Research Statement

Nie, He

Department of Economics, National University of Singapore

I am a macro-economist currently working on topics related to Monetary and Fiscal Policy, DSGE, Banking and Financial Markets, and Data Economy. The aim of my research is to study macroeconomic questions analytically and empirically. Methodologically, I use the Markov Chain to obtain closed-form solutions of the Dynamic Stochastic General Equilibrium (DSGE) models. In addition, the DSGE models can fit the data well and can be suitable for policy analysis.

Tractable DSGE models.—An important part of my work has been on the macroeconomic effects of monetary/fiscal policy in a tractable model. I aim to show the equilibrium analytically and graphically. To this end, I use the Markov structure to derive closed-form solutions. The equilibrium can also be depicted in the AS/AD diagram.

Monetary policy.—What happens if the central bank anchors future policy announcements to short run inflation? Nie & Roulleau-Pasdeloup (2022) model this situation with control-contingent forward guidance. We analytically show that control-contingent forward guidance can rid the model of sunspot liquidity traps. The same holds for a policy of price level targeting, which emerges as a special case. Finally, we leverage this new framework to formally show that announced interest rates are only a means to an end: what truly matters is expected inflation.

Fiscal Policy.—New empirical studies evidence that government multipliers are lower in liquidity traps which is in stark contrast with the standard New Keynesian (NK) model. Nie (2021a) identifies a new real cost channel that corroborates empirically lower government spending multipliers. I analytically show that the deflationary pressure is exacerbated in the presence of the real cost channel at the zero lower bound (ZLB). Then the output gap multiplier will be overestimated by ignoring this channel.

The empirical tax papers indicate that the labor tax multiplier is quite effective while the consumption tax multiplier is less effective than the model prediction. Nie (2021b) offers theoretical justifications with the real cost channel. This channel is important to help us better understand the empirical tax change effects.

NK models with occasionally binding constraints (OBC).—Existing tractable DSGE models with OBC make strong assumptions about the behavior of expectations in a recession: maximum effect on impact and then decay back to the steady state. Using data from professional forecasters, Nie et al. (2022) document that forecasters' expectations of macroeconomic aggregates instead display hump shape dynamics in these situations. To rationalize that, we develop a new analytical framework to solve DSGE models with both OBCs and endogenous persistence.

New survey evidence shows that in the US, Europe, and Japan, households do not expect deflation in an environment with a high persistence of realized deflation. It stands in stark contrast to the standard macroeconomic models with rational expectations. To rationalize this fact, Nie (2022) develops a tractable NK model with the real cost channel. I identify this channel that reduces the occurrence of expectations-driven traps by altering the effective slope of the Phillips Curve at the ZLB episode.

Quantitative modelling and financial econometrics modelling.—The policy analysis using quantitative tools and financial econometrics method is another important strand of my work. Among them, I focus on the policy implications in the questions involving environment, welfare, and financial stability.

Climate finance.—Several Green Banks in the US have been established to help secure low-cost capital for clean energy projects. George et al. (2022) develop a two-sector DSGE model in which banks impose an favorable emission-elastic lending rate for clean capital loans to mimic this policy and calibrate the model to the US economy. We find that the emission-elastic rate can improve both bank profits and social welfare. Additionally, emission-elastic lending rate can substitute a carbon tax and better reallocate capital resources.

Financial markets.—China recently reins in the country's cryptocurrency industry, and bans crypto mining operations. Li et al. (2022) explore the dynamics between cryptocurrencies and traditional financial assets in China to provide empirical support for this policy. We find that cryptocurrencies are the primary risk sources for traditional financial assets in China. In addition, conventional financial assets are more sharply influenced by cryptocurrencies in the short term, and spillover fluctuations are intense during the COVID-19 pandemic.

Future research.—I plan to continue my work with the **tractable DSGE models** and investigate the macroeconomic effects of monetary and fiscal policy from *Heterogeneous-Agent New Keynesian (HANK)* perspectives. In addition, I intend to study questions in the field of **international finance**. For example, Mo & Nie (2022) document the effects of non-fundamental shocks (e.g., sentimental shocks) on the global financial market dynamics. On a different project, I work on the **data economy** as in Nie & Zhao (2022) and see the role of open government data in the endogenous growth model.

Research papers

George, A., Huang, J., Nie, H., & Xie, T. (2022). Emission-elastic lending rate: Implications on environment, welfare, and financial stability. *Welfare, and Financial Stability (September 15, 2022)*.

Li, Z., Mo, B., & Nie, H. (2022). Time and frequency dynamic connectedness between cryptocurrencies and financial assets in china. *Working paper*.

Mo, B. & Nie, H. (2022). Sentiment, capital flows and financial market volatility. *Working in progress*.

Nie, H. (2021a). Government spending multipliers with the real cost channel. *Available at SSRN 3930472*.

Nie, H. (2021b). The macroeconomic effects of tax shocks: The cost channel. *Available at SSRN 3905695*.

Nie, H. (2022). Avoiding expectations-driven liquidity traps. *Available at SSRN 4212646*.

Nie, H. & Roulleau-Pasdeloup, J. (2022). The promises (and perils) of control-contingent forward guidance. *Review of Economic Dynamics*.

Nie, H., Roulleau-Pasdeloup, J., & Zheng, Z. (2022). Occasionally binding constraints with data-consistent expectations: a new analytical framework. *Working in progress*.

Nie, H. & Zhao, J. (2022). Endogenous growth with open government data. *Working in progress*.