the Netherlands. We find that a majority of the sample firms are SMEs where patent counts pop up sporadically. The new extended R&D and patent count data enables us to obtain more insights in linking their patent behaviour with R&D behaviour and productivity.

The original Paper 3 and certainly the new Paper 3' have the function to establish a link to Papers 4A and 4B regarding R&D cooperation since analyzing the relative positioning of different industries depending on their attitude towards inter-firm knowledge spillovers allows us to derive certain implications about the necessity of measures to stimulate R&D cooperation. For example, it is preferred that the regulator proposes more R&D cooperation stimulating policy towards the industries with less intensive knowledge spillovers, and employs less regulation in the industries where such spillovers are stronger and create more natural incentives for firms to cooperate in R&D.

In general, our more detailed firm-level models in Papers 1', 2', and 3' allow to investigate policy reactions in a much more accurate way than was possible in the original Papers 1, 2, and 3.

Dissemination of Results

On the 1st of July 2008 Joseph Plasmans presented an overview of the state of the project with the main policy conclusions obtained thus far on the DVI Workshop at the Ministry of Economic Affairs in The Hague.

As also mentioned before Joseph Plasmans presented an extended version of the original Paper 3 (with backward and forward USPTO citations) at the Ninth International Scientific Conference on 'Innovation and Patent' in Tokyo on the 19th of December 2008 (see <http://www.aea-eu.com/UK/conferences/index.asp>).

Moreover, several parts of the papers were used in the courses on "Econometrics of Innovation" (Joseph Plasmans at the University of Antwerp) and "Econometrics" (Bertrand Melenberg, NAKE-course).

Finally, there was an important interplay of knowledge, model and data utilization between Papers 2 and 2' and the research project "Impact analysis of fiscal measures on R&D investments in Flanders" from the Flemish Council of Scientific Policy (Vlaamse Raad voor Wetenschapsbeleid (VRWB)); see <http://www.vrwb.be>).

Output

Publications in other journals and other scientific output

Plasmans, J. and R. Lukach, "The Patterns of Inter-firm and Inter-industry Knowledge Flows in the Netherlands", Conference Proceedings (CD-rom) of the Ninth International Scientific Conference on 'Innovation and Patent', Tokyo, 19-20 December 2008.

Other output

Paper 1': Amoroso, S., P. Kort, B. Melenberg, J. Plasmans, and M. Vancauteran (2009), "Total factor productivity under varying returns to scale and imperfect competition in labor and output markets – An application to firms in the Netherlands", CentER Paper, Tilburg University.

Paper 2': Kort, P., B. Melenberg, J. Plasmans, and M. Vancauteran (2009), "Innovation, competition and productivity of enterprises in the Netherlands: A panel data analysis", CentER Paper, Tilburg University.

Paper 3': Plasmans, J. and R. Lukach (2009), "Inter-firm and inter-industry knowledge flows in the Netherlands using backward and forward EPO and USPTO patent citations", CentER Paper, Tilburg University.

The Influence of Team Mobility on Knowledge Transfer and Innovation Processes within Teams.

Code: 472-04-044

Project leader: prof.dr N. Ellemers

Other applicants: dr F.A. Rink

Budget: € 289.682

Starting date: 01-09-2005

Final date: 31-12-2009

Summary of the project

The central question of this research proposal is how the entry of newcomers in teams can have a positive influence on knowledge transfer and innovation processes within teams, without them being rejected as deviant or reducing team cohesiveness and the task motivation of individual team members. We aim to examine the conditions under which a newcomer's *previous work environment* (whether teams are exposed to newcomers from *within* or *outside* the organisation) will have a beneficial or detrimental influence on the extent to which newcomers are accepted by teams and the consequent innovation processes within the team.

Scientific Relevance

Although previous theory and research has examined how individuals adjust to existing practices when they enter a new team or organization (accommodation), relatively little is known about the conditions under which novel information and unique expertise that is introduced by newcomers can foster innovation. In this project, we focus on newcomers who possess unique knowledge and skills through which they can contribute to innovative processes in teams. The central question of our research proposal is how such newcomers can have a positive influence on knowledge transfer, without them being rejected as deviant or reducing team cohesiveness.

In the past year, we have finalized two lines of research that examined whether there are conditions under which teams can accommodate effectively to both internal *and* external newcomers (newcomers from within or outside the organization). In the first, we tested whether this depends on the future prospects of a newcomer – whether the newcomer is seen as a temporary or permanent team member. This project has resulted in a publication in a high quality peer reviewed scientific journal (in press at *Personality and Social Psychology Bulletin*). In the second, we focused on the influence of the team climate: whether the team focuses on the achievement of success (promotion focus), or on the avoidance of failure (prevention focus). We have finalized our data collection and are currently revising the first draft of our manuscript. We are confident that this line of work is publishable in a high standard refereed journal as well. A paper presenting the overarching theoretical framework of both projects came out in a book series on research on managing groups and teams published by Stanford Business School. Furthermore, a selection of studies from both projects has been accepted for publication in a Dutch peer reviewed journal (in press at *Gedrag en Organisatie*). Both outlets are widely known among scientists and practitioners in our field. Finally, a more general conceptual chapter about our research

on managing diversity and mobility in organizations has now been published in the women book series of the American Psychology Association (APA).

Apart from finishing the two abovementioned projects, we continued working on several lines of research that we had developed last year. In addition to that, we started several new projects. On the basis of this work, we have been invited to contribute chapters to books edited by international experts in our field (Prof. dr. Jolanda Jetten, Prof. Dr. Matthew Hornsey & Prof. Dr. Richard Crisp). Both books are forthcoming in 2009, and will be published by Blackwell-Wiley. Our ongoing and newly started research projects are described in more detail below.

Finally, as in the previous years, we have presented the results of our program to an academic audience, and have taken initiatives to discuss our findings with organizations and government institutions in the Netherlands as well. The list of presentations will also be presented below.

Report to the Programme Committee

This past year, there were not changes in our research plans.

Ongoing projects:

- Expert Status Newcomer.

We have conducted two studies showing that highly experienced newcomers threaten existing team members when they come from *outside* the organization and viewed as competitors (Doosje, Ellemers & Spears, 1995). Experts only facilitate team innovation when they are similar to the members of the teams they enter (i.e. when they come from within the organization). We are currently preparing the first draft of a paper on these studies.

- Position (in)security of oldtimers.

This line of research examines whether oldtimers who are in a secure and stable position are more likely to accommodate to expert newcomers than oldtimers who are less secure about their position. The preliminary results of a first scenario study confirmed this hypothesis. Since then, we have conducted two additional studies, using a more interactive methodology, by observing individuals' responses while actually engaging in a computer mediated collaborative team task. These studies show similar results, and additionally confirm that position insecurity of oldtimers does not reduce their level of team commitment, but undermines their self-esteem. This lack of self esteem in turn caused them to perceive new team members as a source of threat (as in the previous project). Further mediation analyses showed that as a result of this, team members invest more in their own contributions to the team and devalue the task contributions of newcomers. The manuscript has been submitted for publication to *Personality and Social Psychology Bulletin*.

- Influence strategies and team innovation.

In this research project, we predicted that the influence of newcomers on team innovation is contingent on the *way* newcomers behave during the first interactions. Research has suggested that newcomers should demonstrate their loyalty by embracing the identity of their new team. A previously conducted scenario study confirmed this assumption. In collaboration with Dr. A. Kane and Prof. J. Levine, we have replicated this finding. We examined newcomers who entered real student teams, which enabled us to establish their effects on actual decision making processes and real team outcomes. The first results look promising and in the expected direction. We are therefore planning one final study (March 2009) to further examine the underlying mechanisms of this effect.

- *Management Game.*

As indicated last year, we have started to examine six-person student teams performing a "management game" in order to get course credits (Van der Vegt & Van de Vliert, 2005). This project gives us an excellent opportunity to examine whether the long-term influence of newcomers (Gruenfeld, Martorana & Fan, 2000). So far, 43 teams have participated in this study. In order to obtain a sufficient amount of teams, another round of data collection is planned in April 2009 (and possibly in September 2009).

- *Field Studies.*

Last year, we started our first longitudinal field study to survey different management instruments and relates them to team mobility and team innovation. We are currently conducting the second wave of data collection, and hope to finish it in March 2009.

Moreover, we had developed a second field study in collaboration with the NWO Casimir programme. A total of 32 Casimir/Senternovem projects have participated so far. We hope to be able to obtain the data from all participants with the next few months.

New projects:

- *Liking vs. competence: Key factors that drive newcomer behavior*

This project studied whether newcomers attach more value to being liked by oldtimers than to being valued for their competence. We have just received the data of our first study, and the results seem to suggest that socially liked newcomers in fact experience the socialization process as a threat, while newcomers that are believed to be incompetent experience the introductory period as challenge. We plan to conduct a follow up study to refine and improve our previously used manipulations.

- *Team climate, task type and the selection of newcomers*

In this line of research, we aim to examine whether teams are inclined to select newcomers that fit their climate (promotion vs. prevention focused), as suggested by previous research (Levine, 2008). We predicted that this would even be the case when the tasks at hand require a different focus. Our first study shows that promotion focused teams prefer fit over non-fit when selecting a newcomer, but are able to put their initial preferences aside when this is necessary to successfully perform a task. Interestingly, prevention focused teams actually prefer non-fit over fit, and are more task focused in general. These teams believe that their chances of failing on a task will be substantially reduced when they select newcomers who are an expert at the tasks that need to be performed, and therefore attach less value to fit. We will conduct a follow up study in March 2009 to further examine this finding.

- *Field studies*

Last year, we started up two additional field studies. In the first, we will examine the conditions under which interim managers can be most beneficial for the organizations in which they are placed (in collaboration with Randstad). In the second, we have contacted all members of the "Juxta" group (12 young academia that have been placed in the Amsterdam police corps with the explicit work assignment to change the existing norms in the organization) for interviews so that we can obtain more qualitative data on the key factors that determine the extent to which newcomers can influence the teams they enter.

Stagnation and / or difficulties, e.g. unavailability of researchers, data, etc.

We did encounter some difficulties in our research on the Casimir projects. The first wave of data collection is still not finished, as it turned out to be more difficult than expected to

obtain a reasonable response rate. This is for a large part due to the fact that most projects had already finished when we contacted them. Even though we originally wanted to follow the projects longitudinally, we now realize that a second wave of data collection will not be feasible.

Furthermore, a few follow up studies in ongoing projects have been postponed until 2009 due to the fact that Dr. Floor Rink was on maternity leave from May 2008 – September 2008. These studies will now take place in the upcoming 2 or 3 months.

Policy Relevance

As indicated in our previous progress report, organizations increasingly rely on interdependent, multidisciplinary and project-based teams. Team innovation has become one of the most critical micro level factors that influences the extent to which organizations are able to introduce new innovative technologies and products on the market. It is therefore highly important to study the key factors that can enhance innovation processes within work teams. In our research, we focus on those newcomer and team characteristics that can be regulated by management interventions within the organizations. This will enable us to indicate specific organizational policies that can foster and improve team innovation. Current management practices with respect to newcomers mostly focus on facilitating an effective *assimilation* of new employees into the team or organization (Rink & Ellemers, 2006). This focus on assimilation of newcomers implies that they are taught *not* to challenge the scope of existing methods and knowledge within a team. Accordingly, newcomers tend to adjust to the status quo so that teams cannot recognize their unique knowledge, even when newcomers possess valuable expertise. Moreover, newcomers often find it difficult to openly express the potential value of their new ideas for team innovation.

So far, our research suggest some concrete measures that can be taken to enhance team innovation. For instance, the knowledge that external newcomers tend to be more effective in introducing team innovation can be used, as managers can hire external expertise from outside the organization. The knowledge that the temporary presence expertise is more favourable for innovation than a more permanent addition of new team members may make it more easy to realize this, for instance through mutual exchange of specific knowledge within larger consortia, or through temporary employment of workers from outside the Netherlands who have specific expertise. Policy recommendations relevant to innovation thus include programs that advocate horizontal mobility of employees within and across organizations, the legal facilitation of knowledge migration, and provisions for temporary employment permits to attract workers with specific expertise. At the same time, it is important that employees do not feel insecure or threatened in their position by newcomers. At the micro-level, top management should therefore foster an organizational culture that focuses on the achievement on success (instead of on the avoidance of failure), and should publicize and reward innovative teams and individual mobility (create flexicurity, see for instance the European Union Employment Strategies). Moreover, our results show that organizations can train expert newcomers to increase their impact on team innovativeness by using specific influencing strategies.

Dissemination of research results:

We have presented our initial findings to academic and practitioners audiences, in order to validate the soundness of our scientific analysis and to disseminate the conclusions of our work to a broader public.

Academic presentations 2008

- Rink, F., & Ellemers, N. (2008). Team mobility and diversity. Invited talk Marketing department, University of Groningen
- Ellemers, N. Diversity, newcomers, and team innovation. Invited colloquium, Universiteit Tilburg, may 2008.
- Ellemers, N. Diversity, newcomers, and team innovation. Invited colloquium, Australian National University, Canberra (Australie), September 2008.
- Ellemers, N. Diversity, newcomers, and team innovation. Invited colloquium, University of Queensland, Brisbane (Australie), September 2008.
- Ellemers, N., & Rink, F. Managing Diversity at Work, European Association of Social Psychology, General Meeting, Opatija, Juli 2008
- Ellemers, N., & Rink, F. Team Mobiliteit en Innovatie, Dynamisering van Innovatie Workshop, Den Haag, Juli 2008

Presentations for practitioners 2008

- Rink, F., & Ellemers, N. (2008). The human factor in innovation. Presentation for the Board of Directors of DJI (Dienst Justitiele Inrichtingen, The Hague).
- Rink, F., & Ellemers, N. (2008). The impact of mobilisation on team performance. Symposium "Bridging Science and Practice". Organized by the OB department of the faculty of Economics and Business of the University of Groningen for practitioners in our field.

Output

Manuscripts in press/forthcoming

(Inter)national refereed journals

- Rink, F. & Ellemers, N. (in press). Temporary vs. permanent group membership: How the future prospects of newcomers affect newcomer acceptance and newcomer influence. *Personality and Social Psychology Bulletin*
- Rink, F., & Ellemers, N. (in press). De Invloed van mobiliteit op kennis overdracht en innovatie processen binnen teams. *Gedrag & Organisatie*.

Manuscripts under submission

- Rink, F. & Ellemers, N. (2009). *Benefiting from informational differences: How diversity can help focus on common group goals*. Revise and Resubmit Group Processes and Intergroup Relations.
- Ellemers, N. & Rink, F. (2009). *Security as a source of innovation: How position (in)security of existing team members affects innovative behavior and newcomer acceptance*. Submitted for publication to *Personality and Social Psychology Bulletin*.

Manuscripts in preparation (in writing stage)

- Rink, F. & Ellemers, N. (2009). Collective regulatory focus and the acceptance of newcomers.
- Lount, R., Rink, F., & Phillips, K. W. P. (2009). Racial diversity as a liability for perceptions of relationship conflict in work groups.
- Kane, A. & Rink, F. (2009). Newcomers as active agents: How different types of newcomer influence tactics affect team innovation.
- Rink, F., & Ellemers, N. (2009). Newcomers and team innovation: The importance of expertise and prototypicality.

Chapters in books

- Rink, F., & Ellemers, N. (2008). Managing diversity in organizations: How identity processes affect work groups. In M. Barreto, M. Ryan, & M. Schmitt (Eds.), *Barriers to diversity: The Glass Ceiling 20 years on*, p. 281 - 304. APA Psychology of Women Book Series.
- Rink, F. & Ellemers, N. (2008) Diversity, Newcomers and Team innovation. In B. Mannix, M. Neale, & K. Phillips. (Eds), *Diversity & Groups. Research on managing groups and teams*, p. 221-244. Stamford: JAI Press.
- Stoker, J., Stapel, D & Rink, F. (2008). De rol van macht: Eigen belang versus organisatiebelang. In J. Stoker & T. Camps. *Managers and vluchtgedrag*. Berenschot serie.

Contributions to books

- Rink, F., & Ellemers, N. (2009). Newcomers as a source of creativity. To appear in J. Jetten and M. Hornsey. (Eds.). *Rebels in Groups: Dissent, deviance, difference and defiance*. Blackwell-Wiley
- Rink, F. & Jehn, K. A. (2009). Perceptions of subgroup formation and faultline activation. To appear in R. Crisp (Ed.). *The Psychology of Social and Cultural Diversity*. SPSSIBlackwell-Wiley series
- Ellemers, N. (in press). Group boundaries. In: J.M. Levine, & M.A. Hogg (Eds.) *Encyclopedia of Group Processes and Intergroup Relations*. London: Sage.

The impact of M&A-driven market dominance on innovation dynamics

Code: 472-04-008

Project leader: : Prof. dr E. J. J. Schenk MBA, University of Utrecht

Other applicants: prof.dr O. Omta, dr E. Wiebe, dr E. Cefis, dr R. Kemp

Budget: € 234.823

Starting date: 01-01-2006

Final date: 01-01-2008

Summary of the project

This research project investigates the impact of mergers & acquisitions (M&A) on the innovativeness in and of firms and industries. Should Dutch economic policies and competition authorities allow and/or encourage the creation of dominant firms, if these can rightly claim that this would foster or increase innovativeness, because of justified claims of maintaining innovativeness? Alternatively, with the creation of a dominant firm by M&A, how can innovativeness be maintained? We will, first, investigate conceptually and empirically, the determinants of innovativeness in M&A, and the forms that such efficiencies may take. We will use both enriched datasets and international comparative case studies. Second, we will derive and formulate competition policy recommendations.

Final report

Proceedings of the project

The current project was scheduled to extend over two calendar years, which made it less stretched than other projects in the programme. Although the academic work has proceeded well, it has become evident that a project of the current size and time schedule cannot be fully completed within the allotted two years. We have informed various stakeholders on this already last year.

There are two principal causes for not having been able to fully complete the project by now. First, we have been very much concerned with the composition of original databases. In fact, however, this has appeared perhaps too idealistic a goal, especially since we wished to build such databases at the industry and firm level. As it turned out, there is not much history, thus experience, in the Netherlands with respect to the latter. Due to the sensitivity of possible results, various firms were unwilling to collaborate on this project or were unwilling to allow interviews beyond board members or gatekeepers, despite the fact that the mergers in question had been consummated already some time ago (between 6-8 years). Because of this, we extended our planning period beyond the termination date of the project. Unfortunately, the researcher who had been especially appointed to focus exclusively on the building up of the database decided to accept an offer for a PhD position from a non-participating university immediately after the termination date of the current project.

Secondly, we wanted to have at least one paper formally accepted by a high-ranking journal rather than having more working papers finished at the end of the two years. This took more time than expected (but we have succeeded in getting two of our papers accepted already,

as is evident from our Status Review of Deliverables). We are currently progressing very much with a few other papers that should be ready for submission soon. Obviously, our focus on the publication of papers has been determined in part by the current university climate in Dutch economics departments.

Third, one of our senior team members received an offer from a non-participating university just when we were half-way the project, which she decided to accept. Although this has not diminished her productivity for the current project, perhaps even the contrary, it meant that communication within the team became more cumbersome than expected. More generally, we may have underestimated the disadvantages of collaborating in a team that divides between two institutions that are not within 'walking distance' from each other. Although the rather different orientations of the Utrecht and the Wageningen teams respectively allowed interesting perspectives on our collaborative work, this appeared to consume quite some energy too. On balance, however, we think that it has been a good decision to collaborate in the current project. Trying to combine different levels of aggregation, industry level analyses with micro level (case) analyses, and detached analyses with managerial approaches, was a rather challenging task that made it worthwhile to put up with the increased transaction costs involved.

Finally, as leader of the project, I am happy to be able to observe that almost all team members, either individually or in collaboration with each other, will be continuing work on the current problematic. In summary, the project has not just proven its resilience but also its capturing characteristics. We think that continuation of the project is both academically and from a societal (policy) point of view desirable. We will therefore be pursuing subsequent project funding.

Obviously, all publications that will follow from the work done during 2006 and 2007 will duly refer to the current project. We expect that it may take as much as two more years before all publications that we are currently working on will be officially published.

Scientific and policy relevance

Many of the papers that have resulted from the project have used data sources that have not been employed frequently before to shed new light on both old and new questions. While ultimately meant to contribute to answering our main question, all our individual papers appear publishable or likely to be publishable in the near future thus demonstrating their scientific relevance. While some of our work adds to the existing body of knowledge, other parts would seem to contradict it (especially in Industrial Organisation economics). For example, since by far most mergers and acquisitions are acquisitions, our findings with respect to the effects on the firm size distributions illustrate that the path to size matters also in terms of industry structure. Also, technological and market relatedness between merging firms seems to have a positive impact on post-merger patenting performance in the European electrical equipment industry and life sciences. This finding is inconsistent with much of the literature in which it is suggested that technological relatedness negatively affects innovation. If substantiated, these findings would suggest fostering horizontal rather than diagonal mergers. In turn, this may have more competition implications than would follow from other recently published work.

Our econometric studies have focused on small and medium-sized firms (some of which may nevertheless be close to dominance in their respective markets) rather than really big ones. We find a positive association between external growth of these firms and innovation. The question still remains, however, whether our evidence applies across size classes. Most competition policies, in fact, focus on the really large firms so that additional research would be needed. Part of this is supplied through our case studies and from our comparisons of US and EU treatments of innovation in merger control.

When dealing with actual merger/innovation cases, it would seem that a transparent combination of the innovation market doctrine, typical of US treatments, and the efficiency defence approach as adopted in the EU, would be commendable. First, such a combination would allow a more comprehensive analysis of a transaction's impact. The reason is that innovation markets focus on the inputs of R&D while efficiency defence approaches measure the effects of innovation in the output market (new/improved products and processes). Second, risks of errors (type I and II) could be reduced. The European approach may imply the acceptance of an acquisition even if it creates market dominance. Under the innovation markets standard, transactions detrimental to innovation might be blocked even if they would not raise concerns for the current market structure.

All in all, since many industrial and technology policies implicitly assume that firms tend to grow as a direct result from successful product or services portfolios, firms' focus on external growth for its own sake (i.e. for a reason that has not been included in the innovation literature thus far) may have significant implications for the effectiveness of such policies. For example, facilitating the access to new capital may favour investments in acquisitions rather than in R&D. Any effect on innovation may subsequently be coincidental rather than purposive.

Status of Deliverables – 20 June 2008

A. Papers

1. *Factors related to innovative output in the Dutch agrifood industry*
Principal: dr. Emiel Wubben
In-programme collaborators: Maarten Batterink MSc; prof. Onno Omta
Target journal: *Journal on Chain and Network Science*
Status: published in *Journal on Chain and Network Science* 6 (1) 2006: 31-44
2. *The Effects of Mergers and Acquisitions on the Firm Size Distribution*
Principal: dr.dr. Elena Cefis
In-programme collaborators: prof. Hans Schenk
Non-programme collaborators: dr. Orietta Marsili
Target journal: *Journal of Evolutionary Economics*
Status: forthcoming in *Journal of Evolutionary Economics*
3. *Partnerships and Innovative Patterns in Small and Medium Enterprises*
Principal: dr.dr. Elena Cefis
In-programme collaborators: Mihaela Ghita MSc, Anna Sabidussi MSc
Target journal: *International Journal of Entrepreneurship and Small Business*

Status: forthcoming in *International Journal of Entrepreneurship and Small Business*

4. *The impact of different governance modes for external knowledge acquisition on innovation performance: an empirical assessment in The Netherlands*
Principal: dr. Emiel Wubben
In-programme collaborators: Maarten Batterink MSc, prof. Onno Omta
Non-programme collaborators: dr. Ron Kemp
Target journal: *Strategic Management Journal*
Status: revise and resubmit (chapter 3 of PhD-thesis of Batterink, *Improving the innovation capabilities through Open Innovation and M&As*, to be submitted before year-end 2008)

5. *The Impact of M&As on Technology Sourcing Strategies*
Principal: dr.dr. Elena Cefis
In-programme collaborators: prof. Hans Schenk
Target journal: *Economics of Innovation and New Technology*
Status: submitted to *Economics of Innovation and New Technology* in November 2007

6. *Post Merger Innovative Patterns in Small and Medium Firms*
Principal: dr.dr. Elena Cefis
In-programme collaborators: Mihaela Ghita MSc
Target journal: *Small Business Economics*
Status: submitted to *Small Business Economics* in March 2008

7. *Do mergers of potentially dominant firms foster innovation? An empirical analysis for the manufacturing sector*
Principal: dr.dr. Elena Cefis
In-programme collaborators: Anna Sabidussi MSc, prof. Hans Schenk
Target journal: *Oxford Economic Papers*
Status: published as *Working Paper 07-20* (2007), T.C. Koopmans Institute, Utrecht School of Economics, Utrecht University, Utrecht; to be submitted to *Oxford Economic Papers* 1 August 2008

8. *The role of innovation in merger policy: Europe's efficiency defence versus America's innovation markets approach. Two cases*
Principal: dr.dr. Elena Cefis
In-programme collaborators: Anna Sabidussi MSc, prof. Hans Schenk
Non-programme collaborators: Mark Grondsma MSc
Target journal: *Journal of Common Market Studies*
Status: published as *Working Paper 07-21* (2007), T.C. Koopmans Institute, Utrecht School of Economics, Utrecht University, Utrecht; to be submitted to *Journal of Common Market Studies* 1 August 2008

9. *The effect of technological and market relatedness on post-merger innovative firm performance in Europe's electrical equipment industry*
Principal: prof. Hans Schenk
In-programme collaborators: dr.dr. Elena Cefis

Non-programme collaborators: Victor Joosen MSc, prof. Alfred Kleinknecht

Target journal: *Research Policy*

Status: ready to be submitted to *Research Policy* 1 August 2008

10. *Dynamic efficiency effects in forbidden vs. authorised mergers: A comparative case analysis of five proceedings in the EU and the USA*

Principal: prof. Hans Schenk

In-programme collaborators: dr.dr. Elena Cefis

Non-programme collaborators: Tijmen Lisman BSc, dr. Utz Weitzel

Target journal: *International Journal of the Economics of Business; Journal of Common Market Studies; Oxford Review of Economic Policy*

Status: ready to be submitted to *International Journal of the Economics of Business* 1 October 2008

11. *The impact of a market-dominant merger on innovation: the case of GlaxoSmithKline (2000-2005)*

Principal: dr Emiel Wubben

In-programme collaborators: Maarten Batterink MSc, dr. Lianne Simonse, prof. Onno Omta

Non-programme collaborators: Gerbrand van Veldhuizen MSc

Target journal: not decided yet

Status: ongoing; will be integrated with no. 14 (low priority)

12. *The impact of M&As on innovation dynamics in potentially dominant positions. Evidence from Dutch CIS data*

Principal: dr.dr. Elena Cefis

In-programme collaborators: Anna Sabidussi MSc, prof. Hans Schenk

To be split up in 2-3 parts

Target journal: *Industrial and Corporate Change; Research Policy; Review of Industrial Organization*

Status: ongoing; proceedings dependent on continued access to CBS (CIS data) via remote log in facility (request for financial support pending)

13. *The impact of mergers and acquisitions on innovation dynamics: a comparative case study*

Principal: dr Emiel Wubben

In-programme collaborators: Maarten Batterink MSc, prof. Onno Omta

To be split up in 2 parts:

- *Designing and implementing post-merger integration to realize innovation synergies: evidence from the life sciences*

Target journals: *International Journal of Technology Management*

- *Realizing innovation synergies through mergers and acquisitions*

Target journal: *Technovation; Technology Analysis & Strategic Management; R&D Management*

Status: ongoing (chapters 5 and 6 of PhD-thesis of Batterink, *Improving the innovation capabilities through Open Innovation and M&As*, to be submitted before year-end 2008)

14. *M&As and innovation performance in the drugs industry: an empirical study of four dominant firms.*

Principal: dr.dr. Elena Cefis

In-programme collaborators: prof. Hans Schenk

Non-programme collaborators: Maarten Kok MSc, Ivo Wantia MSc

Target journal: not decided yet

Status: ongoing; will be integrated with no. 11 (low priority)

15. *On the unpopularity of the efficiency defence*

Principal: dr. Emiel Wubben

In-programme collaborators: Maarten Batterink MSc

Non-programme collaborators: prof. Johan van de Gronden

Target journals: *Common Market Law Review*; *Competition Law Review*; *World Competition*

Status: ongoing

16. *The impact of post merger integration processes on realizing innovation synergies: a comparative case study of five major acquisitions*

Principal: dr. Emiel Wubben

In-programme collaborators: Maarten Batterink MSc, dr. Lianne Simonse, prof. Onno Omta

Non-programme collaborators: Peter Schoch MSc

Target journals: *R&D management*; *Organization Dynamics*

Status: ongoing

17. *Business-to-business external sources of technology (BEST) and innovation: a dynamic portfolio approach*

Principal: prof. Onno Omta

In-programme collaborators: Anna Sabidussi MSc

Non-programme collaborators: Harry J. Bremmers

Target journal: still to be decided.

Status: ongoing

B. Other documents

- *Construction of a firm-level European database with respect to M&As and innovation*

Principal: dr.dr. Elena Cefis

In-programme collaborators: Mihaela Ghita MSc, Anna Sabidussi MSc, prof. Hans Schenk

Status: ongoing

- Various MSc theses, among which two were graded 9/10 and one won the award for Best MSc-thesis in Business Administration, Wageningen University, academic year 2007-2008

C. Dissemination

Apart from the publication of the papers reported above, dissemination of the problematics of the project or parts of it has taken place at various occasions, among which:

1. *Post merger integration of the innovation organisation: a literature overview*
Principal: dr Emiel Wubben
In-programme collaborators: Maarten Batterink MSc, dr. Lianne Simonse, prof. Onno Omta
Presented at RADMA Conference, Bremen, 4 July 2007
2. *Realising innovation synergies through mergers & acquisitions*
Principal: dr. Emiel Wubben
In-programme collaborators: Maarten Batterink MSc, dr. Lianne Simonse, prof. Onno Omta
Presented at Academy of Management Conference, Philadelphia, 6 August 2007
3. *The Impact of M&As on Technology Sourcing Strategies*
Principal: dr.dr. Elena Cefis
In-programme collaborators: prof. Hans Schenk
Presented as invited contribution at the First European Conference on Corporate R&D (CONCORD), 'Knowledge for Growth: Role and Dynamics of Corporate R&D', Directorate General Joint Research Centre/Directorate General for Research, Institute for Prospective Technological Studies (IPTS), Sevilla, 8 October 2007
4. *Mergers and Innovation: Not all mergers are equal—assessments and policy implications*
Principal: prof. Hans Schenk
In-programme collaborators: dr.dr. Elena Cefis
Presented at Staff Workshop, Institute for Prospective Technological Studies (IPTS), Sevilla, 10 October 2007
5. *Post Merger Innovative Patterns in Small and Medium Firms*
Principal: dr.dr. Elena Cefis
In-programme collaborators: Mihaela Ghita MSc
Presented at 2nd European Conference on Entrepreneurship and Innovation, Utrecht, 7-9 November 2007
6. *The impact of different governance modes for external knowledge acquisition on innovation performance: an empirical assessment in The Netherlands*
Principal: dr. Emiel Wubben
In-programme collaborators: Maarten Batterink MSc, prof. Onno Omta
Non-programme collaborators: dr. Ron Kemp
Presented at The Mansholt Doctoral Symposium 2008, Mansholt Graduate School, Wageningen, 28 May 2008
7. *The impact of the Post-Merger Integration process on innovation synergy realisation.*
Principal: dr. Emiel Wubben
In-programme collaborators: Maarten Batterink MSc
Non-programme collaborators: Peter Schoch MSc
Presented at 8th International conference on Management in Agrifood Chains and Networks, Ede, 29 May 2008

Smaller and/or nationally focused presentations have been given at the Dutch competition authority NMa and the Dutch Society for Competition Law VvM during the Fall of 2007, and at the Dutch Ministry of Finance in January 2008. Presentations at the Dutch Ministry of Economic Affairs (on occasion of the preparations concerning the 'Industriebrief') and the European Commission are pending. Roundtable presentations for professionals were given at the Annual Meeting of the Dutch Corporate Finance Association (June, 2007) and at the Centre for International Business and Management at the University of Cambridge (February, 2008). Besides, half a dozen meetings have been held with company officials in industry as well as agriculture during which the problematics of the project were discussed.

Amongst the many interviews that were given to the media, several in particular focused on the issues that are addressed in the current project, for example in the Dutch business newspaper *het Financieele Dagblad* and the industry journal *Bloemisterij* (on the innovation effects of the merger of FloraHolland with Verenigde Bloemveilingen Aalsmeer VBA, creating the largest flower auction trader in the world).

Dissemination of research results

In compliance with earlier promises as well as requests, dissemination efforts have been stepped up during the second year of the project. Yet, our main focus has been on output in terms of academic papers. By now, we can be confident that the project will eventually turn out more than the ten academic papers that we expected a year ago. Three papers have already been accepted or published by major journals while two others were formally published as working papers. Two more papers have been submitted to journals over the last four months while others are close to submission.

Five major presentations have been given at academic and/or academic/policy conferences (as detailed in the Status Review of Deliverables), whereas about ten smaller presentations have been held (or will soon be given) at ministries (Financial Affairs; Economic Affairs), seminars and round tables at the government level (the Dutch Competition Authority NMa) as well as the professional level (the Society for Competition Law VvM; the Dutch Corporate Finance Association; the Centre for International Business and Management at the University of Cambridge). Dissemination in the business community has taken place at seminars and consultation meetings with individual businesses in industry as well as agriculture.

Amongst the many interviews that were given to the media, several in particular focused on the issues that are addressed in the current project, for example in the Dutch business newspaper *het Financieele Dagblad* (on the innovation effects of the merger of FloraHolland with Verenigde Bloemveilingen Aalsmeer VBA, creating the largest flower auction trader in the world). One of the team's members accepted an invitation from the parties to give his expert view on the case.

Unfortunately, due to lacking financial means, we have not been able to organise our own hoped-for conference on mergers and innovation. Last year, we hoped to be able to find external sponsors for such a venture, but we haven't (yet) been able to generate the resources that are necessary to get it going.

e. *Implications for June, 2007 questions*

Looking back at the questions that were raised on occasion of the June 22, 2007 workshop, it is noted that most of these questions refer more explicitly to other projects within the current programme than to ours. Still, the implications that have already been mentioned above in section c, explicitly mixed with some speculative ingredients, may amount to the following.

1. Innovation, by definition, cannot be predicted. Consequently, a major derived hypothesis would be that an ex post search for driver factors will necessarily remain rather elusive and/or superficial and/or debatable.
2. Innovation sometimes requires large R&D expenditures and systematic activity, though sometimes not much more than a creative mind or coincidental occurrences. Serendipity sometimes plays a crucial role—and by definition it cannot be predicted.
3. For economic policy makers these are not fully useless findings. They require fostering an environment in which chances can occur, thus an environment that is as unbureaucratic as possible, and that facilitates the meeting of different minds and disciplines.
4. Although the previous point may appear to be at loggerheads with our finding that horizontal mergers have a stronger effect on innovation than conglomerate mergers, it should be stressed that meeting is something else than merging. 'Conglomerate meetings' might be more beneficial to innovation than horizontal mergers.
5. The effects of competition on innovation despite decades of econometric research are still uncertain, to put it euphemistically. Sometimes, increasing concentration is related to increasing innovation, while at other times reverse relations hold. Up till now it has proved impossible to establish the determinants of either—which in view of the previous points should not come as a surprise.
6. Similarly, despite decades of econometric research, it has not appeared possible to come up with unambiguous systematic and reliable indicators of competitive intensity. It is therefore not surprising that relationships between competition and innovation appear ambiguous.
7. It would therefore seem that we may never be able to arrive at general and verified theories on the relationships that are addressed in this programme. In this respect, one might think of questions concerning sectoral differentiation; the extent of imperfection; the measurement and thus the impact of various degrees of protection. There simply may be too many idiosyncrasies in the world 'out there'.
8. In general, policy implications can therefore only be drawn, it seems, from case studies, i.e. from studying the idiosyncrasies of individual firms and individual mergers, especially while making combinations of economics and management theories and approaches.

The diversity of knowledge transfer in public-private knowledge networks

Code: 472-04-020

Project leader: Prof. dr H.H.G. Verspagen (TUE)

Other applicants: dr M. van der Steen, drs P. den Hertog

Budget: € 332.321

Starting date: 01-02-2006

Final date: 01-08-2008

Summary of the project

The first aim of the project is to assess the variety of knowledge transfer in public-private knowledge networks across various industries. The theoretical starting point lies in the innovation literature that stresses the sectoral variety of knowledge accumulation patterns. As a first research line, we propose to conduct a survey on the channels of public private knowledge interaction. A second line conducts a large number of case studies on how university inventions get into practice in the Netherlands. The last research line aims to apply the findings to the policy situation, using an institutional perspective.

Final report

Scientific relevance, conclusions of the research

The channels of public-private knowledge transfer are diverse and multi-faceted. Researchers in universities and firms interact through a wide variety of mechanisms and channels. The most important of these channels occur outside the realm of what policy (in the Netherlands and abroad) usually addresses: patents, start-ups and the activities of technology transfer offices are generally considered to be less important than others channels (e.g., publications, mobility of employees and students). Moreover, the variety of knowledge transfer channels is not systematically related to differences between sectors, but to differences in types of knowledge, technology fields and characteristics of researchers involved, which instead may cluster across sectors.

Our case study research shows that the variety of knowledge transfer channels is related to industrial and university motivations, perceived barriers in the innovation process, and to (policy) institutions. University-industry knowledge transfer occurs for a variety of motivations (on both sides of the transfer) and within a set of different institutional contexts. These motivations and contexts are systematically related to the channels and formats of collaboration and knowledge transfer. The analysis of our case studies gives further detailed conclusions with regard to the context and effectiveness of a number of modes that are commonly used for public-private knowledge transfer, such as joint research projects, public research sponsoring, part-time professorships, etc.

The Dutch technology transfer policy is found to be increasingly encompassing both formal and informal channels of knowledge transfer and to be generic rather than sector-specific. Science policies, especially from the 1990s, have focused on research excellence, which has been understood as the main factor for industrial performance. Contrary to this national trend, since 2000, all 13 Dutch universities have launched technology transfer policies

mostly focused on a limited number of formal knowledge transfer channels (university spin-offs, university patenting, licensing and research contracts) (van der Steen et al. 2008). National Dutch policy, contrary to local university policies, seems to match with standing technology transfer practices (van der Steen et al. 2008). Our survey findings are supportive of horizontal and generic technology transfer policies rather than sector-specific ones, as firms tend to be multi-technological and their products and innovations (highly) multi-disciplinary (Bodas Freitas and Bekkers, 2008; van der Steen et al. 2008).

All of these conclusions are elaborated in the papers that are listed in the last section of this report

Policy relevance

The conclusions that were reached in this project, and which are documented in the outputs listed below, provide direct insights in the working of specific policies that are employed for public-private knowledge transfer in the Netherlands. Among the most relevant ideas stemming from the project are the notion that knowledge transfer channels are not specific to industries and sectors (and hence that there is – from this point of view – no rationale for a sector-specific policy), that a wide variety of indicators must be used to capture the effects of policy in this field, and that particular channels, and hence policies, are connected to specific motivations (e.g., developing products vs. broadly exploring new technological opportunities). Moreover, our case studies analyses put forward the existence of relationships between forms of technology transfer and national institutions and policy instruments (Bodas Freitas and Verspagen, 2008). These results also allowed us to address the debate of the importance of academic patenting for technology transfer (Bodas Freitas and Nuvolari, 2008).

From the scientific point of view, the project contributes to a general literature in this field, as is evident from the fact that papers from the project are published in some of the leading journals, and are being presented at major conferences. The general view that emerges from this is that is useful to explore the details of the knowledge transfer process, because this enlarges the insight into how this process works. In particular, we managed to address issues such as the existence of industrial differences in the forms of knowledge transfer, the links between university-industry motivations, forms of collaboration and national institutions or the link between academic patenting and types of university-industry interaction.

The project has delivered a survey-based database as well as a set of case studies that can be used for more empirical research in this field.

Dissemination of research results

The researchers involved in the project have published their results, so that these are available to the general public, including policy makers. Results have also been presented in academic as well as in policy-oriented conferences, such as the DRUID conference, the Schumpeter conference, the Prime-Globelics conference. Particular effort has been made to provide a number of popularized articles, for example in ESB and De Volkskrant.

Output

Publications in refereed journals:

- Groenewegen, J and M. van der Steen (2007), The Evolutionary Policymaker, *Journal of Economic Issues*, vol. XLI, no.2, June 2007, p. 351-358. (3)⁵
- Bodas Freitas, I.M. and Bekkers, R. (2007). Analysing knowledge transfer channels between universities and industry: To what degree do sectors also matter?. *Research Policy*, vol. 37, pp. 1837-1853. (1)

Manuscripts yet unpublished:

- Van der Steen, M., R. Bekkers, I. M. Bodas Freitas and V. Gilsing (2007). Beyond the Demand-Side Perspective of Technology Transfer Policies: An Empirical Analysis of the Netherlands. (3)
- Bodas Freitas, Isabel Maria & Bart Verspagen, 2009, The motivations, organisation and outcomes of university-industry interaction in the Netherlands, UNU-MERIT Working Paper 2009-011 (2)

Publications in non-refereed journals and other outlets:

- Van der Steen, M. en B. Verspagen, Het verzilveren van universitaire kennis, *Economisch Statistische Berichten*, no. 4537, pp. 326-329 (1)
- Verspagen, B., *Economie vereist samenwerking*, *Volkskrant*, *Opinie*, 16-Apr-08. (2)

Papers presented at conferences:

- Marques, R. A.; Bodas Freitas, I.M. and Silva, E. M. P. (2007). Collaboration with university and the innovative activities of Brazilian firms. Presented at ALTEC conference, Buenos Aires, September 2007. Published in portuguese by ENGEVISTA, Universidade Federal Fluminense, Rio de Janeiro. <http://www.uff.br/engevista/> (2)
- Van der Steen, M. (2008) The Evolutionary Foundations of Technology Transfer Policy; the case of the Netherlands, Presented in the Schumpeter Society Conference, July 2008, Rio de Janeiro. (3)
- Bodas Freitas, I. M. and B. Verspagen. The motivations, organisation and outcomes of university-industry interaction, in the Netherlands. What is the role of national institutions? Presented in the Schumpeter Society Conference, July 2008, Rio de Janeiro. (2)
- Bodas Freitas, I.M., R. A. Marques, and E. M.P. Silva. University-Industry Collaboration and the Development of High-Technology Sectors, in Brazil. To be presented in the PRIME-Globelics Conference, September 2008, Mexico City (2)
- Bodas Freitas, I. M. and A. Nuvolari. Traditional versus Heterodox Motives of academic patenting: Evidence from the Netherlands. Presented in the EPIP- European Policy for Intellectual Property conference, October 2008, Bern (1)
- van der Steen, M. , R. Bekkers, I.M. Bodas Freitas, and V. Gilsing. Diversity in Technology Transfer Policies and Practices: Empirical Evidence from the Netherlands. Presented at the Dime conference, April 2008, Strasbourg (3)

MSc theses:

- R.C.R.W. van Ewijk, University-industry knowledge transfer : comparing contract research and spin-off creation, MSc thesis Eindhoven University of Technology, 2007 (3)

⁵ The figure between brackets refers to the research line in the original proposal.

D. W. Versteeg, Influence of STW funding on public-private knowledge transfer, MSc thesis Eindhoven University of Technology, 2007 (3)

W. Smid, The role of patents in university-industry knowledge transfer : the case of Eindhoven University of Technology, MSc thesis Eindhoven University of Technology, 2007 (3)

A reaction to specific questions raised by the program committee

1. "In het eindverslag staan twee beleidsrelevante conclusies op basis van het onderzoek:

1. Er zijn geen sectorale verschillen in kennisoverdracht, dat ondersteunt generiek beleid.

2. 'Informele kanalen' zijn belangrijker voor kennisoverdracht dan 'formele kanalen'.

In aansluiting op de tweede conclusie wordt gesuggereerd om beleid vooral te richten op bijeenbrengen van partijen, en het stellen van doelen m.b.t. congressen en lezingen en publicaties. Wat echter opvalt is dat de resultaten van dit onderzoekproject met name zijn gericht op de wetenschappelijke kring met presentaties op wetenschappelijke conferenties en publicaties. Er staat slechts één beleidsgerichte conferentie. Kunnen we daarmee uit de eindrapportage afleiden dat de onderzoekers hun eigen aanbeveling niet hebben toegepast, bijvoorbeeld in de vorm van informele kennisoverdracht? Hierop zouden we gaarne een nadere toelichting ontvangen."

Antwoord: Van der Steen is vanaf 2007 nauw betrokken geweest bij de beleidscommissie van het Innovatieplatform 'Deltaplan Valorisatie'. De disseminatie van onze onderzoeksresultaten zijn door middel van gesprekken en bijeenkomsten met betrokken beleidsambtenaren, ambtelijke projectleider, en de voorzitter van de commissie, prof. Marco Waas direct overgedragen ten behoeve van het Nederlandse valorisatiebeleid. In samenspraak met de betrokken ambtenaren is besloten voor deze directe en persoonlijke kennisoverdracht, zodat onze resultaten meegenomen konden worden in de besluitvorming. Deze interacties hebben mede bijgedragen tot de valorisatie agenda (ondertekend door alle betrokken partijen in december 2008) en de nota van het Innovatieplatform "Kennis moet circuleren". In september heeft er eveneens een beleidsbijeenkomst plaatsgevonden met betrokken beleidsambtenaren van het Ministerie van Economische Zaken, het Ministerie van OC&W, Prof. Marco Waas, Prof. Bart Verspagen en Dr. Marianne van der Steen met betrekking tot het ontwikkelen van valorisatie-indicatoren in het kader van het project Deltaplan Valorisatie.

2. "Verder zouden wij het op prijsstellen als u nog in het verslag iets zou willen opnemen hoe het DvI project doorwerkt in de eigen onderzoeksagenda: naast de hiervoor genoemde vraag of men nog voor valorisatie van de opgedane kennis gaat zorgen is de vraag of er vervolprojecten gestart gaat worden. Bijv. het ESB-artikel gaat in op indicatoren t.a.v. kennisvalorisatie. Gaat men hier zelf onderzoek naar doen en wordt daar aansluiting gezocht met beleid? In de DvI-workshop kwam aan de orde dat er onderzoek gericht op bedrijven gaat volgen (dit onderzoek was gericht op universiteiten). Wat gaat er concreet gebeuren?"

Antwoord: Dit verschilt sterk per individuele onderzoeker. Sommigen uit het onderzoeksteam hebben het onderwerp van dit project nog steeds als een kernonderwerp in hun onderzoeksagenda (b.v. Bekkers, Van der Steen). Anderen (Bodas Freitas en Verspagen) hebben inmiddels een andere werkkring, en hiermee gepaard gaande hebben zij hun onderzoeksagenda ietwat verlegd. In ieder geval wordt er nog gewerkt aan projecten op basis van de databases die in het project verzameld zijn. Er wordt in ieder geval gewerkt aan een publicatie met betrekking tot het ontwikkelen van valorisatie indicatoren. De resultaten van dit onderzoek zullen zeker ter beschikking van de betrokken Ministeries en het Innovatieplatform komen. Een enquête meer specifiek gericht op bedrijven (i.p.v. individuele onderzoekers) werd op de workshop gepresenteerd als een mogelijk vervolproject, maar hiervoor zijn vooralsnog geen specifieke plannen ontwikkeld omdat er geen specifiek projectgeld beschikbaar is.

4. Summary overview of the projects and staffing

Below a summary overview is presented of the research projects, the universities involved and the staffing of the DvI projects.

| Project number | Title | Project leader | * | Researcher |
|----------------|--|----------------------------|------------|--|
| 472-04-008 | The impact of M&A- driven market dominance on innovation dynamics. | Prof. dr E.J.J. Schenk MBA | UU WU | dr E. Cefis drs Sabidussi mw. dr Simonse Ir Batterink M. Ghita MSc - research assistant |
| 472-04-019 | Dynamics of Innovation R&D Cooperation, Competition, and Productivity: A Simultaneous Panel Data Study | Prof. dr. J.E.J. Plasmans | UvT | dr M. Vancauteren (till 1 November 2007) dr Rosen Marinov (from 15 November 2007) Sara Amoroso (from 15 May 2008) |
| 472-04-020 | The diversity of knowledge transfer in public-private knowledge networks. | Prof. dr. H.H.G. Verspagen | TUE TUD | mw. dr I.M. Bodas de Araujo Freitas dr.ir.ing. R. Bekkers Ir. J. Segers |
| 472-04-031 | Market Structure, Innovation and Productivity: An Empirical Approach | Dr. J. Boone | UvT | dr E. Brouwer drs H. van der Wiel dr. G. Langus (till 1 December 2007) dr. Lapo Fillistrucchi (from 1 May 2008) |
| 472-04-044 | The influence of Team Mobility on Knowledge Transfer and Innovation Processes within Teams | Prof.dr. N. Ellemers | UL RuG | dr F.A. Rink Student Assistants |

* Participating Universities

| | |
|-----|--------------------------------|
| RuG | University of Groningen |
| TUD | Technical University Delft |
| TUE | Technical University Eindhoven |
| UL | University of Leiden |
| UvT | University of Tilburg |
| UU | University of Utrecht |
| WU | Wageningen University |

5. Finance

Not available.

Annex

Steering Committee of the DVI Programme

- Dr. Th. J. A. Roelandt, chair Ministry of Economic Affairs
- Prof. dr. B. Wierenga Erasmus University Rotterdam
- Dr. R.R. van Kessel-Hagesteijn NWO Social Sciences
- Dr. E.M. van der Wenden Ministry of Economic Affairs
- Prof. dr. H.H. Van Ark University of Groningen (observer on behalf of the PC)

Programme Committee of the DVI Programme

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- Prof. dr. B. Clarysse University of Gent
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- Prof. dr. ing. G.R. Teisman Erasmus University Rotterdam
- Dr. E.M. van der Wenden Ministry of Economic Affairs (observer)

Secretary: drs. H.W. Waaijers, MBA, and ms. C.A. Rövekamp (NWO Social Sciences)