

Appendix: Economic Models at the Bank of Thailand^{1/}

The conduct of monetary policy under the inflation targeting framework attaches particular importance to analyses and forecasts that are accurate and well supported by economic rationale, so that appropriate monetary policy can be effectively implemented to safeguard economic and financial stability. In this endeavor, the MPC requires economic models as tools to provide forecasts of economic growth and inflation as well as to assess the impact of various economic disturbances and macroeconomic policies. The MPC also uses economic models as tools to structure its communication with the public about economic projection as well as the rationale behind their policy decision.

Useful economic models should aid the MPC and Bank of Thailand staff in gaining insights into the dynamics of the economy, which arise out of complex interactions between different economic players, and hence helping the MPC to obtain accurate forecasts. Nevertheless, given that no single model can accomplish all the tasks required, the MPC stresses the importance of using a variety of models to complement each other throughout the forecasting and policy analysis process in the formulation of monetary policy and emphasizes the need to develop models of different types, a summary of which is given as follows.

1. The Bank of Thailand Macroeconometric Model (BOTMM) is the main model the MPC uses in producing forecasts. It was first published in the July 2000 *Inflation Report* and has been continuously developed. BOTMM is a system of equations that represents the workings of the economy through various interdependences between key economic variables. Such relationships-guided by theory and obtained from econometric estimations based on an error correction mechanism using quarterly data since 1993-capture

^{1/}Details appear on the BOT Website (www.bot.or.th) under Monetary Policy/ Understanding Monetary Policy /Macroeconomic Model.

dynamics of variables in the short run and the long run. The model, which consists of 25 behavioural equations and 44 identities, covers four important sectors; namely, the real sector, the monetary sector, the external sector, and the public sector. BOTMM has a particularly important role in the forecasting process, as well as in the assessments of the impacts of changes in the policy interest rate and in the projected paths of exogenous variables such as public spending, oil prices, and the outlook of trading partners' economies. Nonetheless, limitations of BOTMM lie in addressing policy questions related to structural changes, such as the impacts of changes in tax rates or policy regime shifts, because a model of this type characterizes the behavior of economic units that is not entirely invariant to changes in government policies and in particular is silent on explicit expectation formation by those whose behaviour it attempts to forecast.

2. A small semi-structural model has a structure that is consistent with the New Keynesian theory. It consists of only five behavioural equations that capture the domestic economy through a few important variables-namely, the output gap, inflation, the policy interest rate, the exchange rate, and the current account balance and another set of four equations to capture the dynamics of the foreign economy. Parameters of the model are estimated using the Bayesian approach, which integrate the understanding of the structure of the economy with statistical estimation. A small semi-structural model is mostly used in analyzing the impact of various shocks on important variables. Due to its compact size, the tractability of this model is a key feature as it facilitates communication of the underlying economic stories and intuition.

3. A dynamic stochastic general equilibrium (DSGE) model has a core structure in general equilibrium analysis that is grounded in growth and business cycle theory. This modelling approach emphasizes optimization by households and firms subject to various kinds of constraints in deriving consumption and investment paths that have clear theoretical foundations. A DSGE model is suitable for describing the working of the economy, thanks to coherent structural relationships within the model. In particular, the model's structural parameters are calibrated to capture salient features of the Thai economy, thus obviating

the need for parameter estimation that usually becomes a problem given data insufficiency and the presence of important structural breaks. Furthermore, given that the model parameters are structural, they are not affected by changes in policy, rendering for more accurate model dynamic than those obtained from other types of models especially in the face of changes in economic policies.

4. Other economic models used at the Bank of Thailand include models such as the corporate sector model and the household model, both of which are couched within the macroeconometric modeling paradigm similar to BOTMM, and vector autoregressive models (VARs) estimated using historical data.

The MPC uses results from various types of models, each of which has its own comparative advantage, along with policymakers' judgment throughout the forecasting and policy analysis process in order to obtain the appropriate monetary policy going forward.