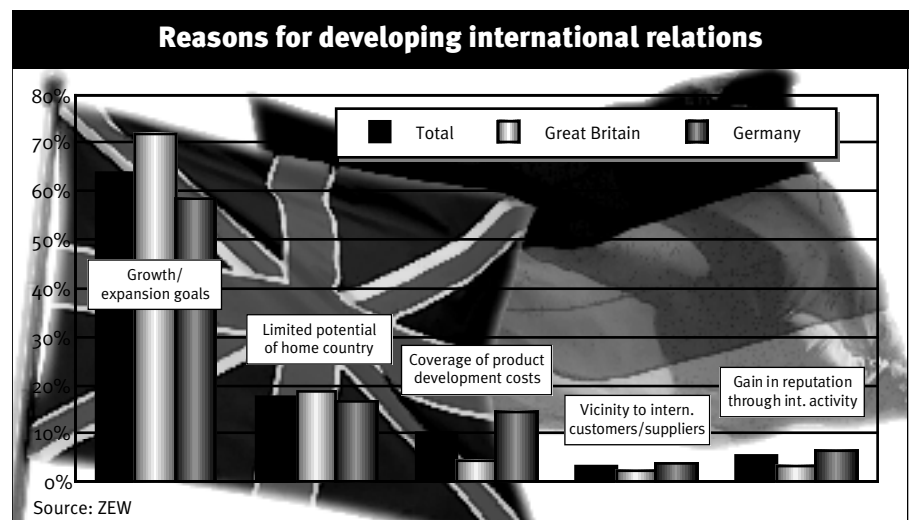


Trend towards Internationalisation of Young Technology Enterprises

In global exports, Germany has for years been taking a top position next to the USA. In 1997 alone, goods worth DM 886.8 bn were exported. As in previous years, the partner countries of the European Union (EU) were the most important foreign recipients of German products. And young technology enterprises are also becoming increasingly active in global markets.

■ In many European countries, much hope is put on young technological enterprises and on their potential to contribute to structural change. They imply innovations and expectations of greater growth and employment than in traditional industries. Due to the small national home markets, it is reasonable for European companies to expand abroad at an early stage.

From a survey of 600 German and British technology-oriented start-ups by the ZEW and WBS, it can be seen that more than 60 percent of companies are already internationally active in the first years of their business activities. A large percentage of them are even so-called “born-globals”, which are companies that are represented in foreign markets from the very beginning of their business activities. A comparison between enterprises that are restricted to their home markets and internationally active companies shows considerable differences in terms of the companies themselves, their founders and their products. International



companies regularly carry out R&D activities and seek market advantages through technology-based product differentiation. At the same time, the founders far more often have work experience in foreign countries or in international companies. However, for product characteristics, the rule of thumb “the greater the customer-specific adaptation effort, the

more likely companies stay within their well-known home market” can be applied.

In interviews, German managers report that it is often encounters at trade fairs, referrals or the influence of large customers that induced their companies to go global. International trade fairs such as the CEBIT, the industrial trade fair in Hanover, as well as regional and industry fairs are a helpful platform for German young entrepreneurs especially, from which they can promote their products. In contrast to this, British managers concentrate on marketing their products in foreign markets even at the developing stage.

If questioned about the motives for commencing international activities, al-

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most two thirds of firms stated growth and expansion goals as the most important reasons for internationalisation. It is significant that British companies in particular turn out to be growth-oriented, and that only very few young companies in the high-tech sector expand abroad in order to cover their high pro-

duct development costs. If on the other hand one takes a closer look at the most important obstacles hindering a pursuit of international business activities, lack of management time takes top position. Furthermore, the additional costs and the high risk associated with internationalism are also mentioned. However,

lack of experience is not seen as a barrier for taking up international relations.

Basically, the ZEW/WBS-study underlines the importance of early internationalisation for young technological enterprises. ◀

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A Barometer for Transport Markets

Supported by German Parcel, Prognos and the ZEW have developed an information instrument based on an expert sample – the “German Parcel TransportMarketBarometer by Prognos/ZEW“. Its aim is to systematically use the expert knowledge in transport companies and shippers for estimating the short-term development of the transport demand and prices in transport markets. This newly developed information tool represents a kind of cyclical barometer for the entire German transport industry.

■ For the TransportMarketBarometer, a fixed circle of experts is regularly questioned – four times a year – on how they assess the quantities and prices in six transport market segments for the following six months compared to the prevailing situation. Distinctions are made between the transport markets of road freight traffic, rail traffic, inland waterway transport, air freight, courier and parcel services and combined transportation. In addition, national and international transportation is differentiated by Eastern and Western Europe. In road freight traffic, questions refer to both short- and long-distance transportation in Germany.

pletion of this test phase, it was decided to continue the information gathering as a series of regular interviews for an unrestricted period of time.

As the third sample was completed in December 1998, the results are now available. In the above chart, the changes to the individual transport market segments from the last three samples are contrasted with each other and briefly explained.

The Prognos/ZEW team gave this

chart, showing the estimate of the development in road freight traffic, the title “damped optimism” and explained this as follows: Although the majority of experts still expect an increase rather than a decrease in road freight traffic volumes – and this is particularly so for German and

West European long-distance transportation –, this optimistic assessment is diminishing compared to the previous quarters. Although the uncertainty and the pessimism regarding road freight transport to Eastern Europe have slightly improved, the growth prospects for

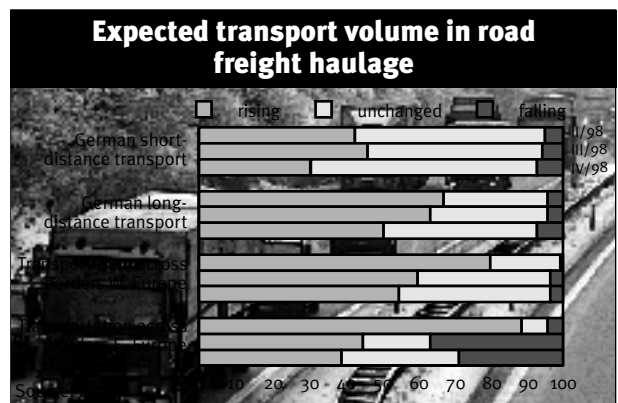
the German market have become more moderate.

When analysing the estimates of the development of transport prices, only the difference in percentage points between the question categories “rising prices” and “falling prices” is presented.

As an example, the development of air freight prices was chosen. The graphic was given the title “Majority forecasts stable air freight rates, but with falling tendency”, since most experts expect stable air freight rates in all market segments. Among those 20 to 30 percent expecting changes, however, an increasing number are forecasting falling prices.

With a tendency towards a decline in demand (except in Eastern Europe), accompanied by a constant to rising supply, market forces will make price adjustments unavoidable. ◀

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The first two interview rounds were conducted in June and September 1998 as a testing phase of the project. These interviews attracted the desired number of approx. 150 experts which are ready to participate regularly in the TransportMarketBarometer. After successful com-

Germany's Technological Performance – Updated Report 1998

The factor “knowledge” is gaining in importance as a driving force for economic growth, structural change and thus for economic welfare. The ability and readiness of enterprises to innovate, the conditions for the realisation and distribution of new technologies by turning them into new products and processes, and the economy's knowledge base are important for the competitive advantage and the macroeconomic development.

■ The following picture might sum up the current state of Germany's technological performance and the potentials of future development.

In the short run, the German innovation system displays a relatively high efficiency. Industry turns new knowledge quickly into patented inventions. Innovative activities are widely distributed among German manufacturing firms; expenditures for innovations increase; both accompanied by a high ability of German innovators to assert themselves on global markets. Foreign demand for R&D intensive goods is still the most important driver of economic growth.

However, the current upward trend does not yet seem to be strong enough to offset the mistakes made in recent years when investment in the development of knowledge (human) and real capital base falls short compared to needs of structural change and international competition. Obviously medium-term market expectations of enterprises are not optimistic enough to make enterprises extend their production potential or to trigger a substantial number of start-ups. In this respect, medium-term prospects are beginning to look bleak.

R&D level of German industry too low in the medium term

The continuous reduction of R&D intensity observed in the past few years has obviously come to an end. Industry's R&D intensity is increasing again, which gives reason for hope as R&D activities are an important stimulus for technological progress. While the R&D actually carried out reflects only a part of the total innovation potential of knowledge intensive industries, it nevertheless represents

The examination on German technological performance in 1998 was commissioned by the Federal Ministry for Research and Education. The ZEW was responsible for the coordination of the project. The report will be available in English by the end of May. The material on which the final report is based was supplied by the following institutes:

- ▷ Deutsches Institut für Wirtschaftsforschung (German Institute for Economic Research), Berlin
- ▷ Fraunhofer-Institut Systemtechnik und Innovationsforschung (Fraunhofer Society for Systems Technology and Innovation Research), Karlsruhe
- ▷ Niedersächsisches Institut für Wirtschaftsforschung (Institut for Economic Research of Lower Saxony), Hannover
- ▷ Wissenschaftsstatistik im Stifterverband für die Deutsche Wissenschaft (Scientific Statistics in the “Stifterverband” association for German Science), Essen
- ▷ Wissenschaftszentrum Berlin für Sozialforschung (Berlin Scientific Centre for Sociological Research), Berlin
- ▷ ZEW (Centre for European Economic Research), Mannheim

the most important part. However, in the medium run the level of R&D intensity in German industry still has to be evaluated as being too low, especially when compared to competing European countries, which have boosted their investment into R&D considerably for several years.

Whether the international competitiveness of the German economy is also sustainable in the long run will be decided in schools and universities. Last, but

not least, innovations are the result of investment in education. Deficiencies in these sectors could later hamper innovativeness, growth and development.

The problems arising in Germany with these factors, which decide on the long-term technological ability to perform, should not be forgotten over deceptive short-term successes achieved in global markets during a phase of upswing and increased innovative activities.

Even if the achieved potential of German universities and research institutes can still be evaluated as high, a clear delay in necessary reforms can be observed here. In addition, the current technological competitiveness is based on investment made in the past. At present, too little is done for education, vocational training and universities. It would give reason for concern if Germany's investment in its education would fall further behind its most important competitors.

The report recommends that educational, research and innovative policies should focus on

- ▷ maintaining and further extending Germany's global top position in established high technology and advanced technologies,
- ▷ supporting the establishment of new/additional competencies in new technological areas in order to create a basis for “fast-follower-strategies” in a variety of diverse technologies,
- ▷ promoting the change towards a knowledge society by education, vocational training, and education policies,
- ▷ increasing the adaptability of the German innovative system, and
- ▷ improving the economic incentives for innovative activities in Germany. ◀

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Integrated Environmental Technologies – Small Net Impact on Employment

The environmental sector has become an employment sector of aggregate economic importance: many call for a speedier change from additive to integrated environmental protection, hoping to create stimuli for inward investment and labour markets. In view of the continuously high levels of unemployment, the political-economic question arises whether, and under which conditions, the net effect of further efforts in this direction will be an increase or a reduction in employment.

■ Integrated environmental technologies can trigger expansive employment effects in some enterprises but also contractive effects in others. Thus, product-integrated environmental protection (such as low-solvent lacquers) creates new markets, but also crowds out existing markets (for example: solvent-containing lacquers). Process-integrated environmental protection (for example corporate waste water recycling) lead to additional investment, creating jobs; however, higher production costs can also have a negative impact on competitiveness.

First empirical study

A study carried out by the ZEW that was commissioned by the German Ministry of Research and Education has for the first time now found theoretical and empirical evidence for the relationship between integrated environmental protection and employment.

The empirical analysis is based on case studies and on a broad survey carried out at enterprises from the manufactur-

ing industry, which was undertaken in addition to the 1996 Mannheim Innovation Panel. The results of the case studies and the broad survey show that innovations in environmental technology have employment effects which are similar to those of other innovations. Their quantitative impact is however not very high if the net effects are calculated, that is, if the crowding out of less environmentally friendly technologies is taken into account. The case studies examined were:

- ▷ Process-integrated primary measures with coal power plants replacing end-of-pipe technologies,
- ▷ Low-solvent and solvent-free lacquers replacing solvent-containing lacquers,
- ▷ Process-integrated primary recycling in textile refinement businesses replacing end-of-pipe technologies,
- ▷ Eco-audits as organisational environmental innovations (without additive technology reference cases),
- ▷ use of biomass as a replacement source of energy from oil and coal.

The telephone interviews confirmed that, overall, rather modest employment

effects have resulted from integrated technologies and eco-technologies. Depending on the type of innovation, 80 to 90 percent of enterprises state that for them, environmental innovations were rather neutral in terms of employment effects. As far as positive employment effects could be observed, integrated technologies rank second after end-of-pipe technologies.

Technology Policy not sufficient

Integrated technologies nevertheless have more positive employment effects (cf. table) compared to additive technologies (end-of-pipe technologies). However, considering the (small) size of these positive employment effects, they are unlikely to make a substantial contribution to the general reduction of unemployment.

It has been shown that the promotion of integrated technologies does not counteract political employment measures and sometimes can even effect partial synergies. However, it is also clear that employment policy must not be reduced to a mere general technology promotion policy, and in particular the promotion of integrated environmental protection. However, the argument for cleaner production is still that the employment prospects are at least as good on an environmental path, and the environmental consequences are infinitely better.

The project report is available at bookshops under the following title: F. Pfeiffer and K. Rennings (eds.) (1999), "Employment Effects of Integrated Environmental Technologies", Physica-Verlag, Heidelberg.

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Employment effects of environmental innovations between 1994 and 1996

	Increase	Unchanged	Decrease
Waste recycling	6.6%	91.2%	2.2%
Waste disposal	8.4%	86.3%	5.3%
Soil decontamination	3.1%	90.6%	6.3%
End-of-pipe measures	14.3%	84.1%	1.6%
Development of environmentally friendly product characteristics	8.4%	91.1%	0.5%
Environmentally friendly optimisation of production processes	9.7%	87.4%	2.9%

Source: Telephone sample additional to the MIP, 1997.

ZEW Financial Market Test

Results of the Survey in March 1999

■ 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 350 enterprises participate in the survey, among which are 260 banks, 60 insurance companies and 30 industrial enterprises. Participants in the survey are: Financial ex-

perts 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 March 05 - 22, 1999 and all calculations are termed to March 25. ◀

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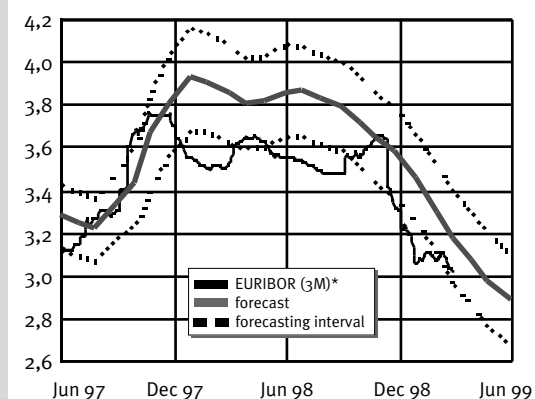
ECB: Experts See Interest Rate Reduction Becoming Less Likely

■ The March survey shows a clear "Lafontaine effect" in the short term interest rate expectations: While 28 percent of the market experts expected a decline in money market rates before the resignation of the German Finance Minister, it was 38 percent after the resignation. Some of the respondents obviously think that Lafontaine's urging to lower interest rates would have caused rather the opposite. In their opinion, the ECB is now in the position to lower interest rates without having to fear the reproach of giving way to pressure.

Despite this optimism, the number of interest rate optimists declined again in March. In January, 51 percent of the experts questioned were convinced that the ECB would take interest-lowering measures. This fraction of respondents decreased to 35 percent in March. About 60 percent of experts expect money market rates in the Euro zone to remain unchanged in the medium term irrespective of Lafontaine's resignation. How can this evaluation of the situation be explained?

As guardian of the European currency, the ECB has a money supply target and an inflation rate target. The growing fear of increasing inflation in the EU-11 countries shows that some of the respondents see dangers arising. Almost 25 percent of the financial analysts expect an increase in the inflation rate in the Euro zone in the medium term, which is eight percentage points more than in the preceding month. For Germany, even 30 percent of people questioned share that opinion. In contrast, a further reduction in inflation is expected only by approximately four percent of the respondents. ◀

EURIBOR (3M): Forecast and development

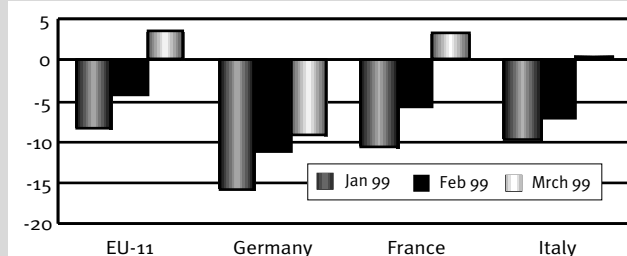


* until 04.01.99 three-month-FIBOR

* Source: Datastream

The EU-11 Economy Continues to Recover

Business Cycle Barometer



Median value of the evaluation of the current economic situation and the expectations regarding the future economic development.

■ The president of the ECB, Wim Duisenberg, keeps emphasising that the ECB is not responsible for economic growth. The necessity of interest rate cuts in order to stimulate growth is currently not seen by the respondents. The business cycle barometer for EU-11, calculated from the survey data, had recovered again. Only Germany is still assessed in negative terms, but even here expectations have been improving since January. Even if an interest rate induced stimulus would help the German economy, the other EU-11 countries do not seem to need it. As far as the future economic development in both the Euro zone and in Germany is concerned, almost a quarter of experts are optimistic. ◀

Research Results

Fiscal Policy under EMU: Lower Deficits without a Depreciation Threat?

Since the start of EMU, finance ministers of the EMU member states no longer have to fear a crisis of their national currencies caused by an unsound national deficit policy. In the past, such a fear may have been useful for disciplining national fiscal policy. Therefore, the question arises whether since the successful start of the Euro an increase in deficits has to be expected.

■ Currency crises also have their positive aspects. If a crisis is caused by imprudent economic politics, these deficiencies are revealed, which may enhance the readiness to finally introduce reforms previously avoided. The economic crises in Asia in 1998 can be interpreted in this way. The shock-like depreciation of the South-East Asian currencies in these countries led to the view that long outstanding structural reforms had to be finally initiated. Also in Europe, the flexible exchange rates of the past used to have a disciplining effect. The avoidance of a politically costly depreciation in relation to the leading DM currency forced more than one government to adjust its policy direction. This was particularly true for fiscal imbalances, insofar these belong to the fundamentals relevant for the determination of exchange rates.

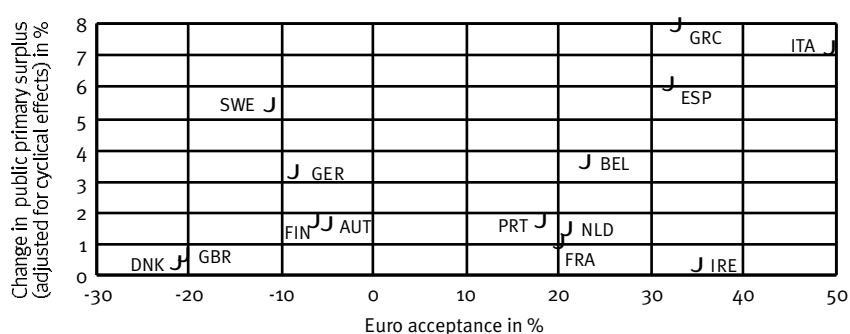
Empirical relevance

A data-supported analysis bears the problem that the actual effect of the Euro on national fiscal policy can only be examined in several years time. The following procedure, however, is applicable today: It can be analysed how different exchange rate regimes in the past influenced fiscal deficits. If it is shown that exchange rate targets for example within the EMS have exerted more discipline than free-floating exchange rates, this confirms the dangers for EMU. If exchange rate targets have to be achieved, political actions are explicitly subordinated to the aim of limiting the fluctuations of nominal exchange rates. If this brings about a higher discipline compared to floating it can be expected that under EMU this discipline will be impaired.

In a ZEW study, the extent to which different exchange rate regimes influenced deficits between 1970 and 1996 was examined on the basis of a country panel consisting of 20 OECD countries. The primary deficit – i.e. the deficit clear-

ly increased pressure for consolidation than in more eurosceptic countries. In fact, as it can be seen in the table, a country like Italy with strong consent for the Euro was able to raise its primary surplus (that is, lower its deficit) the most.

Euro acceptance and change in public primary surplus (adjusted for cyclical effects) between 1991 and 1997



The Euro acceptance is the difference in percent between the percentages of the "for" and "against" answers to the question concerning the support of the Euro in the Euro barometer polls (average of 1993-1997). For Sweden, Finland, and Austria, the average value is based on the period between 1995 and 1997. The source for the primary surplus (adjusted for cyclical effects) is the OECD Fiscal Positions and Business Cycles database.

ed by interest payments for the government debt – was used as the independent variable. Apart from the exchange rate regime, a number of other explanatory variables were included: the growth rate of the GDP and the change in unemployment grasp the influence of the economic cycle on the deficit. In addition, the openness of an economy, measured by the significance of foreign exchange was included. Lastly, a Maastricht-related variable was included into the regression: the degree of consent of the population to joining EMU in each respective EU member state in the nineties. This variable is used for measuring the influence of the convergence criteria. It can be assumed that in countries with a greater acceptance of the Euro, the convergence criteria have resulted in in-

The result is the following. The exchange rate regime as such is not a significant explanatory variable for the primary deficit. Viewed separately, this result is good news for the fiscal discipline of the European Monetary Union. At the same time, however, both the openness of an economy and the convergence criteria prove to be relevant determinants for the debt inclination of an economy. This is a negative finding for fiscal discipline within EMU. With qualification being achieved and the disputed effectiveness of the stability pact, the convergence criteria are not likely to exert any significant disciplinary pressure. Furthermore, the openness of Euroland as a whole is considerably lower than the openness of the individual countries. ◀

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Research Results

Influence of Cyclical Shocks on Industries within EU-11 Countries

The start of EMU at the beginning of this year implies that the eleven EU member states have fulfilled the required nominal convergence criteria. However, this nominal convergence does not mean that within the individual EU-11 countries a parallel development is also taking place in real economic terms. This article examines how both common and country-specific problems influence EU-11 industrial production.

■ Convergence of interest and inflation rates, as well as restrictions on levels of public debt are certainly basic requirements for a successful European monetary policy. However, nominal convergence is no guarantee for a similar absorption capacity of external and internal shocks in real economic terms. If individual countries are affected by aggregate economic or sector-related disturbances in different ways and to differing degrees, this can lead to conflicting developments within the EU-11.

During the preparations for EMU, it was frequently discussed how different disturbances (shocks) affect the individual member countries, in addition to the mechanisms or instruments available, or which had to be created to offset such shocks. Possible instruments highlighted for improving the adaptability are a high capital flexibility, a regionally and structurally flexible labour market, and transfer payments within an affected country, contributing to a homogenous economic development within the EU-11.

Economic disturbances can occur at any time. In this context the following questions arise: from which sources do these disturbances come, what relative

Common vs. country-specific shocks						
	Austria	Belgium	West Germany	France	Netherlands	
Ratio	0.24	0.22	0.36	0.13	0.39	
Ranking	3	2	4	1	5	
	Finland	Luxembourg	Portugal	Spain	Ireland	Italy
Ratio	0.99	1.67	1.92	0.68	1.19	0.47
Ranking	8	10	11	7	9	6

importance do individual disturbances have on individual countries, and will these disturbances lead to tension between EU-11 states? In order to answer these questions at least in part, the relative importance of common shocks, as well as country-specific shocks was analysed for the EU-11 countries. In addition, with the help of respective dummy variables, special country characteristics were taken into account. Common shocks such as oil crises were considered using time-related dummies.

The residual of the estimated regression are interpreted as country-specific shocks. The examination is based on annual change rates of industrial production between 1970 and 1997.

Firstly, it was analysed whether the way industrial production adapts to such shocks is different in every country.

This hypothesis could not be verified. However, there is a certain temporary dependence (persistence) in the way a country adapts to disturbances, which is virtually the same for all EU-11 states. In contrast, the hypothesis that within individual countries

there exist industry-specific peculiarities could not be ruled out. It follows therefore that the individual industrial sectors within the individual EU-11 countries can develop in different ways. What is far more important is that common shocks affect the individual EU-11 countries in different ways. This can lead to considerable tensions within EMU, particularly if common shocks dominate over country-specific shocks.

Country-specific shocks have great impact on small countries

In order to compare the significance of country-specific and common shocks, the variances of both time series were set in relation to each other. Values between 0 and 1 show that common shocks dominate over country-specific ones, values above 1 mean that country-specific shocks are more important, and in the case of equal importance the ratio is 1. The table above shows that above all, country-specific shocks are of great importance for the EU-11 "smaller countries" Portugal, Luxembourg and Ireland.

For EMU as a whole, the results give little reason for concern. However, the smaller countries will especially have problems in easing the effects of negative disturbance. ◀

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The importance of individual influential factors on industry

Hypotheses	Test results
Persistence in industrial production is country-specific	is rejected
Persistence in industrial production is the same and significant	cannot be rejected
Country-specific peculiarities do not exist	is rejected
Common shocks are negligible	is rejected
Common shocks affect all countries in the same way	is rejected

Publications

ZEW Economic Studies

O. Hohmeyer, K. Rennings (Eds.)

Man-made Climate Change – Economic Aspects and Policy Options

The successful signing of the Kyoto Protocol showed that there is international consensus about the problem of man-made climate change and that substantial greenhouse gas emission targets will soon be established. Based on the current scientific knowledge about climate change this workshop report analyses the most important economic aspects of man-made climate change and the way effective and efficient policies can be designed to achieve the necessary reductions in greenhouse gas emissions. Additionally, the official versions of the Framework Convention on Climate Change and the Kyoto Protocol are included as a reference for the reader.

Springer Verlag Heidelberg, 1998, ISBN 3-7908-1146-7

Thies Büttner

Agglomeration, Growth, and Adjustment – A Theoretical and Empirical Study of Regional Labor Markets in Germany

By means of theoretical and empirical analysis agglomeration economies as localized returns to scale are established as the basic source of economic disparity. The central implication for the labor market is the resulting path dependency of the spatial employment pattern. As an empirical investigation of migration within Germany documents strong regional segmentation in the short run, local wage formation is of particular importance for the adjustment process in response to changes of the spatial employment pattern. However, a theoretical discussion shows that in the German setting with centralized wage bargaining local wages tend to be inflexible. This view is supported by an empirical investigation of the spatial wage structure in Germany using district area.

Springer Verlag Heidelberg, 1999, ISBN 3-7908-1160-2

Discussion Papers:

Addison, John T.; Portugal, Petro: *Unemployment Benefits and Joblessness: A Discrete Duration Model with Multiple Destinations*, No. 99-03.

Heinemann, Friedrich: *Exchange Rate Regimes and Fiscal Discipline in OECD Countries*, No. 99-04.

Almus, Matthias; Nerlinger, Eric A.; Steil, Fabian: *Growth Determinants of Start-Ups in Eastern Germany: A Comparison Between Innovative and Non-innovative Firms*, No. 99-05.

Falk, Martin; Koebel, Bertrand: *Curvature*

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Buscher, Herbert S.; Felder, Johannes; Steiner, Viktor: *Regional Convergence and Economic Performance – A Case*

Study of the West German Laender, No. 99-10.

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