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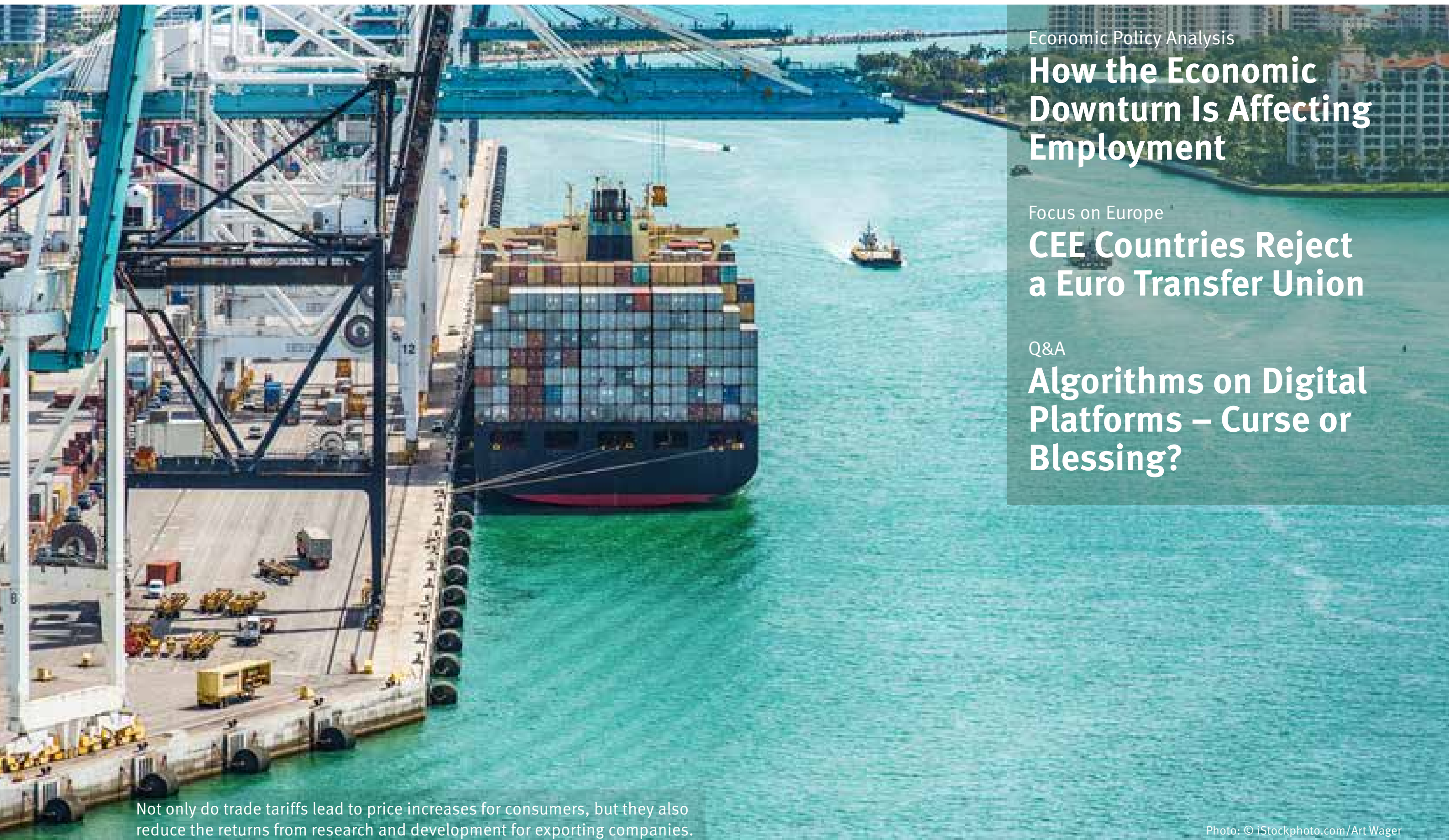



Not only do trade tariffs lead to price increases for consumers, but they also reduce the returns from research and development for exporting companies.

Photo: © iStockphoto.com/Art Wager

# Trade Tariffs Are Toxic for Exporters Investing in Research and Development

Trade tariffs, as they are currently being debated and in some cases already introduced, put a severe strain on export-oriented companies. Not only do such tariffs lead to price increases for consumers, but they also reduce the returns from R&D for exporting companies. This entails the risk that exporters in particular will be deterred from making important investments in R&D in the future. This is all the more serious as companies selling their products on international markets invest significantly more in R&D than companies operating only on their home market.

These are the findings of an empirical study conducted by ZEW. For the analysis, the researchers have developed an empirical model that illustrates the entire innovation process of a company, including the uncertainties to which innovative companies are exposed. This model allowed the authors of the study to simulate the effects of possible trade restrictions in the future. They found that the introduction of trade tariffs on exports of ten per cent severely reduces the sales opportunities for exporters abroad. One consequence of this is that the average long-term profits from R&D investments in the surveyed sectors fall by 17 to 36 per cent.

In addition, the share of enterprises investing in R&D decreases by 2.0 to 7.5 percentage points (see chart on the following page). This leads to a 0.5 to 1.7 per cent drop in firm-level productivity. Retaliation measures taken by German policymakers in the form of additional import duties of ten per cent would lead to further losses in R&D and productivity. Long-term profits from research and development would fall by 27 per cent to just under 50 per cent, with the automotive industry being hit hardest by trade tariffs, followed by the chemical industry (see chart).

The aim of the study is to investigate whether and to what extent the return to R&D differs between companies that are active both in their home market and in foreign markets and those that sell their products solely in their home market. To this end, the researchers drew a sample of companies from the five high-tech sectors of chemistry; mechanical engineering; electronics and electrical engineering; medical, measurement, control and regulation technology; and vehicle construction.

## Exporting companies show higher innovation rate

The study considered almost 1,300 national and international companies with headquarters in Germany in the period from 1994 to 2008. ZEW's Mannheim Innovation Panel (MIP) served as the database. The MIP is an annual survey on the innovation behaviour of the German economy, giving important information on the introduction of new products, services and processes within firms, as well as expenditure on innovation and the degree of success achieved by firms through new products and services and improved processes.

If a company invests in R&D, this need not necessarily lead to new products or processes being implemented, but the probability of this happening increases. The results of the study show that investments in R&D by exporting companies are more likely to lead to new products and processes. Exporters display a higher innovation rate (91.3 per cent) than companies which solely focus on the German market (76.8 per cent). The new products and processes also lead to higher productivity gains for exporters. Companies which only focus on the German market obtain an average productivity gain of 2.3 per cent when introducing new products and processes. For exporters, the productivity gains achieved with new products and processes rise to 6.6 per cent in the German market and 9.4 per cent in foreign markets. These productivity gains from innovations are only slowly diminishing, so that higher sales and thus long-term profits can also be achieved in subsequent years. In addition, with an annual depreciation rate on productivity gains of 14 per cent compared to 21 per cent, productivity gains by exporting companies are more sustainable in future years and thus contribute to profit increases over a longer period of time. Across all sectors, the long-term rate of return to R&D of companies which are only active in Germany ranges from about 1.0 per cent of the firm value in mechanical engineering to 2.4 per cent in electronics and electrical engineering. By contrast, the long-term return to R&D for exporting companies is 4.6 to 10.8 per cent of the firm value.

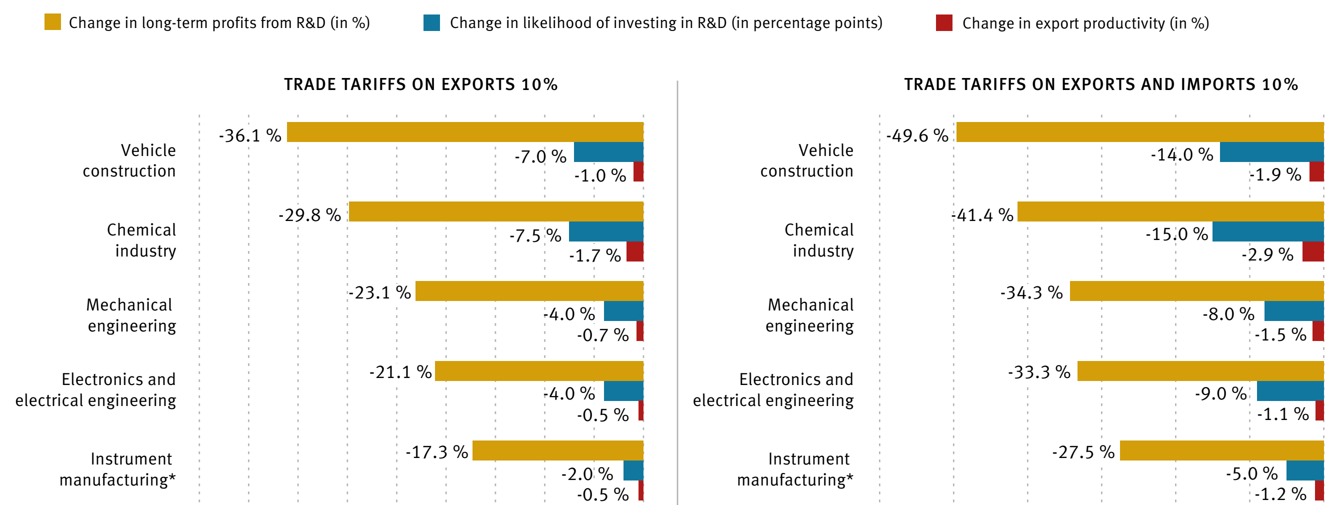
## Access to new technological knowledge on foreign markets promotes new products and processes

Companies choose to carry out R&D mainly when the expected returns exceed the projected costs. If a company is active in foreign markets, this has a positive influence on the innovation result. The access to new technological knowledge on foreign markets makes the successful development of new products and processes more likely. And those new or improved products are not only sold on the domestic market, but also internationally, which fosters turnover and, as a result, also the long-term returns to R&D investment. This development in turn has a positive impact on the company's willingness to innovate, on productivity growth and, ultimately, on future corporate profits.

The study can be downloaded at: *www.zew.de/PU80497-1*

Prof. Dr. Bettina Peters, bettina.peters@zew.de

EFFECTS OF EXPORT AND IMPORT TARIFFS ON LONG-TERM PROFITS, PRODUCTIVITY AND MANAGEMENT DECISIONS (SORTED BY CHANGE IN PROFITS)




* Instrument manufacturing includes medical, precision and optical instruments, watches and clocks.

Source: ZEW, Mannheim Innovation Panel

# Innovative Circular Economy Boosts Firms' Performance and Employment Levels

Promoting a circular economy which significantly reduces resource consumption could be a major step towards more sustainability. But does a circular economy go at the cost of competitiveness and employment? A recent study by ZEW shows that firms that introduced innovative measures towards a circular economy benefit both in terms of turnover growth and employment and experience a better financial standing.

The main principle of the circular economy is resource efficiency, which means minimising the consumption of resources throughout a product's life cycle. This is achieved first and foremost by reducing the use of raw materials and energy in manufacturing; recycling refuse, waste water and raw materials within companies; and replacing fossil fuels with renewables. Improving products' recyclability and extending their life span also play a part here. The approach pursued by the circular economy therefore forms a major plank of efforts to create a truly sustainable economy. Sustainability in this sense encompasses not just the environment but also social aspects.

While researchers have in recent years extensively analysed the environmental impacts of a circular economy, little is known about its effect on firms' performance and employment levels. ZEW has now conducted an empirical study to close this gap.

The study was based on data collected from the two rounds of surveys conducted in 2014 and 2016 as part of the German Community Innovation Survey (CIS). The CIS data were combined with data supplied by credit reporting agency Creditreform on firms' credit standing. The study examined all innovations introduced as part of a circular economy 2012–2014.

The ZEW study reveals that the firms surveyed over the period under review focus mainly on innovations that save energy and raw materials during the manufacturing process (15 to 24 per cent). They also attach considerable importance to the recyclability of raw materials and water used in manufacturing (14 per cent) and to the recyclability of end products (10 per cent).

Half of companies give the rising cost of energy, water and raw materials as the reason for having introduced circular-economy innovations, while roughly 39 per cent cite environmental regulations. Just over 31 per cent of firms hope that these innovations will enhance their public image. Meanwhile, the least popular reason given for such environmental innovations is government subsidies, which just under 16 per cent of firms mention as a key factor

### Cost savings thanks to lower consumption

Econometric research shows that companies that introduced circular-economy innovations between 2012 and 2014 have performed significantly better than other firms, with innovative companies' revenues rising sharply during the years 2014 to 2016. This benign effect is probably a result of the cost savings for energy, water and raw materials owing to their lower consumption. These lower costs, in turn, strengthen firms' competitiveness. This is especially the case when consumers buy environmentally-friendly products and are willing to pay for the ecological value added. Moreover, an innovative circular economy enhances a company's reputation, which boosts demand further. The ZEW study demonstrates that companies' credit standing also improved significantly in 2016 on the back of higher revenues and lower costs. The employment effects on companies are also positive, which means that their staffing levels rose stronger than in firms without circular economy innovations. This positive effect is limited to firms with a low or moderate employment growth, however. In the group of firms with strong increase in employment, circular economy innovations had no role for the change in employment. Positive employment effects are likely linked to investment in new processes for achieving circular economy standards. Such investment often requires specifically qualified personnel, which has to be newly hired. Taken together, the ZEW study suggests that innovative circular-economy measures have a positive impact on the social dimension of a sustainable economy.

The study can be downloaded at: *www.zew.de/PU80774-1*

Dr. Christian Rammer, christian.rammer@zew.de

IN THIS ISSUE

Trade Tariffs Are Toxic for Exporters Investing in Research and Development . . . 1
Innovative Circular Economy Boosts Firms' Performance and Employment Levels . . . 3
Q&A: Algorithms on Digital Platforms – Curse or Blessing? . . . 4
Focus on Europe . . . 5
How the Economic Downturn Is Affecting Employment in Germany . . . 8
Working from Home Provides Considerable Benefits but Comes With Drawbacks . . . 9
Inside ZEW . . . 10
Facts and Figures . . . 11
Opinion . . . 12

Q&A: Algorithms on Digital Platforms – Curse or Blessing?

# “We Need to Better Understand the Impact of Algorithmic Decision-Making”

Search engines, social networks, comparison and rating portals, and other digital platforms are increasingly transforming our lives. They make intensive use of algorithmic decision-making, especially of machine learning. Those markets in which digital platforms occur as intermediaries or market participants are also increasingly influenced by algorithms and machine learning applications. Dr. Dominik Rehse, head of the Junior Research Group “Digital Market Design” in the ZEW Research Department “Digital Economy”, explains the implications of this transformation.

**How do digital platforms change markets?**

Markets are based on rules and institutions, and these are frequently altered by digital platforms. I will give you three examples:

Spotify links music producers and consumers through a largely new market mechanism. Alongside a new way of pricing, this specifically involves a comprehensive mechanism for music recommendation. Tripadvisor has introduced a comprehensive reputation and quality management mechanism. Uber changed the price-setting mechanism in the market for ad-hoc short-distance mobility by replacing time-or-distance based ride prices – customary for taxis – with prices flexibly determined by supply and demand.

**How and why do digital platforms employ algorithms?**

Algorithmic decision-making is used in multiple ways on digital platforms. For example, Amazon uses a machine learning algorithm to recommend products that might be of interest to a customer. This recommendation is based upon data about other users’ purchasing behaviour. Machine learning is also employed on digital platforms to predict supply and demand and to automate price-setting mechanisms. Even the introduction of voice-driven terminal devices simply represents another new pathway for market access.

An indication for the value that machine learning generates for digital platforms is that they dominate significant parts of top-level academic and applied research in this area and are willing to accept significant expenses to do so.

**What are the opportunities and risks of introducing or using algorithms?**

The benefits of algorithmic decision-making on digital platforms are often quite apparent. For instance, many consumers view product recommendations by platforms like Spotify or Amazon as simplifying their lives. From an economic perspective, this means a reduction in search costs.

Opportunities also exist in areas that often are largely hidden from the users of the platforms. These include winnowing out dubious market participants from digital marketplaces, which often is only possible cheaply and efficiently through high levels of automation. What remains hidden in most cases are the underlying risks – among them what is known as algorithmic discrimination.

**What is algorithmic discrimination and how does it develop and work?**

Machine language algorithms are often calibrated on data of human behaviour. In the process, human misbehaviour may be incorporated into the algorithm and even be reinforced.

Another problem area is so-called “selection bias” in the data used to calibrate the algorithms. If the calibration data includes few if any observations of social minorities, then the predictive quality of the algorithms for this portion of the population become expectably poorer.

As a result, the minority may be systematically disadvantaged, for example, fully denying them market access or subjecting them to automatic price-setting discrimination. However, as economists, we are only at a very early stage of understanding the impact of algorithmic decision-making on markets.

Photo: Anna Logue Fotografie

**Dr. Dominik Rehse** is head of the recently established Junior Research Group „Digital Market Design“ within the ZEW Research Department “Digital Economy”. His current research primarily focusses on how digital platforms change the design of existing markets and institutions, or create new ones altogether. Dominik Rehse is particularly interested in how these digital platforms make use of algorithmic decision-making – especially machine learning – for this purpose.

Dr. Dominik Rehse, dominik.rehse@zew.de

**How can we minimise the risks of algorithmic decision-making while at the same time making use of the opportunities that it offers?**

This question concerns scientists in different disciplines and decision-makers in various policy areas. Given the great importance and increasing scope of algorithmic decision-making, particularly through digital platforms, this becomes a matter of some urgency.

What we need is a thorough collection of evidence on the risks and benefits of using algorithms in specific use cases. What we do not need are broad-brush and premature policy recommendations.

# CbCR Makes Tax Havens and High-Tax Countries Less Attractive

Country-by-Country Reporting (CbCR) appears to effectively curb aggressive tax avoidance of multinational corporations and leads to a significant decrease in tax haven operations. The main beneficiaries of this development, however, are European low-tax countries, to which Germany does not belong. It is mainly these low-tax countries that attract real investment from multinationals following the CbCR mandate. These are the findings of empirical studies by ZEW, the University of Mannheim and Stanford University.

Ever since the OECD tackled the task of avoiding aggressive tax planning by multinational companies as part of the Base Erosion and Profit Shifting (BEPS) Action Plan, enhanced tax transparency has been a recurrent focus of political attention. With the introduction of the EU Directive 2016/881, the European Commission has finally adopted the OECD proposals for more transparency. It has made Country-by-Country Reporting mandatory for multinational companies with a consolidated turnover of at least 750 million euros per year, and which have either their headquarters or at least a subsidiary in the EU. Since 2016, CbCR has required affected companies to report to the competent national tax authorities on their overall activities (including subsidiaries, employees, profits, tax payments) on a country-by-country basis in a separate report. The aim of this increased tax transparency is above all to curb aggressive tax planning and to enable international tax authorities to better monitor transfer pricing strategies.

### CbCR significantly reduced companies' presence in tax havens

As researchers from ZEW, the University of Mannheim and Stanford University show, the companies concerned have reacted to the mandatory CbCR on several levels. In their empirical analyses, the researchers compared the presence in tax havens and economic activity in EU Member States of companies above and below the 750 million euro threshold. The results show that companies affected by CbCR have significantly reduced their presence in tax havens. At the same time, the number of employees in the affected companies has grown significantly less than in the non-affected companies in the two years since the introduction of CbCR. In addition, the results suggest that affected companies are increasingly shifting their real investments to European low-tax countries. This is reflected in the lower income tax rates to which the companies concerned are exposed on average on the basis of their subsidiaries' investments and employee numbers. As a result, since 2016 tax payments appear to be increasingly due in countries where the tax rate in Europe is below the median.

### Companies react to CbCR in ways not anticipated by the legislator

The empirical findings show for the first time the effectiveness of mandatory Country-by-Country Reporting. According to the authors of the study, this has important implications for tax policy. The greater tax transparency reduces aggressive forms of tax planning by means of tax havens. By relocating real investments, however, companies also seem to react in ways not anticipated by the legislator. It is expected that CbCR could lead to higher tax competition for corporate investment within Europe. In addition, lower growth rates indicate that multinationals perceive higher tax uncertainty.

To counteract the unintended developments, legislators and tax authorities would have to send a strong signal to multinational companies that greater tax transparency will not result in more aggressive tax audits.

Download the ZEW policy brief with the detailed results:
*http://ftp.zew.de/pub/zew-docs/policybrief/en/pb05-19.pdf*

Marcel Olbert, olbert@uni-mannheim.de
Prof. Dr. Christoph Spengel, spengel@uni-mannheim.de

# CEE Countries Reject a Euro Transfer Union

From the point of view of Central and Eastern European (CEE) EU Member States, the attractiveness of the euro has declined significantly in recent years. If the eurozone were to move towards greater fiscal centralisation and solidarity, this would probably increase the scepticism of these countries about joining the single currency. Only a well-balanced reform package that credibly prevents the collectivisation of government debt could pave the way for an eastward expansion of the eurozone.

These are the findings of a recent study carried out by ZEW with the support of the Brigitte Strube Stiftung. The ZEW team has made an extensive screening of the economic situation of CEE Member States. Some of these countries are already in the process of overtaking Southern European countries in GDP per capita. In addition, most CEE members of the EU have comparatively low national debt levels and have been able to meet most of Europe's deficit limits in recent years.

The analysis was complemented by a survey in which more than 1,800 economists in CEE Member States as well as in Germany, France and Italy were asked about their reform preferences. With regard to the policy areas of defence, immigration and taxation, CEE respondents are more reluctant to grant the EU new competencies than those from Western Europe.

With regard to euro reform ideas, in some areas there is more agreement with the German respondents than with those in Italy and France. Survey participants of the economically wealthier CEE countries (such as the Czech Republic and Poland) agree with their German colleagues in rejecting a relaxation of the Stability and Growth Pact. There is also broader consensus with Germany than with France and Italy on the question of dealing with highly indebted euro states.

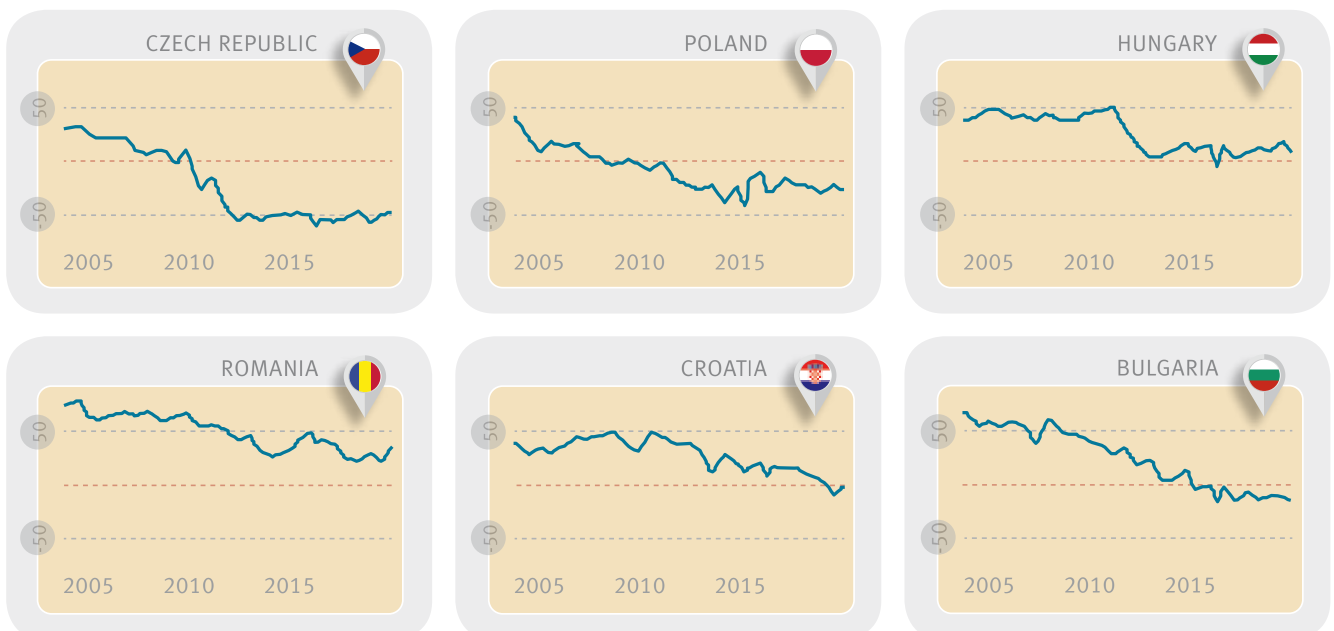
Both German and CEE respondents support the implementation of an insolvency procedure for eurozone countries with a debt overhang. Stabilisation tools like a European unemployment insurance scheme for protecting the euro area against strong economic fluctuations are finding favour in CEE states.

From the perspective of CEE countries, the disadvantages of introducing the euro could outweigh the advantages. Given the much higher level of government debt in Western and Southern Europe, there seems to be great concern that joining the eurozone would entail incalculable financial risks. The authors of the study conclude that at least the wealthier CEE states will not join a union of joint liabilities and transfers. This makes well-balanced euro reforms that provide credible ways of dealing with heavily indebted Member States all the more important and necessarily includes an insolvency system for euro countries. A unilateral expansion of new transfer instruments without better debt rules will permanently prevent countries such as Poland, the Czech Republic and Hungary from introducing the euro and only allow the poorer EU states to join the eurozone.

The study is available to download at: *http://ftp.zew.de/pub/zew-docs/gutachten/ZEW_EMUReform_CEE_2019.pdf*

Prof. Dr. Friedrich Heinemann, friedrich.heinemann@zew.de

NET SUPPORT FOR THE SINGLE CURRENCY IN NON-EURO AREA COUNTRIES 1999 – 2018 (IN %)




Source: Eurobarometer surveys from March 1999 to March 2018

# Slow Recoveries Through Fiscal Austerity

New insights from the FRAME project show that fiscal austerity slows down technology diffusion. Through its negative effect on technology diffusion, austerity has severe negative consequences for productivity and economic growth in the medium-run and can lead to slow recoveries.

Sovereign bond yields and public debt levels skyrocketed during the Great Recession and the European Debt Crisis. Several European countries such as Spain, Portugal, and Greece implemented austerity programmes to cope with the government-debt crisis in the aftermath of the Great Recession. They increased taxes on consumption, labour and capital, and reduced government expenditures. The overall tax burden as a share of GDP in Spain, Portugal and Greece increased markedly from 2009 to 2015. It was between four and six percentage points higher in 2015 than it was in 2009. Spain, for example, increased the VAT rate from 18 per cent to 21 per cent in 2012. The top rate on personal income was increased from 43 per cent in 2010 to 52 per cent in 2012.

While tax revenues were raised, government consumption was cut. In 2013, Spanish government consumption relative to gross domestic product was nearly four per cent lower than in 2009. Portuguese government consumption expenditures relative to GDP were down by more than ten per cent and Greece cut government consumption relative to GDP by as much as 12 per cent. In 2013, the unemployment rate in Spain exceeded 25 per cent and real GDP per capita was more than six per cent below its 2009 level.

## Strong adverse effects on productivity, output and consumption

How do austerity measures affect technology adoption and what are the implications for productivity and income growth? These questions are at the core of the Horizon 2020 research project FRAME. As part of FRAME, Bianchi, Comin, Kung and Jung have investigated this question focussing on the case of Spain during the Great Recession. Their model endogenously accounts for the connectedness of Spain with other European economies through the trade of goods and financial assets. The study finds support for strong adverse effects of austerity programmes on productivity, output and consumption. Because tax rates are increased to consolidate the government's budget, investment decisions are distorted.

In particular, fiscal austerity deters both investment in capital and in the adoption of new technologies. This reduces the speed of technology diffusion and leads to a slower recovery. Fifteen years after the beginning of the Spanish debt crisis, both the technology adoption rate, output and consumption are still more than two per cent lower when austerity measures are implemented compared to a situation without austerity measures in which fiscal policy continues to operate the fiscal rules estimated for pre-recession times. These findings suggest that the austerity measures taken in the eurozone have contributed to the slow recoveries that were observed. They may be one explanation for the very different experiences in the US and in most of Europe after the Great Recession. Fiscal policy was much less austere in the US than in the EU. In turn, the recovery was faster in the US than in many European countries: In 2017, real GDP per capita in the US was already 6.7 per cent higher than ten years before while Spanish real GDP per capita had merely returned to its pre-crisis level.

The exact design of austerity programmes greatly affects their consequences. There is evidence that expenditure-based consolidations have much higher output costs than tax-based measures. Among tax-based measures, Bianchi et al. find large differences regarding the consequences for growth depending on which types of taxes are used to increase revenues. According to their simulations, the adverse effects of labour tax raises on GDP and consumption are especially strong. Raising capital taxes is the preferred means of fiscal consolidation. For the Spanish case, an austerity programme that relies solely on higher capital taxes to stabilize debt leads to a trough response of output of minus three per cent ten years after the shock. The recession is much deeper and the recovery slower when only the labour tax is used to stabilize debt. For this scenario, the model in Bianchi, Comin, et al. predicts output to be ten per cent below trend ten years after the shock.

These findings have important implications for policy. First, besides consequences for demand in the short run, negative medium-run effects of austerity measures can be very large and should be taken into account when deciding on such policies. Austerity is only advisable if it can reduce interest rate spreads quickly, which is unlikely for countries in severe financial distress. Second, if austerity measures are implemented, they should be accompanied by policies that support innovation and thereby limit the negative effects on technology adoption. This includes innovation subsidies but also policies aimed at alleviating credit constraints of firms.

The article is based on a ZEW policy brief. The complete paper is available to download at: *www.zew.de/PU80741-1*

Alexander Matusche, alexander.matusche@gess.uni-mannheim.de

**FRAME** stands for Framework for the Analysis of Research and Adoption Activities and their Macroeconomic Effects. FRAME has received funding from the European Union's Horizon 2020 research and innovation programme. The multi-partner project was coordinated by ZEW and ran from April 2017 to March 2019. FRAME investigated which factors ease the diffusion of knowledge from the public domain across all economic agents to innovate and sustain economic growth at the European level. This video provides a clearer idea of the project: *https://bit.ly/2YLtsgk*

# How the Economic Downturn Is Affecting Employment in Germany

The German economy is weakening, while the labour market continues to perform well. How is this possible? Companies' first response to a slowdown in business activity is to reduce the working hours of employees, followed by a delay in the hiring of new staff. If the downturn persists then redundancies may be necessary. Employment across the economy as a whole has so far remained stable during the current business cycle.

The economy has been faltering since the middle of last year. Since then, the growth forecasts for Germany have been revised downwards. Many forecasters currently predict an economic growth rate of 0.8 per cent for 2019. This is roughly half of last year's forecast for the current year. There are mixed signals about the strength of business activity going forward. The main macroeconomic risks – especially for Germany's export-led industry – continue to be Brexit, global trade conflicts and a slowdown of growth in China. But what impact would a persistent economic downturn have on employment?

## Cutting overtime and working hours is the method of choice

Reduced working hours appear – from a personnel policy perspective – to offer a particularly attractive option, and can be implemented fairly quickly in cases where a sufficient number of employees would like to reduce their working hours or have already amassed overtime. It is reasonable to assume that both of these conditions have been met after roughly a decade of moderate growth.

Surveys show that many employees would like to cut their working hours. Moreover, overtime continues to be accumulated in some sectors. Consequently, reducing overtime and working hours is seen as the method of choice for companies severely affected by the downturn. During the most recent recession in Germany, when economic output fell by 5.6 per cent between 2008 and 2009, the annual number of hours worked in manufacturing declined by the same percentage.

If the downturn becomes more severe or protracted, companies can delay the hiring of new staff, thereby reducing their headcount. This instrument is particularly effective in cases where there is a sufficient number of workers who wish to leave voluntarily, perhaps because they are retiring or have other career options available.

Some statistics provide an illustrative example of the potential effectiveness of such measures. In 2018, Germany's Federal Employment Agency documented that for every 100 workers subject to social insurance contributions, 17.7 individuals left the labour market while 19.5 people joined. Thus, on balance, employment increased in 2018. Although this high level of turnover – which varies from company to company depending on employees' age, gender and skills profile – may potentially decrease if the downturn becomes protracted, it is clear that companies who delay the recruitment of new staff are able to reduce their headcount fairly quickly.

## A weak economy alone does not result in redundancies

Last but not least, companies can react to a drop in their revenues by laying off staff. Hire-and-fire policies, however, incur substantial costs which, according to a rule of thumb, approximate the average annual salary of a company's employees. Firms will therefore only make staff redundant if they truly expect their revenues to decline over the long term. Forward-looking companies will usually not lay off workers for reasons relating purely to the business cycle. First they will cut working hours, and then, if the downturn persists, they will delay the recruitment of new staff.

Employment policies of companies are usually guided by medium- to long-term revenue forecasts and productivity growth, rather than fluctuations in the business cycle. Experience in recent years has shown that employment across the economy as a whole remains stable as long as growth rates vary between one per cent and 1.5 per cent. If growth falls below one per cent for a protracted period, however, this will gradually have consequences for employment.

PD Dr. Friedhelm Pfeiffer, friedhelm.pfeiffer@zew.de

Hire-and-fire policies incur substantial costs.

Photo: © iStockphoto.com/Guillermo Perales Gonzalez

The share of employees in the private sector that have taken up working from home is increasing only at a slow pace.

Photo: © iStockphoto/Georgijevic

# Working from Home Provides Considerable Benefits but Comes With Drawbacks

Digitalisation is making traditional boundaries melt away: these days, thanks to portable computers and mobile devices, nobody who works mostly on a personal computer is confined to the office chair any more. Jobs can be performed in a train or on a plane, or from the comfort of a home office. A recent short expertise published by ZEW and the Institute for Employment Research (IAB) in Nuremberg has investigated the perceived advantages and downsides home-based work arrangements in Germany implicate.

While mobile working has gained in importance in recent years, it is expanding only at a slow pace. In 2018, 26 per cent of all private-sector establishments in Germany offered mobile working arrangements to at least some of their employees, allowing them to work from home or remotely. From the establishments' point of view, gains in productivity and the fact that employees are easier to be reached are major benefits of mobile working. Employees cite the fact that they are better able to carry out some activities at home as their main professional advantage. For both employers and workers, however, the most important advantages lie in the personal benefits like a greater flexibility among workers and a better work-like balance. The avoidance of the daily commute is another big advantage for employees. These are the central findings a detailed analysis of mobile working arrangements on the basis of the Linked Personnel Panel (LPP), a survey among employers and workers in private establishments with at least 50 employees.

Despite the vast number of benefits, merely twelve per cent of employees in German private sector establishments with more than 50 employees work from home at least occasionally. The major reason why this share is not higher is that many tasks cannot be performed from home. The production sector, for instance, often entails machine-aided tasks, making mobile work impossible in this case. 90 per cent of the establishments that do not offer mobile work arrangements cite the tasks of their employees as a major obstacle, a factor that was also confirmed by 75 per cent of employees that do not work from home. The second most important factor that was cited to impede establishments from offering mobile work arrangements is that it makes the cooperation between co-workers more complicated (22 per cent), whereas the third most important factor are data protection concerns (16 per cent).

According to the employees, the direct managers play a determining role in deciding whether working from home is possible or not. More than two thirds of employees named the fact that their manager prefers them to be at the office as a reason for not working from home.

### Downside to the benefits of working from home

Many of the perceived benefits of working from home are aimed at making it easier for workers to organise their daily work routine. By avoiding long commutes, employees save time, which is in turn often used for work purposes. And this organisation of tasks and processes is more compatible with the workers' personal wishes and expectations. According to the authors of the study, there is, however, also a downside to these benefits, since the blurring of the lines between work and private life can lead to conflicts and psychological strain.

40 per cent of employees who work from home only work during their working hours, and 50 per cent of those who also or exclusively work outside of their normal working hours named the blurring of professional and personal lives as a consequence. The study found lower job satisfaction among employees who would like to work from home and do not have the opportunity to do so despite working in an establishment that offers home-based working arrangements. These individuals also perceive the treatment by their managers to be less fair than other employees. The reverse of the medal is that, when there are some workers who have the possibility to work from home and some who do not, this creates a desire for equal treatment that cannot be fulfilled for some of the employees.

It is therefore a great challenge for human resource management to maintain a balance between employees with and employees without home-based working arrangements.

The study can be downloaded (in German only) at:
*http://ftp.zew.de/pub/zew-docs/gutachten/ZEW_Expertise_Homeoffice_2019.pdf*

Jun.-Prof. Dr. Susanne Steffes, susanne.steffes@zew.de

## German-Chinese Partnership: Shandong University and ZEW Seal Collaboration

ZEW and the Chinese Shandong University of Finance and Economics (SDUFE) in Jinan have officially sealed their long-planned collaboration. SDUFE President Professor Zhongxiu Zhao and ZEW President Professor Achim Wambach signed a Memorandum of Understanding in June 2019, on the occasion of the visit of a Chinese delegation from Jinan to ZEW. The aim of this agreement is to strengthen cooperation in fields of research of mutual interest as well as in the qualification of young scientists. The agreement plans on establishing a strategic partnership between ZEW and SDUFE. The aim is to carry out joint research projects in selected fields and to promote international exchange and knowledge transfer as well as to qualify doctoral candidates from both institutions. Zhao pointed out the numerous overlaps of interests between ZEW and the Chinese university. Since SDUFE will also be taking part in the international Beijing Humboldt Forum (BHF) in the future, which ZEW has been co-organising for years, both partners will benefit greatly from the cooperation. For the first time in 2019, BHF events will also take place on the SDUFE campus in Jinan. Also for the first time, students of the SDUFE will participate in the four-week UIBE Summer School 2019 at ZEW in Mannheim, co-organised by the University of International Business and Economics (UIBE).

Photo: ZEW

SDUFE President Professor Zhongxiu Zhao and ZEW President Professor Achim Wambach signing the agreement for increased cooperation.

## ZEW Participates in Research Network on Digitalisation

ZEW is part of a new research alliance aiming to conduct interdisciplinary research into the influence of digitalisation on individuals and society. The Baden-Württemberg Ministry of Science, Research and the Arts will be funding the “Society in Digital Transition” project with around 2.2 million euros for a period of three years. The research alliance counts eight universities and non-university institutions from Baden-Württemberg and is headed by the University of Mannheim. The plan is to identify and analyse the influence of digitalisation on individuals and society in an interdisciplinary way in order to develop design options for the transformation process. “The digital transformation is one of the mega trends of our time and brings extensive changes for the economy and society. As part of the research alliance, we at ZEW will deal with the question of whether digital platforms are neutral towards users. The research alliance offers the opportunity to analyse this issue from the perspective of various disciplines,” explains Professor Irene Bertschek, head of ZEW’s Research Department “Digital Economy”.

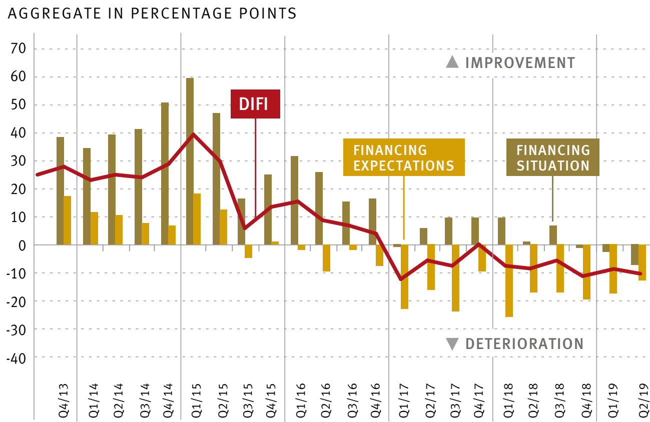
## Facilitating the Distribution of Food Donations via Digital Platforms

To further reduce the quantity of food wasted in Germany by facilitating a needs-based distribution of food donations to food banks is the goal of a project of the ZEW Research Group “Market Design”. To this end, the Research Group is helping to develop a digital platform to improve the network between food banks, wholesalers and food producers. The project “Tafel macht Zukunft – gemeinsam digital” (“Tafel Shapes the Future – Together Digital”) is carried out jointly by ZEW, the German food aid organisation Tafel Deutschland e.V and the Bildungsakademie des Bundesverbandes Deutsche Tafel gGmbH, an associated training academy, and funded by the Federal Ministry of Food and Agriculture with a total of 1.5 million euros over a period of three years. The platform, which serves as an interface between donors and food banks, will be tested with selected food banks and supermarkets across Germany.

The goal of reducing food waste is to be achieved by better matching food supply and demand and by optimising the planning of the transport route, which will be made possible by the digital platform. The ZEW Research Group “Market Design” provides scientific support for the project.

State Secretary Dr. Hermann Onko Aeikens (second from left) presenting the funding certificate to Evelin Schulz from the training academy of Tafel Deutschland, ZEW economist Professor Thilo Klein (second from right) and Jochen Brühl from Tafel Deutschland. Photo: BMEL

## Real Estate Financing Market – Sentiment Remains Subdued

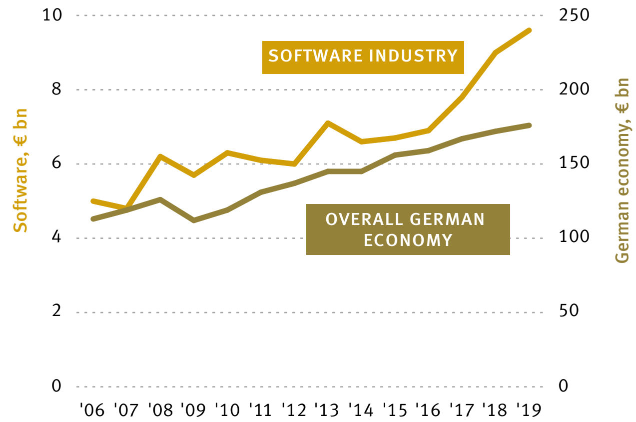



Source: JLL and ZEW

In the second quarter of 2019, the German Real Estate Finance Index (DIFI) by ZEW and JLL decreased by 1.4 points to a current reading of minus 11.1 points, thus remaining in negative territory. This downturn is due to a noticeable slowdown in the financing situation: While respondents were only slightly pessimistic last year, the sentiment barometer for the current financing situation is now clearly in negative territory. The sub-aggregate for financing expectations, on the other hand, has remained in the negative since early 2016 and even its slight increase in the current quarter cannot make up for the pessimism with regard to the current situation. Overall, this development goes hand in hand with the rather subdued economic situation in Germany. The DIFI reflects survey participants' assessment of the current situation of and expectations for the commercial real estate financing market. It is conducted on a quarterly basis and calculated as the average value of the balances between the following segments: office, retail, logistics, residential properties and hotels.

Dr. Carolin Schmidt, carolin.schmidt@zew.de

## German Software Industry Expands Its Spending on Innovations

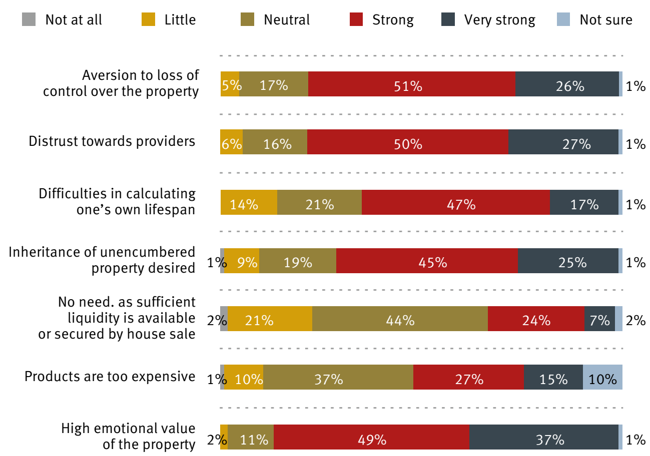



Source: ZEW, Mannheim Innovation Panel

The German software industry is expanding its innovation budgets considerably. In 2017, companies active in the programming and maintenance of software programmes and data processing solutions spent 7.8 billion euros on the development and introduction of new products and processes. This is an increase of 13 per cent compared to the previous year. The target figures for 2018 show a further strong increase of 14 per cent to 9.0 billion euros. The expansion course will be continued in 2019 with a plus of seven per cent. Innovation spending is then expected to reach 9.6 billion euros. The dynamics in the industry are significantly higher than in the overall German economy. The reason for this strong expansion undoubtedly lies in the new information technology applications of artificial intelligence, the use of large amounts of data, the spread of industry 4.0 in smaller companies and the ongoing digitalisation of many product and service offerings. All this requires additional innovation efforts on the part of the software industry.

Dr. Christian Rammer, christian.rammer@zew.de

## Not Very Popular in Germany: Reverse Mortgages for Old-Age Provision




Factors influencing the acceptance of reverse mortgages: demand side

Source: ZEW

Reverse mortgages, which can be used to borrow on debt-free real estate in old age to improve one's pension, have not yet become established in Germany – unlike in the USA and Great Britain. Also for the future, financial market experts expect reverse mortgages to increase only slightly in importance as an instrument for old-age provision in Germany. Less than 30 per cent of those surveyed expect a strong or very strong increase in the significance of reverse mortgages, while around 45 per cent expect no or only a slight increase in significance. The high emotional value of the property is what mainly inhibits the demand for reverse mortgages, with 88 per cent of respondents seeing this as a strong or very strong obstacle. For mortgage providers, by contrast, the primary obstacle is the difficulty of estimating the lifespan of property owners. These are the key results of the analysis of the special question in the monthly ZEW Financial Market Survey, which was carried out in July 2019.

Dr. Karolin Kirschenmann, karolin.kirschenmann@zew.de

Photo: ZEW

# In Systemic Competition with China

This summer, the German cabinet will propose its new National Industry Strategy 2030. Federal Minister of Economics Peter Altmaier has made a proposal for this. While the one-sided attention to industry and large firms has drawn some criticism, underlying justification for the strategy has received less attention: How should Europe, with its market-based orientation, position itself against China's state capitalism?

On the one hand, security issues must be taken into account. The question whether the use of Huawei technology in the 5G network represents a security risk for Germany cannot be assessed from an economic perspective alone. The German government has responded to security policy concerns by adjusting the Foreign Trade Ordinance so that for shareholdings by foreign purchasers of over ten per cent, it can verify the extent that such interests compromise national security. It would be good if economic experts were involved in making this risk assessment so as to be able to gauge the influence on the value creation chain.

Economically, state enterprises and state-controlled firms play a dominant role in China. These enterprises grow ever more powerful through mergers. Whereas there were still 189 firms supported by the central government in 2003, after several megamergers, there are only 97 left today. The best-known example is the merged China Railway Rolling Stock Corporation (CRRC), by far the world's largest enterprise in the industry. However, productivity increases in China were not generated in the state enterprise, but rather in the economy's private sector. The hope for the giant state enterprise was to create economies of scale through their large size and increase profitability, but this has not been fulfilled to date. Instead, the debt levels of these firms rose to dangerous heights. And for Europe and the US, there is evidence that mergers lead to fewer innovations, in part because research departments are consolidated and downsized.

The textbook argument for competition as a leading market principle should not be ignored: competition increases the likelihood of creating innovations and leads to increased prosperity. Crippling Europe's market and innovation dynamics at the expense of competition by creating champions would be the wrong response to China's state capitalism.

It will turn out over time how the trade-off between private corporate dynamics and government management of firms will develop in China. It is irritating when Chinese companies merge in order to eliminate "needless competition". Should this development intensify, German corporations should be able to respond to this through their activity in China. One instrument for doing this used to exist. Until the end of the 1990s, export cartels were permitted. These were dismantled on the grounds "that in view of the efforts to dismantle global government and private restrictions on competition, export cartels no longer had any justification for their existence." If China decides in favour of a non-competitive market form, there are good reasons to reactivate this instrument. The purchase of European firms by Chinese firms ought to always be evaluated with the understanding that these are not independent purchase procedures by individual corporations, but instead, are being conducted by a (government) enterprise. Given this premise, when there are problems of competitiveness, the competition authorities should be able to intervene. If there are security issues, a risk assessment should be made. Otherwise, one should leave the purchase alone. Germany has done very well with its open markets.

Currently, there are further instruments under discussion: Border tax adjustments could take care of compensating for any competitive advantage for Chinese companies resulting from laxer environmental standards. EU anti-dumping instruments could be given more teeth in order to punish too-aggressive price-setting by Chinese firms. The investment treaty that Europe has been negotiating with China would be welcome. Europe is not powerless to stand up to competition with state capitalism.

President of ZEW, Prof. Achim Wambach, PhD

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L 7, 1 · 68161 Mannheim · Germany · www.zew.de
President: Prof. Achim Wambach, PhD · Director: Thomas Kohl

**Editors:** Gunter Grittmann (V.i.S.d.P) · Phone +49 621 1235-132 · gunter.grittmann@zew.de
Sarah Tiedemann · Phone +49 621 1235-135 · sarah.tiedemann@zew.de
Kathrin Böhmer · Phone +49 621 1235-128 · kathrin.boehmer@zew.de

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