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Thesis Title: Calibration and Estimation of Real Business Cycle for the Sudanese Economy

Abstract:

In this study, we conduct the Simple version of Dynamic Stochastic General Equilibrium (DSGE) Model using the idea of the neoclassical growth model to see the nature of short-run fluctuations of the Sudanese economy over the period of 1970-2014. There have been significant changes in the structure of the Sudanese economy over the last few decades. Which include; liberalization, privatization, US imposed economic sanctions in 1997, accessing to trade blocks/markets, global financial crises, passing through the secession of South Sudan in 2011, and its aftereffects, as well as failed frequent attempts by the government to achieve economic stabilization through stimulating policies. Therefore, we constrained our analysis to the last 50 years considering the need to query the economic landscape as well as the sources of the Sudanese business cycles, by using indivisible labor version model and modified it to divisible labor. Moreover, we evaluate the performance of the Calibrated Real Business Cycle Models (RBC) driven by exogenous Total Factor Productivity shock (TFP) to explain the cyclical fluctuations in the economy. The baseline RBC model performs poorly regarding match the second moments related to fluctuations in the short run as shown by the data.

The paper also used Bayesian approach to estimate model parameters by applying Metropolis Hastings-Markov Chain Monte Carlo (MCMC) to obtain posteriors. Our estimation results showed that all parameters are different from zero, except for labor parameter in case of Divisible Labor Model. The structural parameters (persistence and standard deviation) of the technological shock are greater than we have obtained from calibration. Moreover, the models captured the volatilities for output. The baseline model showed more volatility for investment and consumption than output, which is considered one of the stylized facts of the business cycle in developing countries¹. Both models are failed to explain co-movement (countercyclical & procyclical) of the variables. In total RBC model driven by exogenous shocks subject to Solow Residual (TFP) failed to explain business cycle in case of Sudan.

¹ Based on Empirical works for emerging markets Business Cycles, using both RBC & tradition DSGE Models documented that the Properties of emerging economies fluctuations, different from developed economies (Aguiar and Gopinath, 2007; Chakraborty, 2008; Neumeyer and Perri, 2005; Uribe and Yue, 2006; Batini et al., 2010; Gabriel et al., 2010; Garcia-Cicco et al., 2010).