

Essays on New Keynesian Dynamic Stochastic General Equilibrium Models: Inference on Parameters, Unconventional Monetary Policy and Taxation

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論 文 内 容 の 要 旨

This thesis has three essays and one survey. The survey (Chapter 2) describes the conceptual and methodological claims common to the New Keynesian Dynamic Stochastic General Equilibrium (NK-DSGE) models, and contributes to the discussion of the NK-DSGE models by identifying and describing the problem of inference on parameters, divided into type I and type II. Type I occurs when a researcher estimates his parameters without considering the link between the structure of the model, econometric specification, and the data, while type II occurs when a researcher takes estimates from some previous studies and pretends that they are standard (or known) numbers as in Niu et al. (2018) and He et al. (2017) and others.

The first essay (Chapter 3), the NK-DSGE model and inference on parameters, contributes to the literature by showing how the problem of inference on parameters affects the results of an NK-DSGE model. The model used in this essay is as in Galí (2015) Chapter 3 but with habit formation in consumption. The inclusion of habit formation in consumption is as in Christiano et al. (2005), Smets and Wouters (2007), and Adolfson et al. (2007), and is favored by the data (Kutchka, 2014). This essay uses a set of parameters from Galí (2015), Gertler and Karadi (2011), and mixed parameters (households parameters from Galí (2015) and others from Gertler and Karadi (2011)). The results are divided into calibrated and estimated; the estimated results provide tools to judge the reliability of the model; and the tools suggest that the model is reliable. The calibrated results show how different set of parameters affects the results and shows that the pattern of the dynamic responses of the three set of parameters is the same, however, the amplitudes differ considerably, implying that taking parameters from a previous study and pretending that they are standard (or known) numbers without considering the link between the model, the data and the econometric specification applied to estimate the parameters are not convincing and lead to inconsistent results.

The second essay (Chapter 4) contributes to the literature by providing a proposal for an unconventional monetary policy for a developing country. It assumes the existence of Ricardian and non-Ricardian households. The non-Ricardian households optimize their current consumption intra-temporally (in the current period), contrary to Costa (2016) that assumes intertemporally (in different periods) and Coenen and Straub (2004) who assume that

non-Ricardian households set nominal consumption expenditure equal to after-tax disposable income. Furthermore, the Ricardian households' budget constraints include return on deposits (savings) as the other source of income, contrary to nominal riskless bond as in Costa (2016) and Coenen and Straub (2004), and to return on capital as in Marto (2014). Labor is the firms production input. The monetary policy is as in Kitamura (2010), however, to fit the characteristics of a developing country, it is assumed that the central bank is responding to fluctuations in the output gap, price inflation, and wage inflation. Contrary to Kitamura (2010) who does not include wage inflation in the central bank reaction function, in this chapter, wage inflation is included to account for staggering wages, which is a common feature in developing countries. The resulting model has monetary policy shock, technology shock, and labor supply shock, and is calibrated with Mozambique (from Peris and Saxegaard, 2007) and South Africa (from Steinbach et al., 2009) parameters. The results suggest that by applying an unconventional monetary policy with a model that fits the characteristics of a developing country, it is possible to replicate common dynamics of Ricardian and non-Ricardian households.

The third essay (Chapter 5) studies the dynamics of capital income tax, consumption tax, and labor income tax in South Africa, Malawi, and Mozambique and contributes to the literature by providing an analysis of the elasticity of taxable revenue for developing countries. In this essay, there are Ricardian and non-Ricardian households. The Ricardian households' budget constraints include consumption tax, labor income tax, and capital income tax, while the non-Ricardian households' budget constraints include consumption and labor income tax. These taxes are fiscal authority instruments that generate fiscal revenue. A fraction of the revenue is invested in public infrastructure and the rest is transferred to households (transfer payments). The allocation of fiscal revenue is exogenous, i.e., the social welfare is not maximized. Firms' production function has labor, public and private capital as production inputs, while monetary policy is in the form of the Taylor rule. The resulting model is calibrated with Malawi (from Chuku et al., 2019), South Africa, and Mozambique parameters; the last two countries' parameters are as in Chapter 4. The results suggest that the labor income tax has a great impact on the dynamics of consumption and employment than the consumption tax and capital income tax. Furthermore, the results of the Laffer curve (a tool used to analyze the elasticity of taxable revenue) show that the capital income tax has higher fiscal revenue than consumption and labor income, while labor income tax has higher fiscal revenue than a consumption tax. These results are at odds with the findings of Trabandt and Uhlig (2011) that suggest that in the U.S. the labor tax has higher fiscal revenue than capital income tax, while in 14 Euro Area countries (excluding Luxemburg) the labor income and capital income tax provides almost the same tax revenue. Our findings are similar to Fernández-de-Córdoba and Torres (2012) that suggest that in most of the 15 Euro Area countries the maximum labor and capital tax revenue level is relatively far from the current tax level.

The conclusions and recommendations are in Chapter 6. It also describes the path to future work that intends to study the inclusion of carbon emission and digital currency in the NK-DSGE models.