THE OUTPUT AND PRICE EFFECTS OF MONETARY POLICY IN EMERGING AND DEVELOPING COUNTRIES WITH A SPECIAL CASE STUDY OF VIETNAM

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Summary

This thesis - the outcome of my five-year PhD trajectory - is about the output and price effects of monetary policy in emerging and developing countries with a focus on the case of Vietnam. A comprehensive analysis of the output and price effects of monetary policy is especially necessary for Vietnam regarding the transformation of the Vietnamese economy and the changing role of the Central Bank since the adoption of the Law (No.01/1997/QH10) on the Central Banking in 1998. The findings and quality of the existing studies on Vietnam are unfortunately limited and hence do not offer sufficient guidance for evidence-based policy. In addition, the effect of monetary policy in emerging and developing countries is possibly weak due to the low level of financial development in these countries (Mishra et al. 2012, Mishra and Montiel 2013). Moreover, the empirical evidence of output and price effects of monetary policy in emerging and developing countries is heterogeneous (in terms of the effect sign, the magnitude, and the occurrence of anomalous/"puzzle" effects) and possibly affected by publication bias.

Taking into account the heterogeneity of the existing empirical evidence of the effects of monetary policy in emerging and developing countries, this thesis econometrically surveys the existing empirical evidence in order to investigate the meta-effects, the drivers of the heterogeneity of the reported effects, and the nature and determinants of the anomalous ("price puzzle") effects. Next, the "best practice" in terms of methodology (the model specifications, variables, and data frequency) is adapted (in accordance with the context and policy environment of Vietnam) to measure the output and price effects of monetary policy for Vietnam.

My research primarily focuses the effects of monetary policy on output and price level in the short-term (effect at 12 months, 24 months, the bottom negative effect, and the anomalous ("price puzzle") effects. The reason for this focus is that output and price level are the ultimate goals of monetary policy in Vietnam as well as in many other emerging and developing countries (see Table 2.2). The thesis is based on the vector auto-regressive (VARs) findings of existing studies to synthesize the effects and employ a VAR application for Vietnam. The thesis aims at providing answer to three specific objectives:

- What are the meta effects (the magnitude, the sign) of monetary policy on output and price level in the context of emerging and developing countries? Are the reported findings of vector auto-regressive models in the existing literature of the effect of monetary policy affected by a publication bias? What are underlying drivers of the heterogeneity of the reported effects in the existing studies?
- What is the nature (the frequency of occurrence, the persistence and the time lags) of the anomalous effects – the so called the "price puzzle" – of a tighter monetary policy in emerging and developing countries. What are the possible determinants of the "price puzzles"?
- How effective is the monetary policy in Vietnam since the adoption of the Law (No. 01/1997/QH10) on the Central Bank? Is a monetary policy in Vietnam useful to control inflation?

To pursue these objectives, the empirical analyses are constructed into three parts containing four empirical chapters.

Part 1 consists of Chapter 3 and Chapter 4, which employ quantitative surveys to synthesize the existing studies. Meta-regression analysis (MRA) method is used in this part to answer the research objectives on publication bias, genuine effect, and heterogeneity in reporting output and price effects of a tighter monetary policy in emerging and developing countries. In particular, this thesis completely followed the most recent reporting guidelines (Stanley et al. 2013) by the Meta-Analysis of Economics Research network (MAER-net) and the general-to-specific approach by Charemza and Deadman (1997) to answer the research questions of Chapter 3 (focuses output effects) and Chapter 4 (focuses on price effects).

Part 2 consists of Chapter 5 is another quantitative analysis to investigate the "price puzzles". The methodological approach of Chapter 5 differs from two previous empirical chapters. Regarding the high frequency occurrence of the "price puzzles" which are not under reported in both published and non-published primary studies, this chapter employs probit regressions to explain the occurrence of "price puzzles" or persistent "price puzzles". In addition, it employs ordinary least square (OLS) to investigate the determinants of the time lag of the "price puzzles".

Part 3 consists of Chapter 6, which is a vector-auto regressive application to analyze the output and price effect of money policy in Vietnam covering the period from January 1998 to November 2017. The methodological design (the model specification, the inclusion of commodity prices, and data frequency) of this chapter is based on the findings of the two previous analytic parts to avoid the misspecification of the VAR models. Chapter 6 estimates Cholesky recursive VAR models in level including six endogenous variables (industrial production, consumer price index, broad money M2, policy interest rates, credit, and exchange rates) representing the domestic block and two exogenous variables (the world oil price and the Chinese lending rate) representing the external block. The data property tests, Granger causality tests, impulse response functions and variance decomposition are estimated to uncover the effects of monetary policy on aggregate price level and output. Sensitivity analyses (with different lag lengths, different variable orderings, and generalized VAR approach) is carried out to support the main findings

The empirical chapters are based on four data sets. The data sets for first three empirical chapters comprise primary data (collected, measured, computed, and coded from the primary studies) and secondary data. The data for the VAR analysis on Vietnam is secondary data collected from several reliable published sources such as the IMF, the World Bank, and the Vietnamese General Statistic Office of Vietnam (GSO).

Several important empirical findings are as follows:

First, the systematical review of the existing output and price effects of monetary policy in emerging and developing countries points to a substantial heterogeneity across reported estimates. The empirical evidence of two meta-regression analyses reveals that both the output effect and the price effect reported in the literature employing vector auto-regressive models are affected by a negative publication bias. After filtering out the publication bias, the misspecification, a genuine negative effect of an increase in interest rate on output and on price level remains. The genuine bottom output effect (using "best practice" method) is on average -0.15% at on average about 9 months after a one-percentage point increase in policy interest rate. The genuine price effects (using "best practice" method) is on average -0.14% at on average 14 months after an increase in the interest rate. Compared to the average genuine price effect in advanced countries (studied by Rusnák using the same methodology), the average genuine price effects in emerging and developing countries is smaller (genuine bottom effect on price levels in developed countries is -0.33%. The findings support the view that monetary policy in emerging and developing countries is less effective than in developed countries.

Second, several factors could explain the heterogeneity in the reported output and price effects of a tightening monetary policy among emerging and developing countries. A primary studies that uses industrial production as a proxy for output or including commodity prices is more likely to report a stronger negative output effect. Regarding the country characteristics, the output effects reported in the primary studies are smaller in countries with high inflation volatility and to be larger in a country with a more developed financial system. In addition, this thesis finds that several control factors can help to explain the observed heterogeneity in reported price effects. On average, studies published in academic (ISI-listed) journals tend to report stronger negative effects. Furthermore, a tighter monetary policy tends to be less effective (in lowering price levels) in economies characterized by a floating exchange-rate regime (and fewer regulatory restrictions on financial/exchange transactions).

Third, the "price puzzle" is a relevant phenomenon in the context of emerging and developing countries. The "price puzzle" is significant in 42% of the estimates of the price responses, in 19% of the countries investigated, and in 40% of the primary studies. Moreover, the "price puzzle" is persistent in 15% of the reported price responses. The average magnitude of "price puzzle" effect is 0.4% and occurs shortly after an increase in the policy interest rate. This study founds robust empirical evidence of the positive relationship between CPI variation and the occurrence of a "price puzzle". In an economy with higher volatility of CPI, the "price puzzle" response is more likely to occur and to be more problematic (more persistent and/or have a longer time lag). Commodity prices could alleviate the "price puzzle". The probability of a persistent price "puzzle" is likely to be smaller in studies that include commodity prices.

Fourth, a tighter monetary policy (measured as an increase in the policy interest) is effective in stabilizing the price level in Vietnam. The consumer price index drops significantly (the trough is about -0.28% at 13 months) after an increase in the interest rate. To my knowledge, this is the first time such an empirical effect on price level has been uncovered. This study also found an effect of an expansionary monetary policy (measured as an increase in broad money) on industrial production. Three months after an increase in the broad money, the industrial production index responds positively (+0.5%). However, credit expansion does not stipulate production, but inflation significant. Right after an increase in credit, the consumer price index responds positively and significant.

According to the analytic findings, several recommendations for monetary policy makers in emerging and developing countries could be suggested. For example, policy makers should consider the publication bias in reporting the output and price effects of monetary policy in the VAR literature. Despite the publication bias, empirical evidence of a genuine negative effect on output still exists. This suggests that policy makers could use the interest rate to influence the economy in the short-term. However, after being corrected for the publication bias, no evidence of a genuine effect on price level remains. This finding suggests an ineffective monetary policy in controlling price level and therefore, at low levels of financial development the interest rate should not be entirely relied upon as an instrument to control inflation.

The policy makers should also consider remedies to improve the effectiveness of monetary policy such as improving financial development and stabilizing price variation. The conduct of monetary policy in a more open economy requires more efforts since the meta-regression analyses reveal that economic openness reduces the effects on output and price level.

Regarding the conduct of monetary policy in Vietnam, key recommendations for the policy makers are follows. First, despite a low level of financial development and the conduct of monetary policy is still in the process toward a market-based mechanism, there are effects of monetary policy on output (expansionary money supply stipulates output) and price level (tighter policy interest lowers inflation). Therefore, a combination of price stability and growth as the main goals of monetary policy (as the

Law on the Central Bank currently states) is possible for the context of Vietnam. Second, empirical evidence reveals that the effect of monetary policy in Vietnam works through the credit channel. A continuously increasing credit policy could cause inflation. Hence, the Vietnamese central bankers should reconsider its ongoing expansive credit policy.