

Experts Favour More ECB Transparency

„It is not our policy to surprise the financial markets. We want to be predictable, and thus credible“, ECB President Wim Duisenberg said when the key lending rates were raised on November 4th. But a majority of capital market players believe that this objective has not yet been achieved. This is also clearly verified by a survey which the ZEW conducted among 330 financial experts.



The building of the European Central Bank.

■ The majority of those surveyed gave the ECB poor marks: 53.3 per cent take the view that the ECB Council has not yet done enough to achieve sufficient transparency in its decisions, whereas 46.7 per cent think, the decision-making process is already sufficiently predictable.

The fact that the first raise in key lending rates since the launch of the euro occurred while the survey was being

conducted provides a special analytical opportunity: a comparison of the responses given before and after November 4th makes it possible to examine the effects this decision had. In the eyes of the ECB observers the decision on interest rates has hardly changed the transparency problem. On the contrary, following the decision the share of those dissatisfied with the situation actually increased by a few points.

In addition, the persons surveyed assessed three suggestions as to how to optimise transparency. At the heart of the problem is the tension between the indicators monetary growth and inflationary expectations. While the exact monetary growth rate is known and can be compared with the reference value, this is not possible for the rate of inflation the ECB anticipates for the future. Although the ECB Council comments on the outlook in news conferences and monthly reports, so far they have not condensed this complex information into a single number.

Against this background the least far-reaching suggestion is to optimise the current practice by commenting on the inflationary expectations in greater detail.

For instance, there could be a series of publications modelled on the inflation reports produced by the central banks in England, Sweden and New Zealand. A second possibility would be for the ECB to publish an exact inflation forecast. Advocates hope, this will make it easier to check decisions on monetary policy. A third option is to publish the minutes of ECB Council meetings in a manner similar to what is done in the UK. That way, observers hope to get some information about how the Council members deal with conflicting goals.

No profound changes needed

In the survey a clear ranking of the three options emerges. The suggestion to improve transparency through more detailed comments on inflationary expectations is favoured by 54.8 per cent of those polled. 43.7 per cent call for the quantitatively exact inflation forecast. Supported by 33.1 per cent, the publication of the minutes of the meetings finishes up way down. Evidently many fear that complete transparency in the formation of opinion in the supreme ECB

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body would pose a threat to the independence of the national central bank presidents.

On the whole the survey contains good and bad news for the ECB Council. It is bad news that despite all the ef-

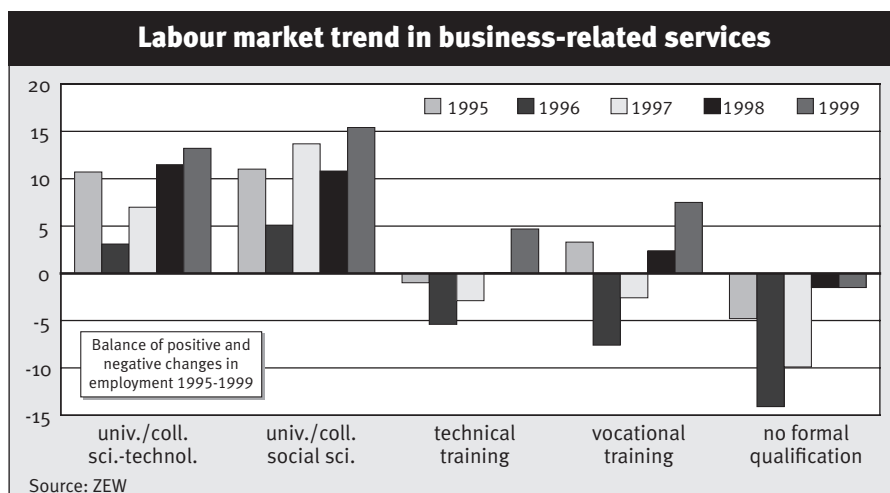
forts, market participants are predominantly unhappy about the degree of transparency. The good news is that a majority of financial market players are not insisting on profound changes. A more in-depth communication of the in-

flationary expectations could take the wind out of the critics' sails, avoiding the need for more far-reaching steps such as the publication of the exact inflation forecast and the minutes. ◀

Dr. Friedrich Heinemann, heinemann@zew.de

Business-related Services: Hardly Any Chance for Low-skilled Labour

In the German manufacturing industry and service sector, the share of employees without any formal qualifications has been declining for some years. Even the steadily growing service sector has not been able to offset the job losses among low-skilled employees. A new ZEW study reveals that even during a boom, unskilled labour stands little chance of getting a job in the business-related service sector.



■ The study is based on analyses of the ZEW and Creditreform survey among business-related services. More than 1,100 companies from ten industries belonging to business-related services participate in the quarterly survey. Business-related services include EDP services, tax advisors, business consultants, architects, technical testing and planning, advertising agencies, vehicle renting, machine renting, cargo handling and storing, and waste and refuse disposal.

As part of this survey, annually business-related service providers are asked about changes in the number of employees related to different skill levels. The analysis of the latest survey shows that the demand for persons holding a university degree rose considerably during the period 1995-1999. Even in 1996,

when on the whole business-related service providers recorded more dismissals than new hirings, they took on more university graduates than they dismissed. In 1996 and 1997, employees with completed vocational and technical training and especially workers with no formal qualification were particularly affected by job losses. Even in the booming year of 1998, employees with no formal qualification were hardest hit by dismissals. Thus, a steady and not just high growth is one of several prerequisites for low-skilled labour to succeed in the job market. However, at least with regard to business-related services this does not guarantee that there will be new hirings or at least no dismissals in a boom. But employees with a certificate obtained at vocational and technical schools man-

ed to find more jobs at business-related service providers once the economy picked up. Therefore, good qualifications will continue to be an important precondition for finding a job in the business-related services sector.

The ability to adapt to the constant changes resulting from technological progress is an essential prerequisite for success in the labour market. In fact, innovations are about as important to business-related services as they are to the manufacturing sector. Between 1998 and 1999 almost half of the business-related service providers launched product innovations, i. e. new or substantially improved products. Process innovations, i.e. the application of new or substantially improved technologies, were implemented by around 60 per cent of business-related services. EDP service providers and business consultants are specially innovative. But also advertising agencies and cargo handling and storing often successfully introduced innovations between 1998 and 1999, too.

In the case of process innovations, stronger competition from abroad may have prompted an optimisation of internal processes, for in particular cargo handling and storing and business consultants state that they are affected by competition from abroad. Particularly these industries have seen competitive pressures intensify since 1998. ◀

Ulrich Kaiser, kaiser@zew.de

Research Findings

Ownership Structures in Germany

Corporate Governance has become a very popular field in economic research. It combines aspects of industrial economics with those of financial markets and is also of vital significance for the transformation process of formerly planned economies. The term corporate governance stands for the complex system of legal, institutional and market forces by which an enterprise is influenced and controlled.

■ A new ZEW study examines the ownership structure of corporate capital – an important element in this system. If a company is controlled by a few large owners it is, in theory, managed efficiently and according to the interests of its owners. If the owners of a company have less influence on actual corporate management because share capital is owned by a multitude of small stockholders, sufficient control of the management is no longer ensured. It is also relevant who controls a company. If, for example, control lies with another company instead of an individual, the corporate incentive structures (for example acting on behalf of third parties) are theoretically hampering efficient control.

Internationally, the German economy has been criticised in recent years because mutual links between industrial corporations and banks were assumed to prevent efficient corporate governance. The aforementioned ZEW study now documents the nature of ownership structures of more than 1,500 German companies in the manufacturing industry and tries to quantify how far ownership structures might obstruct corporate governance.

Concentration of Property

German enterprises in the manufacturing sector are more or less in the hands of a few large stockholders. On average, the largest stockholder owns 81 percent of the shares, while the three largest stockholders together hold almost 90 percent. In public limited companies, the concentration is lower – the largest stockholder owns 58 percent, the three largest ones hold 68 percent. From an international point of view, this concentration of ownership is high. In the USA and the Netherlands, the largest shareholder



in a public stock corporation owns only 23 percent, the three largest holders together 28 percent. Due to the high concentration of shares in Germany, particularly efficient control of corporate management should be possible.

Further analysis shows, however, that in more than 60 percent of the cases the largest owner is another industrial enterprise. Although in public stock corporations the significance of industrial enterprises as shareholders is lower than in private ones (41 vs. 68 percent), they still represent the strongest type of stockholder next to individuals (eleven percent), banks and insurance companies (four percent), the state (one percent) and foreigners (six percent). The important role of industrial enterprises is due to the fact that companies from the manufacturing industry are often part of large holding companies. Companies with the GmbH legal form (Private Limited Company) are particularly managed like that. Thus, control chains develop which often reach a considerable length: 14 percent of the companies are managed by at least two intermediate compa-

nies. The ownership structures are, however, even more complex: interlocking stockholders that are in ultimate control were found in about four percent of the enterprises examined. These companies generate eight percent of the turnover of all companies in the sample. Thus, interlockings are less significant in the manufacturing industry than it is portrayed in public discussion. The scope of cross ownership, however, only represents a lower bound. In general, in light of the importance of industrial enterprises as shareholders and the sometimes complex ownership situation, efficient corporate governance is questionable.

But interesting to see is the rate of change of ownership structures over time. In only 25 percent of the cases examined the concentration of owners remained unchanged in the period from 1994 to 1998. Also, the percentage of the individual types of owners varies strongly. This points to an active market for corporate shares in Germany and thus to a potential market solution for efficient corporate governance. ◀

Jens Köke, koeke@zew.de

Research Findings

The Global Sourcing Management Tool – A new Country Selection Method

The large German share in foreign trade now already earmarks the far-reaching integration of German companies within the world economy. The companies meet the globalisation of markets by internationalising their own activities and aligning company strategies according to international competition. The German home market no longer makes up the decisive benchmark of strategic considerations, meaning that even procurement strategies – and here especially the regional configuration of the suppliers – are increasingly being put on the test stand.

■ How can the most competitive suppliers in international procurement markets be identified? The selection of suppliers particularly arise for those companies that are just starting to internationalize their procurement activities and therefore have hardly any international experience. But even internationally experienced companies are forced into continuously checking the competitiveness and product quality of their suppliers in order to develop their own product and cost leadership. In practice, no statistical methods are offered by which the competitiveness of supplier countries could be evaluated.

The multitude of options which may exist within the context of a global procurement strategy can only be opti-

as well as the construction of decision models. Decision models known from literature, which are based solely on information about the individual suppliers at company level, are only feasible when a manageable number of potential suppliers exists world-wide. This, however, should be an exception. Regularly, the reduction has to comprise reducing complexity of national frame data.

Pre-selection of suppliers

In co-operation with the mechanical engineering company Heidelberger Druckmaschinen AG, an attempt was therefore made to develop and validate a method for pre-selecting possible

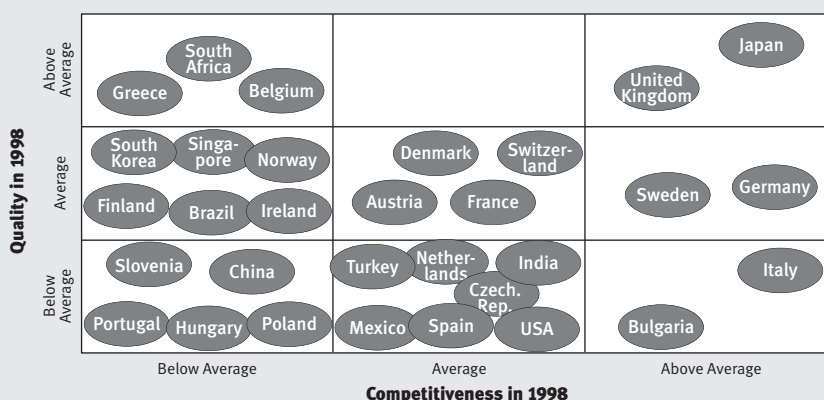
economic) level where, at first, all countries in the world can be taken into consideration. With the help of selection criteria, the individual supplying countries – and with it their companies – are filtered step by step. This procedure is part of the “Global Sourcing Management-Tool”, a Software developed by the ZEW in co-operation with the Heidelberger Druckmaschinen AG.

Based on foreign trade data, the method uses indicators, which allows a cross section and longitudinal section valuation of the average international competitiveness and the average supplied product quality of all possible supplier countries. The statistical method thus provides a variety of information for procurement departments, including the present level and the dynamic of competitiveness and product quality for the potential supplier countries within every product group of the international product nomenclature (Combined System and the Harmonised System). Potential supplier countries – the companies of which have proven to be particularly competitive in the different product quality stages – are identified. This pre-selection of countries enables the companies to limit their search for potential suppliers to the selected supplier countries.

Thus, high search costs are reduced and, in addition to that, trend prognoses can be constructed. Potential supplier countries which have not yet reached a certain quality standard or a certain competitiveness, but have caught up strongly during recent years, can be observed sensitively. ◀

Dr. Thomas Cleff, cleff@zew.de

The portfolio of quality and competitiveness for linear-acting pneumatic power engines and motors



Reading Aid: In 1998, Japan's competitiveness was above average. Great Britain's competitiveness was also above average in the production of linear-acting pneumatic power engines and motors. In both countries, the production quality was above average as well in 1998. Source: Global Sourcing Management-Tool

mally utilised when the conception of various strategies is supported by the processing and provision of information

supplier countries. The demand for a systematic procedure calls for an analysis set at a highly aggregated (macro-

ZEW Financial Market Test

Results of the Survey in January 2000

■ The Financial Market Test conducted by the ZEW is a monthly business survey of German financial market experts which started in December 1991. The survey asks for the predominant expectations about the development in six international financial markets.

As a whole around 400 enterprises participate in the survey, among which are 270 banks, 50 insurance companies, 40 investment companies and 40 others. Participants in the survey are: Fi-

ancial experts of the finance departments, the research departments and the economic departments as well as the investment and securities departments of the firms. In detail, the financial experts are questioned on their medium term expectations about the development of important international financial markets with respect to the business cycle, the inflation rate, short term and long term interest rates, the exchange rate and share prices.

To construct forecasted figures, the qualitative response categories (increasing, unchanged, declining) are transformed into quantitative figures by the Carlson/Parkin procedure. Additional information to the applied procedure is available as an abridged version published by the ZEW. The present survey was conducted between December 27, 1999 and January 18, 2000 and all calculations are termed to January 21, 2000. ◀

Andrea Szczesny, szczesny@zew.de

Special question: Something new in the East?

■ Eastern Europe is up-and-coming. At least that is what 245 financial market experts told the ZEW when they were asked about the weight of Central and Eastern European equity shares in an optimal global portfolio. While at the end of 1998 equity markets in Central and Eastern Europe including Russia only accounted for approximately 0.2 per cent of the global market capitalisation, experts are now on average aiming at a weight of 5.6 per cent.

The optimal portfolio for Central and Eastern Europe is composed as follows: Hungary and Poland are the heavyweights with 23.4 and 22.3 per cent, followed by the Czech Republic with 18.3 per cent. Russia, which is still the biggest country in the East, is included with 14 per cent. But also Estonia (6.6 per cent) and Slovenia (9.5 per cent), two rather small countries, make up a not insignificant part of the Eastern European portfolio. With only 6 per cent, other countries play only a minor role.

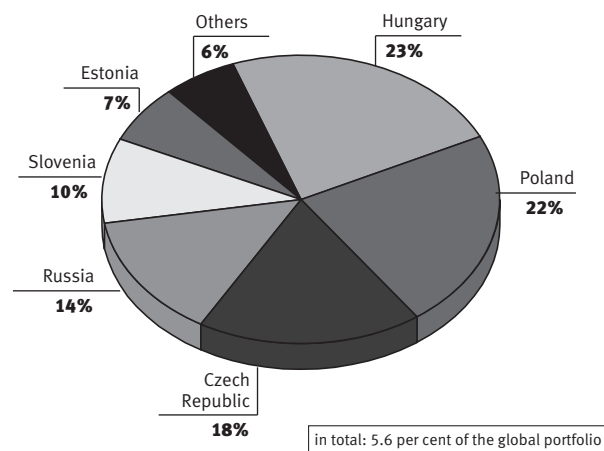
Compared with the actual size of Eastern European equity markets in terms of their capitalisation the small economies are clearly overweighted. For instance, at the end of 1998 the Estonian equity market accounted for only 1.3 per cent of the capitalisation of Eastern European stock exchanges instead of the 6.6 per cent in the recommended portfolio. If the reference figure is reduced to the capitalisation of shares which are available to portfolio investors – the free float –, Czech and Estonian shares are rather overweighted, whereas Russian and Hungarian papers are highly underweighted.

On the whole, the financial experts recommend that a portfolio of Central and Eastern European shares should mainly be comprised of Hungarian, Polish, and Czech shares, since these are the largest equity markets. Yet, according to the financial experts, investors should also consider the small economies – in particular Estonia, which is known for its investor-oriented policy. Thus there is indeed something new in the East for German investors. ◀

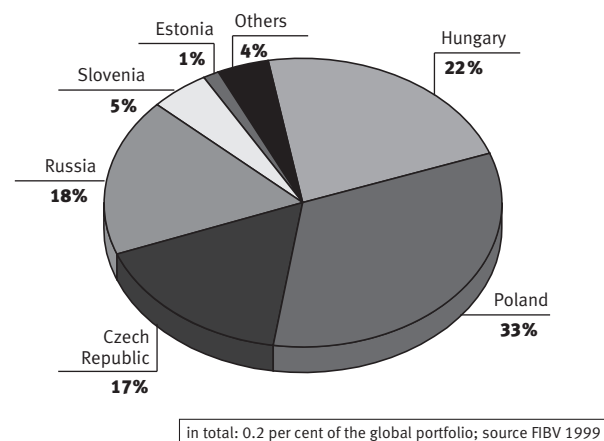
Jens Köke, koeke@zew.de

Portfolio of Central and Eastern European shares

Recommendations of financial experts, January 2000



Market capitalisation at the end of 1998



Conferences

“Flexible Mechanisms for an Efficient Climate Policy”

■ In 1999, the ZEW and the Ministry for the Environment and Transport of the German State Baden-Württemberg organized a conference about “Flexible Mechanisms for an Efficient Climate Policy” in Stuttgart/Germany. Over 150 participants from politics, business, and science discussed the role flexible mechanisms – such as international emissions trading (IET), joint implementation (JI), and the clean development mechanism (CDM) – can play in climate policy.



Garth Edward (Natsource) und Peter Knoedel (Deutsche BP AG)

Introductory talks started with the urgent demand of the Minister for Environment and Transport of Baden-Württemberg, Ulrich Müller, for a new policy style in German and European climate policy: Natural science should determine the ecological targets, and economics the instruments to use. Wolfgang Franz, President of ZEW, motivated this by pointing to the fact that cost efficiency is necessary for the well-being of any economy that is exposed to a growing international competition. In addition, a policy making use of efficient climate policy instruments not only helps avoiding unnecessary costs for the economy. It also integrates developing countries into international climate policy and raises acceptance for urgent new commitments to reduce emissions of greenhouse gases (GHG) beyond the Kyoto-targets.

Christoph Böhringer (ZEW) showed that flexible mechanisms can reduce potential welfare losses significantly. This

is true also for developing countries which are not yet subject to a binding cap on their GHG emissions under the Kyoto Protocol, as negative spill-over effects from the abating developed world to the non-abating developing world would be less. Thus, flexible mechanisms seem to be necessary in order to include developing countries in a post-Kyoto strategy. In addition, the economic gains going along with these instruments relax the problem of fair burden sharing across regions and make it easier to comply with basic equity criteria.

Peter Zapfel (European Commission, DG II) then explained which role flexible mechanisms can play in European climate policy and announced a Greenbook of the Commission for the year 2000. Of utmost interest to the participants were the presentations of Garth Edward (Natsource) and Peter Knoedel (BP Amoco) giving some insight in U.S. and a private company's experience with permit trading. The U.S. trading schemes for sulfur- and NO_x-emissions helped reducing costs and stimulated technical and organisational innovation. In addition, there is already a small but growing GHG market, e.g. from international initiatives, from many countries' early action pilot trading programs and crediting legislation. The BP Amoco scheme gave an impression that emissions trading can be an important tool for a private company, and that companies can engage in climate protection by themselves without hard incentives by legal environmental instruments. Climate change may be increasingly seen as a company competitive issue as it is likely that the issue will become more significant for governments and the public.

Another session dealt with the two project-based mechanisms JI and CDM.

Nathalie Eddy (U.S. CAN) stressed that national climate policy measures should take precedence over international flexible measures as the necessary turn in global GHG emissions can only be reached by national measures. Any approach should set clear and comprehensive rules in order to avoid ecological loopholes. The project-based mechanisms raise the question of additionality. Therefore, only projects screened by a strict verification and certification process and based on “clean” best available technologies should be acknowledged. Axel Michaelowa (HWWA) discussed the differences and problems related to these instruments. One of the most discussed features of JI and CDM is the baseline constructed to compute emission reductions. Here, Michaelowa supports an institutional competition between alternative approaches. Furthermore, some first estimates showed that CDM is likely to play an important role amongst the Kyoto mechanisms.

In a session dealing with national implementation of GHG trading schemes, Annie Petsonk (EDF) and Ray Kopp (RFF) took two different perspectives on options for the U.S. to act early, i.e. before 2008. Whereas Annie Petsonk described a framework for voluntary early action creating credits which companies can use after 2007, Ray Kopp proposed a mandatory early emissions trading scheme establishing a generous cap on emissions and setting an upper price limit on emission rights, in order to avoid disruptions in the economy (combined allowance/tax system).

Market-based instruments

All in all, real world experience shows that market-based instruments – if properly designed – are a promising efficient tool to tackle the environmental problem of climate change. However, a concrete and stable framework is necessary in order to reduce uncertainties and diminish transaction costs. ◀

Dr. Karl Ludwig Brockmann, brockmann@zew.de
 Marcus Stronzik, stronzik@zew.de

Conferences

”Econometric Evaluations of Active Labour Market Policies in Europe”

■ In 1999, the ZEW arranged a conference on the topic of ”Econometric Evaluations of Active Labour Market Policies in Europe”, during which labour market researchers from Europe and the United States discussed the results of their studies on the effectiveness of active European labour politics. The conference was organised by Professor Dr. Michael Lechner from the University of St. Gallen and by Dr. Friedhelm Pfeiffer from the Centre for European Economic Research (ZEW), Mannheim.

In the face of the high unemployment rate in Europe, governments have increasingly resorted to instruments of active labour politics with the aim of reintegrating unemployed people into the labour market. In recent years, the costs

for such measures have risen sharply in almost all countries, and the variety of measures has also increased. Should those measures be successful, this will lead to an increase in employment and thus, to a decrease in the unemployment rate. The aim of a scientific evaluation is to assess the effectiveness of the measures applied and to deduct statements about the efficiency of the use of financial resources.

The conference started with a paper by James J. Heckman, who is Henry Shultz Distinguished Service Professor, as well as Director of the Center for Evaluation of Social Programs at Chicago University. Heckman drew a very differentiated, but also sobering conclusion from thirty years of social-scientific analyses of the efficiency of active labour market politics in modern welfare states. Subsequently, 14 scientific evaluation studies were presented, among them studies dealing with the effectiveness of programmes of further vocational training (Poland, Norway, Belgium, Slovakia, Great Britain), of non-profit temp agencies (Germany), of so-called ”paid-leave programmes” (Denmark) and of support programmes of the unemployed starting a business venture (Italy). Besides the contents and concrete results of active labour market policies, questions of adequate econometric methods of evaluation were also discussed, as well as the quality of the data that the research was based upon.

Low net social benefit of active labour market policy

Although the studies of the European countries showed a considerable heterogeneity in terms of the instruments and the results achieved, their results presented during the ZEW conference on average generally supported the results of the US-American research. Although positive effects clearly exist, they are rather moderate and in each case can, as a rule, only be proven for a relatively small minority of unemployed. In many



Professor James J. Heckman

cases, a massive extension of further measures necessary to noticeably reduce mass unemployment could even be expected to have negative results due to undesirable side effects on people already employed. This points to the fact that the net social benefit of active labour market policy is far lower than governments have estimated.

The relatively young evaluation research in Europe can also profit from the thirty years of experience of US-American evaluation research. According to Heckman, the quality of scientific evaluation depends on whether the parameters used for the evaluation are exactly defined; whether the control group was selected with the necessary care in order to obtain comparable people; the fact that the data quality is decisive for the quality of the results; the fact that there is no single correct econometric method; that the selection procedure should depend on the economic theory applied, the question examined and the data available; the fact that different estimation methods should also lead as a rule to different results; the fact that both experimental and non-experimental methods have their advantages; and the fact that the results of an evaluation particularly of larger programmes are not complete without an examination of the effects on wages, processes and employment, and can indeed lead to wrong conclusions. ◀

Dr. Friedhelm Pfeiffer, pfeiffer@zew.de

Speakers and Discussants

Arild Aakvik, University of Bergen, Norway
 Karsten Albæk, University of Copenhagen, Denmark
 Joshua D. Angrist, MIT Cambridge, USA
 Kenneth Carling, Office for Labour Market Policy Evaluation, Sweden
 Bart Cockx, Université Catholique de Louvain, Belgium
 Rajeev H. Dehejia, Columbia University, USA
 Martin Eichler, SIAW, Switzerland
 Bernd Fitzenberger, University of Dresden, Germany
 Denis Fougère, CREST, France
 Wolfgang Franz, ZEW, Germany
 James J. Heckman, University of Chicago, USA
 Almas Heshmati, Stockholm School of Economics, Sweden
 Guido W. Imbens, UCLA, USA
 Michael Lechner, SIAW, Switzerland
 Costas Meghir, IFS, Great Britain
 Julie H. Mortimer, UCLA, USA
 Friedhelm Pfeiffer, ZEW, Germany
 Winfried Pohlmeier, University of Konstanz, Germany
 Patrick A. Puhani, ZEW, Germany
 Enrico Rettore, University of Padova, Italy
 Jeffrey A. Smith, University of Western Ontario, Canada
 Hannes Spengler, ZEW, Germany
 Viktor Steiner, ZEW, Germany
 Jan C. van Ours, CENTER, Netherlands

Publications

Discussion Papers

Weichenrieder, Alfons J.: *Public Procurement in the Presence of Capital Taxation*, No. 99-41.

Poutvaara, Panu: *Federation's Alternative Tax Constitutions and Risky Education*, No. 99-42.

Böhringer, Christoph: *Cooling Down Hot Air. A Global CGE Analysis of Post-Kyoto Carbon Abatement Strategies*, No. 99-43.

Demougin, Dominique; Schwager, Robert: *Law Enforcement and Criminality: Europe vs. USA*, No. 99-44.

Schwager, Robert: *Democratisation Versus Accountability – Should the European Parliament be Given More Powers?* No. 99-45.

Czarnitzki, Dirk; Stadtmann, Georg: *Uncertainty of Outcome Versus Reputation: Empirical Evidence for the First German Football Division*, No. 99-46.

Puhani, Patrick A.: *Labour Mobility – An Adjustment Mechanism in Euroland?*

Empirical Evidence for Western Germany, France, and Italy, No. 99-47.

Franz, Wolfgang: *Real and Monetary Challenges to Wage Policy in Germany at the Turn of the Millennium: Technical Progress, Globalization and European Monetary Union*, No. 99-48.

Bordignon, Massimo; Brusco, Sandro: *Optimal Secession Rules*, No. 99-51.

Wagener, Andreas: *Double Bertrand Tax Competition: A Fiscal Game with Governments Acting as Middlemen*, No. 99-52.

Ebling, Günther; Janz, Norbert: *Export and Innovation Activities in the German Service Sector: Empirical Evidence at the Firm Level*, No. 99-53.

Jacobs, Otto H.; Spengel, Christoph: *The Effective Average Tax Burden in the European Union and the USA: A Computer-based Calculation and Comparison with the model of the European Tax Analyzer*, No. 99-54.

Spengel, Christoph: *Effective Marginal*

Tax Rates for US Investors in Germany and Europe: An Analysis of Recent Tax Reforms in Germany, No. 99-55.

Radowski, Daniel; Smolny, Werner; Winker, Peter: *Investment and Employment Adjustment after Unification: Some Results from a Macroeconometric Disequilibrium Model*, No. 99-56.

Falk, Martin; Seim, Katja: *The Impact of Information Technology on High-skilled Labour in Services: Evidence from Firm Level Panel Data*, No. 99-58.

Falk, Martin: *Technological Innovations and the Expected Demand for Skilled Labour at the Firm Level*, No. 99-59.

Winker, Peter; Smolny, Werner; Radowski, Daniel: *Modeling German Unification in a Disequilibrium Framework*, No. 99-61.

Kaiser, Ulrich: *Measuring Knowledge Spillovers in Manufacturing and Services: An Empirical Assessment of Alternative Approaches*, No. 99-62.

ZEW Economic Studies

Capros, P.; Mantzos, L.; Criqui, P.; Kouvaritakis, N.; Soria Ramirez, A.; Schrattenholzer, L.; Vouyoukas, E. L.:

Climate Technology Strategies 1: Controlling Greenhouse Gases. Policy and Technology Options

The book provides an integrated analysis of the implications for the energy system from adapting to meet climate change targets and analyses the role of improving energy technologies for the world and the EU markets. The first part of the book sets the stage for the analysis by presenting the European and World economic and energy outlook. The second part examines the policy options available for controlling greenhouse gases in the period to 2010. Over such a relatively short period, the role of technology lies mostly in making possible the more efficient use of energy. Finally, the third part of the volume examines the longer term role of technology in the context of a case study for the power generation sector.

Springer-Verlag Heidelberg, 1999, ISBN 3-7908-1229-3.

Capros, P.; Georgakopoulos, P.; Van Regemorter, D.; Proost, S.; Schmidt, T. F. N.; Koschel, H.; Conrad, K.; Vouyoukas, E. L.:

Climate Technology Strategies 2: The Macro-economic Cost and Benefit of Reducing Greenhouse Gas Emissions in the European Union

Climate technology becomes more and more relevant in international environmental policy negotiations. At the Kyoto conference binding emission reduction targets have been established for several regions of the world. The major challenge is how to realize these reduction goals with minimum costs without generating new distributional and social difficulties. The book analyses the macroeconomic structural and distributional impacts of greenhouse gas mitigation strategies for the EU and the member states.

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President: Prof. Dr. Wolfgang Franz

Editors: Katrin Voß, Phone +49/621/1235-103, Fax +49/621/1235-222, E-Mail voss@zew.de;

Dr. Herbert S. Buscher, Phone +49/621/1235-135, Fax +49/621/1235-222, E-Mail buscher@zew.de

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