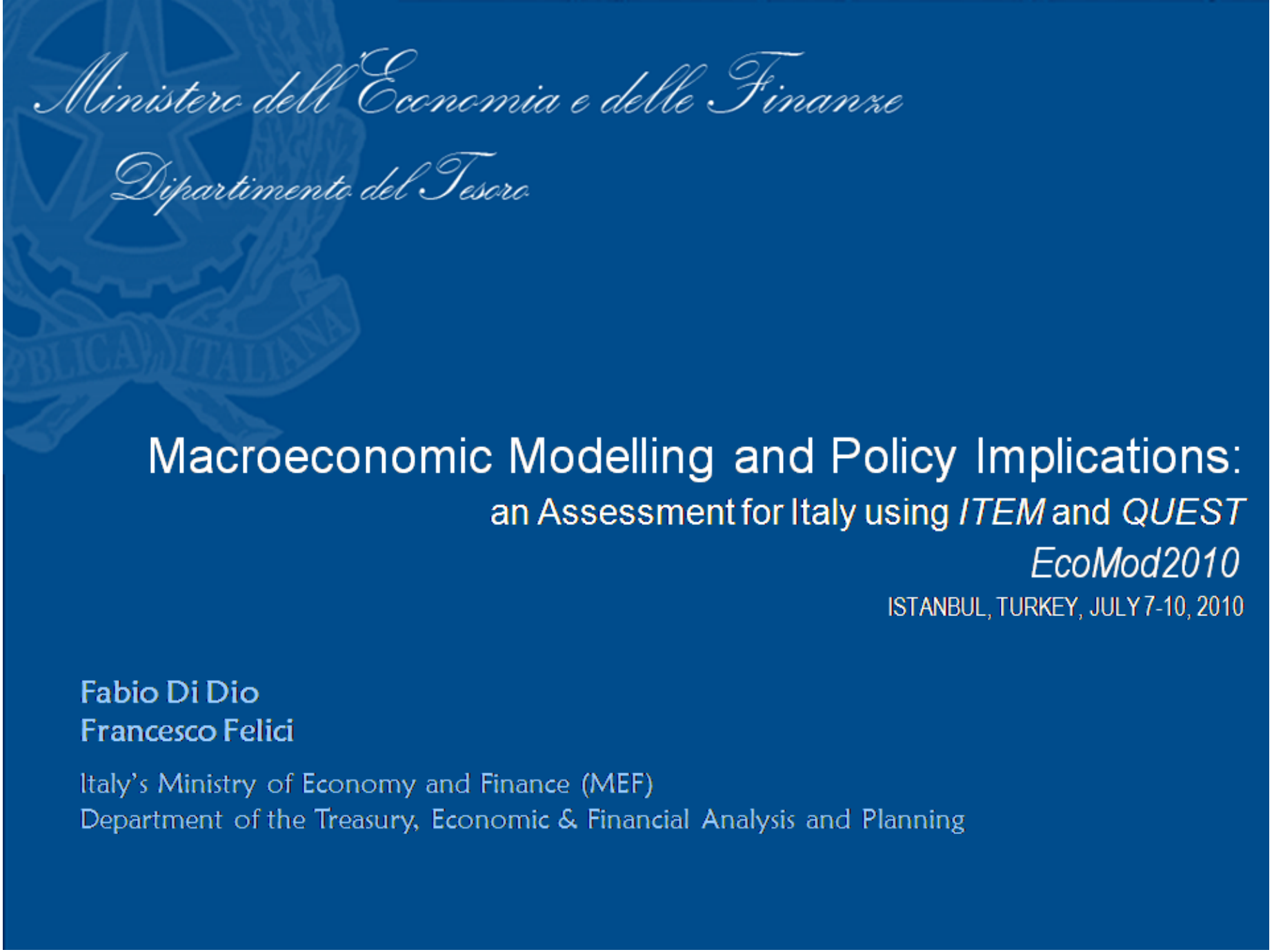
Ministero dell'Economia e delle Finanze
Dipartimento del Tesoro
Macroeconomic Modelling and Policy Implications:
an Assessment for Italy using ITEM and QUEST
EcoMod2010
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Fabio Di Dio
Francesco Felici
Italy's Ministry of Economy and Finance (MEF)
Department of the Treasury, Economic & Financial Analysis and Planning

Plan of presentation

- Aim: assessing the implications for the Italian economy of a number of structural reforms, showing potential gains and limitations using two models
- Analysing the main transmission channels, we provide a comparative assessment of the magnitude and the persistence of the effects of two simulation scenarios, and the responses on some macrovariables
- In doing so, we use ITEM, the Econometric Model of the Italian Economy. It is the institutional simulation tool of the Italian Treasury Department used for economic policy and forecasting exercises
- But we also rely on QUEST (DSGE methodology), recently made available from the European Commission (calibrated for Italy)

Gains for using more than one tool

- A large number of insights can be drawn from comparing the economy's responses to shocks using ITEM and QUEST
- Relying on two complementary quantitative tools allows to broaden our view on the national economy and also pin down shortfalls or inadequacies of a single model
- The insights from the comparative assessment call for adjustments and innovation in the structure of a model
- Shed light on the potential gains from structural reforms and the existing limitations

Quick overview of ITEM (i)

- ITEM is a medium-large scale traditional macroeconometric model. It is designed properly for:

1. Forecasting/projections in the medium run conditioned on the hypotheses on exogenous variables
2. Analysis of alternative scenarios based on different profiles of some relevant variables
3. Estimation of effects of some fiscal policy measures and structural reforms

- It is a quarterly model and includes 36 behavioral equations and 211 identities
- The equation specification is of Error Correction Model (ECM) type

Quick overview of ITEM (ii)

- Factors on the demand side are predominant in shaping the output movements in the short run. The impact of demand shocks is temporary (Cicinelli et al., Economic Modeling, 2009)
- In the long run, supply side factors are key determinants of the output level
- Output level is permanently affected by supply side factors: Total Factor Productivity (TFP), labor supply shocks, tax wedge, etc.
- Market value added is determined by a Cobb-Douglas production function (potential output): $Y^* = TFP \times L^{\alpha} \times K^{1-\alpha}$
- The model is closed by: $\Delta INV = Y - (C + G + I + X - M)$ so that in the short run the GDP is determined on the demand side
- The difference between Y and Y^* (output gap) affects internal prices

Quick overview of ITEM (iii)

- Measured TFP is pro-cyclical because data on L and K fall short of capturing the intensity of factor utilization (factor hoarding: Burnside-Eichenbaum, 1996; Basu-Fernald-Kimball, 2006)
- The production function can be written as: $Y = TFP^* \times (U \times L)^{\alpha} \times (U \times K)^{1-\alpha}$ where U is the intensity of factor utilization and TFP^* is technical progress: $TFP = TFP^* \times U$ and $log(U) = log(TFP) - log(TFP^*)$
- TFP^* is exogenous and is calculated using the HP filter
- U depends on cyclical and is explained by the equation (demand condition): $TFP - TFP^* = \beta \Delta Dem - \varepsilon ASAD_{-1}$, where ΔDem is the variation of aggregate demand and $ASAD$ is the ratio between supply and demand
- An increase of ASAD corresponds to an accumulation of inventories

Quick overview of ITEM (iv)

- A demand impulse creates a positive discrepancy between output and potential output
- The resulting variations of prices reduce the demand and the actual GDP to a level consistent with the potential output
- Another channel for re-equilibrating the demand and the supply side is the reduction of financial wealth affected by inflation
- Policy rules (Taylor rule, public finance rules) can speed up the process

Quick overview of QUEST (i)

- QUEST (Quartely European Simulation Tool: Italian version)
- Latest version of the European Commission' DSGE Model (calibrated for Italy)
- It is a version augmented with endogenous growth (Roeger and al., 2008)
- It is modelled consistently with the framework proposed by Jones (1995, 2005) to adapt the Romer's model
- Already employed by the Commission in several multi-country analyses of structural reforms (D'Auria et al., 2009)

Quick overview of QUEST (ii)

- This version is well-suited to analyze the impact of structural reforms in the context of Lisbon Strategy
- The endogenous mechanism of growth allows to study policies aimed at increasing the rate of knowledge creation
- Distinction of employment in three skill categories (low, medium and high) allows to analyze the effects of specific market labor policies
- Fully microfounded (not subject to the Lucas critique (1976))
- Rational expectations

Quick overview of QUEST (iii)

- It has eight types of agents: households-workers, trade unions, final goods firms, intermediate goods firms, R&D sector, foreign sector, monetary and fiscal authorities
- Optimising households (non liquidity constrained households) and hand-to-mouth consumers (differentiation is necessary to reproduce empirically relevant Keynesian effects of fiscal policy)
- Consumption (Euler equation)
- Real and nominal frictions (trade unions set wages, hire and lay off workers is costly, etc.)

Quick overview of QUEST (iv)

- Monopolistic competition
- Product variety by Dixit and Stiglitz (1977)
- Innovation: new designs depend on the number of skilled workers employed and on the existing stock of ideas (the long run growth is not affected by saving decisions nor by number of workers employed in R&D)
- Monetary policy is described by a Taylor rule

Simulations

- 2 simulation scenarios (structural reforms):

1. Exogenous productivity shock of 1%

Simulations

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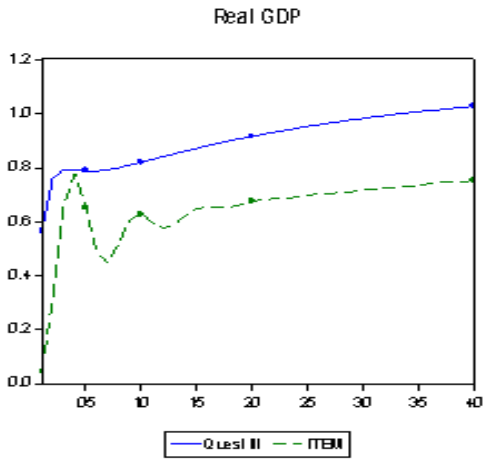
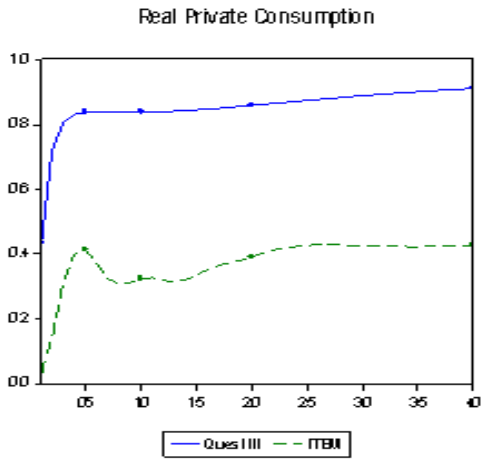
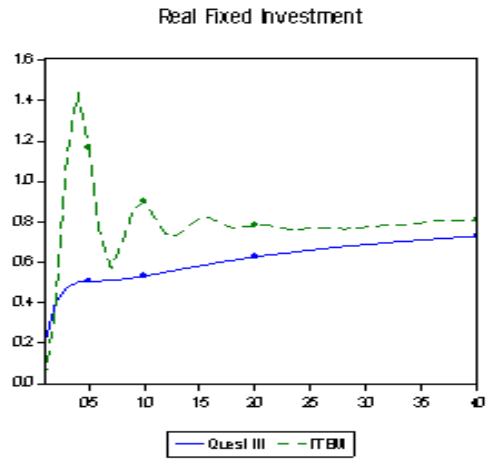
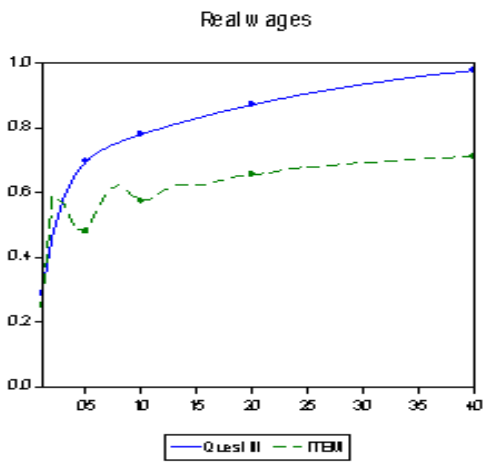
1. Exogenous productivity shock of 1%
2. A reduction of the price mark-up of 1%

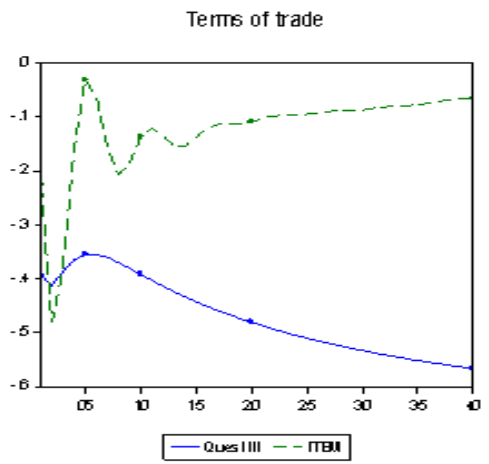
Exogenous productivity shock of 1% (responses of the main macrovariables)

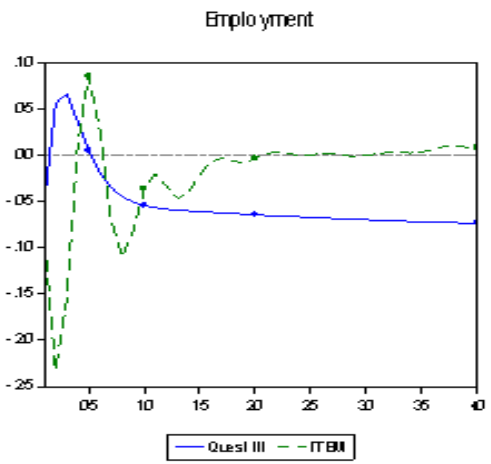




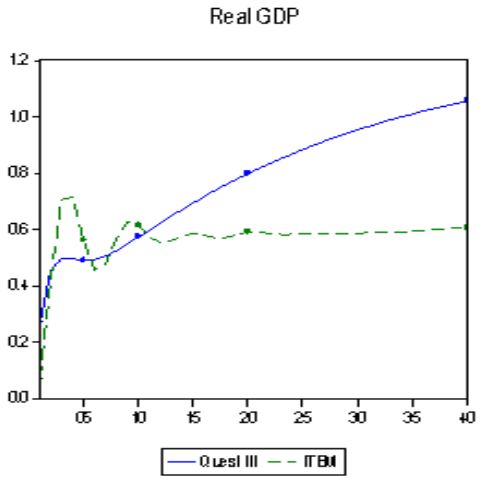


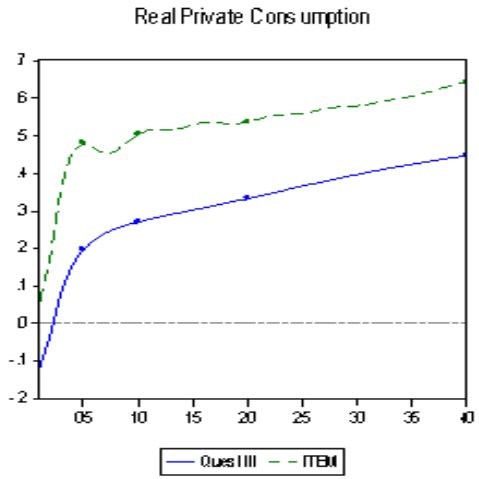


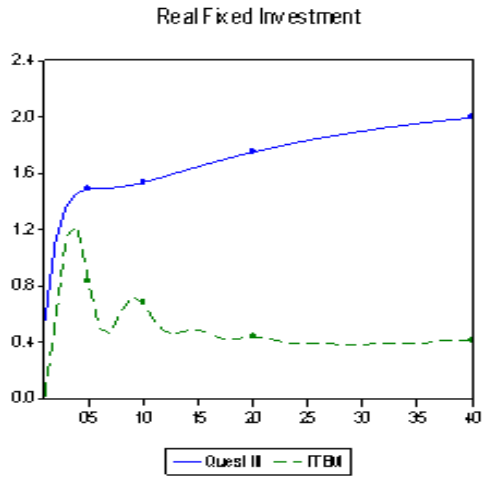


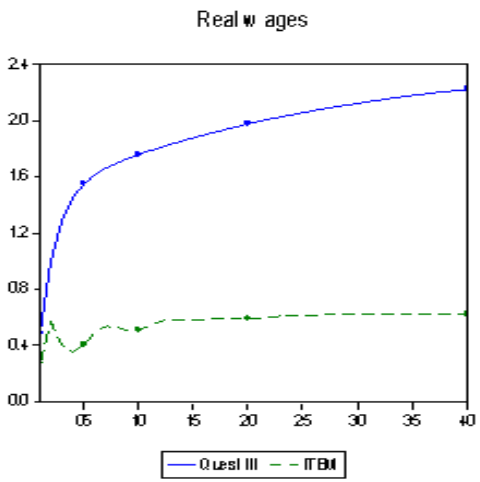


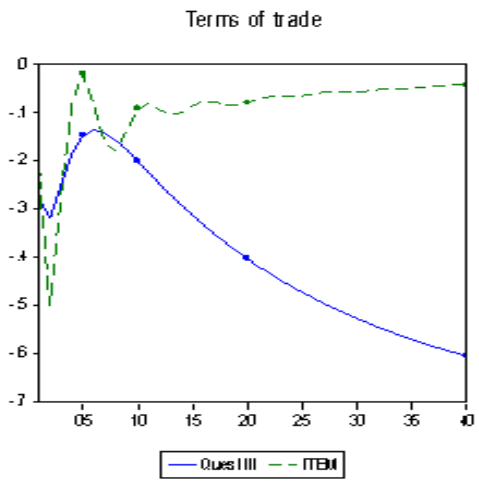
Reduction of price mark-up of 1% (responses of the main macrovariables)

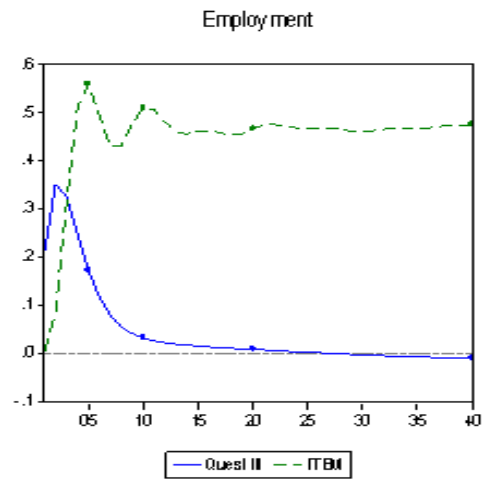












Conclusions

- In QUEST we observe smoother dynamic responses of variables to structural changes (due to the sluggishness and rigidities of the model)
- The endogenous growth mechanism operative in QUEST contributes to explain part of the differences across the two models in the size of the level effect of shocks on many variables (indeed, behind each shock we observe changes in the composition of the employed workforce)
- The forward looking nature of QUEST contributes to explain the differences in consumption and investment decisions

Thanks

- Many thanks for your kind attention