Economic Modelling at the Banque de France

Financial deregulation and economic performance in France

Edited by
Michel Boutillier and Jean Cordier

ROUTLEDGE

ECONOMIC MODELLING AT THE BANQUE DE FRANCE

What are the results of a pro-European economic policy in the context of financial deregulation?

Economic Modelling at the Bank of France gives the reader the opportunity to get information about the French economy straight from 'the horse's mouth'. Economists at the Banque de France analyse causes and consequences of French monetary policy and financial deregulation during the 1980s. Using the latest econometric techniques, they demonstrate a consistent strategy which may be worth understanding by other European countries.

This volume draws together a collection of complementary essays—never published in English before—which use a variety of different research techniques and:

- Show that the widening of the financial markets makes it relevant to model the financial assets of households and insurance companies using portfolio choice theory;
- Explain how the French economy has deepened its integration into Europe and the world economy by investigating the factors of foreign trade, foreign direct investments and Eurorates;
- Assess the overall impact of changes in interest rates and financial regulation on the macroeconomic stance through macroeconomic simulations and model structure analyses.

The reader is given a valuable insight into the French economy using applied econometrics; those with a special interest in financial regulation in the context of Europe will find this to be a comprehensive and authoritative analysis of a successful economy.

Michel Boutillier is Professor of Monetary and Financial Economics at the University of Evry-Val d'Essonne and consultant at the Banque de France. Formerly, he worked as an economist at the Banque de France.

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ECONOMIC MODELLING AT THE BANQUE DE FRANCE

Financial Deregulation and Economic Performance in France

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PREFACE

André Icard[*]

This book has been written by the team in charge of modelling and economic forecasting at the Banque de France.

I am very glad that the work undertaken in this project is now being published. First of all, I have had the pleasure and the intellectual stimulus of benefiting closely for several years from the wide experience and knowledge of the contributors. A second reason, at least as important as the first, is that the opportunity of publishing this book offers some compensation for one of the biggest constraints imposed on them. Being a central bank econometrician is not always as rewarding as it should be: the predilection for discretion which is an innate characteristic of all central banks means that economists working there generally produce much more for internal needs than for an external readership. This contrasts with academics and economists working in other institutions, who can usually publish more easily and, are sometimes not immune to the temptation of publishing even more than they perhaps would have wished!

I am therefore very pleased that this book will be able to give a wider public some insight into the intensive work undertaken in recent years by this modelling team within the Banque de France. This work opens the door on a number of issues which, in my view, may be of great interest to many people. That interest goes without saying for the restricted circle of macroeconometricians, but I hope it will be shared by the much broader group of economists interested in the French economy and its evolution over the last fifteen years.

The former will certainly discover new aspects of modelling and new practical applications mainly developed in the framework of the macromodel of the financial sphere (MEFISTO). The development of this macromodel and its linkage with the Banque de France model of the real domestic economy has created an analytical tool which is unique in France. The book gives some indication of the remarkable innovation which this marks in the

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field of modelling at the Banque de France, and I can testify to the assistance which this new instrument has provided in the formulation of monetary policy.

From a more general point of view, the book contains many elements of analysis on the way in which the French economy and in particular its financial sector behaved during the period of so-called 'competitive disinflation' implemented since 1983.

Many important insights can be gained from the macroeconomic analysis presented in the book. I shall cite only a few of them here:

- the improvement in export dynamics which started to materialise at the beginning of the 1990s and which has since been clearly reflected in the rapid growth of the French trade surplus;
- the strengthening of competitiveness in terms of both price and non-price advantages, together with the greater ability of the French exporting sector to protect itself against exchange rate variations in the definitions of its export price policy;
- clarification of the fact that the real interest rate rise which occurred in the 1980s was not specific to France and that the rise generated by the foreign exchange constraint in addition to the international trend imposed on all developed economies in any case was ultimately small;
- confirmation that a different policy from the one pursued since 1983 (involving a stimulation of demand) would have fuelled inflationary pressures and would have generated unbearable pressures on the external side, in terms of both trade and foreign exchange, for only a modest gain in terms of business activity and employment.

The book also gives a fairly broad description of the changes which occurred in the structure of the financial sector in the behaviour of the financial agents as a reaction to the long-standing policy of competitive disinflation.

To conclude this short preface, I should simply like to express to the authors my congratulations on the high scientific quality and analytical clarity of this very informative book.

INTRODUCTION

Michel Boutillier and Jean Cordier

Economic Modelling at the Banque de France is a collection of complementary analyses carried out in the early 1990s, which aim to assess some of the major economic developments that occurred in France during the 1980s.

Since the mid-1980s, the French economy has had to respond to two major challenges at the same time. First, it has participated in the world-wide phenomenon of the vigorous development of financial operations. Secondly, and simultaneously, it has worked to improve its overall level of integration in the world economy. In particular, it has strengthened its European links and has helped ensure the stability of the Exchange Rate Mechanism (ERM). Facing up to these two challenges has necessarily had important consequences for France's macroeconomic situation, the primary concern to the economists at the central bank.

A major aim of their work has been to assess the macroeconomic developments which dominated the 1980s. In so doing, they made extensive use of time series techniques, which have come a long way since the mid-1980s. A particular debt is due to all the econometricians who have done so much to reconcile economics and statistics, by dealing with the difficult, but unavoidable, use of non-stationary series.

This book provides examples of the macroeconomic assessments that were carried out. Chapters 1, 2 and 3 deal with the financial developments that made headlines in the 1980s. In developing a full macromodel of the financial sphere (MEFISTO), particular attention was paid to the extent to which it is possible to refer to portfolio choice theory. In the first two chapters, the relevance and convenience of the portfolio choice theory for modelling the financial investments of households and insurance companies is demonstrated. Conversely, it was decided that this theory was not suitable for assessing banks' behaviour, which forms the subject of the Chapter 3.

Chapters 4, 5 and 6 help the reader understand the deepened integration of the French economy in the world economy. The relevance of alternative models has been econometrically tested on foreign direct investment and foreign trade, and the results are presented in Chapters 4 and 5. Foreign direct investment behaviour appears to be driven by industrial determinants, rather than by strictly financial ones. Where foreign trade is concerned, it appears that price competitiveness alone cannot account for the improved performance of the French economy; non-price competitiveness also has played its part in the progress recorded in French foreign trade. The French economy has thus largely accepted the rules of international competition and European monetary integration. As a counterpart, France has sought to operate within the framework of a stable exchange rate grid. Thanks to France's determined defence of its position in the European Monetary System (EMS), this has been partly achieved through the ERM, defence of which has implied a closer relationship between domestic interest rates and international rates, especially those of Germany. The extent to which the connection with foreign interest rates has been strengthened is assessed in Chapter 6.

Finally, Chapters 7 and 8 appraise the overall influence that the financial deregulation in the French economy has had on its macroeconomic stance and on the techniques for assessing it. Simulations have been carried out with MEFISTO and the econometric model of the Banque de France in order to evaluate the macroeconomic and macrofinancial effects of both the change in the monetary regime and the financial innovation of the mid-1980s (Chapter 7). Chapter 8 analyses, from a technical point of view, the modifications that have had to be made to the macroeconometric model to take into account what has been learnt about the structural changes in the financial sphere.

What follows is a more in-depth look at each of the different chapters.

* * *

Chapter 1, by Jérôme Henry and Marielle Phélipot, presents a wide range of up-to-date econometric attempts to estimate portfolio choice behaviour by French households. The paper discusses plausible specifications that aim to explain the share of low-risk assets (ranging from bills and deposits to bonds) in the financial portfolio of households. It begins by presenting some univariate results, the most interesting of which was an error-correction model. The core of this model is a cointegration relation between the relevant share, the spread between the returns on low- and high-risk assets, the inflation rate and the real income. A full multivariate analysis is then carried out, using Johansen and Juselius maximum likelihood techniques. The number and type of cointegration relations are found by progressively increasing the order of a VAR model, by adding inflation, and then real income, to a basic bivariate process that includes the asset share and the spread of returns.

This provides the authors with an opportunity to discuss the usefulness of inductive research of the Johansen kind. Having tested the possible linear restrictions with and without trend, the authors finally obtain two cointegrating vectors: one close to the result of the univariate analysis and the other formed from return spread and inflation, with a negative coefficient. Finally, the authors estimate a two-step error-correction model, the long term of which is derived from both FIML long-run relations: the linear combination of the two error correction terms is very close to the long-run relation obtained in the one-step univariate estimate. Moreover, the authors found that the system could be termed 'long-run recursive': inflation is 'long-run exogenous' with respect to the two long-run relations; the error term of the relation between returns and inflation 'causes' relative return, and it also 'causes' real income; the long-run values of inflation, relative return and real income finally 'cause' the asset share through the feedback from both long-run relations. Such a deep insight into the statistic induction nevertheless fails to provide estimated parameters with as much accuracy as might have been hoped. Accordingly, there may be difficulties in identifying the short-run and long-run influences of variables. It is encouraging to think, however, that a degree of theory is still needed in order to calculate the relative weights of the long-run variables.

On the other hand, modelling developments of the 1980s highlights another difficulty which has often been neglected. Indeed, there have been very few attempts at modelling financial agents, but with the increase in financial operations, a new examination of this issue became necessary. The tremendous development of financial markets gave rise to the idea that the current scale of banking activity might have reached its own limit. The belief was that the increase in financial market activity created much more scope for portfolio choice behaviour to expand, and that less attention could be paid to the specific features of standard banking intermediaries. The early 1990s show the extent to which this belief was exaggerated. In practice, much of the previous development of the asset markets had been financed by banks, often through risky speculative activities. The theory is now very much concerned with the specific nature of the credit market, and especially the problems caused by asymmetric information. In practice, at a macroeconomic level, there is a very simple distinction: on the one hand, non-monetary financial intermediaries may well behave according to the portfolio choice theory; on the other hand, this is not generally the case with banking firms. In both cases, there are still powerful institutional factors that need to be taken into account.

The second chapter addresses the question of French insurance companies. In this chapter Roland Ricart has produced an original quantitative assessment. Prior to this study, few comparable trials had been carried out at a macroeconomic level, in spite of the boom in insurance company activity. This is because econometricians had been reluctant to deal with a development that had commonly been considered as exogenous by French macroeconomic model-makers. Indeed, the growth in activity in this sector was due to tax incentives and financial innovations. Nevertheless, the consequences had to be appraised, especially as regards the structure of the financial assets. Ricart's chapter constitutes an overall assessment of this subject and combines portfolio choice theory and an in-depth study of the actual practices of French insurance companies. It demonstrates that, in spite of institutional constraints, insurance companies do have an aggregate utility function that includes asset returns and the level of financial risk, i.e. the volatility of the returns. Moreover, the asset shares in the portfolio depend on inflation, which, as is often the case, has two complementary effects: first, it is not evenly reflected in the return of every asset, and thus has an impact on the real relative returns; secondly, it generates a real cash balance effect. In addition, the paper provides us with two further insights. It shows that correlation between wealth and risk aversion is unlikely where insurance companies are concerned. It also reveals that innovation in the financial markets has not changed insurers' investment behaviour: in particular, the introduction of new money market assets, which is taken into account as a diffusion process, does not appear as an explanatory variable. All in all, French insurance companies behave according to the portfolio choice theory, as do mutual funds and other non-banking intermediaries.

The third chapter takes a brief look at French banking firms, which had to cope with a wide-ranging transformation of their working environment in the 1980s. Jean Cordier, Pascal Jacquinot and Dominique Plihon have tried to assess the extent to which this might have changed their assets and liabilities management. They begin with a reminder that, from a macroeconomic point of view, it is rather difficult to think of bank balance sheet management in terms of pure portfolio choice theory. Two main reasons are advanced for this: first, a bank is involved in the complex process of producing joint financial services for its customers; secondly, the risks generated by these financial transactions are not measured simply by the volatility of the returns. The authors therefore consider that banks have to simultaneously fund a net customer position and hedge the different risks included in this position. Leaving aside interest-rate risk, which is largely ignored at the macroeconomic level, they have focused on the insolvency and illiquidity risks contained in claims on customers. For practical and prudential purposes, banks hedge these risks by issuing long-term resources, shares and bonds. In France, it has been possible to estimate a relationship where the share of claims on customers funded by long-term resources is explained by two factors. On the one hand, there is the spread between the yield on claims and the cost of the long-term resources. On the other hand, there is some measure of the risk, i.e. the real interest rate (for the marginal risk) and an insolvency ratio (interest flows paid by firms on their gross operating surplus as an average risk indicator). With regard to the equity position, it seems that the net position, which is taken into account in the computation of prudential ratios, is managed through the size of the equity portfolio rather than through issues. Thus, it has been estimated that the size of the equity portfolio, as a percentage of banking assets, simply depends on the ability of French banks to generate cash flow and on the long-term yield on shares. It therefore appears that bank liquidity constraints are eased by bond issues or by short-term refinancing by the central bank. Equity ratios, which are supposed to hedge insolvency risks, are improved mainly by the cash flow. The same is true of the ability of banks to fund firms with equity.

Chapters 4–6 deal with the international immersion of the French economy. As the fourth exporting country in the world, France is a widely open economy. Its world trade relations changed in the course of the 1980s. On the volume side, external trade has been affected by emerging forms of competitiveness, and is now backed by direct investment to an extent not seen in France since 1945. On the price side, exchange rate realignments have been correspondingly reduced as commitment to the ERM has strengthened. All these international evolutions are indeed in many ways motivated by France’s commitment to European integration. Such a policy within Europe implies ever-growing mobility of commodities and capital, and a push ahead towards price equalization and exchange rate stabilization.

Chapter 4 is devoted to the grey zone which lies between current transactions and capital movements in the balance of payments, i.e. foreign direct investment in France and French direct investment abroad. Both categories grew appreciably during the 1980s, in absolute as well as in relative terms, giving rise to an urgent need for an assessment of its economic foundations. Their position in the middle of the balance of payments is indicative of the hybrid nature of these transactions, which have both real and financial motivations.

The study by Jérôme Henry provides a short descriptive review of direct investment by France in the three main developed country zones (the European Community, North America and the rest of the OECD) and by these zones in France. It then reviews reference models used to explain the levels of direct investments and assesses the performance of these models in the case of France. The conclusions are that the French economy’s propensity to export goods and services, and the real exchange rates (computed with reference to domestic and foreign wages) are factors to be taken into account, whereas financial motives (corporate indebtedness and exchange rate uncertainty) are more marginal factors. Therefore the situation of direct investment within the balance of payments appears to be closer to the current transactions than to the financial flows. On the other hand, econometric results confirm the relevance of recording French direct investment according to the host country; distinguishing the EC countries appears to be relevant.

Chapter 5, by Michel Aglietta and Camille Baulant, is concerned with French foreign trade. The fall in the industrial balance in the 1980s brought to light supply factors and contradicted the previously commonly held theory, which emphasized demand factors as well as price competitiveness. Many economists had assumed that the low level of business investment observed in France in the early 1980s had weakened the responsiveness of the French economy to foreign demand. To some extent, this analysis was perceived as an incentive to improve the supply side and the specialization of the economy and, more particularly, to restore French competitiveness not by further currency devaluations and inflation, but by new value-added sharing and cost disinflation. This so-called competitive disinflation strategy, which replaced the previous tactic of competitive devaluations, was slow to improve export dynamics in France, but the long-awaited progress started to materialize at the beginning of the 1990s. On the other hand, European integration and, above all, monetary union, imply the pursuit of an economic policy that stands up to external shocks not through exchange-rate adjustments, but through industrial policy or supply-side policy. All this justifies examination of the influence of non-price factors on external competitiveness. Chapter 5 is just such a study.

The paper begins with a theoretical appraisal of the links between growth and non-price competitiveness, where the nature of product differentiation (vertical and horizontal) plays an important role. Thereafter, attention is turned to the various competitiveness factors and their measurement. This theoretical and statistical background provides an opportunity to perform econometric tests on the determination of the prices and volumes of French foreign trade in manufactured products. This has been done using the same methodology as in the rest of the book, i.e. econometrics of non-stationary variables and error-correction mechanisms. Among the various specifications, the most robust estimates use, as explanatory variables, capital accumulation rates in the long run, as well as capital utilization rates in the short run, confirming the emphasis placed on the supply side.

Following the two chapters dealing with significant volumes of transactions between France and abroad, Chapter 6 attempts to shed some light on the major price of foreign transactions, the exchange rate. This may be analysed further by looking at a commonplace of international economics, the uncovered interest parity (UIP) condition. This examination involves an appraisal of the relationships between, on the one hand, the French interest rate and, on the other hand, the American and the German rates. This is not to say that the world consists of these three countries alone, but reflects the fact that, in the past, French monetary policy was conducted with an eye on the movements of the dollar, and that it is now defined after close scrutiny of the franc's position against the mark in the Exchange Rate Mechanism.

These very general assertions are partly confirmed: as indicated by the title of Chapter 6, 'An analysis of uncovered interest parity in a system of three Eurorates', prominence is given to the idea of a ‘system’. There are two reasons for this. The first is linked to the careful scrutiny of the relationships between not only two of the three Eurorates, but also between the three taken together, in order to appraise their overall behaviour. For example, assessments have been made of how the American rate and policy influence the EMS, either taken as a whole or broken down into its constituent parts. This is a way of ‘continuously’ evaluating how the triangle of Eurorates evolves, and especially how one pair disappears in favour of another pair. The second reason, which is the technical counterpart of the first one, is the choice of the general framework of cointegration analysis, popularized by Johansen and Juselius.

On the basis of daily data covering the period April 1983 to December 1992, the tests support the theory of German dominance of the EMS, especially in the period after German reunification. This leads to an econometric evaluation of French short-term interest rate, where a central role is played by the relationship between French and German interest rates and the deviation from the central parity in the ERM, a kind of UIP with exchange rate expectations being based on that deviation. But the results show that there was no expectation of a full reversion towards the central parity in the ERM until 1992. Therefore, the EMS appears to have been an imperfect target zone.

Chapters 7 and 8 represent an examination of the consequences that progress towards strong international linkage has had for the French economy as a whole. Chapter 7, by Michel Boutillier and Jean Cordier, looks briefly also at the overall macroeconomic stance.

While targeting the nominal exchange rate of the French franc in the European Exchange Rate Mechanism has gained increasing credibility, it has become clear that there was a change of monetary policy regime around 1983. The pros and the cons of the French competitive disinflation policy have been widely, and sometimes passionately, debated. Few works, however, have attempted a quantitative assessment of the impact of the change in monetary policy and, more particularly, of the way it passed through the financial system, despite the fact this change in policy initially caused a financial stimulus.

Moreover, the authors felt that macroeconometric models can be profitably used to help explain past developments. To this end, in performing their evaluation, they ran simulations with the entirely new macrofinancial model known as MEFISTO, alongside the usual Banque de France macroeconomic model. These simulations were intended to measure what the path of the French economy might have been had three major complementary shocks not occurred, namely the change in monetary policy regime, financial deregulation and innovation, and changes in banking behaviour. These three factors reinforced one other, and it appears there was a durable and consistent process of modernization.

During the period under review, there was overall growth in the level of financial transactions and in the income earned from them: the flow of capital income from resident non-financial agents increased by approximately one percentage point of GDP. There were also significant changes in the structure of financial intermediation. Economic policy choices were to a large extent responsible for these developments, but the role played by the behaviour of financial intermediaries themselves was also significant. All in all, the policy of regulating money supply through interest rates had an influence on behaviour patterns in the financial and real economies that made equilibrium on the foreign exchange market easier to attain.

Indeed, the authorities' interest rate policy was backed up by deregulation in specific financial markets, to make French-franc investments more attractive, and by the market intermediaries' active efforts to adapt to their new environment. In the end, these factors bolstered France's foreign exchange reserves and enhanced the franc's international credibility. Conversely, the absence of these three factors would inevitably have led to one or more currency crises in the second half of the 1980s and necessitated even more energetic macroeconomic adjustment.

The last chapter shares many aspects with Chapter 7. It is focused on the use of the Banque de France's MEFISTO model of the financial sphere and on assessing deregulation in France. It departs from the previous chapter, however, insofar as its subject is not the real world as understood through models, but rather the models themselves, as perceived by their causality and dynamics properties. More precisely, Chapter 8, by Michel Boutillier and Pascal Jacquinot, tries to evaluate how changes in specifications (due to actual changes, particularly as a result of financial innovation and deregulation) have altered the overall properties of models of the French financial system. Macroeconomic models are extremely complex, requiring the use of tools such as causality analysis and dynamics analysis. The methods used to deal with the problem were, for the most part, defined in the 1970s with the increasing use and size of macroeconomic models at that time. This trend has now reversed somewhat, and MEFISTO was designed to be more medium-sized. Even so, the need for structural knowledge appears to be as great as in the past and a complete analysis of MEFISTO was carried out. Chapter 8 focuses on this evaluation of the changes that the financial innovation process has imposed on model structures.

In order to overcome the complexity of the problem, the recent drift towards deregulation is simply assessed through structural changes in the way both the central bank and the commercial banks fix their interest rates. The work is therefore based upon a comparison of the current MEFISTO model with its LUCIFER variant, consistent with previous interest rate determination processes. The error-correction mechanisms make it easy to distinguish between the short run and the long run. Causality analysis reveals two levels of interdependency. The major one stresses the interactive links between interest rate fixing and financial position determination. This interdependency helps to distinguish between the two models, as it is restricted to the short run in MEFISTO and is permanent in LUCIFER. The other level of inter-dependency is permanent in both versions and every set of interdependent relationships gathers only a small number of mechanisms. Unit roots due to stock-flow derivations are an accurate feature in financial models but lead to difficulties in dynamics analysis. In spite of this, both models are accurate in emphasizing a dynamic core model centred on the credit side and mainly involving the corporate and the banking sectors. Deregulation, or its reflection in the models, seems to have ambiguous consequences with regard to the stability of the financial system. Changes in monetary policy still appear to be implemented through financial intermediaries, and the regulatory power exercised on them by the French monetary authorities seems to be an important and consistent part of financial regulation.

* * *

To conclude, we would like to thank the many colleagues in the Banque de France who gave us help or encouragement. In particular, we are grateful to: Béatrice Saes-Escorbiac, who has typed so many manuscripts from a variety of handwriting and converted so many files from a variety of software; to the translation team of the Banque de France, who dealt with entire chapters, as well as providing speedy advice; and to all the agents of the SEMEF (the unit specialized in macroeconomic studies in the Economics Research Division), especially the direct contributors and their assistants, who provided a friendly and scientific environment, and who have contributed at many stages and in many forms to the collective project of this book.

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