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80 Years of Business Cycle Studies at DIW Berlin

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1 Introduction

To celebrate its 80th anniversary DIW Berlin organised on 8 and 9 December 2005 a conference centred on two themes. The first dealt with the methods and performance of forecasting. The second discussed scenarios for the future of Europe and its major economies. A selection of the contributions to the conference is presented in this volume.

Section 2 is an overview of the papers in this volume. The following sections deal with the history of business cycle studies at DIW Berlin viewed from the wider perspective of the evolution of forecasting. To do that I first describe in Section 3 the historical context for setting up of the institute in 1925. Then I organize the discussion along the lines of the methods and tools of forecasting which I classify into three broad categories. The period 1925 to 1950 was marked by the search for laws of motion and supporting statistical evidence. This was followed by a period stretching from 1950 to 1990s, described in Section 4, during which statistical information was organized around the concepts of national income accounts and input-output tables. Equipped with well-organized statistics the construction of macroeconomic models, first of the national economy and later of the world economy were developed. The third phase picking up momentum in the 1990s, and discussed in Section 5, focussed more and more on the provision of timely data, raw and transformed, as market participants of a globalized economy, in particular financial markets, need on a daily – even hourly – basis information updates on their Bloomberg screens.

2 Overview

The papers by B. Antholz, U. Fritsche and J. Döpke, and L. Bini Smaghi all deal with forecasting but with very different goals and perspectives. The paper by *Birger Antholz* provides a very detailed survey of the academic evaluations of forecasting performance from the early 1920s to today. Whilst it may well be the case that the precision of forecasting has not dramatically improved, the coherence and timeliness of forecasts have progressed significantly. Also the number of variables forecast has expanded substantially. What has improved is the evaluation of forecasting activity, both qualitatively and quantitatively.

A good example of the latter is the contribution by *Ulrich Fritsche* and *Jörg Döpke*. These authors concur with the mainstream of the evaluation literature in that forecasts exhibit

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very high error margins but they fail to find systemic errors. In other words, at the time of making forecasts analysts use all the pertinent available information. They also show that forecasting errors are correlated with the level and volatility of macroeconomic variables. In particular, the effects of monetary shocks and of monetary policy are modelled very differently by forecasting models and contribute to significantly different results. There is therefore no "uniform" model applied by economic agents, as required by the rational expectations school. Another implication of this finding is that competition among forecasters makes perfect sense.

Monetary policy is stringently dependent on the forecasts of inflationary expectations and of the output gap. Unfortunately, the problems associated with forecasting the output gap are substantial. *Lorenzo Bini Smaghi* demonstrates how forecast errors affect decision making for monetary policy and that the assessments of forecasting risks is as important as the central forecast scenario. He argues that policy-makers are confronted with two sorts of mistaken decisions. Type I error is committed in case recovery takes place but is not adequately forecast. Type II error corresponds in fact to forecasting a recovery that does not materialize. As the cost of type I error increases the larger are the liquidity imbalances accumulated during the early phase of recovery, central bankers have an incentive to minimize error I by keeping excess liquidity at all times as low as possible. This also supports the credibility of the central bank and lowers the cost of error I. By implication, the Central Bank is induced to always under-estimate recovery and not commit error II and then minimize the cost of error I by avoiding a built-up of excess liquidity.

This is however not the full story of the ECB in recent years when the ECB tended regularly to overestimate recovery and thus fell prey to error II. It also failed to minimize the cost of error I, perhaps because it suffered from error II, by not keeping excess liquidity at a minimum, begging the question how excess liquidity is properly defined.

Patrick Artus is concerned by the competition of emerging countries and what that entails for European economies. He shows that the implications are very different for activities that are liable to relocation to low-cost countries, such as manufacturing, and those that are not, such as non-tradable services. Countries such as Germany pursued the strategies of cutting costs and increasing productivity whereas Italy and Spain have developed jobs in non-competition exposed service activities and France is occupying an intermediate position. As a result Germany has been losing more jobs but has preserved higher productivity growth and foreign market shares. The only way Germany can reduce its unemployment is to generate more jobs in the sheltered parts of the service sector.

Daniel Gros addresses the challenges Europe will face over the coming decade. He isolates two in particular: the challenge to digest the new members that joined the European Union in 2004 and those joining in 2007 and to remain open to deeper and wider integration; and the challenge to members of the Euro area that consists in coping with adjustment needs without the exchange rate as a policy instrument.

Gros argues convincingly that EMU is likely to undergo a stress test over the next decade as some member countries have allowed their prices and costs to drift too far away from the mean. He argues that is nevertheless unlikely that this will lead to a break-up of EMU because the stress will be most intense for the weakest members, namely those that can

least afford to leave. He also demonstrates that a strong process of integration deepening will occur over the next decade under the unfolding of two driving forces. One is that the common currency has not yet achieved its full impact on markets and another that the last enlargement was "incomplete" with respect to labour mobility, EMU participation and the Schengen agreement. A key question is whether the larger "old" member states will be able to reform their labour and service markets enough to transform the coming integration challenge into an opportunity.

3 The Creation of the Institut für Konjunkturforschung (IfK)

In 1925 the then director of the Statistische Reichsamt, Ernst Wagemann created and headed in Berlin a new institute, called Institut für Konjunkturforschung. As a responsible producer of statistics he perceived the opportunity of making research use of the data. Economic theory at the time was essentially static and able to characterize short-run or long run equilibriums, although bits and pieces of the cyclical pattern of economic activity were assembled by researchers in many countries. Examples are the widely read works by Aftalion (1913), Juglar (1860), von Tugan-Baranowski (1901). Mitchell (1913) achieved the synthesis between the historical, theoretical and the more statistical empirical approaches and provided the impetus to more systematic studies of the cyclical behaviour of the economy. The empirical studies paid attention to the circular flow of income, filtered out seasonal factors, and searched for correlations among major variables, distinguishing contemporaneous and causal relationships as well as counter-movements. Cycles were identified in foreign trade, in credit allocation and unsold products on stock. Mathematicians like Juglar and Kondratiev discovered wave-like movements in the economy of various time lengths.

To bring together the theoretic and empirical parts of the venture, requiring large teams, institutes for business cycle studies were created in the 1920s in several European countries to better comprehend the cyclical nature of the economy. The first such institute was the Harvard University Committee of Economic Research, founded in 1917 by Warren Pearsons and Charles Bullock. Universities in Europe apparently could not do that job as they saw their mission in nobler, individual, theoretic work and not in data crunching. For different reasons and with a different purpose also in Russia institutes were created to study empirically the laws of the economy as the plan economy started in 1928 and needed instruments for planning.

Wagemann (1928) was looking for a model for business cycle studies that differed from the American and, of course, from the Russian approach. This transpires clearly from the sub-title of his Treatise "Eine Grundlegung zur Lehre vom Rhythmus der Wirtschaft". His logic, which has some present day flavour, rejects the US mechanic, mathematical approach in favour of an organic biologic approach. Instead of searching for a single indicator to capture the cycle he pleads for a battery of different indicators shedding different lights and shades on the cycle.

The first publication of the IfK appeared at the end of 1925, entitled "The world economic situation in 1925". Given the dearth of information of the time this was a precious piece of information. It is also of interest to note that the study was focussed on the world and not the national economic situation. As national income accounts did not exist yet, studies

dealt mostly with specific industries, their outputs, inputs, raw material requirements and with price developments. Trade and financial issues also received continually attention. Views about the future business cycle were offered in very general terms, without quantification. In 1928 the view was offered that after years of pronounced waves of economic activity, the next years were to be expected steadier. Of course, IfK was not the only institution that missed to see the crash of 1929 coming, but the question cannot be suppressed: how good are forecasts? In the same year Oskar Morgenstern finished his habilitation on the subject "Forecasting: An examination of conditions and possibilities" and concluded that neither economic theory nor the statistical tools provided a scientific basis for forecasting. (See Antholz, this volume).

In 1932, one year before his dismissal as President of the Reichsamt and as President of the IfK, Wagemann co-signed a call for expansionary monetary policy. This was highly significant, fore-shadowing Keynesian policy advice, as the general policy response to the world economic depression was to consolidate state budgets and to increase interest rates to "solidify" the economy.

The IfK created outposts starting in 1926, in Essen, centre of the iron and steel industry, Breslau, the second concentration of heavy industry, Munich, Braunschweig, Halle and took over the Österreichische Institut für Konjunkturforschung in Vienna, created in 1926. Several of these outposts have gained independence after World War II and have become prominent institutes in their own right. Starting in 1933 the research output of the IfK declined dramatically and the IfK became an instrument for planning purposes. The name was changed in 1941 to Deutsches Institut für Wirtschaftsforschung.

4 Forecasting in the Post-War Period

Until the early fifties there was no forecasting in the modern sense of the word. The study of the economic cycle was based on indicators on an industry by industry basis, thought however to discern "co-movements", concentrated the analysis on diagnosing the forces at work in the recent past and underlining the potential for future developments. The distinction, still applied today, was between diagnosis and prognosis where diagnosis occupied the largest part and was quantified whereas prognosis was mainly qualitative. With hindsight, this is not surprising as national accounts were not yet available, macroeconomic theory only developing after the war and econometric modelling following with some delay.

In Germany, the DIW played an important role in the elaboration of the statistical instruments needed for macroeconomic work. Since 1953 the DIW provided valuable contributions to the elaboration of quarterly national income data, a service gradually taken over by the official statistical authorities. Until very recently the DIW had however, earlier and more complete estimates.

Work on an input-output model for Germany started in 1951, supported also by industry. The long-standing expertise on sectorial and industrial studies proved very valuable. A complete input-output model became operational in 1966 and was the German input-output model for the following decades until it was also taken over by the official statistical

authorities. As it behoves a research institute, the DIW did the research groundwork, ensured the operationality, and provided improvements until it became a self-runner.

Until the late 1950s the DIW continued to concentrate in its business cycle reports on the diagnosis. Reports were brief (4 pages), verbal and without forecasts. Only in 1960 appeared the first graphs, summary data and forecasts (up to year-end). The national income data were restricted to the user side. This was extended in 1961 to include the production and distribution accounts.

During the early 1960s Germany managed to return to full employment. The first sign of unemployment appeared in 1966 when for the winter of 1966/67 an unemployment of 50,000 was expected with great socio-political concern. This concern generated the first counter-cyclical policy recommendation in the form of increased public investments. These recommendations were well received by the then Minister of the economy Karl Schiller, a university teacher well acquainted with Keynesian teachings, ready to launch demand management under the label "Globalsteuerung". The following years exhibited strong volatility in GDP growth and extremely weak forecasting performance. For 1967 the DIW forecast a growth of 4 percent, but the economy delivered zero growth. A recovery took place in 1968 with growth of 7 percent, under-estimated by over 4 percent. This experience was repeated in 1969 when again growth was very strong with 8 percent with a forecast error of half that size. The first massive Keynesian stimulation programme of the government characterized these years. It took the economic actors and forecasters, not yet equipped with experience of counter-cyclical Keynesian policy, by surprise.

When in 1973 the first oil shock occurred, the DIW like some other institutions refused to make forecasts because the experience with shocks of that magnitude was lacking. But the report offered various scenario evaluations. This was an admirable demonstration of professional honesty. It turned out that the forecasts made just before the oil shock, at least for GDP and consumer price inflation for 1974 were right on the mark. But the full effects of the oil shock materialized in 1975 with a negative GDP growth of 3.5 percent against a forecast of plus 1.5 percent. We seem to do somewhat better in more recent times as demonstrated in the paper by Fritsche and Döpke (2006), comparing the forecast performance of a large group of forecasters, including the DIW, during the last 30 years.

Until 1978 there was no macro-economic model estimated and used for forecasts in Germany. The estimation method consisted in using the national income accounts, making assumptions about world demand, changes in employment and production, and breaking down the changes on the demand side. Consistency was achieved through an iterative process, into which were feed detailed information, including leading indicators and judgemental adjustment to individual components. This has remained until now an important part in the forecasting process.

In 1978 the first econometrically estimated macro-economic model for the German economy became available. The partner institutions of the Joint Economic Forecast Group, in which the DIW is a member since the beginning, developed it.

5 Recent Developments

In a way, forecasting has become much easier, albeit not more precise. The access to worldwide data, the ease of treating data, the speed of communication and the low cost of operating sophisticated models make the job today incomparably easier and professional than before these technological advances. Despite these progresses, forecasting is still characterized by the simple and unavoidable fact that forecasts are often and unavoidably missing the mark, in particular turning points. Forecasts reflect our understanding of how economies work and how they interact with others and our current information. Forecasts are probabilistic statements with large error bands. If a forecaster makes the statement that GDP growth for next year is expected to be 2 percent he really means that this is the midpoint of a fan given by a probabilistic distribution. The outcome may even by outside of that interval because the world is continuously changing in an unpredictable way. There are political crises, wars or oil shocks that are difficult to forecast. In addition the key variables from the financial markets, such as exchange rates or the oil price, are so-called random walks, meaning that the current price embodies all the information available. And still, the current price is a poor forecaster of future prices.

Despite these limitations, economic actors, in particular governments need forecasts to make decisions. How can we possible evaluate any concrete economic situation, or any policy initiative without a view on how the future will unfold? To judge the present we need to assess what it implies for the future.

Forecasters are increasingly successful in at least avoiding inconsistencies with the help of modelling, and in endogenizing more and more relevant variables. In particular, with globalisation and increasing interdependencies among national economies, it became necessary to abandon national models for global ones. This usually exceeds the capacity of a single institution and requires international co-operation. In addition to the national co-operation in the Joint Forecasting group, the DIW, like other forecasting institutions has joined international groups such as EUROFRAME, financially supported by the European Commission. In EUROFRAME, national institutions from several European countries work together to share their national know-how and they use a model of the world economy developed by the British National Institute.

DIW has also entered into partnership with the worldwide largest private provider of forecasting services Global Insight. This cooperation is motivated by a recent trend of considerable importance. Perhaps more important than the demand for analysis has become the demand for instantaneous real-time information on the global economy. Again collection, standardization, treatment and easy access to real-time data provision is costly and characterized by massive economies of scale implying that only few providers can exist worldwide. Therefore there is no point for individual institutions to attempt and produce the data. The only way is to enter into a co-operative agreement and this is what we have done.

Although large-scale macro-economic models are still employed as major tools for forecasting, they are suffering from the Lucas critique. Lucas (1976) pointed out that policy changes affect the behaviour of economic agents and thereby invalidate traditional behaviour underlying the estimation of such models. There are several possible reactions to the Lucas critique. One is to abandon traditional large-scale models and go for dynamic sto-

chastic general equilibrium models that provide micro-foundations based on intertemporal optimisation by rational economic agents in a non-deterministic environment. The price to be paid is a great increase in complexity and therefore a limitation to simple models that are designed for specific purposes. As demonstrated by the new behavioural economics economic agents often behave with limited or bounded rationality. So far, this approach is not yet usable for forecasting purposes but is a very promising avenue.

The other reaction consists in complementing macro models with other techniques such as time series analyses that extract information from data series or factor models that extract from a wide variety of time series explanations of a variable under analysis. Particularly for short-term forecasts (say, next quarter) these are useful techniques.

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