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## Exchange rate pass-through effect and monetary policy in Mongolia: Small open economy DSGE model

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### Abstract

This study is carried out in a small open economy New Keynesian DSGE model proposed by Monacelli (2005). As a result, firstly the exchange rate pass-through into import price and inflation is 0.69% and 0.49% respectively in short run. Secondly, the exchange rate acts as a shock absorber for domestic productivity and foreign demand shock. Thirdly, in case of incomplete pass-through the central bank of Mongolia is required to adjust the nominal interest rate more under the productivity shock. Therefore, considering incomplete pass-through is significant to improve the effectiveness of the monetary policy for the central bank of Mongolia.

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### 1. Introduction

In small open economy, the exchange rate pass-through has a considerable effect on inflation and output fluctuations. The exchange rate transmits the impact of any shock on the economy through its effect on import prices and relative prices. Under this circumstance, exchange rate channel plays a role as either shock absorber or amplifier in implementing the monetary policy, but how much it can absorb (or amplify) depends on the exchange rate pass-through. Therefore, the exchange rate pass-through is an important consideration with respect to the effectiveness of monetary policy. The goal of this study is to examine the effect of incomplete exchange rate pass-

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through on the economy and thereby its implications on the monetary policy in case of Mongolia.

Mongolian economy is very vulnerable to the exchange rate fluctuations originated from structural shocks. There are several reasons. Firstly, the exchange rate fluctuation works similar as cost-push shock in Mongolia. Imported goods are accounted about 80% of GDP. Hereof, the imported goods compose of 55% of total final consumption and the most of inputs in the domestic production are imported from abroad. Distribution business from abroad to the domestic market is dominated at the retail level. According to these features, when the foreign and domestic shock hit the economy, the exchange rate fluctuates more frequently at larger magnitude. For instance, during last five years the intensive rise of foreign direct investment caused dramatic increase of aggregate demand. Due to the large capital inflow in economy it seemed likely that the exchange rate (MNT/USD) will continue to appreciate. However even it depreciated dramatically by 20% in last year. Consequently, the import price index increased by 13% and currently it has high pressure on CPI inflation in Mongolian economy.

Secondly, foreign shocks such as commodity price shock in the world market, and Chinese demand shock increase the exchange rate fluctuations. Mongolian economy is very much dependent on main trade partner China. The 80% of Mongolian exports are made of mineral commodities such as coal, gold and copper. Moreover, the 90% of total export is supplied to the Chinese market. Therefore, Mongolian economy is very vulnerable to exchange rate fluctuations induced by other shocks.

On the other hand, the role of exchange rate in the monetary policy regime is still challenging issue for the central Bank of Mongolia (BoM). Under these circumstances, examining the impact of exchange rate on the economy and defining appropriate monetary policy reaction to the shocks are important issues to improve the effectiveness of the monetary policy.

New Open Economy Macroeconomics has developed strongly since the mid of 1990's. In this strand, studies of Clarida, Gali and Gertler (1999, 2001), Obstfeld and Rogoff (2002), Gali and Monacelli (2005), Woodford (2003), Benigno and Benigno (2003) are pioneering works that contributed to the development of small open economy dynamic stochastic general equilibrium (DSGE) model applied to the analysis of the monetary policy. Interestingly, the implication of this result in open economies is that the exchange rate volatility does not have any direct impact on welfare whereas only the price volatility affects welfare. In these models, they assume that exchange rate pass-through is complete, implying that LOP holds continually. In case of Mongolia, Batsukh, et al. (2014) suggested that the volatility of exchange rate should be considered to some extent in designing of monetary policy by analyzing inflation targeting rules under the small open economy DSGE model with complete pass-through.

However, the many empirical studies such as Marston (1990), Rogoff (1996), Goldberg and Knetter (1997), and Campa and Goldberg (2002, 2005) showed that the exchange rate pass-through is incomplete for developing and developed countries such as OECD, Eastern European, US and Asian countries. In the case of Mongolia, Gan-Ochir (2009) obtained that the exchange rate pass-through to consumer prices is about 55% in three quarters after the shock.

Therefore, many authors such as Monacelli (2005), Adolfson (2001, 2007), Devereux and Engel (2002), Smets and Wouters (2002), Corsetti and Pesenti (2005), and Sutherland (2005) argued that introducing incomplete pass-through creates the important implications for designing of design of monetary policy. Overall they accepted that the exchange rate volatility and the degree of pass-through are key parameters in the design of optimal monetary policy.

The paper focuses on the importance of the degree of pass-through. It is based on three hypotheses as follows: i) the exchange rate pass-through is incomplete in Mongolia; ii) the exchange rate is a source of shock that can fluctuate the economy and its impact depends on the degree of pass-through; iii) the monetary policy response depends on the degree of pass-through and thereby the monetary policy considering the exchange rate might have better achievement.

The analysis is pursued in a small open economy New Keynesian DSGE model, where incomplete exchange rate pass-through is introduced in the model via nominal rigidities on import prices. We follow the model proposed by Monacelli (2005). This assumption delivers the different result from the result of open economy model with complete exchange rate pass-through.

To accomplish the goal, firstly we estimate the exchange rate pass-through using SVAR empirical methodology

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