Rational Expectations and the
St. Louis Model for the U.K.

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Summary: The purpose of this paper is to examine the forecasting ability of a reduced form macro-model in the absence of detailed knowledge of the economic structure, under the assumption of Rational Expectations.

A reduced form model for the U.K. is estimated adopting the St. Louis specification, and its simulation properties are examined in the cases of anticipated and unanticipated changes in fiscal and monetary policies, in all cases the real output remains virtually undisturbed whilst the impact of the shocks is fully absorbed into the price level.

Finally, the model’s ex-ante forecasting performance is compared to the NIESR forecasts.

Introduction

"The way expectations are formed depends specifically on the structure of the relevant system describing the economy", so writes Muth [1961], in his seminal essay on Rational Expectations. This is arguably the most contentious assertion made in relation to the hypothesis. In this paper we accept the rational expectations assertions relating to the use of information and the ineffectiveness of "public prediction", but we argue that economic agents are not always aware of the "structure" of the system. Instead we propose that given the limited information of the system agents use approximations to the reduced form of broad aggregates to forecast the effects of policy and generate expectations.

The first section discusses the philosophy of the reduced form and links it to the Rational Expectations approach. The second and third sections deal with the construction and estimation of a reduced form — St. Louis type model for the U.K. The fourth section deals with the model’s performance in ex post simulation and forecast concluding with some comments on model properties and the question of neutrality.

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The Reduced Form

The earliest study involving reduced form monetarism came from Friedman/Meiselman [1964]. Popularised by the Federal Reserve Bank of St. Louis, the reduced form approach was prompted by two main monetarist considerations. Firstly there was the causal consideration. The tenets of the Quantity theory proposed that changes in the money supply were the main cause of changes in nominal income, [see Friedman, 1974]. The second consideration was methodological. Its philosophy stems from the urge to explain 'much from little'. Its strength in explanatory power and computational simplicity enhanced the arguments of many and unknown channels of monetary influence. Thus the Reduced form provides an accurate description of basic causal relationships in Macro Economic variables and provides a useful platform for policy evaluation.

It is argued that the alleged reduced form of the St. Louis studies [Anderson/Jordan] is only an approximation to the true reduced form see [Fischer/Sheppard] and is in principle compatible with a Keynesian structure [Anderson/Carlson]. However if these approximate reduced forms are considered good enough to capture aggregate policy effects, one could superimpose this approach on to the economic agent. We argue that the economic agent is less interested in specific information and is more interested in broad aggregates, like the rate of inflation, growth and unemployment. We extend this line of reasoning to the notion of rational expectations. We assert that economic agents (like economists) are not always aware of the true structure of the economy and resort to quasi reduced forms to approximate the effects of policy, external forces and exogenous shocks.

The use of reduced form models without the apriori restrictions of a deeper structure does pose problems for the strict rational expectations (RE) hypothesis. One obvious problem is that if the structure changes how do economic agents accommodate such a change in the reduced form model? We do not pursue the implications of such problems but note that the dichotomy of information, exploitation and information availability has been treated elsewhere, see Friedman [1979].

The Model

In the past there has been little empirical support for St. Louis type models for the U.K. The methodological debate has been tempered by the broadly negative finding of various researchers [Goodhart/Crockett; Artis/Nobay]. More recently Matthews/Ormerod [1978] have shown that St. Louis expenditure functions can be estimated for the U.K. with similar impact and lag structure as that of U.S. findings. Building on their work we add an expectations augmented Phillips curve and an unemployment equation in the tradition of the St. Louis model of Anderson/Carlson [1970]. The basic model contains 3 behavioural equations and 3 identities.

Expenditure

\[
\Delta Y_t = \alpha_0 + \sum_{i=0}^{n} \beta_i \Delta M_{t-i} + \sum_{j=0}^{m} \sigma_j \Delta F_{t-j} + \epsilon_{1t}
\]  
(8)