การดำเนินนโยบายการเงิน: เครื่องมือที่เหมาะสม
(Monetary Policy Conduct in Review: The Appropriate Choice of Instruments)

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ข้อคิดเห็นที่ปรากฏในบทความนี้เป็นความคิดเห็นของผู้เขียน
ซึ่งไม่จำเป็นต้องสอดคล้องกับความเห็นของธนาคารแห่งประเทศไทย

บทคัดย่อ

ธนาคารกลางทั่วโลกล้วนมีเป้าหมายหลักในการดำเนินนโยบายการเงินอย่างเดียวกัน คือ การรักษา
เสถียรภาพด้านราคา (price stability) โดยความแตกต่างอยู่ที่การเลือกใช้เครื่องมือในการดำเนินนโยบาย มิใช่กรอบ
การดำเนินนโยบาย จากการศึกษาพบว่าประเทศที่ใช้อัตราดอกเบี้ยเป็นเครื่องมือหลัก ส่วนใหญ่มีความเข้มแข็งเชิง
โครงสร้างสถาบัน มีระดับการพัฒนาระบบการเงินในเกณฑ์ดี และสามารถผลิตสินค้าส่งออกที่มีลักษณะพิเศษเฉพาะ
นอกจากปัจจัยแวดล้อมข้างต้น ในการเลือกใช้เครื่องมือยังต้องคำนึงถึงคุณสมบัติหลัก 3 ข้อคือ (1) ความสามารถใน
การควบคุมเครื่องมือและภาวะการเงิน (2) ความสามารถในการต้านทานวัฏจักรเศรษฐกิจ และ (3) ประสิทธิผลของ
เครื่องมือต่อเงินเฟ้อและเศรษฐกิจโดยรวม จากการประเมินคุณสมบัติดังกล่าว สรุปได้ว่าอัตราดอกเบี้ยยังมีความ
เหมาะสมในฐานะเครื่องมือหลักในการดำเนินนโยบายการเงินของไทย นอกจากนี้ ประสิทธิภาพในการดำเนิน
นโยบายการเงินของไทยภายใต้กรอบนโยบายการเงินปัจจุบัน ที่ผ่านมานับว่าอยู่ในเกณฑ์ดี โดยความโปร่งใสผ่าน
การสื่อสารกับสาธารณชน เป็นหนึ่งในปัจจัยสำคัญที่ช่วยเสริมสร้างประสิทธิภาพในการดำเนินนโยบาย

BANK OF THAILAND

Monetary Policy Conduct in Review: The Appropriate Choice of Instruments

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The views expressed in this paper are those of the authors and
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Abstract

In achieving price stability, a common mandate of monetary policy, central banks can choose different ways to conduct monetary policy. The difference in the conduct of monetary policy lies in the instrument they use not in the monetary policy regime *per se*. The paper finds that the higher the level of financial development, the higher degree of monopoly power (uniqueness) in exports and the stronger the institution, the more likely a country will use interest rate as the main monetary policy instrument. Furthermore, based on three criteria: (1) controllability of policy instrument and monetary conditions (2) the degree of counter-cyclicality and (3) the effectiveness of instrument in influencing inflation and output, interest rate appears to be an appropriate monetary policy instrument for Thailand. So far, performance of the current monetary policy framework in Thailand has been fine, with transparency through communication with the general public being one of the key factors contributing to the performance and policy effectiveness.

Contents

I.   Introduction

Since May 2000, the Bank of Thailand (BOT) has adopted flexible inflation targeting regime (FIT) with the use of interest rate as the primary monetary policy instrument. This adoption follows the failure of fixed exchange rate regime in July 1997 and a stop-gap monetary targeting regime under the IMF program between 1997-2000. Over the course of FIT implementation, the Thai economy has been relatively stable with historically low inflation and sound economic performance. However, increasing interconnectedness not only through trade but also financial channels has intensified the impact of global factors on the domestic economy and further complicated the conduct of domestic monetary policy.

Over the past few months, much debate has focus on the appropriate way to conduct monetary policy in Thailand. Despite over a decade of satisfactory macroeconomic performance, it is important to revisit the appropriateness of current monetary policy conduct under a changing environment. On this front, one of the issues widely discussed is the fact that Thailand is a small open economy, where commodity prices are determined by the world price, therefore, the use of interest rate as the main monetary policy instrument may fail to control inflation due to a close relationship between domestic and global inflation. In light of this, exchange rate was proposed as an alternative monetary policy instrument – with Singapore and Hong Kong as good examples. The other side of the debate argued, however, that being a small open economy does not necessarily hijack the ability to navigate the economy via the use of interest rate. Several small open economies, Korea and Malaysia for instance, also use interest rate as the main monetary policy instrument in a broadly similar fashion as Thailand. Therefore, it appears that countries are choosing between the use of interest rate or exchange rate as the main monetary policy instrument

The debate raises two important questions: **1) what are the common features shared by countries using the same monetary policy instrument – interest rate or exchange rate? and 2) What is the most appropriate monetary policy instrument for Thailand?**

The paper is organized as follows: the next section investigates central bank mandate and how it is translated into the practice of monetary policy. Based on this, countries will be divided into two main groups – those using interest rate and those using exchange rate as the main monetary policy instrument. In answering question 1, Section III then discusses common features shared among countries within the same group. The section that follows will set out criteria upon which the use of interest rate and exchange rate will be compared. This will enable a fair assessment on which instrument should be more appropriate in the Thai context, thus answer question 2. Section V then concludes.

II. The central bank mandate and alternative monetary policy conduct

This section identifies the central bank mandate, the underlying rationales along with the translation from the mandate into the practice of monetary policy. The first part of the section draws on a survey of central banks' mandates to identify the common objective of monetary policy, for which the underpinning rationales will be provided. The chapter then explores the practical aspects of monetary policy – different options to achieve a similar objective through the use of different monetary policy regimes. Looking closely, however, **the key difference in the practice of monetary policy does not lie in the regime *per se* but in the actual use of different instruments**.

2.1 Price stability as a common objective of monetary policy

A review of central banks' practice of monetary policy identifies price stability as a common objective of monetary policy. IMF (2011) classifies countries into various groups according to monetary policy framework and identifies their monetary policy objectives. (Table 1) Clearly, all countries identify price stability as the objective of monetary policy.

Table 1: Classification of Countries by Monetary Policy Framework and Objectives

Country	Monetary Policy Framework	Monetary Policy Objectives	
		Price Stability	Currency Stability
Hong Kong, Bosnia, Lithuania	Hard Peg	Yes	Yes
Argentina, Bahrain, Bangladesh, Belarus, China, Honduras, Iran, Jordan, Kazakhstan, Kuwait, Latvia, Lebanon, Morocco, Namibia, Nigeria, Pakistan, Qatar, Saudi, Singapore, Sri Lanka, Tunisia, Ukraine, UAE, Venezuela, Vietnam, Yemen	Soft Peg	Yes	Yes
Armenia, Australia, Brazil, Canada Chile, Colombia, Czech Republic, Ghana, Guatemala, Hungary, Iceland, Indonesia, Israel, Korea, Mexico, New Zealand, Norway, Peru, Philippines, Poland, Romania, Serbia, South Africa, Sweden, Thailand, Turkey, UK	Inflation targeting	Yes	No
EU, Japan, Malaysia, Switzerland, India, US, Egypt, Russia, Taiwan	Implicit	Yes	No

Source: Annual Report of Exchange Arrangements and Exchange Restrictions 2011, IMF

2.2 Why price stability? A theoretical approach

In theory, price stability should be set as the long-run overriding goal of monetary policy to avoid time inconsistency problems. Time inconsistency problem describes a situation where, with the passing of time, policies that were determined to be optimal yesterday are no longer perceived to be optimal today and are not implemented. (Dennis, 2003) The time inconsistency problem was advocated by Kydland and Prescott (1977) and Barro and Gordon (1983) and provides a classic foundation of modern monetary theory. The problem arises because there is a short-run tradeoff between employment and inflation but no such tradeoff in the long run. Policymakers may try to exploit the short-run tradeoff by implementing

expansionary monetary policy to expand output. However, subsequently as a consequence of expansionary monetary policy, wage and price expectations will adjust upwards and result in higher inflation in the long run without any gains in output. In other words, expansionary monetary policy may appear optimal in the short run but gives inferior outcome in the long run. **By assigning price stability as a long-term overriding objective of monetary theory, this helps reduce a temptation to inflate the economy for short-run gain and pins down wage and price expectations.**

2.3 Why price stability? A practical approach

Price stability allows the market to allocate resources more efficiently. [1] With price stability, households and firms are able to distinguish between relative and general price changes and price mechanism is not obscured by the fluctuation in prices. With efficient price mechanism, resources are steered to their most productive use and increase the productive potential of the economy.

Price stability reduces inflation risk premium and costs of hedging. With price stability, inflation risk premium is lower making investment more attractive. At the same time, households and firms do not need to divert their resources away from productive use to hedge against inflation. Overall welfare can be improved.

Price stability provides a convivial environment for sustainable economic growth. Alan Greenspan, the former Federal Reserve chairman, defined price stability as an environment in which inflation is so low and stable over time that it does not materially enter into the decisions of households and firms. The definition highlights the role of inflation expectation in fostering economic growth. With low and stable inflation, households and firms are able to form their expectation on the price level, plan their consumption and investment and execute the plans - leading to sustainable economic growth.

Price stability helps preserve purchasing power and maintain competitiveness. High inflation erodes consumers' purchasing power, given the same amount of income. As a result, under high inflation, consumers will be reluctant to consume, which could adversely affect overall economic activities. Moreover, high inflation relative to other countries also leads to a loss of competitiveness as prices of domestic goods are more expensive than foreign goods.

Maintaining price stability does not imply that output is ignored. While price stability is defined in the mandate of monetary policy, it should not be treated as an end in itself. The rationale underlying preservation of price stability is that it paves ways to sustainable economic growth. Maintaining price stability in the long-run does not rule out the central bank's role to safeguard overall economic stability as output and price fluctuations are closely related.

2.4 Translating the principle of price stability into practice

Maintaining price stability aligns with good central banking. Transparency, accountability and independence are key conditions for good central banking[2], hence, effective monetary policy conduct. To achieve price stability, central banks identify a *nominal anchor* or a clear target, against which monetary policy can be evaluated by the general public (transparency).
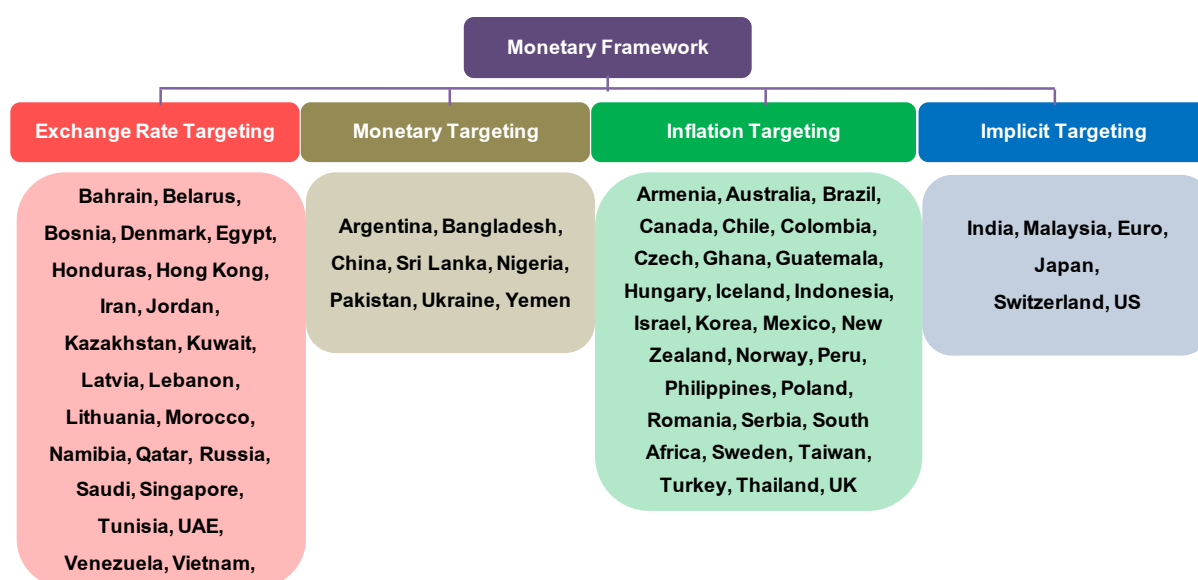
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[1] Oesterreichische Nationalbank (OENB)
[2] Amtenbrink (2004)

A clear nominal anchor translates price stability into actual policy implementation. If the target is missed, the central bank is directly accountable to provide explanations and/or right the wrongs (accountability). With operational independence, the central bank is empowered to steer the course of monetary policy to ensure the target is met. This helps lessen political pressure and avoid time inconsistency problems.

2.5 Alternative ways to achieve price stability: monetary policy regimes

The similar goal of price stability can be achieved via various means as reflected in different nominal anchors and corresponding monetary policy regimes. The use of different nominal anchors can be mapped against monetary policy regimes. According to the IMF *op. cit.*, there are **four types of monetary policy regimes: exchange rate targeting, monetary targeting, inflation targeting and implicit targeting** (Chart 1).

Chart 1: Classification of Countries by *De Facto* Monetary Policy Regimes

Monetary Framework			
Exchange Rate Targeting	**Monetary Targeting**	**Inflation Targeting**	**Implicit Targeting**
Bahrain, Belarus, Bosnia, Denmark, Egypt, Honduras, Hong Kong, Iran, Jordan, Kazakhstan, Kuwait, Latvia, Lebanon, Lithuania, Morocco, Namibia, Qatar, Russia, Saudi, Singapore, Tunisia, UAE, Venezuela, Vietnam,	Argentina, Bangladesh, China, Sri Lanka, Nigeria, Pakistan, Ukraine, Yemen	Armenia, Australia, Brazil, Canada, Chile, Colombia, Czech, Ghana, Guatemala, Hungary, Iceland, Indonesia, Israel, Korea, Mexico, New Zealand, Norway, Peru, Philippines, Poland, Romania, Serbia, South Africa, Sweden, Taiwan, Turkey, Thailand, UK	India, Malaysia, Euro, Japan, Switzerland, US

Source: Annual Report of Exchange Arrangements and Exchange Restrictions (AREAER) 2011, IMF

Each regime has been initiated and adopted at different point in time and for different reasons. The development of new monetary policy regime is usually an attempt to improve on existing regimes and address any loopholes or undesirable impact on the economy. Among them, exchange rate targeting is the oldest, which dates as far back as pre-WW I, while inflation targeting was first adopted in 1989. Each regime has virtues and drawbacks, there is no one-size-fits-all best regime. Details of virtues and drawbacks of each regime can be found in Box 1.

1) Exchange rate targeting

Under exchange rate targeting, the central bank buys or sells foreign exchange to maintain the exchange rate at its predetermined level or within a range. The exchange rate thus serves as the nominal anchor or intermediate target of monetary policy. These frameworks are associated

with exchange rate arrangements with no separate legal tender, currency board arrangements, pegs (or stabilized arrangements) with or without bands, crawling pegs (or crawl-like arrangements), and other managed arrangements.

Exchange rate targeting regime has evolved from its primary form known as the Gold Standard. Under the Gold Standard (1880s – 1910s), countries fixed the value of their currency in terms of gold and ability to print money would depend on the gold supply. Later on, when the need to print money for domestic use outpaced the supply of gold, the Gold Standard collapsed. The restoration of international financial order created the Bretton Woods system in 1944, where countries fixed their currencies to the US dollar. However, increasing cross-border borrowing and prolonged current account deficit in the US led to a breakdown of the system. Since then, exchange rate targeting came in various forms – from the strictest (the currency board, e.g. Hong Kong) to the most flexible (Singapore's basket band crawl).

2) Monetary targeting

Under monetary targeting, the monetary authority uses its instruments to achieve a target growth rate for a monetary aggregate, such as reserve money, M1, or M2, and the targeted aggregate becomes the nominal anchor or intermediate target of monetary policy.

Monetary targeting was founded on the Quantity Theory of Money advocated by Milton Friedman, where money demand depends on predictable macroeconomic factors, hence the central bank could control inflation by controlling monetary aggregate. Not many countries adopted this regime during normal times.[3] The well-known successful examples of this regime adoption are the Bundesbank and the Swiss National Bank (SNB) between 1980s – 1990s.

3) Inflation targeting

Under inflation targeting regime, the public announcement of numerical targets for inflation is the key, with an institutional commitment by the monetary authority to achieve these targets, typically over a medium-term horizon. Additional key features normally include: 1) an information inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments; 2) increased transparency of the monetary policy strategy through communication with the public and the markets about the plans, objectives, and decisions of the monetary authorities; and 3) increased accountability of the central bank for attaining its inflation objectives.

Inflation targeting regime was first adopted by Reserve Bank of New Zealand in 1989 and become increasingly more popular over the past decade with 27 countries adopting this regime in 2012.[4] The framework is neither a rigid rule nor a complete discretion but a "constrained discretion"[5], as it allows some flexibility in the conduct of monetary policy. While inflation target is set, it is merely a medium-term target because it takes time for monetary policy to transmit to the economy. If there were shocks to the economy, central banks can address such shocks without losing sight of its medium-term target. The framework stresses on transparency with

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[3] Countries under the IMF program are usually forced to adopt monetary targeting regime as one of the conditionalities due to short-lag time and ease of evaluation.
[4] Hammond (2012)
[5] Bernanke and Mishkin (1997)

communication on 1) goal and limit of policy, including rationale for inflation target 2) numerical value of inflation target and how to determine 3) how inflation target can be achieved, given current economic condition and 4) the reason for deviation from target.

4) Implicit targeting

Under this regime, the country has no explicitly stated nominal anchor,[6] but instead monitors various indicators in conducting monetary policy. Countries without explicit targets are usually advanced economies with high policy credibility such as the US, the ECB and Japan (until February 2012). Without explicit target, effective monetary policy could only be achieved if the general public believes that the central bank would stick to its mandate at all times without political influence.

Box 1: Virtues and drawbacks of monetary policy regimes

1. Exchange rate targeting regime

Exchange rate targeting, particularly fixed exchange rate, could help moderate time inconsistency problems due to an automatic rule-type monetary policy. By fixing exchange rate to an anchor country which implies that domestic interest rate will move in tandem with that of the anchor country under free flows of capitals, the country effectively borrows monetary policy credibility from the anchor country. If the country does not have institutional and structural readiness to conduct its own monetary policy credibly, exchange rate targeting may be an appropriate choice of instrument. The regime itself, especially fixed exchange rate, is also clear and easy to communicate. Moreover, stability in exchange rate also eliminates exchange rate risks and facilitates cross-border trade and investment, while helps control inflation and inflation expectations in line with that of the anchor country.

The major drawback of exchange rate targeting is the flip side of the same coin. By importing the anchor country's monetary policy stance, the country using this regime loses monetary policy autonomy. Under free flows of capital, the central bank will have no control of its domestic interest rate because if there are interest differentials between the domestic and that of the anchor country, capital will flow imposing pressure on exchange rate and make the exchange rate target unsustainable and shocks from the anchor country will be directly transmitted to the domestic economy. Moreover, less ability to use discretionary policy will also weaken accountability and lessen the need for institutional improvement.

In addition, it is an intricate task to find the "right" level of exchange rate to target. If the exchange rate is targeted at the level inconsistent with the country's economic and institutional fundamentals, imbalances would build up and render the economy more vulnerable to shocks. Speculative attacks may follow and jeopardize the regime itself. An example is Thailand leading up to the crisis in 1997, fixed exchange rate and capital account liberalization led to large (unhedged) external debt and misallocation of resources into less productive sector such as real estate and property.

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[6] This category is also used when no relevant information on the country is available.

2. Monetary targeting regime

The strength of monetary targeting regime lies in its ability to reduce time-inconsistency problems through the rule-based conduct. At the same time, the regime itself allows monetary policy autonomy, thus ability to cope with idiosyncratic shocks and tailor monetary policy stance in line with the country's specific economic conditions. Moreover, as it is based on the quantity theory of money, assuming that money demand function is relatively stable, the growth of money supply will then have a direct link with inflation. By controlling money supply, the central bank effectively controls inflation.

In practice, except for the Bundesbank and SNB, there have not been many successful stories on the adoption of this regime. The US, UK and Canada adopted the regime around 1980s and failed. The failure was largely attributed to an unstable money demand function as a result of rapid financial regulation and innovation, which largely weakened the linkage between money supply growth and inflation. Even in the successful cases, Mishkin (1999) posited that the success of monetary targeting regime was not due to the regime itself but clear policy communication and clear priority in achieving price stability over growth during the time when two goals were in conflict.

3. Inflation targeting regime

Inflation targeting regime allows monetary policy autonomy and flexibility to respond to output shocks – both from demand and supply without losing the eventual objective of price stability. Temporary target blips are allowed as long as the miss is not prolonged and justifiable. The regime also helps reduce time inconsistency problems as it stresses on transparency by communication with the general public and accountability of the central bank to the target. Moreover, by announcing an explicit inflation target and committed to it, the central bank helps pin down the general public's inflation expectations.

Nevertheless, the implementation of successful inflation targeting is not simple.[6] Apart from effective communication with the general public, the actual implementation itself requires a thorough assessment of complete and comprehensive economic indicators and a forecasting model to ensure that the monetary policy decision made is consistent with underlying economic conditions and appropriate for the economy going forward. Such requirements rule out countries that may not have sufficient institutional and technical readiness.

2.6 Alternative ways to achieve price stability: monetary policy instruments

A closer examination reveals that, in fact, the key difference in the monetary policy conduct is not in the regime *per se* but in the actual use of different instruments. Most studies divide countries according to regimes, however, there are certain doubts whether countries should belong to the regime they are classified into. To illustrate this issue, we pointed out the followings:

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[6] Mishkin (1999) wrote "…Inflation targeting does not provide a simple and mechanical instruction of how to…"

1) Countries classified under monetary targeting regime such as Argentina, Bangladesh, China, Nigeria, Pakistan, Sri Lanka, Ukraine, and Yemen, in practice, conduct their monetary policy by using exchange rate with an explicit target on exchange rate and mandate to maintain currency stability.

2) Countries classified under implicit targeting regime such as the US, the euro area, Switzerland, Japan, India and Malaysia appear to implement their monetary policy in a similar fashion as inflation targeters. This implicit target group primarily uses interest rate as the main instrument. They also define medium-term inflation target[7] and anchor inflation expectation through communication. Furthermore, several economic and financial indicators were exhaustively employed before monetary policy decision could be reached.

A quantitative assessment on reaction functions affirms the similarity between inflation targeters (IT) and implicit targeters (Implicit). We estimate a panel regression on these two groups of countries and found that (Table 2):

Table 2: Panel estimation results

$$i_t = \beta_0 + \beta_1 i_{t-1} + \beta_2(\pi_{t+2} - \pi^{tgt}) + \beta_3 ygap_t$$

	β_1	β_2	β_3	Adjusted R^2
IT	0.89 (0.02)	0.09 (0.01)	0.12 (0.02)	0.97
Emerging Market Countries	0.86 (0.02)	0.09 (0.02)	0.10 (0.02)	0.97
Advanced Economies	0.93 (0.02)	0.12 (0.03)	0.14 (0.03)	0.95
Implicit	0.90 (0.03)	0.10 (0.04)	0.11 (0.03)	0.93

Note: S.E. in the blanket

IT emerging markets – Brazil, Chile, Colombia, Czech Rep., Hungary, Indonesia, Israel, Korea, Peru, Philippines, Poland, Thailand, Turkey, Mexico, and South Africa

IT advanced economies – Norway, Sweden, Australia, New Zealand, and UK

Implicit - India, Malaysia, Russia, Euro zone, US, and Japan

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[7] For example, the Fed set medium-term inflation target at 2 percent and announced it in January 2012.

1) The weights attached to output and inflation are comparable in IT and Implicit groups

2) Both groups – IT and Implicit – attach broadly equal importance to output and inflation (implying that IT is a FIT)

3) There is not much difference within IT group between emerging market countries and advanced economies.

We therefore reclassify countries into two groups according to the main monetary policy instrument used to reflect the actual implementation: interest rate and exchange rate. The exchange rate group consists of 32 countries and the interest rate group comprises 34 countries (Chart 2). Within each group, there is variation in the use of the instrument, for example, Hong Kong and Singapore fall into different sub-categories of exchange rate group, while interest rate group can be further divided into managed and free floating exchange rate regime. The sample covers around 90 percent of overall world GDP and selected based on data availability in the different dimensions that we will explore in the following section.

Chart 2: Classification of Countries by Main Monetary Policy Instrument and Exchange Rate Management
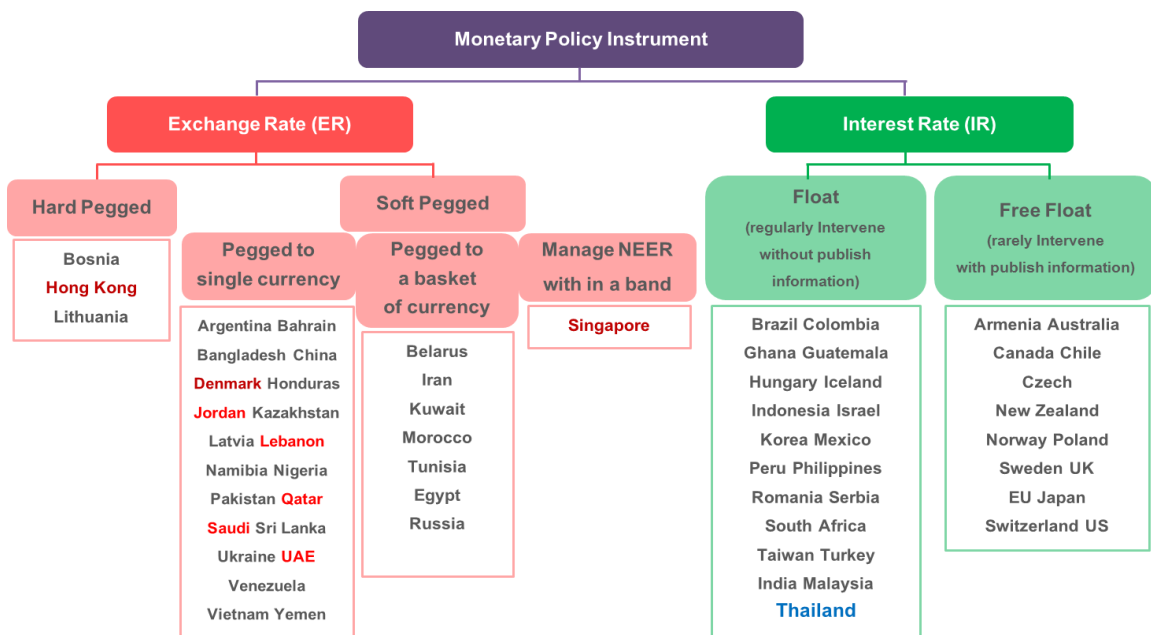
Note: Degree of exchange rate management is according to AREAER 2011 IMF. Hard pegged is including exchange arrangement with no separate legal tender and currency board. While soft pegged is including conventional pegged, pegged within horizontal band, crawling pegged, stabilized arrangement, and crawl-like arrangement.

Source: (1) Annual Report on Exchange Arrangements and Exchange Restrictions, IMF 2011
(2) Monetary policy frameworks and central bank market operations, Market Committee, MC Compendium, BIS, May 2009
(3) Hammond (2012)
(4) Sterne (2002)
(5) Central bank websites

III. <u>**What are the common features underlying the different choice of instrument?**</u>

Countries using the same instrument (interest rate or exchange rate) may share certain common features or environment. This section aims to provide some stylized facts on the association of instrument and underlying environment as well as position Thailand among other countries. The approach will be a positive analysis by nature and we make no claims that countries with certain environment should or should not use a particular instrument. A normative assessment on what is the appropriate instrument under what conditions will be made in Section IV. This section is divided into two sub-sections. The first sub-section provides stylized facts on different types of environment that may be shared by countries of the same group and the other sub-section affirm the relationship between environment and choice of instruments. This study is relatively new as existing literature would focus on particular aspects of the economy, such as trade openness and degree of economic development, and explores whether countries would choose to fix exchange rate or adopt inflation targeting.[8]

3.1 Identifying common features and the choice of instrument: An illustrative approach

In this paper, we explore four dimensions of environment to cover most angles that may be of relevance in the selection of instrument. The four dimensions are:

1) The size and wealth of a country
2) The trade dimension
3) The development of financial system and degree of financial openness
4) Institutional strength: the government and the central bank

1) The size and wealth of a country

The reason why the size and wealth of a country may be of relevance is motivated from a widely discussed issue[9] on the appropriateness of developing countries' adoption of monetary policy framework that is perceived to be suitable for advanced economies. The small economies are more heavily hit by shocks than larger economies. The literature argues that developing countries may have high external exposure both in terms of trade and capital flows. This renders developing countries more vulnerable to shocks due to weak regulatory framework, insufficient monitoring process as well as less developed market. Institutional set-up may also be an important factor preventing the central bank from achieving its objective or reduces the effectiveness of the policy.

Chart 3 provides a scatter plot of countries in the sample based on GDP and GDP per capita (PPP-based). No clear conclusion could be drawn on the association of economic development and the use of instruments. **There is a good mix between the interest rate and exchange rate group both at a lower and higher end of income.** Among the high-income countries, **Denmark, Hong Kong and Singapore as well as oil-exporting countries, stand out from the rest of exchange rate group.**

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[8] Sterne (2002), Petursson (2008), and Hebbel (2009)
[9] Rose (2011)

Chart 3: Countries by GDP and GDP per capita
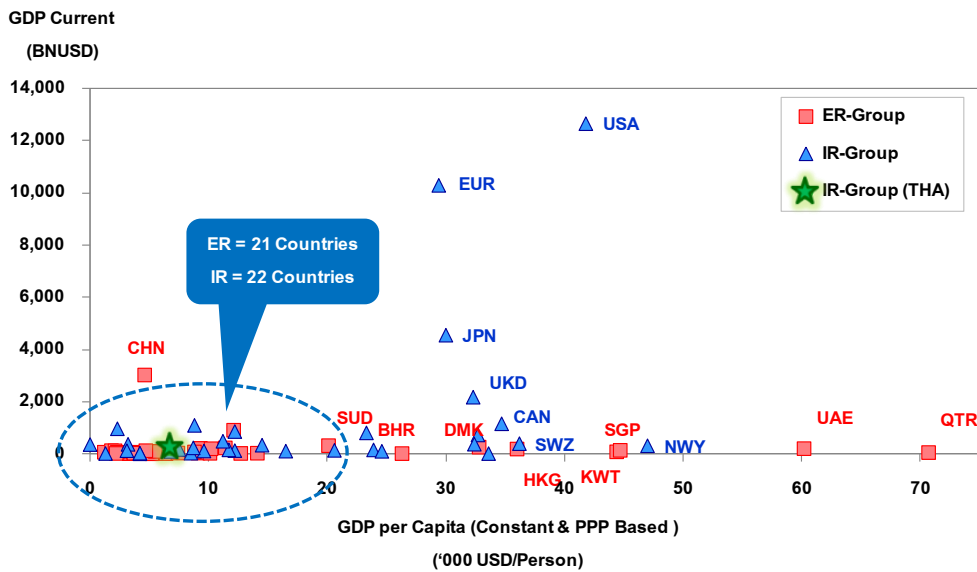
Source: World Bank national accounts data, and OECD National Accounts data files

2) The trade dimension

Much has been discussed whether a country with high degree of trade openness should use exchange rate as the main instrument instead of interest rate. We explore two dimensions of trade: **1) the degree of trade openness, measured by the sum of exports and imports (both in goods and services) as a percentage of GDP – average over 10 years (2001-2010) to smooth out temporary shocks to trade pattern** and **2) the degree of monopoly in exports**[10]**.** The degree of monopoly (uniqueness) in exports is calculated based on the method used by Hausmann, Hwang, and Rodrik (2005) from the country's income weighted by the share of its export to total world exports. This concept may be applied to measure the ability to set the world price. The objective of using this indicator is to measure the intrinsic quality of product that imply its monopoly power (more price competitiveness and price adjustment as a shock absorber), which would provide another dimension on trade.

From Chart 4, **export monopoly is a more distinctive feature compared to trade openness in classifying countries into the two groups.** The majority of interest rate group has higher monopoly power in export goods (horizontal axis) and may not need to use exchange rate as a means to gain price competitiveness. On the other hand, countries with high degree of trade openness (vertical axis) are not necessarily using exchange rate as a main monetary policy instrument. Once again, **Denmark, Hong Kong and Singapore are outliers of exchange rate group.** While Singapore has extremely high export productivity and degree of trade openness, Hong Kong is an exceptional case in terms of trade openness (around 370 percent to GDP) and Denmark has high scores on monopoly power in exports. Thailand, on the other hand, has above-average scores both on the trade openness and monopoly power in exports.

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[10] Based on "The Changing Patterns of Global Trade" IMF (2011)

Chart 4: Countries by trade openness and export monopoly
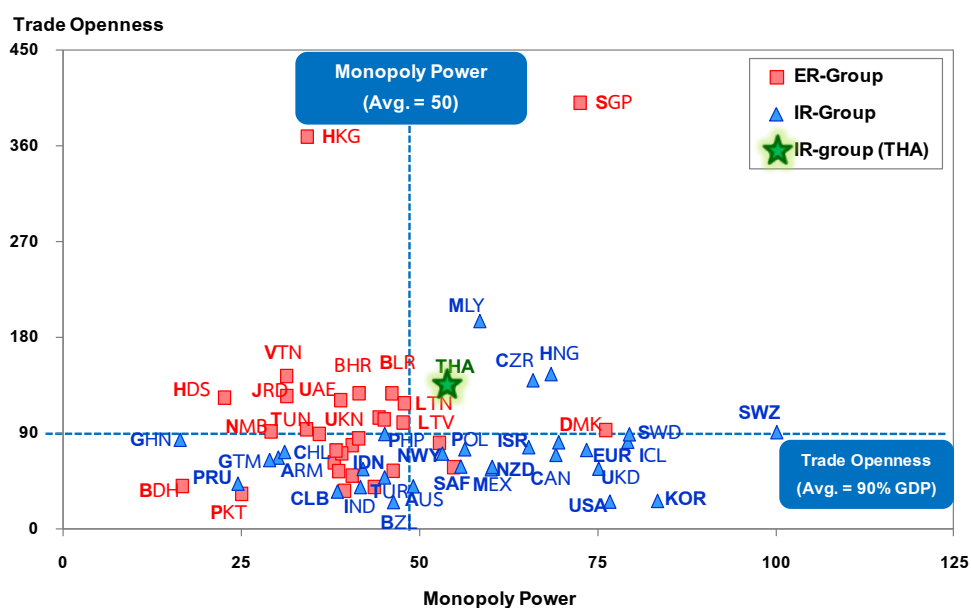
Note: Both trade openness and productivity are averaged 2001-2010
Source: World Bank national accounts data and Changing Patterns of Global Trade, IMF (2011).

3) The structure and development of financial system and degree of financial openness

The previous section pointed out that countries under exchange rate targeting regime, or using exchange rate as a main instrument, are importing credibility from the anchor country, therefore, there need not be high degree of financial development or financial market depth. We turn the argument around and question whether financial development and depth will be associated with the instrument a country may use. In addition, we also explore whether the structure of financial system matters. Simply put, if a country is more bank-based than market-based, using interest rate as the main instrument may be more appropriate due to a more efficient policy transmission via the banking system.
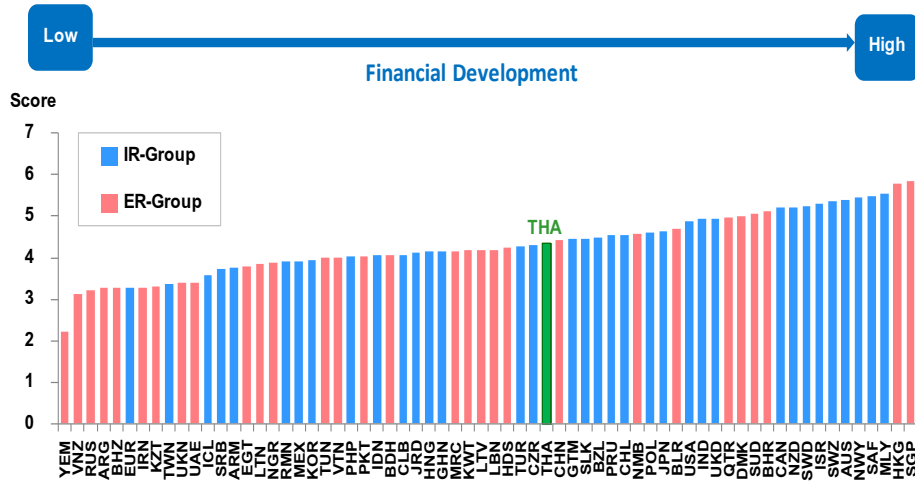
Another important aspect we will look into concerns the degree of financial openness. As capital flows have increased significantly over the past decade, would there be an association between a country's choice of instrument and the degree of financial openness? One argument is that if a country has high degree of financial openness, it may well use exchange rate as the main instrument to avoid undue volatility in exchange rate, which could be damaging to the economy.

We explore three dimensions of financial system: the development aspect, the structure of the financial system and the degree of financial openness. Chart 5 shows the ranking of financial development[11], there is a good mix between members of exchange rate and interest rate groups on both the low- and high-side of the scale. Thailand's position is close to the middle of overall ranking. The proxy of financial market depth is shown in Chart 6, the vertical axis measures the size of the financial market relative to GDP, while the horizontal axis proxies the depth of the market via stock turnover. Unlike the ranking of financial development, Chart 6 shows some pattern. **Most members of interest rate group tend to be at the higher**

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[11] The Global Competitiveness Report, World Economic Forum (2011-2012)

end of both the market size and the financial market depth. Hong Kong and Singapore have extremely large financial market unlike the rest of the exchange rate group. Thailand is positioned closer to the middle.

Chart 5: Countries by Ranking of Financial Development

Chart 6: Countries by Financial Market Depth
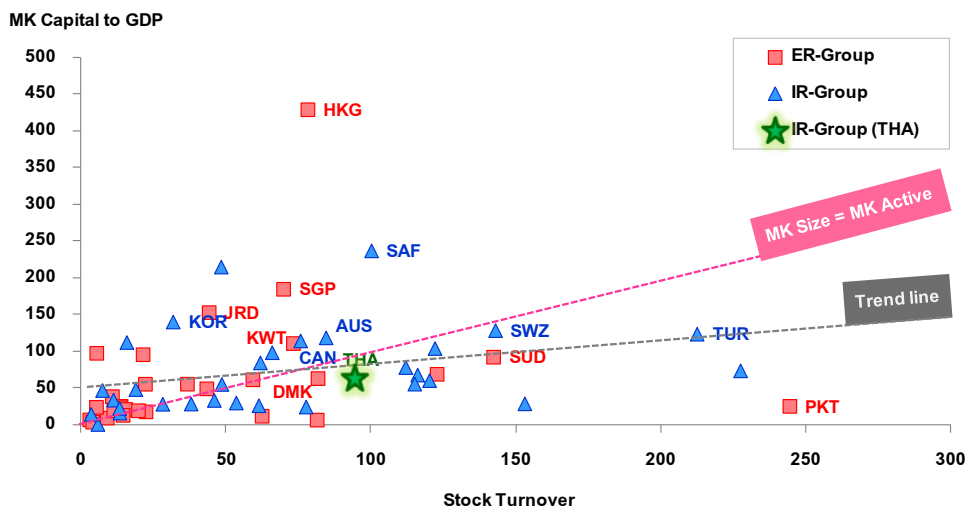
Financial structure aspect is then examined in Chart 7, which shows a scatter plot of countries based on the size of the financial market (on a vertical axis) and the size of the banking system (on a horizontal axis). **Financial structure does not appear to be associated with the use of instrument.** Thailand is, then again, positioned close to average as far as the size of financial system is concerned and slightly more bank-based than average.

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Chart 7: Countries by Financial Structure

Market-based
(MK Capital to GDP)

Avg. degree of Bank-Based = 72% of GDP

Avg. degree of Market-Based = 68% of GDP

- ER-Group
- IR-Group
- IR-Group (THA)

Bank-based
(Private Credit to GDP)
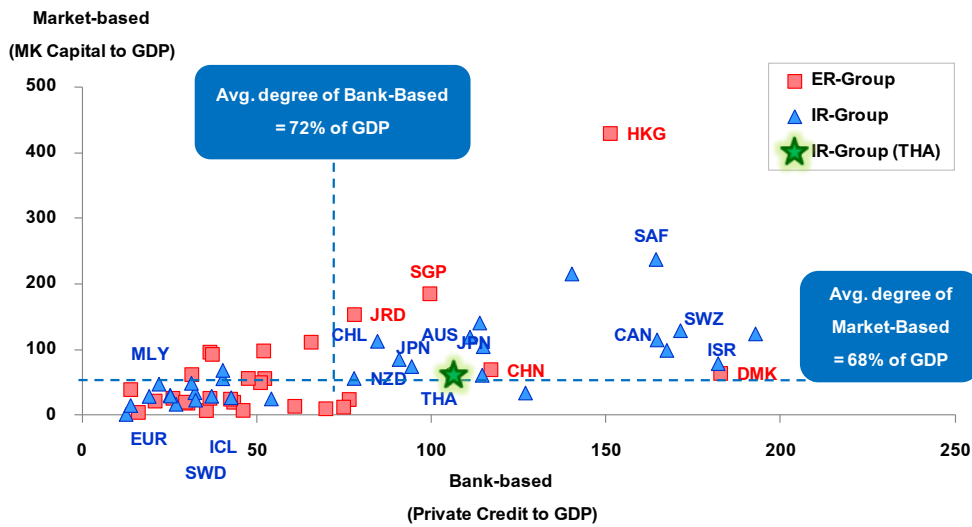
Source: World Bank national accounts data, and OECD National Accounts data files

The degree of financial openness is examined next. Chart 8 illustrates a scatter plot of countries according to financial integration score and financial openness indicator. The two measures provide two dimensions of financial account openness. Financial integration score captures *de facto* openness from the degree of financial exposure (both inward and outward) relative to the size of the economy based on Pongsaparn and Unteroberdoerster (2011). Financial openness indicator shows the degree of *de jure* openness, based on capital account measure scores by Chinn and Ito (2007). The higher the score on both measures, the more open the financial account is.

Chart 8: Countries by Financial Openness

Financial integration

- ER Group
- IR Group
- IR-Group (THA)

KAOPEN Index

Low → High
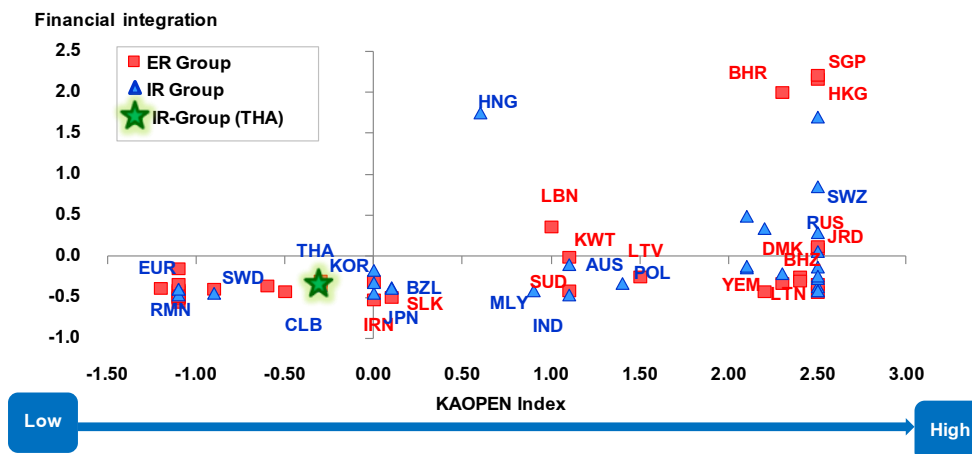
Note: KAOPEN Index is based on the binary dummy variables that codify the restriction on cross-border financial transactions report of IMF. The index takes on higher values is the more open the country is to cross-border capital transaction. Financial Integration is a cross-country z-score capturing the degree of financial exposure (both inward and outward) relative to the size of the economy.

Source: IMF, Chinn and Ito (2007), Pongsaparn and Unteroberdoerster (2011)

From Chart 8, **Singapore and Hong Kong are outliers from the rest of the sample** with extremely high scores on both measures, clearly a consequence of their regional financial center status. Moreover, we find that **most members of interest rate group have relatively high scores compared to exchange rate peers** (leaving out Singapore and Hong Kong).

4) Institutional strength: the government and the central bank

Institutional strength may be associated with the choice of instrument. As mentioned earlier, countries without sufficient institutional strength may conduct its monetary policy by borrowing credibility from a strong country via the use of exchange rate target. This, however, may be a speculation and needed to be backed up by empirical evidence.

The strength of institutional framework can be assessed both on the government and the central bank. On the government, we employ the World Governance Indicator developed by the World Bank,[12] which assesses five main dimensions of governance: government effectiveness, regulatory quality, rule of law, control of corruption, and political stability. On the central bank, we base our assessment on the index of central bank transparency from a study by Dincer and Eichengreen (2007), which comprises five main components: (1) objective transparency, (2) declaring economic information for monetary policy decision, (3) procedure transparency, (4) prompt disclosure of reasons behind policy decision, and (5) operational transparency. These indices may represent the strength of institutional framework better than quantitative indicators such as current account, public debt and the size of international reserves. The reason is that the quantitative indicators may be influenced by a range of external factors which may cloud the impact of policymaking efficiency and institutional strength.

Chart 9: Countries by Central Bank Transparency and Government Governance
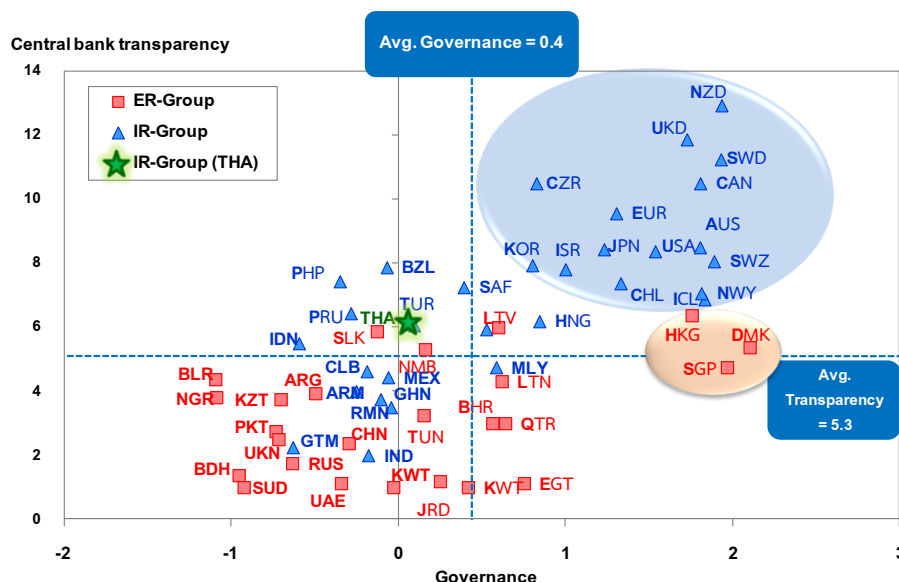
Note: Central bank transparency is average 1998 – 2005 and government governance 2002-2010
Source: Dincer and Eichengreen, (2007) and Worldwide Governance Indicators Report (2012)

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[12] Worldwide Governance Indicator Report 2012

Chart 9 shows a scatter plot of countries according to the governance indicator and central bank transparency. Four important observations emerge:

1) **All Countries with high degree of institutional strength both in terms of the government and the central bank belong to the interest rate group.** These countries are mainly the advanced economies: Canada, the euro area, Iceland, Israel, Japan, Korea, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United State with two members from emerging markets, namely Chile and Czech Republic.

2) **Countries with high score on government governance but lower central bank transparency are Hong Kong, Singapore and Denmark,** which are the outliers of exchange rate group. By using exchange rate as the main instrument, central bank transparency may not be a crucial ingredient for success, or certain degree of opacity is required (as shall be discussed in the following section).

3) **Countries with lower scores on both government governance and central bank transparency are mainly developing countries with a fair mixture of members from interest rate and exchange rate groups.** Thailand is among these countries with higher-than-average central bank transparency and lower-than-average degree of government governance.

4) **The degree of government governance highly correlates with central bank transparency.** Without good governance, it may be difficult for the central bank to have high degree of transparency.

3.2 Identifying common features and the choice of instrument: A quantitative approach

Although we could roughly draw some conclusions from the charts presented, there is no specific quantitative comparison on the degree of association between these features and the choice of instrument. In light of this, we employ a logistic analysis to affirm the results in the previous sub-section and provide a quantitative approach.

A logistic analysis with binary choices is employed. For countries using exchange rate as the main instrument, the score is 1. The score is, therefore, 0 for those belonging to the interest rate group. Using a closely similar dataset to that of the preceding sub-section with 62 countries: 30 belongs to the exchange rate group and 32 are members of the interest rate group. The determinants are the size of the economy, trade openness, export monopoly power, the degree of financial development and institutional factors. Table 3 shows the regression result. The model could explain the data relatively well with McFadden R-squared between 0.3-0.5 and high goodness of fit.

Table 3: Result of Logistic Analysis

Variable	Coefficient	Probability	Odds Ratio
Log(PPPCAP)	1.81 (0.71)	0.01	6.12
TRADEOPEN	0.02 (0.01)	0.01	1.02
Monopoly	-3.48 (1.48)	0.02	0.03
Governance	-2.16 (0.84)	0.01	0.12
FINDEV	-1.05 (0.65)	0.11	0.35
Constant	29.28		

Note: S.D. in blanket, McFadden R^2 is 0.39, and Expectation-Prediction Evaluation is 80.65%
Odds ratio is used for interpretation in logistic function where threshold level is equal to 1.
The more odds ratio moves away from 1, the more significant influence is on explaining
difference of choosing MP instrument.
Odds ratio is more than 1: If X increases, the probability of choosing ER-instrument increases.
Odds ratio is less than 1: If X increases, the probability of choosing ER-instrument decreases
(i.e. the probability of choosing IR-instrument increase).

Regression results suggest a statistically important contribution of all structural factors to the choice of monetary policy instrument. Interpretation of the Odds ratio points to the followings, which helps affirm the result in the previous sub-section:

1) **The higher the GDP per capita, the more likely a country will choose exchange rate over interest rate.** However, the oil-rich countries (such as Qatar, UAE, Singapore and Kuwait), Hong Kong, Singapore and Denmark may dominate the results. As mentioned earlier that these countries have specific reasons for adopting exchange rate, therefore, the result cannot be taken as a general result.

2) **The degree of monopoly power over exports is a significantly more influential factor than the degree of trade openness in choosing monetary policy instrument.** The higher the monopoly power, the less probability (about 32 times) that countries will choose exchange rate over interest rate.

3) **The higher the degree of financial development, the less likely the country will choose exchange rate.** As reflected in financial development index, financial development index covers broad aspects of financial system development. Nevertheless, when compared to other variables, the degree of impact and significance is less.

4) **Government governance is a significantly influential factor in explaining the choice of instrument.** The stronger the institution, the less likely (about 9 times) a country will choose exchange rate over interest rate.

3.3 Summary of findings

The findings from both the illustrative and quantitative parts provide a snapshot of certain features that may be shared among countries within the same group as follows:

1) **Only two common features can be identified to be associated with the choice of instruments: export monopoly power and institutional strength.**

   Monopoly power of exports

   - **Export monopoly power is a more apparent dividing feature than the degree of trade openness.** Members of interest rate group generally have higher export monopoly power than the exchange rate group. The rationale behind this finding is the fact that with high export monopoly, negotiating power is higher, therefore the country will be less affected by external factors and does not need to use exchange rate as an instrument to gain price competitiveness.
   - **Oil-exporting Middle-East countries use exchange rate,** perceiving that a fixed exchange rate could help reduce economic and income fluctuations. Other oil-exporting countries such as countries in Latin America do not use exchange rate. The subprime crisis has provided an important contrasting experience. External shocks (from the US) were directly transmitted to the Middle-East countries, leading to high inflation. As a result, some of the oil-exporting countries are considering a more flexible approach to exchange rate management.

   Institutional strength

   - **The interest rate group has higher degree of institutional strength than the exchange rate group.** Both the degree of government governance and central bank transparency are higher in the interest rate group. The underlying reason is briefly mentioned in the previous section that there is no instruction of how to conduct monetary policy using interest rate. In the decision-making process, information on the current macroeconomic conditions, internal and external risks and policy coordination with the fiscal agent is crucial. At the same time, the policymaker has to be forward-looking. To be able to anchor the general public's expectations and conduct the monetary policy effectively, the central bank needs to be sufficiently transparent, while the government needs to have good governance by not intervening in the central bank's policymaking process.
   - **Singapore, Hong Kong and Denmark are outliers from the exchange rate group in all dimensions.** This is partly due to the fact that these three countries are more advanced than the rest of exchange rate group members. Each has their own specific reason in adopting exchange rate as a policy instrument as follows:

   Singapore: **Not only is Singapore an outlier in all aspects, it is also the only country actively using exchange rate as the main policy instrument, without fixing.** Singapore dollar is not fixed to a single currency or a basket of currencies unlike other countries within the exchange rate group. The Monetary Authority of Singapore (MAS),

the central bank, prescribes a path for nominal effective exchange rate (NEER) in a loose crawling band fashion. This allows some flexibility in the conduct of monetary policy and allows the exchange rate to move in line with changing macroeconomic fundamentals. MAS provided the reasoning behind the use of exchange rate such that exchange rate movement has a large-scale impact on the economy with a significant degree of pass-through to domestic prices due to very high degree of openness – both in the trade and capital accounts. (See further details in Box 2)

Hong Kong: **Hong Kong is among the very few countries who adopt the currency board with the Hong Kong dollar tightly pegged to the US dollar.** The use of currency board is aimed to reduce exchange rate volatility, which may have a significant impact on the economy and facilitate the role of Hong Kong as a regional financial center. However, under this scheme, macro-prudential policy becomes a crucial tool to lessen the risk of property price bubble, which may come about due to low interest rate in line with the Federal Reserve, who needed to maintain the interest rate at low level to stimulate the economy.

Denmark: Denmark is among the more advanced country with strong economic fundamentals and institution. Denmark fixes its currency to the euro due to close trade and financial linkages with countries in the euro area. However, it did not join the euro as the referendum on introducing the euro in 2000 was defeated.

Box 2: A puzzle of monetary policy framework: the case of Singapore

Singapore has a unique monetary policy framework that the exchange rate is managed within a band to facilitate international trade and capital mobility. Singapore's exchange rate system has considerable flexibility in which nominal effective exchange rate (NEER) band can be periodically reviewed and discretely adjusted during periods of external shocks and heightened volatility in financial markets to remain consistent with economic fundamentals. It appears that the SGD has been on an appreciation trend along with the surge of capital flows and productivity growth over the past couple of years. The band adjustment was aimed to keep inflation low. Then, the level or slope of the band would implicitly help shape market expectations. The exchange rate flexibility is therefore a special feature which can prevent currency misalignment and is different from a traditional fixed exchange rate. In addition, the Monetary Authority of Singapore (MAS) does not adhere to the pro-growth strategy, reflecting from counter - cyclical policy implemented. Trade-weighted exchange rate, an intermediate target, is managed against the basket of currencies of its major trading partners and competitors, of which the undisclosed weights depend on the degree of trade dependence. However, the MAS qualitatively announces exchange rate path in each decision semi-annually. Clarified medium - term target (on 6 - month NEER) can enhance public's understanding in policy stance which helps anchor inflation expectations and improve the effectiveness of monetary policy. Therefore, these underlying practices are relatively controllable by the MAS. However, the central bank must have high transparency and gain credibility so as to maintain the trust of the general public.

More important than the design of framework, Singapore also has friendly climate as stated in Eichengreen (2002) that "Singapore's good experience with its managed float system is based

not on the design of the exchange rate band, but on other characteristics of the economy." Singapore has various aspects of economic attributes to facilitate exchange rate management and absorb shocks. First, feasible market flexibility can facilitate internal costs and prices adjustment, and high degree of exchange rate pass through can be attained. Second, interest rate is determined by foreign interest rate under the conditions of freely capital mobility and relatively fixed exchange rate. Third, Singapore pursues prudent fiscal policy and high saving rate so that the economy is less sensitive to domestic interest rate. And Fourth, Singapore is a highly externally oriented economy, so the ample foreign reserves can be obtained and being used as a backup for exchange rate management.

The similarities and difference between Hong Kong and Singapore

"The link ensures that the HKD has a stable external value against major world currencies. This stability plays an important part in supporting HK's role as a trading and financial center." (HKMA)

Hong Kong is a highly externally oriented economy since there is no resource and almost everything consumed has to be imported. Then, the domestic price is highly dependent on exchange rate. The exchange rate is, therefore, chosen to be an intermediate target.

Hong Kong and Singapore share certain features, for example, market flexibility, strong institutions and financial system, prudent fiscal policy and high saving rates, as well as ample foreign reserves, which help facilitate effective exchange rate management. Hong Kong has adopted the currency board by tightly fixing its currency to the USD. Then, the loss of monetary policy autonomy is generally acceptable. The domestic interest rate is determined by the US federal funds rate.

However, "…it is always debatable whether the costs associated with having the comfort of a stable external exchange rate value of the currency of Hong Kong, in the form of a stable exchange rate against USD, are worth assuming at all time, regardless of the changing circumstances that Hong Kong faces..." (Yam, 2012) At present, Hong Kong is more integrated with and dependent on Mainland China than the US, as a result, the business cycle of Hong Kong may not be closely synchronized with the US economy. While the Fed maintains the interest rate at low level to revive the US economy, Hong Kong does not need that push. Low interest rate results in overheating with high inflation and asset price bubbles. Nevertheless, the exchange rate system in Hong Kong is still sustainable due to the HKMA's credibility.

Even in the case of Singapore, the current monetary policy framework came at a price of domestic financial stability. According to MAS Managing Director Ravi Menon: "…there is a limit to how far we can use exchange rate policy to contain inflation. First, while exchange rate policy is effective against imported inflation and domestic cost pressures arising from rapid economic growth, it is less so against inflation in housing rentals and car prices. Even so, housing prices and car prices cannot keep rising rapidly in an environment of weakening economic growth... Second, too rapid a rate of appreciation of the Singapore Dollar can significantly hurt our economic performance, especially in light of heightened uncertainty in the external environment…"

2) Thailand is positioned somewhat in the middle on most dimensions, but closer to the higher end and is not far away from the rest of interest rate group. On the trade dimension, Thailand has slightly higher-than-average trade openness and export productivity. On the financial development, structure and openness, Thailand is slightly more bank-based while the size of the financial market, degree of financial openness and financial development is comparable to overall average. As far as institutional strength is concerned, while central bank transparency is closer to the high side, government governance is slightly below the average.

Despite being positioned in the middle on most dimensions, this does not imply that interest rate and exchange rate are equally suitable for the Thai economy. This section offers only stylize facts without judgment on what would be the appropriate instrument given certain features/environment. An assessment on which instrument is appropriate in the Thai context is carried out in the following section.

IV. Should Thailand use interest rate or exchange rate as the main monetary policy instrument?

This section will take the analysis a step further by assessing which instrument is more appropriate as the main monetary policy instrument for Thailand. In order to do so effectively, we first provide a background on the current state of monetary policy conduct along with some background on inflation dynamics in Thailand to set stage for a proper assessment that follows. The assessment will be carried out by setting criteria against which each instrument will be compared and mapped with the Thai context. In the last sub-section, we will also provide an overview of performance under the current framework, which will lead to a conclusion in the next section.

4.1 Background on monetary policy conduct in Thailand

Since May 2000, the BOT has adopted FIT regime using interest rate as the main monetary policy instrument. Under FIT, the BOT not only aims to keep inflation within the target range going forward, but also uses the policy rate, which is a 1-day bilateral repurchase rate[13], to ensure that the economy can expand in line with its potential while safeguarding economic and financial stability. Currently, the target is quarterly set for core inflation between 0.5 – 3.0 percent per annum. In every Monetary Policy Committee (MPC) meeting, which takes place on a regular basis – every 6-8 weeks, the MPC balances risks to growth, risks to inflation, and financial imbalances concerned before reaching decision on the policy rate. For instance, a recent soft patch caused by the Great Flood in Thailand, which was particularly severe in Q4 2011, and softer global economic outlook prompted the MPC to lower the policy rate in two consecutive MPC meetings (on 30 November 2011 and 25 January 2012). This shows that the BOT is not an "inflation nutter"[14].

To implement the MPC policy rate decision, the BOT conducts monetary operations to manage liquidity in the banking system and anchor short-term interest rates close to the policy rate. Currently, four main types of OMOs are employed: the bilateral repurchase operation (BRP), outright purchase or sale of public debt securities, the issuance of Bank of Thailand bills and bonds, and foreign exchange swap transactions.

While the main instrument is the policy rate, the BOT uses exchange rate as a supplementary instrument via foreign exchange intervention when necessary. However, maintaining the policy rate at the target announced by the MPC is an overriding objective of monetary policy implementation. The use of two instruments is common across emerging market economies. In support of the use of two policy instruments, Ostry *et al.* (2012) writes:

"…benign neglect of large exchange rate movements…are unlikely to be the right policy even under an IT framework… (two policy instruments) should be used in tandem to achieve both price-stability and exchange-rate objectives…"

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[13] 14-day repurchase rate was replaced by 1-day repurchase rate since January 2007.
[14] This term was used by Mervyn King, the governor of the Bank of England, to describe central banks that focus only on controlling inflation.

The use of two instruments under free flows of capital may push the central bank against the impossible trinity, where monetary policy autonomy, free flows of capital and fixed exchange rate cannot co-exist all at the same time. This is simply because the act of foreign exchange intervention results in an injection (or withdrawal) of Thai baht liquidity, which may impose pressure on short-term interest rates to deviate from the policy rate. This forces the BOT to absorb the excess Thai baht liquidity (or inject liquidity) through OMOs to mitigate the impact of foreign exchange intervention on the baht liquidity, or so-called "sterilization". The impact of sterilized foreign exchange intervention will be discussed.

4.2 Background on inflation dynamics in Thailand

Since Thailand is a small open economy, a closer look at the determinants of inflation dynamics may provide further information, which would help the assessment become more clear-cut. As a price taker in the world market, especially for essential commodities such as energy, the global inflation might be an important driving factor behind Thai inflation dynamics over which monetary policy has no control.

Recent study by Khemangkorn et al. (2012) found that over the past decade, inflation dynamics in Thailand was driven largely by inflation expectations and domestic demand, accounting for around 70 percent of overall inflation dynamics. Supply shocks, on the other hand, contributed around 20 – 40 percent. This means the major drive of inflation are factors that can be controlled by monetary policy. The estimation was based on the new Keynesian Phillips curve. (See Table 4 for results)

Table 4: Contribution to domestic inflation

New Keynesian Phillips Curve

Sources	Range of contribution[#]		
Inflation Expectation	58 – 67%	62%	∼ 70%
Supply Output gap	6 – 10%	5%	
Supply Minimum wage Oil Agricultural	23 – 41%	33%	20 – 40%
Exchange rate	0 – 5%	-	
Diesel subsidies	-	0.03%	

Note: # calculated by coefficients multiplied by average rate of variables

Source: Khemangkorn, *et al.* (2012)

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4.3 Criteria for assessing the appropriateness of monetary policy instrument

This sub-section takes a normative approach to provide a fair assessment on the use of each instrument in the Thai context. We identify **three necessary criteria** for an appropriate instrument which should pave ways to effective monetary policy and align with good monetary policy (See Box 3):

1) **Controllability**
2) **Counter-cyclicality**
3) **Effectiveness**

Box 3: Criteria for a good monetary policy

The conduct of monetary policy in each central bank maybe different but they share the same objective of price stability. The objectives/mandates should be clearly defined. Nevertheless, it should be certain that there is no tradeoff between output and inflation in the long term while stabilizing the inflation. Since monetary policy conduct is authorized by the central bank, then the central bank should be given independence in using instruments in pursuit of the ultimate goal. However, it is difficult to attain goal independence since check and balance method need to be considered in democratic society. Bernanke (2010) stated that "…the ability of central banks to make monetary policy decisions should be based on what is good for the economy in the longer run, independent of short term political considerations…"

In addition, an explicit target should be publicly announced for a specified period which can be adjusted by constructing conditional forecasts or projections of target variables. The announced economic and inflation outlook enhances the predictability of monetary policy conduct. In other words, it means that the central bank can have control over the short-term interest rates via Open Markets Operations (OMOs), at the same time, it can influence the long-term interest rate through market expectation about the future path of interest rate based on inflation outlook.

Moreover, the central bank should be accountable to goal achievement and be able to justify the policy decisions to the public. The flexible and cautiously discretionary policy framework can enhance greater transparency and accountability for the central bank. Then, the central bank can achieve the credibility, which helps enhance the effectiveness of monetary policy.

Source: Bernanke and Mishkin 1997, Goodfriend and King 1997 and Bernanke 2010

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1) **Controllability**

A good monetary policy instrument should enable the central bank to have control over monetary conditions in pursuit of the monetary policy mandate. By monetary condition, we refer to the combination of interest rate and exchange rate as well as expected paths of interest rate and exchange rate going forward. The reason why a control on either interest rate or exchange rate does not suffice is because both interest rate and exchange rate have important bearings on the economy. In the case of Thailand, both interest rate and

exchange rate do have comparable impact on the economy, the difference lies in the timing and overall magnitude. (See Chai-anant *et al.* (2008) for details).

Controllability usually ties closely with transparency and communication. Greater transparency through central bank's communication helps enhance the general public's understanding of the policy decisions and increase the predictability in inflation and interest rate. This helps anchor their expectation and enhances the effectiveness of monetary policy.

Controllability over monetary conditions: using interest rate

In the case of using interest rate as the main policy instrument, the central bank can control interest rate (the policy rate) directly through open market operations (OMOs). The decision on the policy rate is announced and communicated with the general public. The central bank's communication regarding the policy stance can influence the long-end interest rate, which reflects market expectations about the future inflation and interest rate. Middledorp (2011) finds that greater monetary policy transparency improves the accuracy of interest rate forecasts for 3 months ahead and also reduces the interest rate volatility. This may explain why, generally, countries in the interest rate group tend to have high central bank transparency (from the findings in Section III)

Although interest rate is used as the main instrument, the central bank can also have some control over exchange rate via sterilized foreign exchange intervention. Ostry *op. cit.* provides a survey of studies on effectiveness of sterilized foreign exchange intervention, which shows that, by and large, countries using interest rate as the main instrument could still exert some control over exchange rate. (See Table 5 from the paper.)

Table 5: Survey of studies on the effectiveness of sterilized intervention in emerging economies

Study	Country	Effectiveness on	
		Level	Volatility
Stone, Walker, and Yosuke (2009)	Brazil	Yes	Yes
Tapia and Tokman (2004)	Chile	Yes	
Mandeng (2003)	Colombia		Yes (mixed)
Kamil (2008)	Colombia	Yes (weak)	Yes
Holub (2004)	Czech Republic	Mixed	
Disyatat and Galati (2005)	Czech Republic	Yes (weak)	No
Barabás (2003)	Hungary	Mixed	
Pattanaik and Sahoo (2003)	India	Yes (weak)	Yes
Rhee and Song (1999)	Korea	Yes	
Domaç and Mendoza (2002)	Mexico and Turkey	Yes	Yes
Guimarães and Karacadag (2004)	Mexico and Turkey	Yes (weak)	Mixed
Abenoja (2003)	Philippines	Mixed	Yes (mixed)
Sangmanee (2003)	Thailand	No	
Chai-anant, Pongsaparn and Tansuwanarat (2008)	Thailand	No	Yes
Adler and Tovar (2011)	Mainly Latin America	Yes	

Source: Ostry *et al.* (2012) and Chai-anant *et al.* (2008)

Despite some control over exchange rate, managing exchange rate should be done only when necessary to allow exchange rate to act as a shock absorber. Flexibility in exchange rate movement in line with economic fundamentals can help dampen the impact of shocks on output and inflation. For example, if there is a country-specific shock such as a demand shock, exchange rate will depreciate to soften the impact of output. The literature on fixed versus flexible exchange rate (see for example, Edwards and Yeyati (2004), and Cheng and Chia (2010)) points to an important role of exchange rate as a shock absorber. The role of exchange rate as a shock absorber is also supported by a specific study on the Thai economy, see Chai-anant *op.cit.*

Controllability over monetary conditions: using exchange rate

Depending on the type of exchange rate framework the country uses and policy credibility, the degree of controllability over exchange rate may vary. Under fixed exchange rate regime, exchange rate is under a complete control of the central bank as long as the policy is credible. Such credibility may partly be related to the amount of international

reserves a country has. Moreover, if exchange rate is fixed at a level inconsistent with economic fundamentals, imbalances may build up rendering the fixed regime unsustainable and subject to speculative attack. Nevertheless, many countries have been able to maintain fixed exchange rates over the past decade.

Under fixed exchange rate, control over interest rate is lost if there are free flows of capital. The impossible trinity (Obstfeld *et al.*, 2003) is at work, where a country cannot simultaneously fix their exchange rate, have free capital flows and have monetary policy autonomy. The exchange rate group (except for Singapore) under free flow of capital then needs to presume the same level of interest rate as their anchor countries. Otherwise, interest rate differentials will prompt capital flows and impose pressure on the exchange rate.

Singapore's exchange rate system is unique. Instead of fixing exchange rate to a currency or a basket, the MAS actively manages exchange rate. In doing so, the MAS announces the trend of exchange rate instead of specifying the rate of change (see details in Box 3). The explicit announcement of a well-specified path of exchange rate may not be feasible given that: 1) the market may immediately price in the entire path of exchange rate to exploit profit opportunities, thus the MAS would be unable to control the pace of exchange rate movement. For example, if the MAS announces that over the latter half of the year, there will be an appreciation of 5 percent. Right after the announcement, market participants will buy the currency causing the Singaporean dollar (SGD) to overshoot and probably reach 5 percent appreciation straight away. 2) If there is a clear prescribed path and the SGD does not move in line with the announced path, the MAS may have to adjust the target and jeopardize its credibility.

Even in Singapore-style exchange rate management, controllability on interest rate may be limited. Based on no-arbitrage principle of uncovered interest parity (UIP), domestic interest rate will depend on the expected path of exchange rate and foreign interest rate.

$$i_t^{domestic} = i_t^{foreign} - expected\ appreciation$$

If the MAS announces an appreciation trend, domestic interest rate will be below foreign interest rate to keep domestic returns equal to foreign returns (Chart 10). However, due to a plausible divergence between market expectations of exchange rate and a targeted path, interest rate may deviate from the level the MAS targets. If Thailand were to use a Singapore-style exchange rate management, it needs to calibrate communication tactics carefully and prepared to accept possible undesirable movement in interest rate.

Chart 10: Singapore dollar, domestic and foreign interest rates
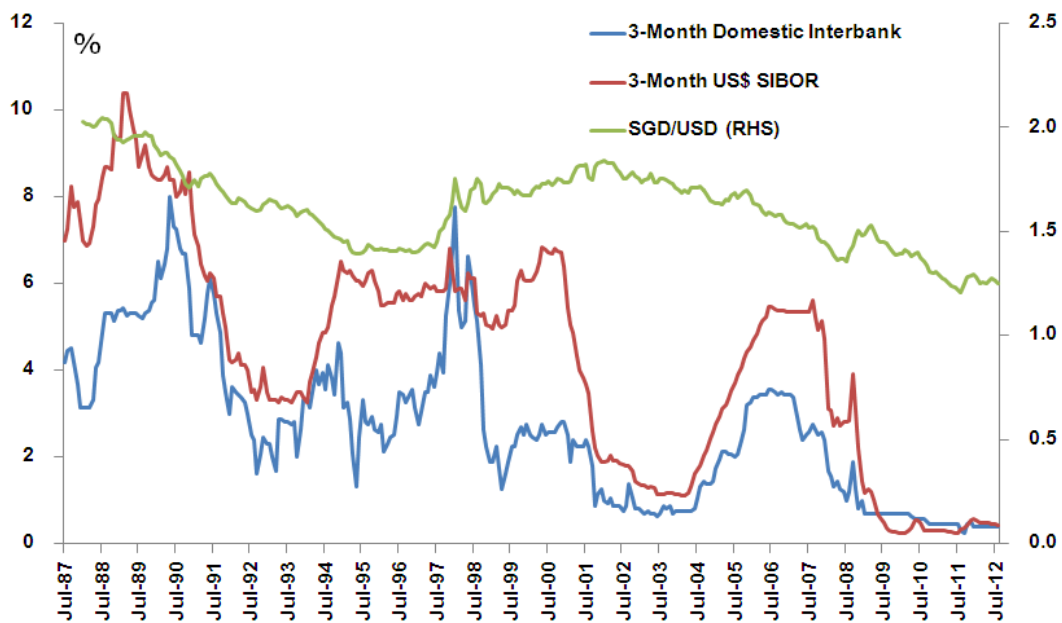
Source: MAS

There is less degree of freedom for interest rate to act as a shock absorber given exchange rate target. As the movement of interest rate is somewhat restricted in line with foreign interest rate and expected path of exchange rate, interest rate cannot act as a shock absorber. Given exchange rate target, exchange rate is also prevented from assuming its role as a shock absorber.

2) Counter-cyclicality

Counter-cyclical monetary condition is another desirable feature of monetary policy conduct. While price stability is an explicit mandate of monetary policy, overall economic stability is also desirable. Literature on monetary economics usually exhibits an objective function of monetary policy as a minimization exercise on inflation and output volatility. (See for example Clarida, Gali and Gertler (1997)) Minimizing volatility reduces uncertainty and facilitates private sector's consumption and investment decision, therefore, promotes sustainable economic growth. Counter-cyclical monetary condition will help dampen the volatility of output and inflation. To put this simply, a counter-cyclical monetary condition implies a tightening monetary condition during the boom and loosening monetary condition during a slowdown.

The exchange rate group, which primarily pegs their exchange rates to major currencies, should in effect import monetary policy and stability[15], from those countries they peg to ("anchor country") given relatively free flows of capital due to the impossible trinity as mentioned earlier. On the other hand, countries using interest rate gain monetary policy autonomy. They can use interest rate to steer the course of the domestic economy, however, their exchange rates are more volatile, which could arguably cause instability.

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[15] To provide an example, if inflation is high in the domestic economy and low in the anchor country, fixed exchange rate implies that domestically produced goods became less attractive compared to imports. Consequently, there will be less demand for domestic goods and prices will decline.

Based on the data, we found that exchange rate group has more volatile output and inflation than interest rate group on average, besides, they also have higher inflation. (Chart 11). Furthermore, once inflation-output volatility tradeoff is considered (Chart 12), again interest rate group seems to fare better than the exchange rate group, except in the case of Singapore.

Chart 11: Inflation and output volatility
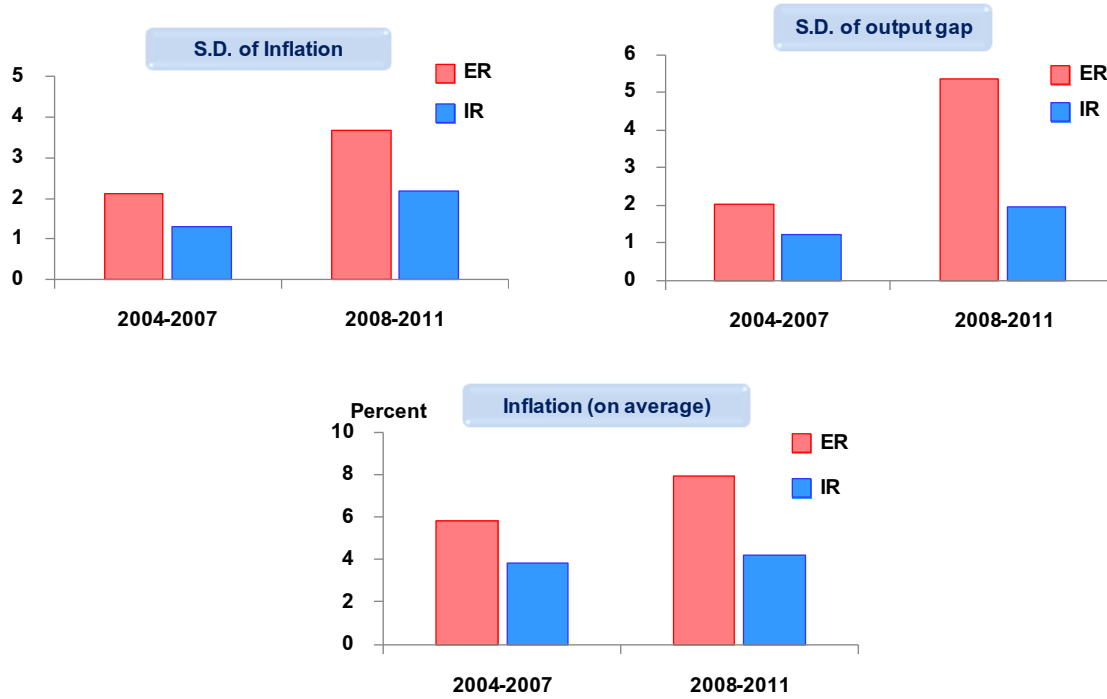
Source: IFS and authors calculation

Chart 12: Inflation-output volatility tradeoff
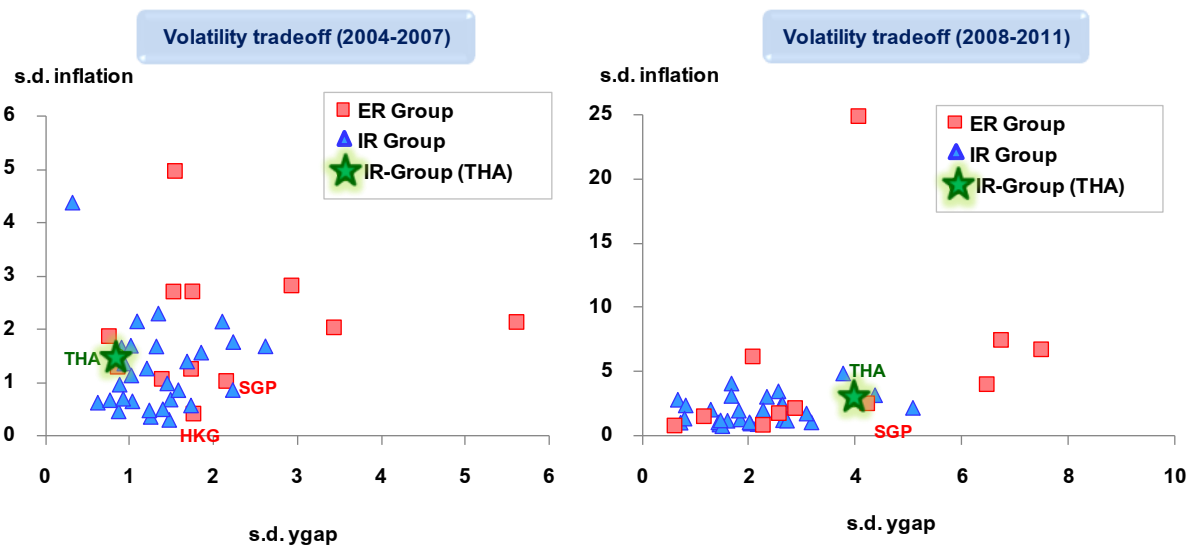
Source: IFS and authors calculation

Table 6: Sacrifice ratio

| Pool Estimation	β_1	β_2	Adjusted R²	Sacrifice Ratio
Exchange rate	0.557 (0.098)	0.197 (0.109)	0.63	2.25
Interest rate	0.597 (0.070)	0.232 (0.043)	0.75	1.74

Source: authors' estimates

One of the reasons why the exchange rate group has worse output-inflation volatility tradeoff is that the cost of disinflation or sacrifice ratio is higher, i.e. to reduce inflation by one percent, exchange rate group will lose more output than the interest rate group. (Table 6) The rationale underpinning this result is associated with the forward-looking nature of the monetary policy conduct and its transparency, which helps pin down inflation expectation and improve the tradeoff.

Another convincing piece of evidence which helps explain greater volatility among exchange rate group is the low degree of counter-cyclicality in monetary conditions. Here, we construct a simple monetary condition index (MCI)[16] to approximate monetary condition and estimate a reaction function of MCI to output gap and inflation to proxy the sensitivity of monetary conditions to economic conditions, based on the following equation:

$$MCI_t = \beta_0 + \beta_1\left(\pi_{t+2} - \pi_{t+2}^{target}\right) + \beta_2 ygap_t$$

The interpretation is if the MCI reacts significantly and positively to output, i.e. β_2 is high, monetary condition is counter-cyclical and helps dampen economic volatility. Chart 13 shows a histogram of MCI sensitivity to output. Clearly, monetary condition in the interest rate group is more counter-cyclical than the exchange rate group. While interest rate is used to dampen the impact of shocks, i.e. interest rates were set high during good times and lowered during bad times, exchange rate flexibility also acts as a shock absorber.

**Chart 13: Histogram of MCI sensitivity to output**
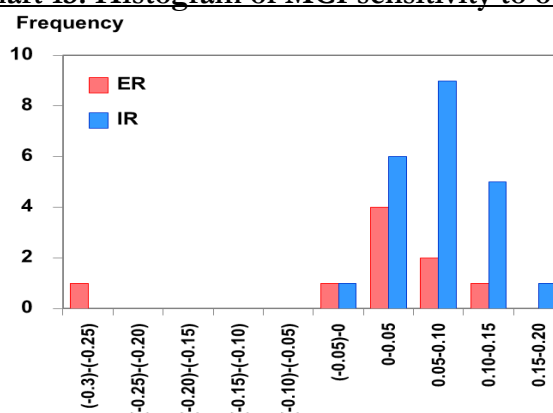
Source: authors' estimates

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[16] MCI is constructed with an equal weight on interest rate (money market rate) and exchange rate (nominal effective exchange rate).

Less sensitivity of monetary condition on output for the exchange rate group is partly a result of smaller degree of business cycle synchronization with the anchor country. Chart 14 exhibits a positive relationship between the degree of sensitivity of monetary conditions and business cycle synchronization[17]. Unsurprisingly, countries with smaller degree of business cycle synchronization but need to synchronize the interest rate cycle with the anchor country tends to have less counter-cyclical monetary conditions resulting in greater volatility in output. However, there have been doubts whether the degree of business cycle synchronization can determine the favorable policy instrument.

Chart 14: Sensitivity of MCI to output and correlation between output gap
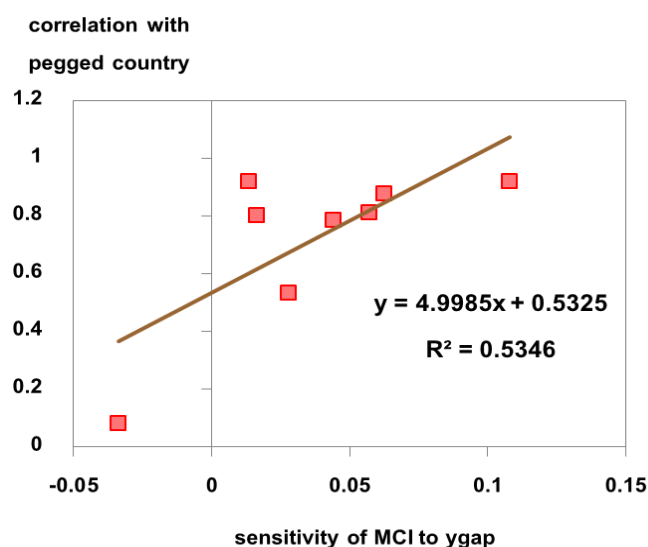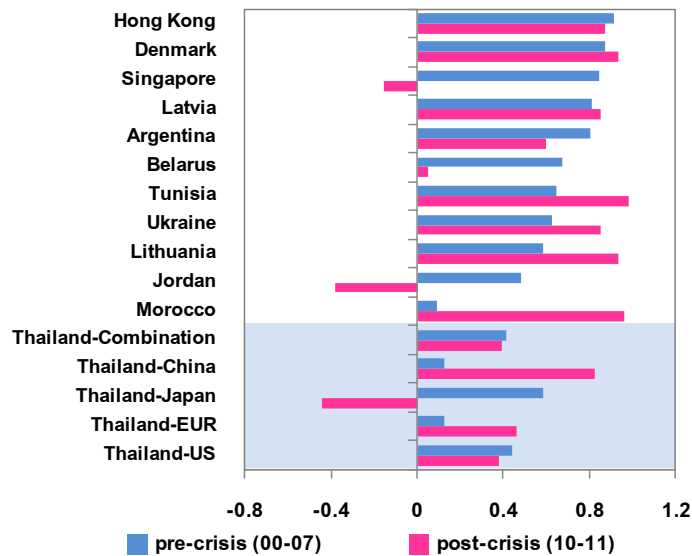

Source: authors' estimates

The correlation between members of exchange rate group and their corresponding anchor country (ies) has changed after the crisis. Singapore, for example, has negative correlation with (proxied) four major countries after the crisis but very high correlation before the crisis. **Thailand is more correlated with major Asian economies than with the US or the euro area.** If it were to adopt exchange rate as the main instrument, it would need to be a basket of currencies, with significant weights attached to regional currencies, to ensure that monetary conditions will be sufficiently counter-cyclical. (Chart 15)

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[17] We use correlation coefficient between output gap of the country and its anchor country (ies). The anchor countries and weights used are based on BIS NEER weights or weights identified in the basket.

**Chart 15: Correlation between members of exchange rate group
(and Thailand) and anchor countries**

Source: authors' estimates

Recently, both Hong Kong and Singapore have cast doubts on the suitability of their respective exchange rate regimes due to domestically financial imbalances. In a changing environment where there is a clear distinction in the speed of growth between advanced economies and the economies of emerging Asia, targeting exchange rate could come at a price in terms of financial instability.

Joseph Yam, the ex-governor of the Hong Kong Monetary Authority (HKMA) quoted *"…it's always debatable whether the costs associated with having the comfort of a stable external exchange rate value of the currency of Hong Kong, in the form of a stable exchange rate against USD, are worth assuming at all time, regardless of the changing circumstances that Hong Kong faces…"* (Yam, 2012) while Ravi Menon, the Managing Director of Monetary Authority of Singapore, also cast doubt on the appropriateness of the current monetary policy framework. Menon (2012) quoted: *"…there is a limit to how far we can use exchange rate policy to contain inflation. First, while exchange rate policy is effective against imported inflation and domestic cost pressures arising from rapid economic growth, it is less so against inflation in housing rentals and car prices. Even so, housing prices and car prices cannot keep rising rapidly in an environment of weakening economic growth..."*

3) Effectiveness

Another desirable property of an instrument is its close linkage with output and inflation. Well-functioning transmission mechanism of monetary policy is a crucial ingredient to successful monetary policy conduct. The chosen instrument must effectively transmit the policy stance to the ultimate targets – which are inflation and output. We compare the impact of changes in interest rate and exchange rate on inflation and output to assess the effectiveness as monetary policy instrument.

Despite being a small open economy with relatively high degree of trade openness, the degree of exchange rate passthrough is not high compared to other countries. The result is based on a study by Petursson (2008) provides a cross-country comparison on the impact of exchange rate on domestic inflation in 42 countries including Thailand. (Chart 17) The top ranking, i.e. countries with high degree of exchange rate passthrough, was concentrated with countries using exchange rate as the main instrument, which is in a way unsurprising. Based on this piece of evidence, the degree of exchange rate passthrough is neither high nor low by international standard but this does not mean that its effectiveness is low compared to interest rate.

### Chart 17: The degree of interest rate passthrough
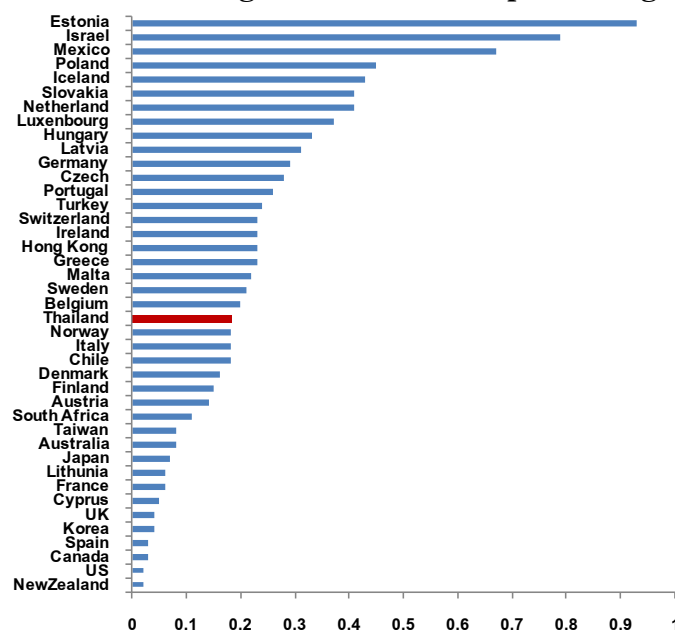
Source: Petursson (2008)

On the transmission from the policy rate to market and retail interest rates, more than 96 percent of policy rate adjustments take effects on the interbank market rate around the same time according to Charoengseang and Manakit (2006), and based on BOT staff calculation the passthrough from the policy rate to lending and deposit rates in Thailand normally takes around 5 days.

The impact of exchange rate on inflation and output was comparable in the case of Thailand. A study by Chai-anant *et al.* (2008) using a small semi-structural model on the Thai economy showed that both interest rate and exchange rate can be effective instruments of monetary policy. Both instruments do have non-negligible impact on inflation and output but the timing may differ. For instance, while exchange rate appreciation may have a short and sharp impact on inflation but the impact on output is more long-lasting compared to interest rate. (Chart 18) The comparable impact of interest rate and exchange rate on inflation and output somewhat supports the case of using exchange rate as a supplementary instrument to interest rate, which shall be discussed further in the next section.

Chart 18: Impact of interest rate and exchange rate on output and inflation
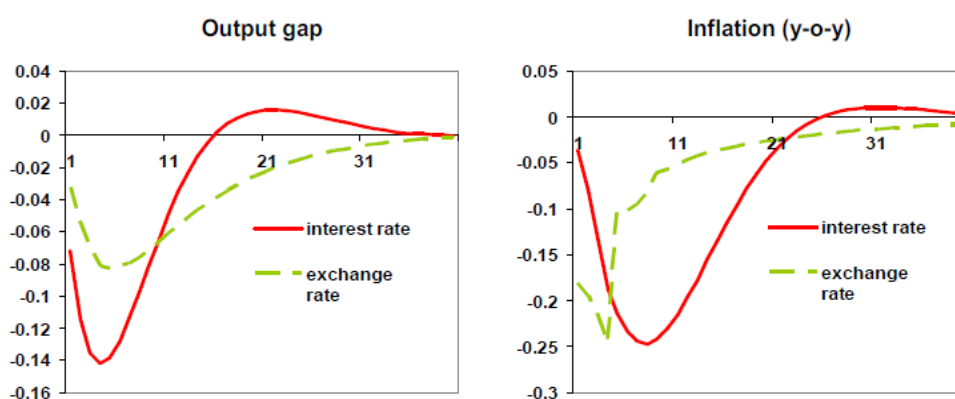
Source: Chai-anant *et al.* (2008)

Based on the criteria, interest rate appears to be a more appropriate instrument in the Thai context. Exchange rate seems to be a slightly inferior instrument with the lower degree of controllability over monetary conditions and counter-cyclicality, even though both interest rate and exchange rate do have impact on inflation and output.

The general trend has been a movement from using exchange rate to interest rate. Most countries on the interest rate side used to have exchange rate as the main instrument before and more is on the way, for example, Egypt and Russia who are in transition from exchange rate to interest rate group. The move another way round – from interest rate to exchange rate is much less common, unless a country had a specific objective in mind, for example, countries aiming to join the euro area changed from using interest rate to fixing their currency against the euro.

4.4 An overview of Thailand's performance under the current framework and limitations

As stated earlier, Thailand has adopted inflation targeting regime with the use of interest rate as the main policy instrument. When necessary, foreign exchange intervention is called for to curb excessive exchange rate volatility which could have an adverse impact on the economy, otherwise, exchange rate remains sufficiently flexible to act as a shock absorber.

So far, performance in terms of inflation-output volatility has improved. Chart 19 shows inflation-output volatility tradeoff over time. To enable a fair assessment, we compare the like and the like, i.e. volatility trade-off during normal time before the current framework against the normal time under the current framework and similarly compare the tradeoff during the crisis against the crisis. It can be concluded that during normal periods as well as the crisis periods, volatility tradeoff has improved under the current framework- for example, compare 1995 against 2004 and 1999 against 2008.

Chart 19: Inflation-output volatility tradeoff (Thailand)
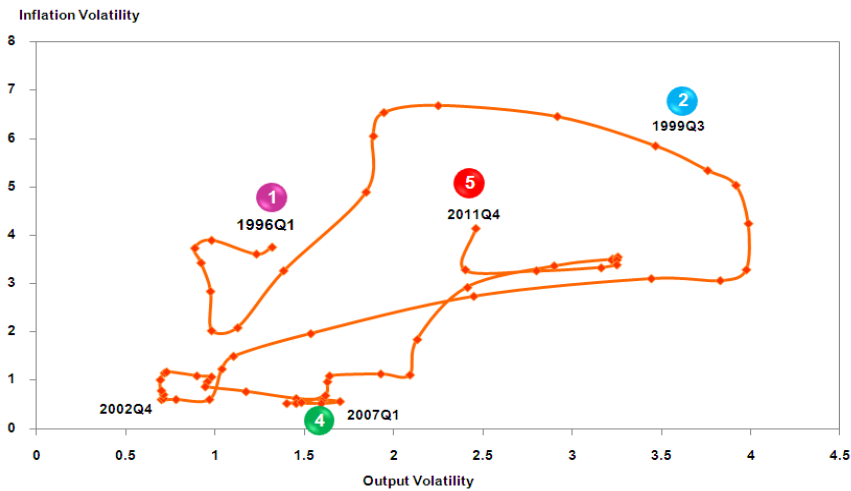

Source: IFS and authors' calculation

The implementation of inflation targeting framework has contributed to this improvement – not by using interest rate *per se* but the overall framework which emphasizes on transparency by regular communication with the general public through publications of quarterly inflation reports providing the assessment of current economic and financial conditions and outlook going forward underpinning the MPC decision, releases of edited minutes, and monthly reports on economic and financial conditions. This helps pin down the general public's expectation and increase the degree of policy predictability, which is partly reflected in high-degree of precision in policy predictability (Chart 20). In relation to this, Chart 21 shows implied forward which would represent market expectations on the path of the policy rate (the grey lines), calculated from government bond yields, and the actual policy rate movement. It may not be too far-fetched to conclude that the BOT has some roles in shaping market expectations.

Chart 20: Policy predictability (Thailand)
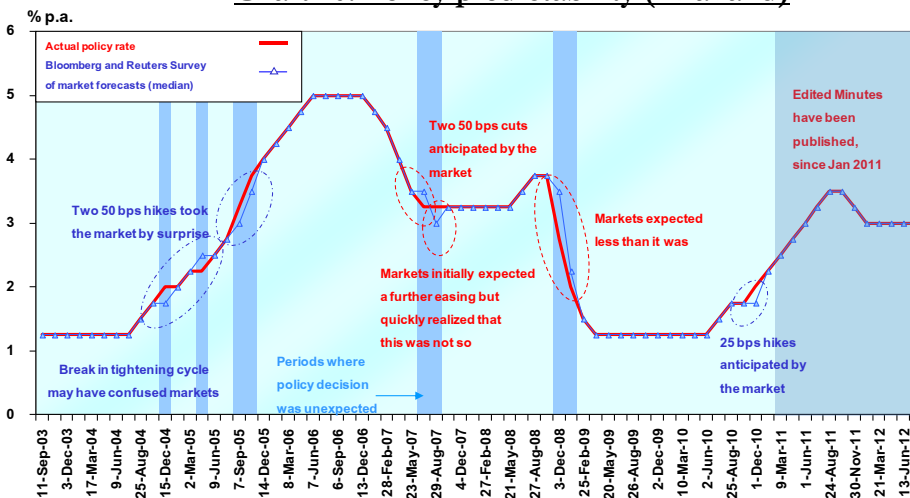
Source: Bloomberg and Reuters

Chart 21: Implied forward and the policy rate
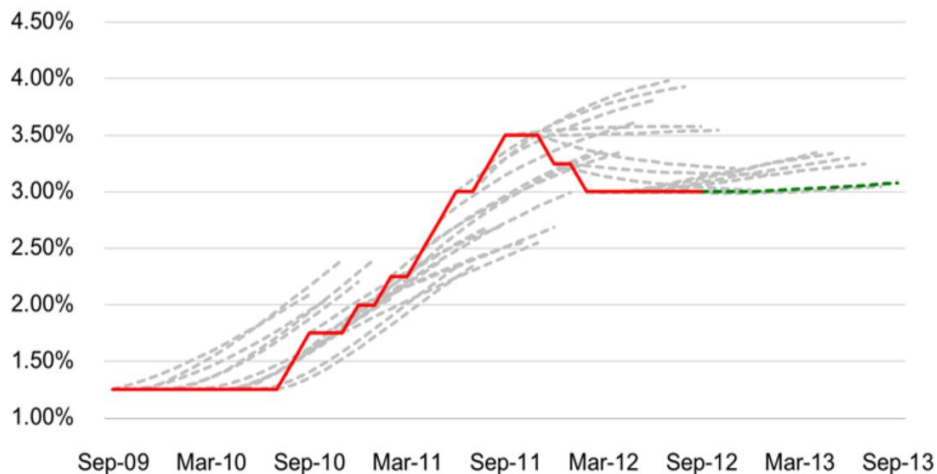
The importance of communication in enhancing the effectiveness of monetary policy is confirmed by the literature. Chortarareas, Stasavage and Sterne (2003) find that enhanced transparency through communication can help increased the predictability of policy decisions, reduce inflation variability, lower cost of disinflation and stabilize inflation expectation. Geraats (2000) finds that the disclosure of edited minutes impacts on short-run market expectations. Meanwhile, the publication of inflation report may affect on the medium to long-run expectation. A number of studies found that high degree of predictability and low degree of uncertainty can enhance the credibility and effectiveness of monetary policy. (see for example Ehrmann and Fratzscher (2005), Dincer and Eichengreen (2007, 2009), and Crowe and Meade (2009))

However, the current framework does have some limitations – not due to the use of interest rate *per se* but the use of two instruments at the same time. During the period of large capital inflows, especially in 2009-2011, the BOT along with regional central banks could not avoid intervening in the foreign exchange market to curb excessive volatility as reflected in an accumulation of reserves at a faster rate than previously. (Chart 22) As mentioned earlier that such foreign exchange intervention needs to be sterilized to avoid the impact on domestic liquidity. (Chart 23) The balance sheet grows bigger with reserve accumulation on the asset side in foreign currencies and absorption obligation on the liability side in baht, this increases currency mismatch. Baht appreciation therefore causes valuation loss as the asset side in terms of baht gets smaller. On top of this, due to different interest rate cycles, returns on assets, which are mainly advanced economies' government bonds, are smaller than interest payments on absorption, this causes a negative carry and worsens the overall balance sheet.[18]

Going forward, more balanced (two-way) capital flows and greater ability of the private sector to adjust to exchange rate volatility will lessen the need for foreign exchange intervention. The Bank of Thailand, in association with the government, has

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[18] Nevertheless, whether worsening balance sheet matters or not is beyond the scope of this paper.

embarked upon capital flow liberalization plan to encourage Thai residents to invest abroad. The plan will be implemented in successive phases and expected increases in capital outflows will help alleviate appreciation pressure. Furthermore, a more widespread use of foreign exchange hedging instruments will enhance the private sector's ability to cope with exchange rate volatility. Both factors will help lessen the need for foreign exchange intervention.

Chart 22: Net Foreign Capital Flows (Thailand)
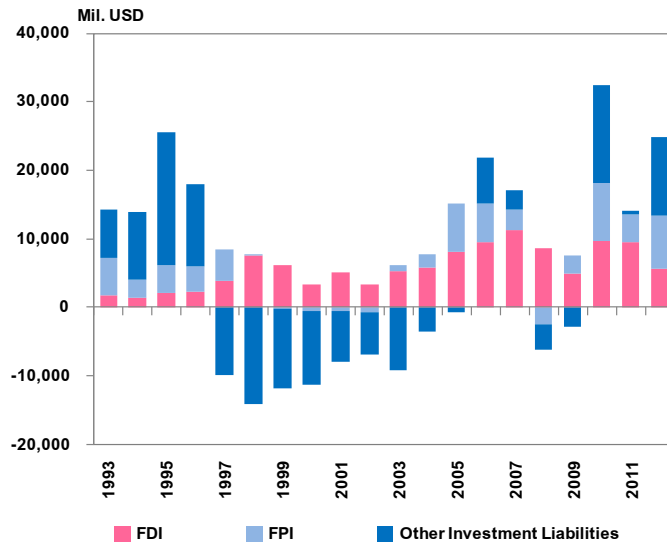
Source: BOT

Chart 23: Gross international reserves (Index: Jan 2000 = 100)
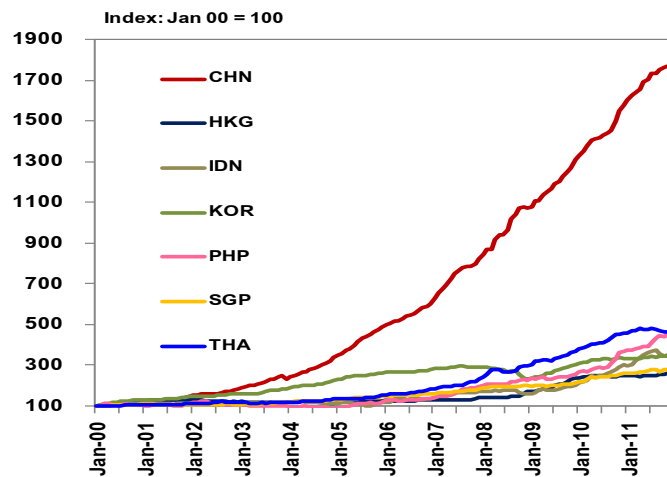
Source: IFS

V. <u>Conclusion</u>

In achieving price stability, the common objective of monetary policy, central banks can embark upon different routes. The difference in monetary policy conduct does not lie in the regime per se but the main policy instrument that the central bank chooses: interest rate or exchange rate.

We found that there are certain common features that countries using the same instrument share. Among them, the level of economic and financial development, degree of export monopoly power and institutional strength tend to be highly associated with countries using interest rate as the main instrument, while high degree of trade openness does not necessarily associate with using exchange rate as instrument. Singapore and Hong Kong, which belong to the exchange rate group, are clearly outliers from the rest of the group, given that they share similar features to those using interest rate. Thailand positions somewhat in the middle, closer to the rest of interest rate peers.

Based on the three criteria set out to find the appropriate instrument for Thailand; controllability of overall monetary conditions, counter-cyclicality and effectiveness, interest rate appears to fare better on the first two criteria but comparable in the last. In the context of Thailand, although interest rate is used as the main instrument, exchange rate is also used as a supplementary instrument from time to time due to its effectiveness on inflation and output. Another important finding arising from performance assessment is the importance of communication. Transparency through regular and clear communication helps enhance the effectiveness of monetary policy conduct, which is at the heart of successful monetary policy.

Despite fine performance so far, there is a limitation of the current regime in terms of a possible adverse impact on the central bank's financial position. Nevertheless, going forward, more balanced flows and availability of instruments to hedge against foreign exchange volatility will help lessen the need for foreign exchange intervention and help contain the extent of the impact on the central bank's financial position.

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