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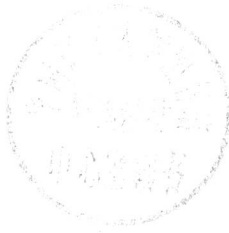
Money, Inflation and Employment

Essays in Honour of James Ball

Edited by

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MONEY, INFLATION AND EMPLOYMENT

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Introduction

This book contains ten essays by distinguished economists to mark the 60th birthday of Sir James Ball. Jim's contribution to the development of econometric modelling in the United Kingdom has been immense. Many of the authors acknowledge the influence that Jim Ball has had on their own thinking about economic policy and the development of macroeconomic models. With Laurence Klein he constructed the first complete model¹ of the UK, using quarterly data and in 1959 published a forecast in the *Bulletin of the Oxford University Institute of Statistics*. Long gone are the days when an academic journal would regard a mere forecast as sufficiently novel to warrant publication. But in 1959 such an event was novel. Because of the scarcity of quarterly data, and the return of Klein to the United States, work on the model was abandoned. By the mid 1960s the greater availability of data and increased computational power made a further modelling effort worthwhile and Jim with Terry Burns put together a small model of the UK economy. This model was then used to produce forecasts and in 1966 they began to be published three times a year in the *Sunday Times*. Of course both the Treasury and the National Institute had been producing regular forecasts for a number of years. But the efforts of Jim and Terry at the London Business School were the first where a completely integrated and computable model was used. After initial scepticism, this practice spread in time to the National Institute, the Treasury and the Bank of England and into the City of London.

One of the features of Jim Ball's early work at the LBS in modelling the economy was that it was not enough to provide forecasts. A regular contribution to the economic policy debate using the model as underpinning was also essential. His influence in changing long held views on the conduct of economic policy is illustrated by Alan Budd in his contribution. It is also attested by the presence of ex-LBS economists at the highest levels of economic policy making. The switch in influence from Oxbridge to London can be traced to his success in building up the reputation of the LBS.

The book is divided broadly into those papers that address aspects of economic policy and those that address technical aspects of modelling and forecasting. However, this is not a hard and fast distinction. There are many overlaps. The contribution by Jeremy Bray, for example, reflects his long standing interest in the application of optimal control methods to economic policy making. As Jeremy explains in his paper, he was instrumental in getting a number of amendments to the Industry Act of 1976 that required the Treasury to, among other things,

make its econometric model publicly available. He also won an agreement that the Treasury would set up a Committee to look into the applicability of optimal control methods. The Committee chaired by Jim Ball duly reported in 1978.

The contribution by Alan Budd provides a nice illustration of the influence that Jim in collaboration with Terry Burns had on the evolution of economic policy during the 1970s and 1980s after the abandonment of the Bretton Woods system and the movement towards floating exchange rates. Many of the issues that were current then still lie at the heart of more recent economic debates. Changes in the nominal exchange rate do not have a permanent effect on the balance of payments. Competitiveness, the real exchange rate, depends in the long run on real factors. A similar theme is also taken up by Bill Robinson and expanded on in the context of the effect of North Sea Oil on the British economy.

The econometric aspects of the effects of a change in the nominal exchange rate is taken up by Keith Church and Ken Wallis who look at the extent to which the price and wage systems in a number of econometric models deliver long-run homogeneity and therefore make the real exchange rate independent in the long run of changes in the nominal exchange rate.

A number of papers in this volume demonstrate the extent to which the problems facing economic modellers evolve over time. Few would have anticipated when the first models were constructed that unemployment would become such a seemingly intractable problem. Robert Coen and Bert Hickman provide a study of UK unemployment and look at the role of real wage rigidity and effective demand. Expectations have always been a key element in any model, and Jim Ball was always very conscious of the key role of expectations for understanding macroeconomic events. But the rational expectations revolution of the 1970s changed radically how they are treated. David Currie and Steven Hall provide a survey of how modellers have sought to endogenize forward looking expectations in order to bring empirical macroeconomic models closer to what microeconomic theorizing implied about behaviour. However, it is difficult to treat expectations without also addressing the nature of uncertainty. Laurence Klein takes up this theme and examines the effect of uncertainty on decision-making and how uncertainty can be handled with econometric models. When forecasting with macroeconomic models it has been the practice to produce the actual forecast by combining the outcome from the model with other auxiliary information as well as judgement. This practice of intercept adjustment is examined from a theoretical perspective in the contribution by David Hendry and Michael Clements as part of an effort to provide a theory of economic forecasting and to understand clearly the conditions under which intercept adjustments will improve a forecast.

Jim still remains an active teacher and researcher while also acting as Chairman of Legal and General and a director of numerous companies. May he continue to do so for many more years.

Note

1. The claim for constructing the first macro-model of the UK economy goes to Radice (1939). However, his model was very rudimentary and amounted to only four behavioural equations and two identities.

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PART I

QUESTIONS OF ECONOMIC POLICY

1 The game of managing the economy

Jeremy Bray

The Ball Committee on Policy Optimization

The origins of the Ball Committee on Policy Optimization are not well documented. ‘Yes, Mrs Butler’ were the only words spoken in the House of Commons on my amendment to the Industry Bill 1975, which opened the way. They were my reply to the Chairman of the Committee, when asked if I wished to move formally a new Schedule to the Bill. The Schedule required the publication of Treasury forecasts and access to the Treasury model, and the statement of policy priorities by the Treasury.

The Industry Bill provided the statutory basis for the industrial policy of the 1974–79 Labour Government, with its apparatus of planning agreements between the Government and individual firms. I felt that if firms were to be encouraged to set out the basis of their plans, government should do likewise – a sentiment which commended itself as much to the Conservative Party in opposition as it did to all back-bench Labour members of the Committee on the Bill, as recorded in the votes of the Committee. The Committee stage of the Bill ended in some confusion with Prime Minister Harold Wilson switching Trade and Industry Minister, Tony Benn (the prime architect of the policy) with Energy Minister, Eric Varley, who was put in to emasculate the policy. My Schedule slipped through undebated, as it did in the Report stage on the floor of the House. Here, the Government attempt to remove the amendment was defeated, with a large back-bench Labour revolt supported by the Conservative opposition. Had I been able to explain policy optimization to the House of Commons at that time, I doubt if it would have reduced the time Britain has taken painfully to move towards viable principles of economic policy.

The House of Lords did at least have a debate (28 July 1975). Roy Kahn said he thought my amendment was a Conservative initiative to discredit the Bill or to expose the Treasury to public ridicule. That was mild compared with Thomas Balogh’s characteristic reaction in the lobby after the debate: fortunately he was gagged in the debate itself because he was a Government adviser at the time.

Years later I asked Nicholas Kaldor (out of the hearing of others) why, to elucidate a point he had been arguing, he did not use control theory, which had become a part of the tool kit of any bright economics graduate student. He replied simply, ‘You cannot teach an old dog new tricks’.

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Since old dogs are nearly as good at old tricks as young dogs (Rabbitt *et al.*, 1992), the lesson is to learn new tricks young. That Professor Ball did. Klein and Ball, Hazelwood and Vandome (1961), published when Ball was 28 years old, was for me as for many others my introduction to the empirical macro-economic modelling of the British economy.

The clauses on the Disclosure of Information in the final Industry Act were drafted one afternoon by Harold Wilson himself, as he told some of us with glee at dinner in the House that evening. His intention was so to hedge about the requirements on firms to disclose information as to make them inoperable. All Part IV of the Industry Act 1975 on the Disclosure of Information has since been repealed except for my amendment which governments of both parties have allowed to stand, like the smile on the face of Lewis Carroll's Cheshire cat.

My original New Schedule required the Treasury to maintain and provide access to a macroeconomic model; and to publish forecasts on alternative assumptions, an ex-post analysis of forecast errors, and estimated standard errors both of current forecasts and of the effects of changes in policy instruments. The intention of this part of the Schedule has more or less been maintained by the Treasury, but without a full model base forecast, and with such operational difficulties in running the model as to deter all but the most determined outside users. Access to the model cannot be said yet to have played any major part in debates on public policy, although it appears to have had an effect on the quality of the Treasury model.

The publication of the Treasury forecast has become a regular part of the Chancellor of the Exchequer's Autumn and Budget Statements, but it is published only in outline, with no consistent full model solution. In this respect the Treasury has not fulfilled my intention in the original Industry Bill amendment, and my understanding of what I agreed with Paymaster General, Edmund Dell, at the time. But the Treasury has offered a stiffer stick with which people can beat its back than I intended, by publishing only one forecast instead of forecasts on different assumptions.

My original version of the Schedule also contained the following paragraph:

3. The Treasury shall state on behalf of all Ministers of the Crown, the priorities in quantitative terms which the Government attaches to a marginal improvement in each macroeconomic variable, indicating thereby the trade-offs the Government will in future seek to make in adjusting the level of policy instruments.

This instruction to the Treasury to specify priorities that could be used in policy optimization was more than Treasury ministers could stomach, and Edmund Dell was deputed to do a deal with me. Had I refused, Treasury ministers would have dug in and thrown out the amendment altogether. I agreed to the omission

of paragraph 3 from the revised text of the Schedule moved by the Government in the Lords, in return for the setting up of a Committee on Policy Optimization under the Chairmanship of Professor R.J. Ball. The Committee may have been justified in its view that, 'rather than setting up *ad hoc* Committees on technical questions it would be better if the Treasury contained within itself, but open to the outside world, a capability to assess new ideas such as optimal control as they are produced' (Ball Committee, para. 43). But to be fair to the Treasury, Parliament had not left it that option.

Ball was a natural choice for Chairman, when Edmund Dell put it to me. Following his early work with Klein, he had initiated the London Business School (LBS) model as the first macroeconomic model to produce regular forecasts of the UK economy.

I had first encountered Treasury forecasting when John Boreham, whom I had met in 1961 at Richard Stone's first presentation of the Growth Model at Cambridge, invited me as a new MP in 1962 to have lunch with the core of the interdepartmental forecasting team. (It is difficult to imagine that happening today in these days of open government.) The core consisted at that time of Wynn Godley and Patricia Brown from the Treasury, and John Boreham from the Central Statistical Office. The methods seemed to me capable of improvement.

Later, after the 1966 general election when I became a junior minister in the Ministry of Power, I asked for and got the papers of the Official Cabinet Committee which produced the forecast, of which only a bowdlerized version went on to ministers. In the wake of the discovery of gas and the prospects of oil in the North Sea, I urged a full fuel policy review, despite the superficial job published by the Ministry of Power just before the election. The idea of a fresh review won the enthusiastic support of Robert Nield and John Hunt from the Treasury. So the Treasury may have been more ready to listen when I suggested that they should follow up the modelling lines opened up by Ball in the UK. Ball was invited to sit in on a Treasury round estimating the effect of a tax change, and to model the process. This led to the Treasury decision to build its own model, developed from the LBS approach.

Ball had been following the work on the use of control theory methods in empirical macroeconomics by the misnamed Programme of Research on Econometric Methods, which I had proposed and helped to launch in 1971 at Queen Mary College with Maurice Peston and John Westcott. The project moved to Imperial College as the Programme for Research in Optimal Policy Evaluation, and continued for 20 years. Its optimization methods or similar methods were adopted by all the main UK modelling teams. (See, for example, Rustem *et al.*, 1978; Holly *et al.*, 1979; Rustem and Zarrop, 1979; Zarrop *et al.*, 1979; Rustem, 1981; Artis and Karakitsos, 1983; Holly and Zarrop, 1983; Karakitsos and Rustem, 1984; Becker *et al.*, 1986; Rustem, 1986; Paraskevopoulos, *et al.*, 1991.)

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I urged that the Committee on Policy Optimization should include economists and control theorists with actual knowledge and experience of policy optimization on economic models, and recommended specifically Gregory Chow, David Kendrick and Karl Astrom. But the Treasury was too chauvinist to consider foreigners. Of the Committee appointed, only David Livesey had any experience of policy optimization on an empirical macroeconomic model, the other members being Tony Bispham, Gwyllim Jenkins, James Mirrlees, Michael Posner, Denis Sargan and David Worswick. Gwyllim Jenkins, with George Box, had made a major contribution to empirical time-series analysis rather than control, but this was in fields other than economics and before the days of vector autoregressive analysis, so Jenkins was suspected by economists. Denis Sargan was an accomplished econometrician.

The Committee conscientiously sought evidence, and Ball and Livesey met most of those working in the field on a visit to the United States. But it did not grasp where the problem lay.

Given a description of the problems addressed by policy optimization, politicians can see themselves as born policy optimizers. As the policy optimizer might say: 'We live in an uncertain and changing world. We do not know where we are or what awaits us around the next corner. We cannot ask the world to stop while we work things out. There is much that we would like to achieve, though priorities have to change with circumstances. Our task is to use our insight, knowledge and experience of the world to decide the direction, size and timing of the next steps. Whatever we do has many effects, some good, some bad. We have always to keep in mind how others will react, but we cannot make ourselves the servant of any particular interest.'

'That sounds right,' says the politician, 'I'll buy it.' 'Well then,' says the policy optimizer, 'this is my stochastic model, this my way of updating it to take account of your experience and your problems. Now what's your objective function? All right then, your priorities? Well, all right then, it doesn't make very much difference what you say. If you want to survive, this is what you'll have to do.'

'Where will that get us then?' 'It's impossible to be sure. This is the most likely outturn, but one thing is for sure, and that is that it won't happen just like that. It may be better, or it may be worse. I'll tell you what to do next when we get there.'

'Well stuff that,' says the politician. 'Fred here tells me it's all right to do this. I cannot please everyone, and I will just have to make up my own mind.'

'Sorry, then,' says the policy optimizer, 'when we try to climb out of the ditch you are about to land us in, your priorities will have to be rather more brutish.'

It is the considerations that make policy optimization difficult to apply that also make it essential.

The final conclusion of the Ball Committee (1978, para. 44) was that: 'an optimal control framework would push in the direction of encouraging a more coherent approach to economic policy making and its public presentation'.

The Ball Report anticipated that the technical problems of policy optimization would not be difficult to overcome, and so it proved. Given the technology of the time, to install such a framework would have required perhaps a doubling of the size of the economic modelling teams, and strong leadership. Since then there has been a formidable development of economic and econometric theory and methods, in policy design and analysis, and in available computing power: the work needed could now be done with no additional resources.

The Committee, however, missed an opportunity to establish economic policy-making methods at a political and technical level which could have saved Britain from major economic policy mistakes in the 14 years which followed.

The Committee was justified in the diffuseness of its recommendations by the general tenor of the evidence it received. But it is not by the general tenor of the evidence that such a Committee has to work. It can work by rational argument, insight and analysis.

The next major economic Report on which I had more influence, the Treasury and Civil Service Committee (1981) Report on Monetary Policy, had more impact on economic policy, pointing to the inadequacy of money supply targets and the necessity of taking into account the exchange rate. It may have been less easy for a professional committee like the Committee on Policy Optimization to have been as specific as a select committee. Many individual economists, however, including Ball and Burns (1976), were quite specific at the time.

On the face of it the failure of the Committee on Policy Optimization to anticipate the fashions and avert the policy mishaps of later years lay in the methodological conservatism and narrowness of experience of the economists of the day, and the philistinism of Chancellors of the Exchequer. However the real cause may lie in the kind of policy game that economists and politicians are able to play, given their capabilities and interests.

Ensuing diversions

Old fashioned Keynesians, who had never dreamed that they were policy optimizing, were like the Bourgeois Gentilhomme, somewhat bemused when they were told by Lucas (1976), that they had been policy optimizing all their lives. Their alleged error was that they thought it a game against nature, not against rational agents who would change their game in response to whatever government did. The monetarists sought to tie up politicians with simple rules so that economic agents could be free to play their own games uninterrupted. But that did not work. Structural changes bedevilled the money supply equations when monetary targetry was pursued seriously in the UK in the early 1980s.

There were also more fundamental considerations. In the heady atmosphere of the rational expectations revolution, Kydland and Prescott (1977) proclaimed: 'We conclude that there is no way control theory can be made applicable to economic planning when expectations are rational'. But as Lucas and Sargent (1981, Introduction p. xxxvii) soon pointed out, to obtain time-consistent plans, Kydland and Prescott in effect computed a Nash equilibrium of a differential game. Far from being able to consign Riccati equations to some bonfire of control theory, they have to be solved for each agent, not just for the Chancellor of the Exchequer! Lucas and Sargent acknowledged that time inconsistency arose from the nature of the game being played. Play a different game, and nobody worries about requiring time consistency. There is no time consistency in bridge.

The fault of the Lucas critique, if there was any, was that it did not go far enough. It did not concentrate attention on the games being played.

The nature of the game

Politicians prefer bridge. You may not know all the facts, but at least you know the cards in your own hand, how to bid and how to read the other bids. The bidding is soon over. Play begins with more evidence, with possibilities of misunderstanding, but moves are soon made, and tricks won or lost. Then round again.

What are the features of bridge that politicians can cope with, and of economic policy-making that they cannot? First, bridge is explicitly a game with recognizably conflicting objectives, in which each player is equally informed about different sets of information.

Within the game, the bridge player can be far sighted, of broad vision, committed and firm. If the economic management game is constructed correctly, can the politician be so too?

A decent game depends on finding partners of the same size and skill. In the game-playing of economic agents in modern microeconomics, the agents are at least of commensurate size in oligopolistic markets, with the individual agents able to affect each other. This has been treated in a wide range of situations (Tirole, 1988). Economic management in a multi-party democracy, and between countries, is likewise a game between agents of commensurate size, and able to affect each other.

In a game between Celtic and Rangers, the supporter in the crowd, with his own personal game, is every bit as engaged in the big game as the economic agent is in his national economy.

Is it possible that we would do better to see economic management as the multi-level game that it is?

The nature of games is that they are man made, with man-made rules. Football did not have to wait until the elasticity, ballistics and aerodynamics of spherical or ellipsoidal balls had been adequately described, the speed and weight of players