CHAPTER 2

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to review related literatures which consist of 2 major parts. The first part is to overview the literatures involving the topic of becoming New Keynesian Macroeconomics together with the tools. The second part is to review the empirical applying New Keynesian NOEM.

2.1 Development of New Keynesian Macroeconomics

2.1.1 Becoming New Keynesian Models

We can say without loss of generality that the term `New Keynesian Models is similar as the `New Neoclassical Synthesis' which is labeled by Goodfriend and King (1997). The explanation of Goodfriend and King's label is that such models are the result of a synthesis of real business cycle (RBC) theory and New Keynesian theory.

In their influential paper of 1982, Kydland and Prescott[1] proposed a model of the business cycle in sharp contrast with both the Keynesian tradition and the Monetarist school. Following Frisch's view of the business cycle (Frisch, 1933) they augmented the neoclassical Ramsey–Cass–Koopmans growth model by introducing stochastic productivity shocks. They showed that such a model is capable of reproducing a number of stylized facts of the business cycle. These models, known as Real Business Cycle (RBC) models, are based on the assumption that the economy is populated by rational agents that optimize their welfare subject to various restrictions, like budget constraints, technological constraints, summarized in the production function and incentive constraints. The typical version of these models would feature an infinitely lived representative household, whose objective would be to maximize

[1] Kydland and Prescott (1982) have been awarded the Nobel's Prize in economics for areas of macroeconomic research in 2004 "The Time Consistency of Economic Policy and the Driving Forces Behind Business Cycles"

its utility by choosing an optimal path for consumption and leisure, alongside a representative firm whose objective would be to maximize profits.

The crucial important of RBC approach is a methodological contribution. Such structures are, for example, microeconomic decision among agents, intertemporally optimizing agents who are assumed to make decisions based on rational expectations. As a result, equilibrium conditions for aggregate variables can be computed from the optimal individual behavior of consumers and firms.

However, the RBC models had criticized in terms of the usefulness for monetary or fiscal policy among economists. On the one hand, many researchers felt that this neglected the impact of monetary policy on business cycles, downplayed the role of market inefficiencies. On the other hand, the way in which the empirical fit of these models was measured came under strong criticism[2].

In recent years a new paradigm has arisen in macroeconomics that combines elements of real business cycle theory (RBC) and New Keynesian Macroeconomics (NKM). The NKM[3] school shared with the RBC approach the belief that macroeconomics needed more rigorous micro-foundations. In contrast to the RBC approach, the NKM researchers considered market imperfections as the key element to understanding the real world, especially the implications of firm-level price and wage rigidities for macroeconomic variables.

The inclusion of New Keynesian ideas into an otherwise RBC model proved to be extremely successful, in terms of reception by the economic profession as well as in terms of explanatory power of the empirical evidence. In particular, the introduction of sticky prices was sufficient to break the neutrality of money typical of RBC models, and hence it opened a new avenue for monetary policy analysis.

The standard model involves a dynamic stochastic general equilibrium (DSGE) structure with intertemporally optimizing agents who are assumed to make decisions based on rational expectations, an assumption that reflects the RBC origins of the paradigm. Meanwhile, NKM features are introduced nominal rigidity or gradual both of price and wage adjustment, for examples of closed economy DSGE

[2] More details see Cooley (1995). Frontiers of Business Cycle Research.

[3] A discussion of the NKM approach see Gordon (1990)

models Christiano, Eichenbaum and Evans (2005), Altig, Christiano, Eichenbaum and Linde (2005), and Smets and Wouters (2003, 2005). Therefore it seems to be more the rapid development of DSGE models for policy analysis in parallel to the improvement of the existing econometric tools.[4]

2.1.2 From New Keynesian Closed Economy Frameworks To New Keynesian Open Economy Macroeconomics (New-Keynesain NOEM)

The restriction of such New Keynesian DSGE models was still concerning only the close economy (CE) with three equations – the IS equation, the Hybrid New-Keyenesain Phillips Curve and the monetary policy rule. Until the seminal work of Obstfeld and Rogoff (1995) was appeared[5], it was marked as a beginning of a new class of open-economy macroeconomic models which are known as New Open Economy Macroeconomics (NOEM). These models have been used to explore many issues which are not addressed in the closed-economy (CE) framework, such as the persistence of real and nominal exchange rates (Chari, Kehoe, and McGrattan 2002) and exchange rate pass-through (Devereux and Engel 2002; Smets and Wouters 2003 and Adolfson 2001).

The main objective of the New Open Economy Macroeconomics (NOEM) is a development of a new fundamental model for open-economy macroeconomics analysis. Such NOEM approach started to be interested in the following key features:[6]

- Optimization-based dynamic general-equilibrium modeling,
- Sticky prices and /or wages in, at least, some sectors of the economy,
- Incorporation of stochastic shocks,
- Evaluation of monetary policies based on household welfare.

From a point of view, many small open economy (SOE) models can be regarded as an extension of the closed economy New Keynesian framework as detailed in, for instance, Clarida, Gali, and Gertler (2001) supported by the contribution of Gali and Monacelli (2005) who develop a small open economy

[4] See Kremer. J et al. (2006)

[5] The famous work of Obstfeld and Rogoff (1995) is *"Exchange Rate Dynamics Redux"*.

[6] Surveys about this topic can be found in Bowman and Doyle (2003), and Lane (2001).

NOEM that follows the reduced-form structure of the New Keynesian paradigm model which is useful for estimation.

Current research in small open DSGE models (NK DSGE) has developed to fit on the empirical front. There are now various techniques to take these models to the data, for example GMM, MLE and Bayesian estimation. It can help selecting the appropriate modelling assumptions and makes the model more suited to answer policy-related questions. One of the first attempts to estimate a two-country model with Bayesian methods has been made by Lubik and Schorfheide (2003,2005).

The model used by Lubik and Schorfheide (2005) is a simplified and straightforward version of Kollmann (2001) and Galí and Monacelli (2005). Like its closed-economy counterpart, the model consists of an (open economy) forward-looking IS curve and a Phillips curve type relationship which determine output and inflation respectively. The terms of trade are introduced via the definition of the consumer price index (CPI) and under the assumption of purchasing-power parity (PPP). The exchange rate will be derived from the uncovered interest rate parity condition. Monetary policy is described by a nominal interest rate rule and they have taken lastly the model to data by using Bayesian for estimation[7].

In an empirical investigation of the degree of exchange rate pass through especially developed economies, Campa and Goldberg (2004) find that short run exchange rate pass through is incomplete, while long run exchange rate pass through is complete. Monacelli (2005) incorporates short run import price rigidities into an open economy DSGE model by allowing for monopolistic competition and staggered reoptimization in the import market as Calvo-type staggered price setting. These import price rigidities generate incomplete exchange rate pass through in the short run, while exchange rate pass through is complete in the long run.

Therefore, on the investigation of empirical evidences, it shows causes of increasing the theoretical literature considering from closed economy DSGE models to open economy (DSGE) models, especially with nominal rigidities (New Keynesian) and it become usefully for the analysis of monetary policy.

[7] For more details in the Bayesian Estimation, we discuss in a section of methodology.

2.2 Investigating Nominal Rigidities and New Keynesian Models in Thailand

2.2.1 Exchange Rate Pass-Through

In the field of international finance, exchange rate pass-through reflected directly to law of one price is a one of interesting issue of researcher in term of examining or implications. There are a lot of empirical evidences that change in nominal exchange rates affecting import prices only gradually or incomplete for example, Campa and Goldberg (2004) estimated pass-through equations for 25 OECD countries over the period 1975 to 1999. They found that they could reject the hypothesis of complete short-run pass-through in 22 of the 25 countries. In contrast, long-run elasiticities are generally closer to one. They reject long-run pass-through equal to one in 9 of the 25 countries.

McCarthy (1999) analyzes the impact of exchange rate changes and import prices on producer and consumer prices in a recursive VAR framework. Using data from six industrialized OECD countries, he finds that the exchange rate has a modest effect on consumer prices. He also finds that the pass-through tends to be correlated with the degree of openness of the economy.

Based on an empirical analysis of international prices for two magazines, Ghosh and Wolf (2001) argue that sticky prices or menu costs are a better explanation for imperfect pass-through than strategic pricing or international product differentiation. Consistently with the findings of Campa and Goldberg (2004), they find complete long-run pass-through, which typically holds in theories based on sticky prices, but does not hold in theories of international product differentiation.

2.2.2 New Keynesian Models in Thailand

From the restriction of a field to study New Keynesian approach for policy analysis, there is a few papers to adopt these models in Thailand until now. Lee (2005) studies the optimal interest rate rule under structural New Keynesian models with Calvo's price setting and setting a preference relationship specified by catching up with Jones (a previous consumption is in utility function) in the context of closed economy. The method to use for estimation is General Method of Moment including with second order Taylor's expansion approximation to obtain a criterion loss-

function that is augmented by variability of a change in inflation and output gap. The result suggests that, supply innovation, implementing that optimal plan is rather complicated because it requires a super-gradual adjustment in endogenous variables over hundred quarters. For a presence of domestic shock, the estimated model suggested for an extraordinary increase in the nominal interest rate by over sixty-percentage basis for a perfectly stabilization scheme.

However, these findings focus only on the closed economy context. It is worth extending to study in an open economy for Thailand.