

Identifying and Preventing Crises



REPORT by Christian Dreger and Konstantin Kholodilin

Speculative Bubble on Housing Markets: Elements of an Early Warning System

3

INTERVIEW with Konstantin Kholodilin

»A new early warning system can forecast housing bubbles«

10

REPORT by Ansgar Belke, Kerstin Bernoth and Ferdinand Fichtner

The Future of the International Monetary System

11

REPORT by Mechthild Schrooten

Brazil, Russia, India, China and South Africa: Strong Economic Growth—Major Challenges

18



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Speculative Bubble on Housing Markets: Elements of an Early Warning System

by Christian Dreger and Konstantin Kholodilin

Excessive speculation on asset markets can cause significant macroeconomic losses in terms of production and employment. Such developments should be detected as early and as reliably as possible in order to enable corrective action through adequate economic policy measures.

This is the goal of the early warning system, which was developed by DIW Berlin on behalf of the Federal Ministry of Finance for the housing market. The early warning system predicts price surges on real estate market that were caused by speculation. If speculative price developments are detected quickly, economic policy has enough leeway to find an adequate response and possibly prevent further development of the bubble.

Speculative bubbles on asset markets can cause significant macroeconomic losses in terms of production and employment. The abrupt ending of the new economy boom at the time of the millennium contributed to a recession in a number of industrialized countries. The burst of the US real estate bubble in 2007/2008 was the cause of the recent financial and economic crisis. The burst of an asset price bubble can lead to substantial cost for an economy resulting from the recapitalization of the financial systems. Public debt grows fast – partly because of suddenly lacking tax revenues, partly because of comprehensive stimulus programs and other actions taken to combat growth losses.

In a number of cases, the beginnings of an asset price bubble lie in times of economic expansion. The actors' risk awareness diminishes, liquidity restrictions are loosened, and credits can easily be obtained. This further heats the development. Asset prices are more and more driven by price expectations. Assessments no longer fit the values which are justified based on fundamental economic variables like income. Actors no longer act rationally, but orient themselves on the behavior of market leaders. The situation is characterized by herd behavior. The ideal exit time can hardly be foreseen by the individual.¹ For different reasons, the process will finally stop, abruptly revealing the imbalances.

Speculation-caused asset prices can stimulate consumption and investment for a certain time span. This creates additional inflationary pressure, which makes it harder for monetary policy to stabilize the price level. In addition, resources are inefficiently allocated, for example, excessive construction investments, which will not be used due to shortages in demand. Also private households may consume beyond their means and reduce their expenditures when an asset illusion bursts. Another ty-

¹ See also Shiller, R. (2005): *Irrational exuberance*. Princeton University Press, Princeton, NJ, and De Grauwe, P. (2008): *Animal spirits and monetary policy*. CESifo Working paper 2418.

pical example of an asset price bubble is an exorbitantly rise in the stock market, which may be accompanied by exaggerated investment activities of firms, that can build up excess capacities.

Prevention of price bubbles through forward looking policy measures

In principle, economic policy should be able to take adequate action to combat the creation and inflation of price bubbles on asset markets.² In order to do so, it needs reliable information as a basis for sound decisions. The main challenge is to detect price bubbles as such, which is not an easy task in the phase of their emergence. It is further complicated by the fact that asset prices also go up because of usual cyclical movements or long-term trends: Higher real estate prices can be expected in periods of increasing incomes. Higher stock prices are often a sign for better profit perspectives of listed companies. Rising commodity prices can sometimes be traced back to global growth. In all these cases, price increases are caused by fundamental factors.

Without adequate instruments for diagnosis, the risk is high to wrongly interpret price increases, which are explained by these factors, as a bubble and to take action aiming at curbing a boom. Serious wealth losses will be the result. The challenge is to separate excessive speculation from fundamentally determined price dynamics and construct indicators, which allow for an early and reliable detection of bubbles.

The DIW Berlin has developed an early warning system for the Federal Ministry of Finance.³ This system can easily be updated, as the necessary data are easily available. In this paper, we are going to present this tool for the real estate market. For many private households, real estate is a major part of their asset investments. In contrast to stock prices, speculative bubbles on real estate markets usually take more time to build up, which

makes their early detection easier.⁴ Furthermore, price bubbles occur only rarely. Each bubble has its own characteristics, but we can still identify certain regularities in order to be better equipped for the future. We are going to examine the developments in 12 industrialized countries in order to figure out the determinants of speculative bubbles on the real estate market.⁵

When Do Price Increases Represent a Bubble?

For the construction of an early warning system, the identification and demarcation of historical bubbles in time is essential. Once the bubbles are defined and detected, we can identify factors that are crucial for their development. This is especially important for housing markets, which are strongly influenced by local conditions. For the sake of a robust calculation we use both filter and so-called structural models.

In the filter model, phases of unusual price developments are identified through deviations from smoothed time series.⁶ Significant deviations of housing prices from their long-term trend do not have to be the result of speculation, though. They can also be caused by fundamental factors such as real income, interest rate, and population growth.⁷ This is the reason why threshold values are needed for the calculation of an exaggerated price increase. Their purpose is to prevent false classification of price dynamics as bubbles, which in reality are caused by economic fundamentals (i.e., by cyclical developments).

In addition, structural models allow interpreting the price developments. Fundamentally determined prices can be considered as fitted values of a regression, in which asset prices can be traced back to different factors. The literature explains housing prices with income, real inte-

² In order to prevent future crises, some researches call for an enlargement of macro-political instruments; see Blanchard, O., Dell'Ariccia, G., Mauro, P. (2010): Rethinking macroeconomic policy. IMF Staff Position Note SPN/10/03. It is also proposed that central banks should behave contrary to market trends; see e.g. Bordo, M.D., Jeanne, O. (2002): Boom-busts in asset prices, economic instability and monetary policy. NBER Working Paper 8966, and Borio, C. (2006): Monetary and financial stability: Here to stay? Journal of Banking and Finance, 30, 3407-3414.

³ This weekly report is a public policy oriented summary of the research project „Methoden zur Analyse der Entwicklung von Vermögenspreisen mit Blick auf Erkennung von Anzeichen für Blasenbildung“, which was carried out by the authors on behalf of the Federal Ministry of Finance. See Dreger, C., Kholodilin, K. (2011): An early warning system to predict the house price bubbles. DIW Discussion Papers 1142.

⁴ For stylized factors for real estate price bubbles see Helbling, T., Terrones, M. (2003): Real and financial effects of bursting asset price bubbles. IMF World Economic Outlook, April, 61-76.

⁵ The calculations are based on different data sources. Real estate price indices are taken from the NiGEM database, the relations between housing prices and gross domestic product (GDP) or the relation to rents are courtesy of Mr. A. Christophe of the OECD. The regulation variable, which stands for the time of deregulation of the mortgage market, is taken from Agnello, L. and Schuknecht, L. (2011): Booms and busts in housing markets: Determinants and implications. Journal of Housing Economics, 20 (3), 171-190. Other variables are taken from Datastream and Global Insight or were calculated by the authors themselves.

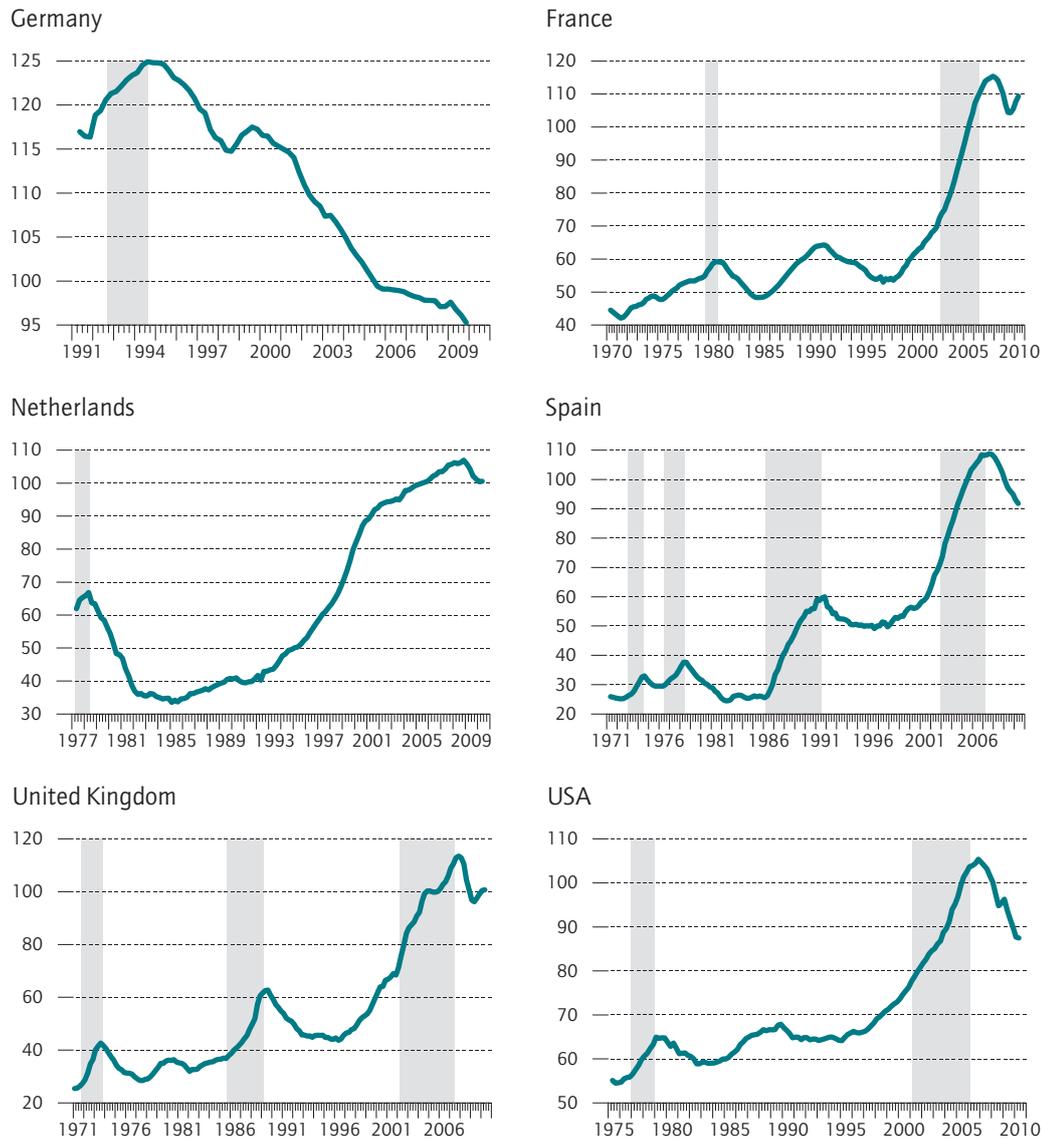
⁶ Evaluation is done relative to a trend which is extracted with the usual processes, e.g. the Hodrick-Prescott-Filter.

⁷ In order to evaluate asset price dynamics relative to the general price development, we use real asset prices. According to the accessibility of data, either the price index of private consumption or the deflator of the GDP is used.

Figure 1

Development of Real Housing Price Indices and Periods with Price Bubbles

Housing Price Index



Note: Periods with price bubbles are marked grey.
Source: See footnote 5; calculations by DIW Berlin.

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Housing price bubbles are relatively rare and take time to build up.

rest rates, population, and urbanization.⁸ Rising incomes and a growing population lead to higher demand for real estate, thus causing higher prices. The real interest rate,

however, has a negative influence, since higher interest rates make other investment forms more attractive, and financing costs for real estate increase. A high degree of urbanization stands for low migration to the cities – meaning that the highest price increase for housing in the agglomerations has already happened.

⁸ For a summary of potential determining factors of real housing prices see Girouard, N., Kennedy, M., Van den Noord, P., André, C. (2006): Recent house price developments: The role of fundamentals. OECD Economics Department Working Papers 47.

The bubble is likely to be under way, if prices deviate from the model-based development over a longer period of time. In order to gain robust results regarding earlier bubbles, the above two methods are used jointly. Time periods, which were identified using both methods as possibly characterized by housing price bubbles, need to overlap at least partly. For the identification of time spans, different threshold values are tried out. At the end, the combination with the highest correlation between the two methods is chosen.

Real Estate Price Bubbles are relatively rare

Real estate price bubbles have occurred in the observed countries in different periods, but remained in general quite rare (Figure 1).⁹ Spain and the United Kingdom were the countries with the most bubbles. Their housing prices were even more strongly characterized by speculative surges than in the US. In contrast, France and Germany have witnessed less price bubbles. The only bubble in Germany occurred between the last quarter of 1992 and the third quarter of 1994. A real estate boom had followed German reunification, leading to overinvestment in housing and commercial buildings. After the bubble burst, construction investments fall over a decade. In the Netherlands, no bubble could be identified for the last two decades, although real estate prices have mostly risen. But in this case, the increase can be explained with fundamental variables. No overheating was detected.

What Are the Causes of Real Estate Price Bubbles?

The basis for an economically and policy relevant early warning system is the identification of the driving forces of price bubbles. Two methods are discussed: A signal approach and logit models. Both methods are based on a panel analysis with data from all 12 industrialized countries of our study. A country-specific analysis would be problematic, given a small number of bubbles per country.

Crossing the Threshold Values Triggers Crisis Signal

In the signal approach, earlier bubble-like developments are examined and variables identified, which might be relevant for a forecast of the bubble. Then critical values for potentially determining factors are calculated. Threshold values are defined in such a way as to detect as many bubbles as possible, but to send as few as possible false alarms. As quality criterion we use a measure of accuracy based on two elements: the percentage of correctly identified bubbles over the actual number of bubbles that occurred, and the percentage of correctly predicted non-bubbles over all non-bubbles. Non-bubble stands for the periods, in which no bubbles occurred. The optimum threshold is achieved when the sum of both elements is as large as possible. Thus, the two characteristics “correctly predicted bubbles” and “little false alarms” are equally weighted.

Crossing the threshold value of a variable is interpreted as a signal of a looming or already existing bubble. We then construct a combined indicator from several signals based on different variables. The higher the number of variables that predict a looming bubble, the higher the value of the indicator. We recommend stronger weighting of variables, which enable a relatively accurate prediction of bubbles.

The results of the signal approach (Table 1) show, for example, that money supply triggers a signal for a bubble when it rises more than 20 percent above its trend development. Other important influencing variables include the house price-to-rent ratio and the house price-to-income ratio. The higher the housing prices are in relation to rents or incomes, the higher the probability of speculative elements in real estate prices. Credit growth also plays a role in forecasting of speculative bubbles. However, the explanatory contribution of this variable (weight about seven percent) is less important than that of the liquidity indicators on the whole. Nevertheless, credit growth exerts more influence than the credit-to-GDP ratio. The public debt ratio is of less importance (about four percent).¹⁰

⁹ On the whole, this chronology follows the results of other authors, see e.g. Bordo, M.D., Jeanne, O. (2002): I.c., Helbling, T., Terrones, M. (2003): I.c., Adalid, R., Detken, C. (2007): Liquidity shocks and asset price boom/bust cycles. ECB Working Paper 732, Laeven, L., Valencia, F. (2008): Systemic banking crises: A new database. IMF Working Paper 08/224.

¹⁰ Most authors give liquidity and/or credit variables high weighting; see also Borio, C., Lowe, P. (2004): Securing sustainable price stability: Should credit come back from the wilderness? Bank for International Settlements Working Paper 157 and Agnello, L., Schuknecht, L., I.c.

Table 1

Variables influencing the Occurrence of Price Bubbles on the Housing Market: Threshold Values and Weighting According to the Signal Approach

Variable	Threshold value	Weighting
Short-term interest rate	0.4	5.7
Short-term real interest rate	0.4	5.6
Interest structure	3	3.7
Real effective exchange rate	1	6.9
Rent	0.4	5
Relation housing prices-income	1	7.6
Relation housing prices-rents	1	8
Investment rate	1	7.9
Credit growth, nominal	0.6	7
Credit growth, real	1	7
Credit-to-GDP ratio	1	5.5
Per-capita GDP growth	0.2	6.5
Money supply	0.2	4.6
Growth of nominal liquidity	0.8	8
Growth of real liquidity	1.2	7.1
Government budget balance	1.4	3.8

Note: Calculation of the optimum threshold value by maximization of the quality criterion described in the paper. Weighting in percent, according to individual forecasting quality.

Source: See footnote 5; calculations by DIW Berlin.

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When investment rate or housing price variables exceed their threshold values, this gives an important indication of a price bubble.

Expansive Monetary Policy and lax lending practices increase probability of speculative developments

The alternative to the signal approach is a logit regression. In this method, the probability of a price bubble is explained by economic determinants. According to the logit model, the probability of a price bubble (defined as 1 for periods with a bubble and 0 for periods without bubbles) is mainly influenced by factors mirroring the financial conditions of the economy (Table 2). Significant nominal money growth increases the probability of a speculation-driven development of housing prices. This applies also to credit growth and the credit-to-GDP ratio. The probability of the occurrence of a bubble increases in times of cyclical upturns, too. This can be observed on the basis of the growth of per-capita income and investment rate. For the diagnosis of real estate price bubbles, the development of housing prices in relation to income or rents is essential. These variables attained a cumulated weight of nearly 30 percent in the overall indicator (22.5 and 7.4). Credit variables make up over

Table 2

Estimation Values of a Logit Model for the Probability of the Occurrence of Housing Price Bubble

Explanatory variable	Direction of effect	Weighting
Constant	-	
Real exchange rate (-2)	+	7.1
Investment rate	+	7.2
Δ (House price-to-income ratio)	+	22.5
Δ (House price-to-income ratio) (-1)	+	
Δ (House price-to-income ratio) (-2)	+	
House price-to-rent ratio	+	7.4
Δ Money supply	+	14.1
Δ Money supply (-1)	+	
Δ GDP per capita	+	6.9
Credit-to-GDP ratio (-1)	+	13.6
Credit-to-GDP ratio, squared	-	
Credit growth, nominal	+	7
Government budget balance*Tax rate	-	6.7
Deregulation ¹ of the mortgage market	-	7.5
Number of observations		1061
Countries		10

Note: Dependent variable: Probability of a price bubble. Weighting (in percent, right column) according to log odds ratio and concordance coefficient.

¹ Deregulation of the mortgage market is defined as dummy variable which is 1 when the mortgage market becomes deregulated and 0 before that point. See Agnello and Schuknecht, l.c.

Source: See footnote 5; calculations by DIW Berlin.

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Credit and monetary conditions influence the building up of housing price bubbles the most.

20 percent, while liquidity conditions account for about 14 percent. The probabilities of a price bubble are shown in Figure 2. Since the forecast accuracy of the logit model proved higher than that of the signal approach, we only present the results of the logit analysis.

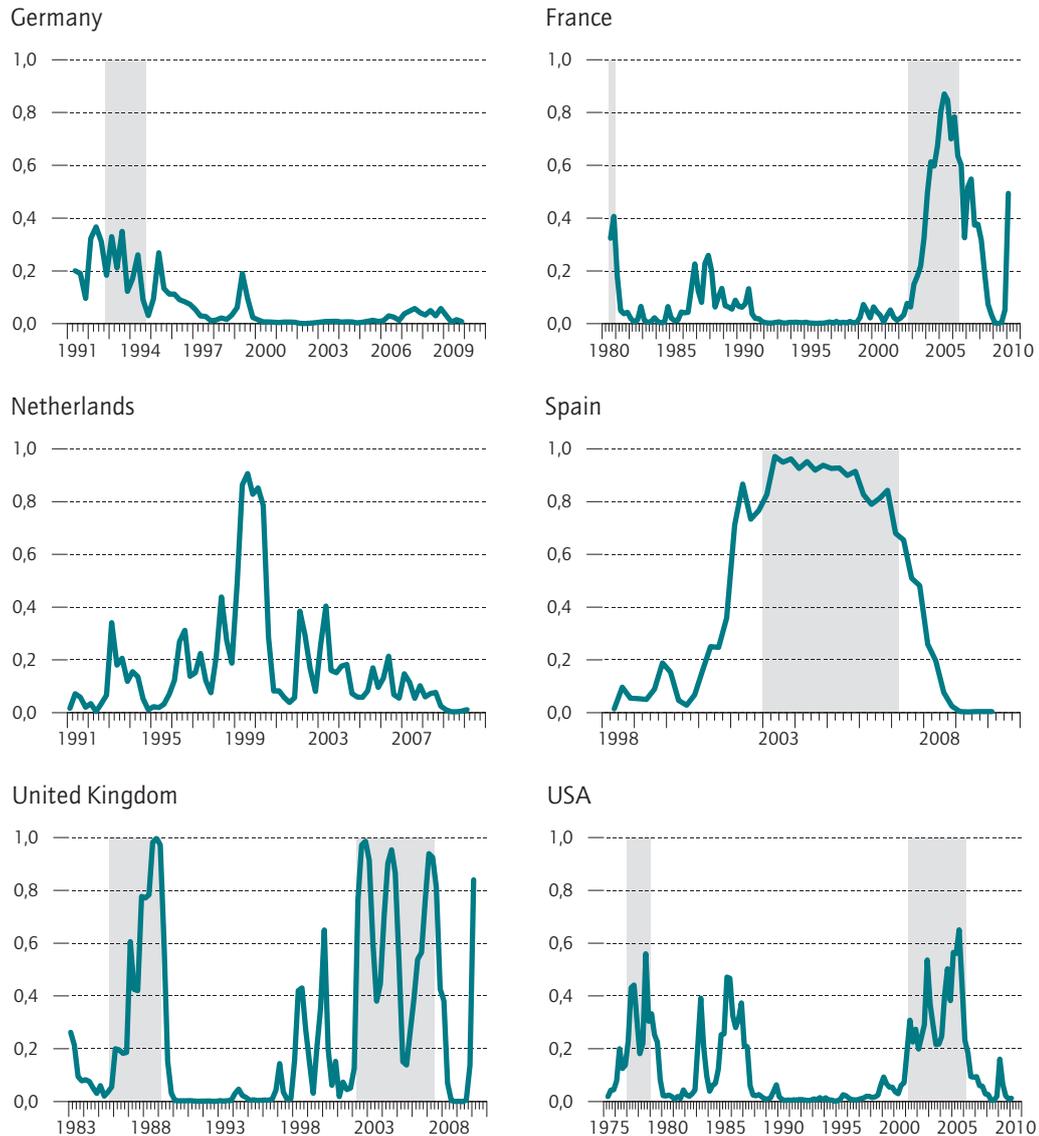
All in all, the results of the logit model show that monetary and financial conditions are crucial for the occurrence and inflation of speculative price bubbles on real estate markets. It makes sense to analyze the development of money and credit aggregates together in order to detect signs of future critical developments. In addition, other indicators can be included, like the cyclical situation or real exchange rates. Especially for smaller countries, a cumulative revaluation of the domestic currency can be an important variable, since it captures the pressure from international capital flows.

Overall, the probability of speculative house price bubbles increases when monetary policy is expansive and the granting of loans is handled laxly. However, a concentration on liquidity and credit variables is insufficient.

Figure 2

Periods with Speculative Bubbles on the Housing Markets According to Logit Model

Probability



Note: Periods with price bubbles are marked grey.
Source: See footnote 5; calculations by DIW Berlin.

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Housing price bubbles are relatively rare and take time to build up.

The emergence of price bubbles is a complex process, which cannot be explained on the basis of just a few variables. Other variables, like per-capita income, investment rates or the government budget balance, need to be taken into account as well in order to obtain sound assessments.

Conclusions

Speculation-driven price bubbles on the real estate markets can seriously affect the economy over longer periods of time. For this reason, forward looking policies should combat looming price bubbles. According to the experience, such bubbles tend to burst quite suddenly.

This is why policymakers need instruments for reliable and timely prediction of speculation-caused price increases. DIW Berlin has developed such an early warning system on behalf of the German Federal Ministry of Finance.

In the early warning system presented here, different kinds of information are optimally weighted in order to ensure a reliable diagnosis of real estate price developments and a forecast of speculative price surges. The results make it clear that the formation of price bubbles is a complex process, which is driven by several factors. Most important are credit and money supply of a national economy. Other relevant criteria include the cyclical situation, income development of private households, and the government budget.

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SIX QUESTIONS TO KONSTANTIN KHOLODILIN

»A new early warning system can forecast housing bubbles«

1. Dr. Kholodilin, speculative bubbles on stock and real estate markets can lead to serious losses of production and employment. DIW Berlin has now developed an early warning system for speculative price bubbles within real estate markets. How can a price bubble be identified at all?
Our technique consists of two parts. Since there is no chronology of bubbles, we have to identify them first. That is the first part of our technique. We have identified the bubbles, that is, the periods when bubbles occur and when they end, using different econometric methods. The second part is to forecast the identified bubbles as precisely as possible. For this, we use a number of different macroeconomic and financial indicators, such as the rent-to-house price ratio, short-term interest rates or money supply. These indicators are especially important for forecasting housing bubbles.
2. Who should apply this early warning system and how does it work?
The project is funded by the Federal Ministry of Finance, which is also the first user of our system. The model we developed computes the probability of housing bubbles to occur based on the current data. This probability signals whether a bubble is in sight or not.
3. How reliable is such an early warning system?
We tested the system using historical data. Our data set includes data of twelve industrial countries and covers more than 40 years. Within this period, there occurred 16 bubbles in these countries. As our study shows, we were able to identify all of these 16 bubbles and produced two false alarms. The system is thus able to forecast housing bubbles quite reliably.
4. At what point should authorities intervene?
First of all, we have to be sure that it is not a false alarm. A false alarm could trigger a panic, which, in turn, could lead to a crisis. The probability of a price bubble should be relatively high, say above 50 percent, and it should last for at least two quarters. Only then, we can be sure that it is in fact a bubble. Since housing bubbles usually last between one and four and a half years, there is enough time to react.
5. Which measures should be taken in this case?
I would prefer institutional measures. For example, the conditions for granting loans could be tightened in order to prevent the banks from granting households too many loans, as it has happened in the USA. Possibly, the transaction costs for buying property, such as taxes or various fees, could be raised as well. These instruments enable us to react in a more focused way to the events happening at the housing market. If we start raising interest rates in order to avoid housing bubbles, this could affect the whole economic dynamics in a negative way.
6. Is Germany currently facing the risk of a housing bubble?
I don't see that. Some bigger cities, such as Hamburg and Berlin, currently have rising prices, but this is not a bubble, since housing prices – like all other prices – just rise from time to time. It has more to do with relatively strong economic growth in the current and past year. But there is currently no decoupling of the housing prices in Germany from overall economic development.

The Future of the International Monetary System

by Ansgar Belke, Kerstin Bernoth and Ferdinand Fichtner

The financial crisis of 2007/2008 and the current “Euro crisis” challenge the current global monetary system. They drastically reveal the actual system’s weaknesses and show the eminent importance of the international monetary system for the stability of markets and national economies. DIW Berlin was commissioned by the Federal Ministry of Finance to research possible alternatives to the existing exchange rate regime. In principle, neither of the two extremes – completely free or fixed exchange rates – is suitable. A mixed system is preferable – with improvements to the status quo, though. An exchange rate regime with few big currency areas, which are linked to each other with flexible exchange rates, should be the aim of reforms. This should correspond to a multi-polar key currency system with the currently dominating US Dollar and the Euro as well as the Chinese Renminbi as most important actors. These developments should be accompanied by substantial improvements in the regulatory framework of the financial markets. Necessary elements are a reinforced global and especially European economic coordination and an internationally agreed-on, assertive financial market authority.¹

¹ This report is based on a comprehensive study on the same topic carried out by DIW Berlin on behalf of the Federal Ministry of Finance. See Belke, A., Bernoth, K., Fichtner, F. (2011): Die Zukunft des internationalen Währungssystems. DIW Berlin: Politikberatung kompakt (currently being published).

Over the past 150 years, the global monetary system has seen a number of varying degrees of links between different currencies (Box 1). Periods of very strong ties between the main currencies of the global economy (like during the gold standard or the Bretton Woods system) alternated (at least shortly) with regimes of relatively high flexibility of exchange rates (mostly after the breakdown of relatively narrow regimes), e.g. after the end of the gold standard in the 1920s and when the intra-European exchange rates became much more flexible following the collapse of the European currency system at the beginning of the 1990s. From a global perspective, there has been a tendency towards more flexible exchange rates in the past years.²

Advantages and Disadvantages of Flexible and Fixed Exchange Rates

The global economic and financial crisis has caused doubts about the existing global exchange rate system. Strong fluctuations in exchange rates, be it between the US Dollar and the Euro or Eastern European currencies, regularly lead to financial market uncertainties, while at the same time fixed exchange rates like between China and the USA support the build-up of massive imbalances. In principle, two extreme forms of exchange rate regimes can be imagined: Full flexibility and a complete fixing of global exchange rates. Full flexibility would hold the advantage of combating global imbalances and the spill-over of economic ups and downs. With flexible exchange rates, a country’s current account surplus leads to the appreciation of the local currency because of higher demand for the domestic currency. This makes exports more expensive on the global market, whereas prices for imports go down from the country’s own perspective. As a consequence, the foreign trade surplus diminishes. An excessive, permanent export surplus of

² The establishment of the European Monetary Union obviously works against this trend.

the type we observe in case of the Chinese economy is less probable in a system of flexible exchange rates.

In many other emerging countries, this connection works the other way around: Based on their high economic growth, domestic demand and imports as well as domestic consumption are strong, causing a high current account deficit, which is mitigated by devaluation.³

On the whole, flexible exchange rates can contribute to an improved resource allocation because of their ability to quickly adapt to new economic conditions. In the role of automatic stabilizers they mitigate international spill-overs of price and cyclical fluctuations, reduce insecurity and, thus, promote investment activity.⁴ Even more so, flexible exchange rates allow for an independent monetary policy⁵ which is able to respond to national economic ups and downs and to contribute to domestic economic stabilization and better framework conditions for economic growth on the whole.

On the other hand, there are a number of reasons for further international stabilization of exchange rates. Even the introduction of a global currency has its followers, even among economists.⁶ The main argument in favor of fixed exchange rates or a global currency is efficiency. Growing international transparency contributes to stronger trade flows and more intense use of the advantages of international division of labor. Furthermore, real economic investment activity can increase, since international investments become more attractive with declining risk premia (because of the end of exchange rate risks). Both connections have the capacity to promote growth, with the growth dynamic in this case resulting from the stabilization of international economic relations in contrast to a flexible exchange rate regime.

³ Examples for such emerging countries with high current account deficits are India and Brazil. China is somehow atypical because of its export-driven growth and the resulting current account surplus.

⁴ See Friedman, M. (1953): *The Case for Flexible Exchange Rates*. In: *Essays in Positive Economics*, University of Chicago Press, Chicago, 157-203. The precondition for mitigated price fluctuations is the endogenous reaction of exchange rates to changed foreign prices. But if exchange rates are understood as a variable which is for example influenced by capital markets, changing exchange rates may also cause destabilizing influence. See also Meese, R.A. and Rogoff, K. (1983): *Empirical Exchange Rate Models of the Seventies: Do They Fit out of Sample?* *Journal of International Economics*, 14, 3-24. They demonstrate that exchange rates fluctuate more frequently than justified by fundamental data.

⁵ The currency trilemma points out that fixed exchange rates are not possible with an autonomous monetary policy and free movement of capital. See the fundamental article by Mundell, R. (1962): *Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates*. In: *Canadian Journal of Economic and Political Science*, Vol. 29, 475-485.

⁶ See e.g. the web site of Robert Mundell, Nobel prize winner in Economics and advocate of a global currency, for a list of academic publications: <http://robertmundell.net/economic-policies/world-currency/>.

The disadvantages of a fixed exchange rate regime or its extreme case – a global currency – can be deducted from the described advantages of a flexible exchange rate system. Especially the danger of excessive current account imbalances is a lot higher with fixed exchange rates. This is especially true when national economies in different stages of development come together.

The French G20 presidency introduced the concept of “Bretton Woods II”⁷ – an effort to remodel the global monetary system named after the 1944 agreement for a post-war monetary order. This concept aims for stronger ties between the exchange rates of the big industrialized and emerging countries. At least G20 members were to agree on exchange rate corridors. But if we look closely, such a regime does not seem beneficial: It would probably hold both the disadvantages of flexible exchange rates and the disadvantages of fixed exchange rates. Exchange rate corridors (in contrast to really fixed exchange rates) do not solve the problem of exchange rate induced insecurity. Short-term fluctuations especially on the capital markets could still lead to sudden reversals of capital flows. The problem of imbalances building up is not solved either. In a world with several economic centers (USA, Eurozone, China, South America etc.), which develop quite differently, such a rigid system is doomed to fail.

Mixed System Still Best Alternative

The status quo regime as a mixed system with the US Dollar as central anchor currency in international trade and capital movement is probably not the worst solution. However, we learn from the developments especially of the last decade, that excessive imbalances between national economies in different stages of development need to be prevented with flexible exchange rates. A (possibly limited) flexibilization of the Chinese Renminbi in relation to the US Dollar would be desirable in order to mitigate the enormous Chinese current account surplus (as well as its mirrored excessive US deficit) through the revaluation of the Chinese currency.

At the same time, the advantages of fixed exchange rates should be used in global trade. According to calculations by DIW Berlin, fixed exchange rates hold significant positive growth effects, especially for industrialized countries. The reason is their strong exposure to internatio-

⁷ The term “Bretton Woods II” is not clearly defined. The name is sometimes also used for the pre-crisis monetary system with the US Dollar as key currency and fixed exchange rates to emerging countries, which showed some parallels to the post-war system. See e.g. Dooley, M.P. et al. (2004): *The Revised Bretton Woods System*. In: *International Journal of Finance and Economics*, Vol. 9, 207-313.

Box 1

Global Monetary Systems before the Crisis

The Gold Standard (1871-1914)

From a historic perspective, the gold standard was probably the most comprehensive international monetary system. Its center piece was the guarantee of stable exchange rates for the conversion of national currencies in gold. In order to ensure this fixed convertibility, the member states of the gold standard were obliged to keep currency reserves. Despite a lack of strict fiscal and monetary targets, the stability-oriented policy of the most important European member states France, Germany and Great Britain guaranteed an overall smooth functioning of the gold standard until World War I.

The Bretton Woods System (1944-1971)

With their accession to the Bretton Woods system, the member states agreed to stabilize their exchange rates to the Dollar and, if necessary, to intervene on the currency markets in order to limit exchange rate fluctuations to a certain margin. As key currency, the value of the Dollar was in turn tied to a fixed gold price. Already in the middle of the 1960s, the growing US deficit did no longer guarantee the gold backing of the US Dollar, de facto turning the Gold/ Dollar standard into a Dollar standard. Over time, different developments of productivity resulted in real distortions of the exchange rates, causing instability in the system.

The European Payments Union (1950-1958)

The European Payments Union (EPU) was introduced in 1950. It guaranteed international convertibility of Western European currencies in the Bretton Woods system. The EPU's core was its payment system, which was based on a multilateral compensation system where surpluses and deficits of all member states were centrally processed through the Bank for International Settlements (BIS). The payment of gold and dollars in the case of a deficit was a financial incentive for export-oriented growth, limited excessive deficits and made structural reforms more attractive.

The European Monetary System

"Snake in the Tunnel" (1972-1979)

In the framework of the so-called "snake in the tunnel", the member states agreed to stabilize the exchange rates of their currencies within a defined corridor. After the oil crises, uncoordinated national fiscal and monetary policies quickly led to diverging inflation rates, and finally also to the collapse of the agreement.

The Exchange Rate Mechanism of the EMS (1979-1993)

The heart of the European Monetary System (EMS) was the Exchange Rate Mechanism (ERM), which limited fluctuations between exchange rates. After the complete liberalization of capital movements in 1986, national monetary policy partly lost its controlling function over macroeconomic developments. When the German Federal Bank raised its interest rates in reaction to the reunification boom, the other EMS states were forced to do the same despite their weak growth, in order to stabilize their currencies in relation to the Deutsche Mark, pushing their economies into a recession. The resulting imbalances finally led to the end of the EMS.

The European Economic and Monetary Union (since 1999)

In 1992, the member states of the European Union (EU) agreed on the establishment of the European Economic and Monetary Union (EMU). For Germany, the EMU is historically unique, since it is the first international currency regime which is based on completely and irrevocably fixed exchange rates, leaving no room for national monetary sovereignty. This means that EMU states with balance of payments problems no longer have the option to influence their deficits or competitiveness through exchange rate or interest rate manipulations. A catalog with convergence criteria was agreed on. Member states fulfilling the criteria are obliged to participate in the common currency. In contrast to the Bretton Woods system or the EMS, there is no key currency which would grant one member state certain privileges.

nal capital and trade flows. Also emerging countries will probably profit from their integration in fixed exchange rates regimes or regional monetary unions, since the resulting greater stability improves their attractiveness for

international investors.⁸ Furthermore, a common supranational monetary policy may find it easier to build up reputation and guarantee independence from natio-

⁸ See Rogoff, K. et al. (2004): Evolution and Performance of Exchange Rate Regimes, IMD Occasional Paper No. 229, International Monetary Fund, Washington, D.C.

nal governments than it would be possible for national monetary policies in emerging countries.

In a long-term perspective one should aim for a global monetary system consisting of several regional currency areas. But for the establishment of these regional currency areas the success conditions of regional common currencies need to be taken into account, as can be found in the theory of optimum currency areas (Box 2). In this context it should also be noted that some important national economies have not yet become involved in economic integration strategies. It would be helpful, if India and China took first steps towards joining a regional integration area or establishing a new one. But above all it must be guaranteed that exchange rate pegs between economic regions which extremely differ in their fundamentals are reduced. One means could be the revaluation of the currencies concerned in a new key currency system. We will enlarge upon that in the next section.

The Question of the Key Currency

At the moment, the US Dollar is relatively unchallenged as key and reserve currency; a major part of international trade and credit transactions are carried out in US Dollar, a big part (61 percent in 2010) of currency reserves of the central banks are held in US Dollar. While the Euro gained importance in the period before the financial crisis (the share of international currency reserves in Euro increased from 18 to 27 percent between 1999 and 2010), the phase of the US Dollar appreciation after the Lehman bankruptcy has underlined the international importance of the Dollar as a safe haven and strengthened its role as most important international means of exchange. Medium-term, a mono-polar international global monetary system with a dominating Dollar is probably going to persist. The reasons are inertia effects, network externalities and the still unequalled size and liquidity of the US financial markets.⁹

China has been one of the advocates¹⁰ for a long-term promotion of the special drawing rights¹¹ (SDR) of the Inter-

national Monetary Fund as central reserve asset in the international monetary system. They have been in use as artificial currency unit since 1969 and could reduce the dependence of the monetary system on the monetary policy of the USA (or other big economic regions).¹² As such, the current very expansive monetary policy of the Federal Reserve Bank causes inflation on the international capital and resource markets because the US Dollar de facto holds a monopoly as trade currency. But if SDR are really to play a global role, deep and liquid markets need be created for SDR – not only through increased issuing by the IMF, but also through the development of a private market for SDR. Furthermore, it is feared that in the case of only vague emission rules the stock of SDR might increase drastically.¹³ This would limit the direct control of the central banks over the circulating amount of money, thus also limiting their sovereignty.

Recently, the role of gold in an international monetary system became again the subject of debate. Theoretically, gold could be a logic store of value for international investors and central banks if trust in the US Dollar is declining. In practice, however, central banks worldwide have drastically reduced their share of gold reserves during the last century. The reasons are clear. Because of its physical properties, gold is considerably less suitable for emergency financial transactions (e.g. purchases of currencies to fend depreciation pressure against the US Dollar or the grant of ‘emergency financial packages’ by the IMF) than monetary means of payment. This applies also to the payment of imports or of interest on foreign debt.¹⁴

A realistic long-term alternative to the current system is first and foremost the establishment of several currencies sharing the role of key and reserve currency. The US Dollar is probably going to lose some of its dominance and the Euro as well as the Chinese Renminbi will very likely gain in importance in the future. Such a process would strengthen the international monetary system at the end of the day, because international investments would be more equally spread and interest rate distortions would be reduced. The emitters of reserve currencies would be compelled to stricter monetary policy dis-

⁹ See Lim, E.-G. (2006): The Euro's Challenge to the Dollar: Different Views from Economists and Evidence from COFER (Currency Composition of Foreign Exchange Reserves) and Other Data. IMF Working Paper WP/06/153, International Monetary Fund, Washington, D.C.

¹⁰ See Zhou, X. (2009): Reform of the International Monetary System, essay posted on the website of the People's Bank of China, 9 April. www.pbc.gov.cn/english/detail.asp?col=6500&id=178

¹¹ SDR are credit lines on currencies of IMF member states. The value of the SDR is based on a basket of the four most important currencies (US Dollar, Euro, Yen and Pound Sterling). It is not a currency in the sense of a means of exchange since there are no private markets for the trading of SDR.

¹² See Dorucci, E., McKay, J. (2011): The International Monetary System After the Financial Crisis. ECB Occasional Paper No. 123; Eichengreen, B. (2011): Exorbitant Privilege – The Rise and Fall of the Dollar and the Future of the International Monetary System. Oxford University Press, Oxford.

¹³ See Cooper, R.N. (2011): Is SDR Creation Inflationary? Report by Richard Cooper, Harvard University, as Independent External Consultant to the IMF, Washington, D.C., January 7.

¹⁴ See Eichengreen, 2011, l.c.

Box 2

The Optimum Currency Area Theory

The Theory of Optimum Currency Areas (OCA theory) lists criteria according to which monetary integration makes sense for national economies. Typically, traditional OCA theory takes the advantages of monetary integration for granted (e.g. higher transparency or lower transaction costs on international goods and capital markets) and identifies conditions limiting the disadvantages of monetary integration – above all, the loss of autonomous monetary policy which could mitigate country-specific employment fluctuations.

Mundell identifies factor mobility as the most important determinant for the cost of monetary integration: He argues that excess or too low demand for labor in the member states of the union can be compensated by migration; thus, stabilizing monetary policy is dispensable if high labor mobility is given.¹

Mundell's seminal work was complemented by additional criteria: McKinnon points out the importance of the degree of openness: The more goods a country imports, the stronger is the influence of international goods prices on the domestic cost of living. Thus, the cost of the loss of national monetary policy is comparably low in this case, since the domestic central

bank has less influence on price levels and employment.² Kenen argues that a high degree of diversification within economies reduces the sensitivity of the member states' reaction on external influences; cyclical fluctuations are mitigated and stabilizing monetary policy is less of a necessity. Other criteria concern the fiscal-policy integration of member states, capital mobility between member states or the population's acceptance of integration.

Recent progress in macroeconomic research tends to challenge traditional OCA theory. Especially the loss of stabilizing monetary policy, which traditionally has been the most important disadvantage of monetary integration, is questionable under the assumption of rational expectations. Thus, more recent work on the OCA theory focuses less on the disadvantages of monetary integration, focusing more on the advantages of the establishment of a monetary union. In many cases, reduced uncertainty on goods and capital markets is identified as the central advantage of monetary integration.³

¹ Mundell, R.A. (1961): A Theory of Optimum Currency Areas. *American Economic Review*, 51 (4), 657-665.

² McKinnon argues strictly Keynesian and assumes that the central bank is free to choose any point on a stable Phillips curve. See McKinnon, R.I. (1963): Optimum Currency Areas. *American Economic Review*, 53 (4), 717-725.

³ Kenen, P.B. (1969): The Optimum Currency Area: An Eclectic View. In: R.A. Mundell, A.K. Swoboda (eds.): *Monetary Problems of the International Economy*, 41-60, The University of Chicago Press, Chicago.

cipline in order to keep the status of reserve currency and the advantages of "exorbitant privilege"¹⁵.

Policy for a New Global Monetary System

A precondition for the transition to a multi-polar monetary system is the establishment of several currencies as international means of payment on the currency

markets.¹⁶ The US Dollar, the currency of the biggest national economic region with the most liquid markets, is going to be the *primus inter pares* in the medium term. The Euro with an economic region of similar importance holds the potential to become more attractive. This will probably take place once the euro zone has solved its debt crisis convincingly. China has already begun to encourage foreigners step by step to use the Renminbi (RMB) for goods and financial transactions.¹⁷ It is likely that this strategy will result in a higher attrac-

¹⁵ "Exorbitant privilege" means the advantage of the emitter of the key and reserve currency to incur debts abroad at low interest rates, since the demand for bonds in the respective currency is quite high. At the same time, assets abroad yield high returns, because the high demand for the reserve currency results in higher interest payments. Another advantage for the key currency country is high money creation profit, since the amount of money in circulation is over-proportionally high.

¹⁶ An international currency is defined as a unit of payment which is globally accepted as contracting currency in trade, as freely convertible unit of account and as liquid investment currency of a well developed financial market.

¹⁷ Stier, O., Bernoth, K., Fisher, A. (2010): Die Internationalisierung des chinesischen Renminbi: eine Chance für China. *DIW Wochenbericht* Nr. 20/2010.

tiveness of the currency for international investors and central banks.¹⁸

In order to make the monetary system less susceptible to the imbalances observed in the past which culminated in the financial crisis, further international coordination of monetary and currency policies is a necessity. It will be crucial that single countries do not try to gain an advantage by manipulating exchange rates or through inappropriate monetary and liquidity strategies. Because of the globalization of financial markets since the 1990s, direct cross-border spill-over effects between national (excess) amounts of money have further increased. Because of international capital flows, increased amounts of money in one country lead to an increase of liquidity in the financial markets of other economies as well. This has also reduced the central banks' influence on the domestic money supply – making an international coordination even more important.

Experiences from the most recent and past financial crises show a clear correlation between capital mobility and crisis probability.¹⁹ If a country's balance of payments suffers from massive in- or outflow of capital, it needs to be checked whether corrective measures like interest or exchange rate adaptations can be introduced. Especially in emerging countries, the development of domestic financial and capital markets must be promoted in order to limit excessive in- and outflow of capital contributing to global imbalances.²⁰ Additional symptom-fighting measures (establishment of big currency reserves, introduction of capital movement controls, currency market interventions) can be helpful from time to time, too. However, they should only be used in addition to interest and exchange rate measures. Above all, a set of rules is required to regulate handling and form of capital movement controls. Based on this set of rules, efficient regulation as well as more effective consulting on the advantages and disadvantages of different intervention instruments would be possible.²¹

18 Other candidates for key currencies are the Indian Rupee and the Brazilian Real. Both economies have to take on major restructuring tasks like China before their currencies can be used internationally.

19 Eichengreen, B. (2004): *Capital Flows and Crises*. Cambridge, London, MIT.

20 See Dell'Ariccia, G., di Giovanni, J., Faria, A., Kose, A., Mauro, P., Ostry, J.D., Schindler, M., Terrones, M. (2008): *Reaping the Benefits of Financial Globalization*. IMD Occasional Paper 264; Kose, A., Prasad, E., Rogoff, K., Wei, S. (2006): *Financial Globalization: A Reappraisal*. IMF Working Paper 06/189; Chinn, M.D., Ito, H. (2005): *What Matters for Financial Development? Capital Controls, Institutions and Interactions*. NBER Working Paper No. 11370; Chinn, M.D., Ito, H. (2008): *East Asia and Global Imbalances: Savings, Investment and Financial Development*. Paper prepared for the 18th Annual NBER-East Asian Seminar on Economics.

21 See IMF (2010): *The Fund's Mandate – The Future Financing Role: Reform Proposals*. IMF Staff Paper.

Conceptual faults of the financial authority need to be abolished, too. The discrepancy between mainly national regulatory authorities and more and more internationally oriented financial markets must be reduced through the creation of new institutions or the restructuring of existing bodies. They should not only monitor national economies, but also check the implications of contagion, synergy and feedback effects and be able to intervene when the need arises. Some steps towards this aim have already been taken: Bodies like the Mutual Assessment Group and the Financial Stability Board by the G20 as well as the IMF/World Bank's Financial Sector Assessment Program were created, which are to develop globally valid rules for financial stability and facilitate the implementation of national reforms for bank and financial market authorities with international support and coordination. On a European level, the Van Rompuy Task Force is currently working on an EU monitoring system for early detection of undesirable developments in the member states and specific recommendations for correction.

However, a reform of the financial regulatory bodies must also take into account that the, in some cases, enormous lack of information on financial and capital market activities needs to be solved. Frequent, detailed and timely publication of important financial indicators for example on payment balances, trade with derivatives, currency market dependencies and cross-border banking activities is essential for an early warning system. In this respect, there is still room for improvements.

It is crucial, however, that risks are not only detected, but that corrective measures can also be implemented better than in the past. The IMF for example should be given better intervention possibilities concerning decision-making processes of the receiving countries. Another central issue is a strengthened regional coordination of financial (and economic) policies. In this context, a stronger economic integration in the euro zone is desirable.

Conclusion: Implications for European Policy Makers

Further regional monetary integration (e.g. in the European, Asian or Latin American regions) with flexible exchange rates between the regions is, as described, the most likely and also the most advantageous scenario for the future international monetary system. Based on the described benefits of fixed exchange rates, European economic policy should in principle aim for an enlargement of the euro zone. This does, however, not mean to repeat the mistakes of the past and accept coun-

tries with highly diverging economic performance. For the future of the EU, an economically homogenous currency area is probably of higher importance than a (still necessary) tightening of the fiscal convergence and stability criteria, since it mitigates the occurrence of macroeconomic imbalances. At the same time, German economic policy should support macroeconomic integration in other economic regions by taking on a mediating and consulting role in this context. Additionally, further global flexibilization of exchange rates should be an aim; in the short-term, this includes mainly the flexibilization of the pegged exchange rate between China and the USA.

The transition to a multi-polar currency system with other reserve currencies besides the US Dollar like the Euro and the Renminbi would probably entail significant advantages for the Euro area countries, since the existing unilateral dependence on the US Dollar on global financial markets could be reduced. From a European perspective, the newly formed monetary dominance of the G-2 (China and USA) needs to be tackled as well. Because of the much more expansionary monetary policy in the USA, this tends to work in favor of an appreciation of the Euro. Once the Euro gains the status of a key currency, stronger global demand for the Euro results in additional seigniorage revenues; in turn, a stability-oriented (and thus growth-friendly) monetary policy is needed to keep them.

In order to permanently establish the Euro as a key currency on capital markets besides the US Dollar, Europe must redesign the rules of the European Monetary Union. A strengthened EU governance framework has to include clear regulations for the handling of fiscal crises and provide preventive measures. Germany, for example, should work for better coordination of economic policies in the euro zone. It is a step forward that, in the framework of the so-called "European semester", EU member countries now need to submit their draft budgets to the European Commission half a year before their adoption. This way, the Commission has more control over possible violations of the stability and growth pact (SGP) and is able to take preventive action if the necessary. The lack of possibilities for sanctions in the case of SGP violations is still a problem, though. Significant improvements are still needed in this field. Realistically, a tightened SGP will only work with a stable European Union, with strong, democratically legitimized institutions and high acceptance among the people. It is only then that we can expect European governments to agree to further coordination and to waive parts of their national sovereignty.

The formation of macroeconomic imbalances inside the EU, as they can be observed in current account imbalances or competitive differences on the labor market, has caused instability in the past. Based on a planned amendment to the EU Treaty, the "proposal for a regulation on the prevention and correction of macroeconomic imbalances", the European Commission is to issue early warnings and propose corrective action in the future. However, there is the risk that the indicators for the identification of macroeconomic imbalances are so vaguely defined that the regulation will be less effective. The German government still has the possibility to influence this regulation to make it more effective by advocating for a clear and detailed list of indicators and threshold values (scoreboard).²²

Additionally, global policy-makers are called to support the stabilization of capital markets – also by assigning clear tasks to the IMF and the G-20. An improved financial authority and financial market regulation, e.g. through new regulations on the monitoring of capital accounts, better publication of financial market indicators and, above all, improved enforceability of proposals correcting undesirable developments, would be first steps towards a crisis-proof global monetary system.

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²² Possible indicators include the developments of current account balances, relative income developments or private debt.

Brazil, Russia, India, China and South Africa: Strong Economic Growth – Major Challenges

by Mechthild Schrooten

Brazil, Russia, India, China and South Africa – the so-called BRICS countries – all show high economic growth rates. They suffered only shortly under the turbulences of the international financial crisis in 2008/2009 and were able to recover quickly – in contrast to most industrialized nations. In recent times of economic fragility in industrialized countries, the BRICS are playing a decisive role for global economic stabilization.

The BRICS countries opt for different catching-up strategies. Although they have experienced remarkable growth rates over the past years, similar income levels like in the most important industrialized countries are still beyond reach in the medium term. Additionally, BRICS states still show considerable deficits in terms of access to education and regarding their health systems. Such infrastructural problems, however, can be important obstacles for future development.

The group of so-called BRICS countries comprises Brazil, Russia, India, China, and South Africa.¹ These states possess quite different economies regarding their history, resources and global economic strategies. However, they have one thing in common: relatively high global economic growth rates and high growth potential in international comparison. In total, over three billion people live in the BRICS countries. With 1.4 billion inhabitants, China is the biggest country, followed by India with 1.1 billion. Brazil has nearly 200 million inhabitants, Russia about 120 million. The smallest country with 53 million inhabitants is South Africa. In comparison: The European Union is home to 502 million people. Within the EU, South Africa would be the fifth biggest country before Spain. On the whole, 40 percent of the world population live in BRICS states. Against this backdrop, these countries are not only important resource suppliers for industrialized states, but also significant sales markets and important economic actors.

Growing Global Economic Importance

The BRICS countries' share in global economic performance is still significantly lower than their share in world population, despite considerable growth over the past years. Their contribution to global production has increased from 15 percent in 1995 to nearly 25 percent in 2010 (Figure 1).² Global economic dynamics of the BRICS countries have been strong for years; this holds especially true in comparison to industrialized countries. The catching-up process has already resulted in a tangibly increased significance of these countries on the global scene. Similarly, the percentage of important industrialized countries in international production is decreasing (Figure 2). The comparative value for the USA

¹ The acronym BRICS was coined by the investment group Goldman Sachs, which saw over-proportional potential for development in these countries.

² Data in purchasing power parity. Data source: International Monetary Fund (2011): World Economic Outlook Database, April 2011.

has gone down from 23 percent in 1995 to 20 percent in 2010.³ Over the same period, Japan's share in global production went down from nine to six percent.⁴ Also for Germany we detect a decline from six to four percent in global production.

Stabilizing Effects during the Financial and Economic Crisis

If we look at BRICS states as a group, we see globally stabilizing impulses during the financial and economic crisis of 2008/2009.⁵ Especially in the cases of the extremely dynamic economies of India and China the crisis did not really slow down their economic catching-up process (Figure 3). India's overall economic growth was even slightly higher in 2009 than in the year before: officially 6.8 percent compared to 6.1 percent. According to official statements, China experienced only a minimal decline in its GDP growth rate in the years of crisis. Brazil briefly suffered a growth cut, but quickly reverted to its dynamic growth path. Considering growth dynamics, South Africa has come in last for years in the group of BRICS countries. Its GDP went down by almost two percent following the economic and financial crisis, but was above the pre-crisis level already in 2010. Russia, by contrast, experienced a strong slump in 2009. By now, its economy seems to be on the mend.

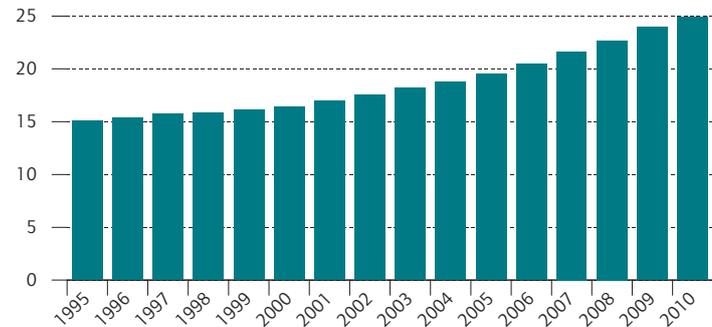
Different Growth Strategies of BRICS Countries

Regarding their economic policy, the BRICS countries prefer different growth strategies. This is mirrored in their respective current account.⁶ China and Russia have been experiencing a current account surplus for years. Especially in China, the export economy is the main driving force for its overall economic dynamic. In contrast, domestic consumption is still at a low level. The resulting high savings ratio makes the country an important net creditor on the international capital market. In Rus-

Figure 1

BRICS Countries' Share in Global Production

In percent



Source: International Monetary Fund (2011): World Economic Outlook Database, April 2011.

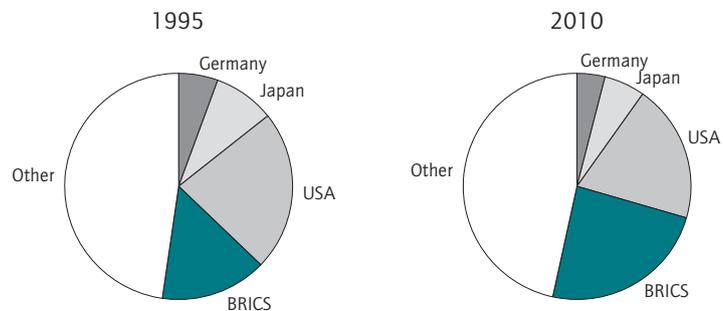
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The BRICS countries' share in global production is clearly increasing.

Figure 2

Share of Selected Countries in Global Production 1995 and 2010

In percent



Source: International Monetary Fund, I.c.

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Industrialized countries are losing importance.

sia, exports of energy carriers play an important part.⁷ Such an export orientation based on natural resources is limited in the long run. Still, the Russian export economy has not yet attempted significant diversification.

In contrast to China and Russia, India's economic growth is massively supported by strong capital imports. Consequently, India currently shows a current account deficit. One reason for this is its exchange rate policy, which

³ International Monetary Fund, I.c.

⁴ In terms of purchasing power parity, China now holds a higher share in global production than Japan. See Erber, G., Schrooten, M. (2011): Japan am Scheideweg - Staatshaushalt bleibt die Achillesferse. DIW Wochenbericht Nr. 31/2011.

⁵ Fichtner, F., Bernoth, K., Bremus, F., Brenke, K., Dreger, C., Große Steffen, C., Hagedorn, H., Junker, S., Kuzin, V., Pijnenburg, K. (2011): Sommergrundlinien. DIW Berlin.

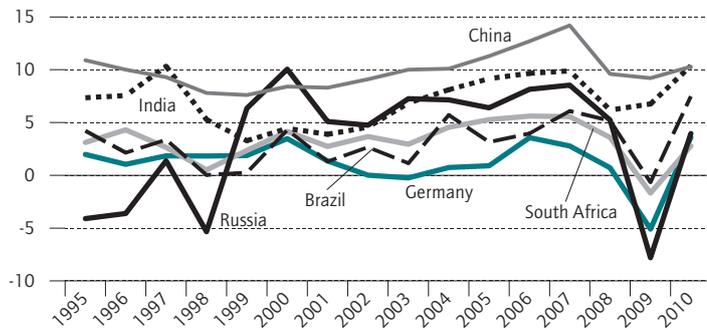
⁶ The current account sums up the balances of trade and service, the income and asset transfer balance and the balance of current dispositions. In contrast, the balance of payments is an indicator for an economy's monetary integration into global economy.

⁷ Engerer, H., Schrooten, M. (2009): Russland im Sog der Internationalen Finanzkrise. DIW Wochenbericht Nr. 3/2009.

Figure 3

Growth Rates of BRICS Countries and Germany

In percent compared to the previous year



Source: International Monetary Fund, I.c., 2010 preliminary estimate.

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BRICS countries had mostly above-average growth rates in the past 15 years.

is more flexible than China's. Unlike in China, foreign investors experience hardly any capital market limitations in India.⁸At the moment there is considerable liquidity on the international capital market looking for attractive investment opportunities in a currently difficult global economic environment. If such capital inflow consists of portfolio investments, there is always the risk that investors suddenly withdraw their capital when the country risk is revaluated. For this reason economic development which is mainly based on foreign capital inflow is considered as risky in the long run. Also Brazil and above all South Africa show long periods of current account deficits. In Brazil, booming domestic demand is the main reason for strong imports. In South Africa, current account deficits are also a result of regional integration contracts, which force countries like Namibia to invest a considerable part of their own current account surplus – and thus their domestic savings – in the neighboring country.

Income Gap to Industrialized Countries still Substantial

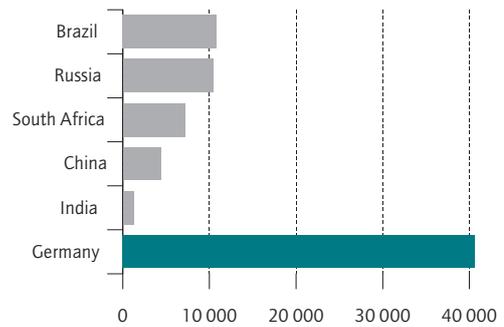
Nominal per-capita GDP according to the IMF was 10,816 USD in Brazil, 10,437 in Russia, 7157 in South Africa, 4382 in China and 1264 in India in 2010 (Figure 4). This shows once again that this group of countries is far from being homogenous. Furthermore, the simp-

⁸ See International Monetary Fund (2011): India: 2010 Article IV Consultation – Staff Report, Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for India. Washington, D.C.

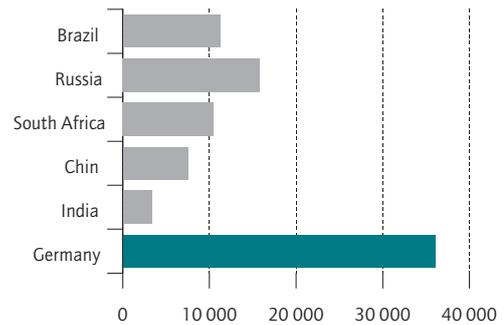
Figure 4

Gross Domestic Product 2010 Nominal and in Purchasing Power Parity for BRICS and Germany

Per capita GDP - nominal in USD



Per capita GDP - PP in USD



Source: International Monetary Fund, I.c., 2010 preliminary estimate.

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The income level of BRICS states is still significantly lower than in Germany.

le comparison of nominal per-capita GDP with Germany (based on IMF data) makes the substantial gap between BRICS states and industrialized countries clearly visible, which hasn't diminished despite their strong growth dynamic.

Assuming the BRICS countries kept their current overall economic growth rates, it would still take decades for them to have similar income levels like the industrialized countries (Figure 5).⁹ For example, Chinese per-capita income would still not have reached the German income level after 25 years.

In order to enable a clearer comparison of income, GDP in purchasing power parity is often used. Taking this

⁹ For this calculation we used the average overall economic growth rate of the years 1995-2010. For Germany, this was 1.3 percent.

into account, the BRICS states take a different order for the year 2010. Now Russia is leading (15,837 USD), followed by Brazil with 11,239 USD. South Africa ranks third (10,499 USD). China comes fourth (7,519 USD), while India once again brings up the rear with 3,339 USD (Figure 4). A comparison of per-capita GDP in purchasing power parity with Germany (2010: 36,033 USD) shows that the income gap between BRICS countries and industrialized countries is still significant. However, it is less striking than in a simple opposition of nominal values.

Development Is More than Income Development

Still, economic development and wealth cannot exclusively be measured with income development and income distribution. It is rather qualitative factors which in the end influence quality of life. Life quality is hard to measure, though – often a satisfaction indicator is used. Measuring problems develop exponentially in international comparisons, since cultural factors have to be taken into account as well. Against this backdrop, the Human Development Index (HDI) becomes more important,¹⁰ as it focuses on quantitative data and offers starting points for international comparison. It goes beyond the orientation on per-capita income and includes other factors like access to education and life expectancy.¹¹ If we include these parameters, the developmental gap between BRICS countries and industrialized nations becomes even clearer (Figure 6).

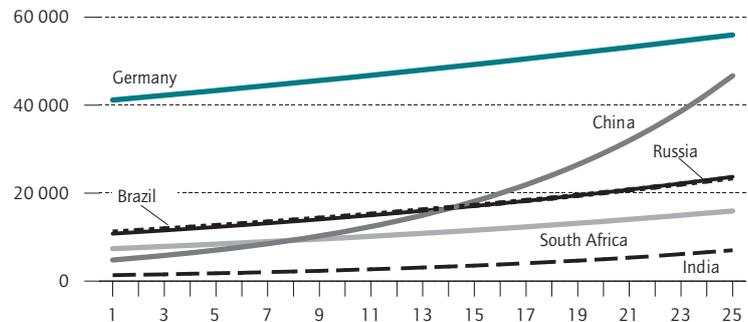
The UN annually publish a ranking of economies and values of these indicators. A total value of the indicator close to 1 means a high degree of development. For years, Norway has ranked first in international comparison. Expenditure on health (public and private) and education (public) of most BRICS countries so far are significantly lower than in Germany, which is about 15 percent of GDP according to the World Bank. This applies most of all to India (health expenditure: four percent, public expenditure on education: three percent). Consequently, the HDI value is low. Public intervention in the fields of education and health provides an opportunity to give the catching-up process a sound and sustainable basis.

¹⁰ The UN have been calculating the HDI for 20 years. The education index is calculated with literacy as two thirds and access to school education as one third. The HDI however leaves out distributional dimensions and gender issues as well as a number of other socially relevant factors. By definition, the HDI has a value between 0 and 1. The closer to 1, the better.

¹¹ The HDI offers an approach to measure the degree of self-realization of individuals in a given economy – the “capability approach”. Sen, A. (1999): *Development as Freedom*. Oxford.

Figure 5

Development of Economic Performance with Continued Past Growth Rates



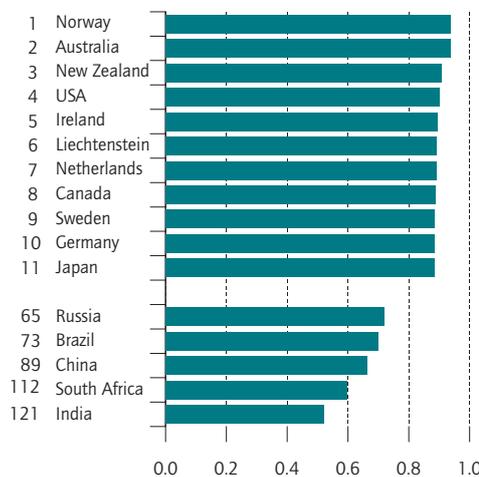
Source: Calculations by DIW Berlin.

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The convergence of income levels with the industrialized countries will still take decades.

Figure 6

HDI of Selected Countries



Source: UN DP (2010): *Human Development Report 2010*. New York.

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The HDI also shows a considerable gap between industrialized countries and BRICS states.

Principles of the human capital theory argue that long-term economic capability of an economy depends largely on the people’s access to education. Indirectly, there is also a connection between human capital and the capability of an economy’s health system: For health not

only influences decisions on education, but also the duration of the ability to work.

Both figures are included in the calculation of the Human Development Index. Education is represented by access to the school system, health by a country's life expectancy. Thus, the HDI not only gives information on the current situation of a given economy, but it also provides clues on its potential for development. The simple ranking of economies already shows considerable need for catching-up for the BRICS states if they are to achieve a similar level like the industrialized countries.

Conclusions

In the current financial crisis, the BRICS countries are stabilizing the global economy. Their weight in global production has significantly increased over the past years – partly due to a relatively modest development in the industrialized countries.

But it is also clear that these countries will still need a lot of time to catch up with the industrialized world when it comes to income levels. This result is also supported by a wealth analysis based on the Human Development Index. In this respect, Russia holds first place within the BRICS group.

The HDI also takes human capital aspects into account and mirrors an economy's potential for development. For the sustainable and long-term promotion of economic growth there are mainly three economic starting points, which are closely connected.

1. Fight against extreme poverty. Income distribution in all BRICS states is strongly asymmetrical. We find few very rich people and a lot of poor people. Such a situation leads to a misallocation of resources. The government is needed to implement a sustainable tax system for redistribution.
2. Access to education. Access to education can in many cases only be guaranteed by a public education system. Equal access to education for both sexes diminishes illiteracy and improves the qualification of employees. Many studies show that the access to education and economic resources for women leads to positive economic effects in general.
3. Health system. Health systems of all BRICS countries are faced with considerable challenges, especially in regard to child and maternal mortality. This is another field where the government is needed to develop and support sound prevention programs.

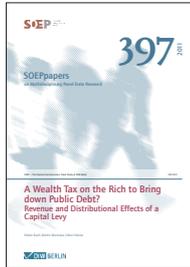
JEL: F02, O15, O57

Keywords: Development, international economic order, human development, comparative studies of countries

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SOEppapers Nr. 397/2011

Stefan Bach, Martin Beznoska, Viktor Steiner



A Wealth Tax on the Rich to Bring down Public Debt? Revenue and Distributional Effects of a Capital Levy

The idea of higher wealth taxes to finance the mounting public debt in the wake of the financial crises is gaining ground in several OECD countries. We evaluate the revenue and distributional effects of a one-time capital levy on personal net wealth that is currently on the German political agenda. We use survey data from the German Socio-Economic Panel (SOEP) and estimate the net wealth distribution at the very top, based on publicly available information about very rich Germans. Since net wealth is strongly concentrated, the capital levy could raise substantial revenue, even if relatively high personal allowances are granted. We also analyze the compliance and administrative costs of the capital levy.

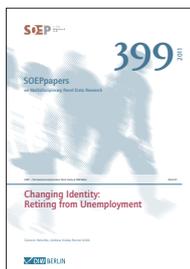
Keywords: Capital levy, wealth distribution, microsimulation.

JEL Classification: H24, D31, H22.

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SOEppapers Nr. 399/2011

Clemens Hetschko, Andreas Knabe, Ronnie Schöb



Changing Identity: Retiring from Unemployment

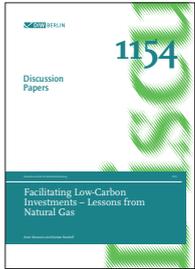
Using data from the German Socio-Economic Panel from 1984-2009, we follow persons from their working life into their retirement years and find that, on average, employed people maintain their life satisfaction upon retirement, while long-term unemployed people report a substantial increase in their life satisfaction when they retire. These results are robust to controlling for changes in other life circumstances and suggest that retiring is associated with a switch in the relevant social norms that causes an increase in identity utility for the formerly unemployed. This is supportive of the idea that, by including identity in the utility function, results from the empirical life satisfaction literature can be reconciled with the economic theory of individual utility.

JEL Classification Codes: I31, J26

Keywords: life satisfaction, retirement, unemployment, identity, social norm.

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Discussion Papers Nr. 1154/2011
Anne Neumann and Karsten Neuhoff

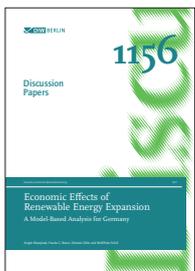


Facilitating Low-Carbon Investments – Lessons from Natural Gas

Decarbonisation of energy and transport infrastructure requires significant private sector investments. The natural gas industry has demonstrated such large scale private sector infrastructure investment over the last decades, typically using long-term contractual arrangements. Are therefore institutional frameworks necessary that facilitate long-term contracting or provide regulation reassuring about future resource streams associated with low-carbon infrastructure – or do factors idiosyncratic to natural gas explain the prevalence of long-term contracts in natural gas infrastructure investment? We identify four reasons for the use of long-term contracting arrangements. The transformation of the natural gas industry and regulatory structure has gradually reduced the rationale for three of these reasons, suggesting that remaining rationale, securing of revenue streams to finance investments has become the main motivation for the use of long-term contracts. This rationale is not idiosyncratic to the natural gas industry, and thus suggests that long-term contracting can also play a significant role in facilitating low-carbon infrastructure investment. We furthermore discuss the role of institutional frameworks necessary for long-term contracting, and identify the significant role governments have been playing in sharing the counterparty risk inherent in long-term contracts.

Keywords: Investment, low-carbon economy, natural gas
JEL: L78, O13, Q58
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Discussion Papers Nr. 1156/2011
Jürgen Blazejczak, Frauke G. Braun, Dietmar Edler and Wolf-Peter Schill



Economic Effects of Renewable Energy Expansion A Model-Based Analysis for Germany

Increasing utilization of renewable energy sources (RES) is a priority worldwide. Germany has been a forerunner in the deployment of RES and has ambitious goals for the future. The support and use of renewables affects the economy: It creates business opportunities in sectors producing renewable energy facilities, but also comes along with costs for supporting the deployment of renewables. This paper analyses and quantifies the net balance of economic effects associated with renewable energy deployment in Germany until 2030. To this end, we use a novel model, the 'Sectoral Energy Economic Econometric Model' (SEEEM). SEEEM is an econometric multi country model which, for Germany, contains a detailed representation of industries, including 14 renewable energy technology sectors. Our results show that renewable energy expansion can be achieved without compromising growth or employment. The analysis reveals a positive net effect on economic growth in Germany. Net employment effects are positive. Their size depends strongly on labour market conditions and policies. Results at the industry level indicate the size and direction of the need for restructuring across the sectors of the Germany economy.

Keywords: Renewable Energy; Germany; Net Economic Effects
JEL Classification: Q43; Q52; C5
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