



# **HIGH-LEVEL SUMMARY TECHNICAL ASSISTANCE REPORT**

## **THAILAND**

Technical Assistance Project on the Development  
of a Dynamic Stochastic General Equilibrium Tool:  
Scoping Report

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**High-Level Summary Technical Assistance Report**  
Institute for Capacity Development

**Thailand: Technical Assistance Project on the development of a Dynamic Stochastic General  
Equilibrium Tool: Scoping Report**

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The *High-Level Summary Technical Assistance Report* series provides summaries of the assistance provided to IMF capacity development recipients, describing the high-level objectives, findings, and recommendations.

**ABSTRACT:** This document describes the technical needs that have given rise to a Fund's technical assistance (TA) project for the development of a customized structural micro-founded (DSGE) model in the Ministry of Finance of Thailand, as well as its objectives and key work program elements. This project, led by the Institute for Capacity Development (ICD) of the Fund, aims to reinforce the policy analysis system in Thailand, through the introduction of the DSGE model for policy simulation and macroeconomic risk analysis. While direct beneficiary of this TA will be the MoF's Fiscal Policy Office, the authorities plan to integrate the tool's outputs in the Thai macroeconomic reporting infrastructure and main policy discussion fora, inside and outside the MoF.

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## Background

- In March 2024, the Ministry of Finance of Thailand (MoF) requested Technical Assistance (TA) from the IMF's Institute for Capacity Development (ICD) to develop a dynamic stochastic general equilibrium model (DSGE). This request, initiated by Mr. Pornchai Thiraveja, Director of the Fiscal Policy Office (FPO) of MoF, sought to expand the analytical toolkit of the Ministry with a DSGE for macroeconomic policy simulation. Upon study of the request, the project was included in ICD's TA work program of FY25 and FY26 and obtained financing assurances from the Government of Japan.
- In November 2024, a scoping mission fielded in Bangkok conducted a diagnostic of the technical capacity of FPO staff and assessed the possible role of a DSGE model in the Thai Government forecasting and policy analysis system (FPAS). To that end, the scoping mission focused on two types of complementary activities. First, it delivered a 6-day introductory training on the economic fundamentals of New Keynesian DSGE models to 14 FPO staff, both to lay the foundations of modeling work under the TA project and as a vehicle of capacity assessment. Second, it met with the most relevant stakeholders in the Thai Government FPAS, and in particular with those involved in the preparation of medium-term macroeconomic and public debt projections, the analysis of macroeconomic risks and macrostructural policy discussions. These included several departments in the MoF<sup>1</sup>, as well as the Research Department of the Bank of Thailand (BOT) and the Macroeconomic Department of the Office of the National Economic and Social Development Council (NESDC).

## Findings of the scoping mission

- **The Thai Government FPAS has solid legal underpinnings, but there is room to strengthen the simulation toolkit to increase the depth and breadth of analytical discussion in decision-making processes.** The Thai Government FPAS architecture is clearly defined by the Fiscal Responsibility Act, the Budget Responsibility Act, and the Public Debt Management Act, with two groups of fiscal rules concerning public debt and expenditure composition in force. Medium-term macroeconomic and fiscal projections are condensed in a Medium-Term Fiscal Framework (MTFF), discussed and approved by the Fiscal Policy Committee (FPC). The FPC encompasses the MoF, BOT, NESDC, Budget Bureau, and members of the Fiscal Risk Management Committee (FRMC). Within the MoF, the FPO plays a central role in providing analytical inputs for policy decision making. The analytical toolkit of MoF, BOT and NESDC is quite heterogeneous, with their different fields of expertise presenting important complementarities regarding the analysis of macroeconomic and policy scenarios. However, there is still room to better integrate policy analysis in the forecasting process. In addition, the analysis of macroeconomic risks in the Fiscal Risk report, that summarizes the conclusions of the FRMC, could be enhanced. In this context, the operationalization by the MoF of a micro-founded simulation model could be very beneficial and strengthen its synergies with the rest of stakeholders in the Government FPAS.

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<sup>1</sup> Within the MoF, the mission met with the Macroeconomic Policy Division (MPD), with particular emphasis on the Macroeconomic Modeling and Forecasting Section (MMFS), and outside the FPO, the Public Debt Management Office (PDMO).

**The MAMUANG<sup>2</sup>, the workhorse forecasting model of MoF, has been used in the past for policy simulation, but it could be supplemented by a structural model.** The MAMUANG is a large-scale macroeconometric model developed in EViews, with more than three hundred equations. It relies on Error Correction Mechanisms estimated by ordinary least squares. Among its exogenous variables, the MAMUANG uses GDP of the major trading partners, the exchange rate vs. US dollar, Dubai oil price, tourism spending and government primary expenditure. Most of these variables are projected using satellite models. The MAMUANG computes a large block of macroeconomic variables, while government revenues and the debt path are consistently projected by the Fiscal Policy Division (FPD) and the PDMO, respectively. However, due both to the reliance of MAMUANG on econometrically estimated coefficients, and lack of full simultaneity in its intersectoral linkages, a structural model would be well suited to supplement it in policy and scenario analysis.

- **The diagnostic of policy analysis needs, and staff’s technical capacity led to conclude that a customized version of the STAMP, an in-house ICD’s DSGE model, would be suitable for this project.** According to staff’s findings, the FPO main needs are in the general equilibrium analysis of policy outcomes, particularly fiscal and macrostructural ones, and the impact of exogenous shocks. In this respect, the Structural Analysis of Macroeconomic Policies (STAMP) model is a state-of-the-art New Keynesian model, featuring sticky prices and wages, consumer heterogeneity and other frictions that enable fiscal and monetary policies to yield short-term effects on aggregate demand mimicking empirical stylized facts. The model, close in its structure to the Fund’s Global Integrated Monetary and Fiscal Model (GIMF), will be customized to reflect the key characteristics of the Thai economy, and is adequate to address the analytical priorities of the authorities, such as the macroeconomic and distributive outcomes of transfers, changes in the taxation structure or rises in minimum wages. The STAMP can also help study the consequences of macroeconomic risks and possible policy responses. It was agreed that an annual version of the STAMP could fit better the focus on fiscal policy simulations, and also be simpler to operate for the FPO staff, with no previous experience in this type of models. Although the training revealed some areas of Macroeconomic Diagnostics where staff capacity could be strengthened, their assessed starting level and absorption capacity allowed the gradual introduction of a DSGE.

## Action Plan agreed with the authorities

- **The Action Plan aims to build capacity at the FPO to customize, operate and embed in the policy analysis system of the MoF a simulation tool based on a DSGE model, taking the canonical STAMP as starting point.** To that end, the authorities nominated a 4-member group of MPD staff<sup>3</sup>, who will directly benefit from TA on a permanent basis and constitute the core modeling team. It was also contemplated that additional members from other relevant FPO divisions<sup>4</sup> would be welcome to join this team in the aftermath

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<sup>2</sup> MAMUANG is the acronym of Macroeconomic Forecasting Model of the Ministry of Finance of Thailand.

<sup>3</sup> To favor the consolidation of the tool at the FPO, members of the other divisions within this department have also been encouraged to join the team and support policy scenario design.

<sup>4</sup> Principally the Fiscal Policy and Tax Policy divisions.

of the scoping mission, either as permanent members or with a more targeted participation focused on the design of policy scenarios. The authorities committed to giving due priority to staff's work within this project, supporting their continuous engagement between missions and promoting the stability of the core group.

▪ **The work program will span one year and a half, with a possible buffer of half a year should further needs arise and comprise six missions after the scoping one.** This period will be divided in two main phases.

- During the first to fourth missions, the tool will be customized and calibrated in several rounds, emphasizing those scenarios and extensions more relevant to fiscal policy analysis. At several points during this phase, the core team will present their preliminary analytical results obtained with the tool to FPO Management, both to get a constructive feedback and to reinforce accountability. Also, during this phase, TA sessions will be interspersed with some refreshers on Macroeconomic Diagnostics, to fill enable the team to fully master the economics underlying the tool. The integration of the tool in policy-making discussions will receive primary attention from the second mission, with the development of a reporting structure.
- During the second phase of the project (missions 5-7), the tool's outputs will be gradually embedded in notes and reports produced by the Macroeconomic Policy Division, both for internal decision-making and interdepartmental discussions. Additionally, the FPO will finalize a comprehensive user manual to foster the long-term sustainability of the project, covering the economics of the model and its derivation, calibration, application to design policy scenarios and some illustrative case studies. In the same vein, it is expected as well that the outputs and properties of the model will be presented during the second phase to an increasingly wide range of interlocutors, including other MoF departments and also possibly technical sessions with BOT and NESDC.

▪ **The TA team will closely coordinate with the Fund's Monetary and Capital Markets Department (MCM) and the Fiscal Affairs Department (FAD).** MCM is working with the BOT in the second phase of a project initiated in 2022, aimed at implementing an estimated DSGE model for Integrated Policy Analysis. The focus and structure of the MoF and BOT DSGE models are not the same -with emphasis on fiscal policy in the first case, and the interaction between monetary policy, foreign exchange intervention and capital flows management in the second one. This notwithstanding, achieving a basic comparability between the outcomes of selected policies and shocks in these models is important to foster a stronger analytical dialogue in the future. For that reason, the ICD and MCM teams have been in contact since the beginning of this project, and will maintain their collaboration over the whole project. The project will also search for possible synergies with the Fiscal Affairs Department over the project, especially around the integration of the analysis of macroeconomic shocks in fiscal risk reporting, as agreed during the preparation of the scoping mission.