



Bangkok Policy Forum
*Macroeconomic Policy Strategy for
Cambodia, Laos, Thailand, and Vietnam*

The Thailand Research Fund in collaboration with
Faculty of Political Science, Faculty of Economics, and
Thammasat Business School

Thammasat University, Bangkok

19-20 May 2011, Thamnattee 2 , Thammasat University



AGENDA

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May 19, 2011

Sriburapha Auditorium

8:30-9:00 Registration

9:00-9:15 Opening Ceremony

9:15-9:45 Keynote Speech I

Chris Baker:

"Moving towards a fairer society: Economic realities, populist policies and development in Thailand and beyond"

9:45-10:30 Plenary Discussion: *Dr. Anan Ganjanapan*

10:30-11:00 Coffee Break

Thamnattee Building, Room 2

CHAIR: *Bhanupong Nidhiprabha,*
Dean, Faculty of Economics

- 11:00-11:25 **Toward the Next Decade of Thailand's Fiscal Decentralization: Learning from the past**
Pracha Khunnathamdee, Thammasat School of Economics
- 11:25-11:40 Discussant: *Euamporn Phijaisanit, TSE*
- 11:40-12:00 Open discussion
- 12:00-12:25 **Dollarization and the effectiveness of monetary policy in Cambodia**
Siphat Lim, National Bank of Cambodia
- 12:25-12:40 Discussant: *Sicha Thubdimphan, TSE*
- 12:40-13:00 Open discussion
- 13:00-14:00 **Lunch**

CHAIR: *Kulpatra Sirodom,
Dean, Thammasat Business School*

- 14:00-14:25 **Exchange rate and capital flows management in Vietnam**
*Nguyen Hong Son, Nguyen Manh Hung, and Nguyen Thi Vu Ha
University of Economics and Business, Vietnam National University*
- 14:25- 14:40 Discussant: *Suluck Pattarathammas, TBS*
- 14:40-15:00 Open discussion
- 15:00-15:25 **Macroeconomic consequences of Thailand's exchange rate policy**
Bhanupong Nidhiprabha, TSE
- 15:25-15:40 Discussant: *Nguyen Ngoc Thanh*
- 15:40- 16:00 Open Discussion
- 16:00-16 30 Coffee Break

Open Forum: Sriburapha Auditorium

- 18:30-21:00 **A new social contract for Thailand: The way out of the transformation crisis?**
Moderator: Dr. Chalidaporn Songsamphan
Panelists: Dr. Chaiwat Satha-Anand, Dr. Pasuk Phongpaichit,
Dr. Duncan McCargo, Dr. Kasian Tejapira

May 20, 2011

Keynote Speech II: Political Science Building, Room 103

9:00-9:45 Dr. Sripgrapha Petcharamesree

9:45-10:00 Coffee Break

Thamnatee Building, Room 2

CHAIR: *Prof. Nguyen Hong Son*
Rector, University of Economics and Business, Vietnam National University

10:00-10:25 **Coping with capital inflows: Policy options for Laos**
Phouphet Kyophilavongs, National University of Laos

10:25-10:40 Discussant: *Siphath Lim*

10:40-11:00 Open discussion

11:00-11:25 **Vietnam's Exchange Rate and Monetary Policy**
Nguyen Ngoc Thanh, and Pham Van Ha,
University of Economics and Business and Ministry of Finance

11:25- 11:40 Discussant: *Ung Luyna*

11:40-12:00 Open discussion

12:00-13:00 **Lunch**

CHAIR: *Nguyen Ngoc Thanh, Vice Rector*
University of Economics and Business, Vietnam National University

13:00-13:25 **The Effects of Government Spending on Output in Vietnam**
Vu Quoc Huy, University of Economics and Business

13:25-13:40 Discussant: *Bhanupong Nidhiprabha*

13:40- 14:00 Open discussion

14:00-14:25 **Effectiveness of Macroeconomic Policies in Cambodia**
Chea Ravin and Ung Luyna
National Bank of Cambodia and Supreme Economic Council

14:25-14:40 Discussant: *Nguyen Manh Hung*

14:40-15:00 Open discussion

15:00-15:15 **Coffee Break**

CHAIR: Saipin Cintrakulchai, Vice Dean, Faculty of Economics

15:15-15:40 **Fiscal policy for growth and price stability: Lesson from Thailand**
Bhanupong Nidhiprabha, Thammasat University

15:40-15:45 Discussant: *Vu Quoc Huy*

15:45-16:00 Open discussion

16:00-16:25 **Macroeconomic policy strategy of CLTV countries**
Phongthorn Wrasai, Thammasat School of Economics

16:25-16:40 Discussant: *Kulpatra Sirodom*

16:40-17:00 Open Discussion

Political Science Building: Room 103

17:00-18:00 Conclusion and Plenary Discussion: Dr. Chayan Vaddhanaphuti

Notes:

Paper presentation: 25 minutes

Discussant: 15 minutes

Open discussion: 20 minutes



LIST OF PARTICIPANTS

Bangkok Policy Forum

Macroeconomic Policy Strategy for Cambodia, Laos, Thailand, and Vietnam

The Thailand Research Fund in collaboration with Faculty of Political Science,
Faculty of Economics, and Thammasat Business School

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Name	Position
1. Ung Luyna	Division Head Supreme National Economic Council (SNEC), Cambodia
2. Siphath Lim	Economic Researcher, Economics Research and Statistics Department, National Bank of Cambodia
3. Dr. Phouphet Kyophilavongs	Faculty of Economics, Lao National University
4. Professor Nguyen Hong Son	Rector, UEB, Vietnam National University
5. Professor Nguyen Ngoc Thanh	Vice Rector, University of Economics and Business, Vietnam National University
6. Nguyen Manh Hung	University of Economics and Business, Vietnam National University
7. Professor Vu Quoc Huy	Dean, Faculty of Economics and Business University of Economics and Business, Vietnam National University

Name	Position
8. Piyada Jutaviriya	Thailand Research Fund
9. Dr. Siriporn Wajjwalku	Dean, Faculty of Political Science, Thammasat University
10. Kulpatra Sirodom	Dean, Faculty of Commerce and Accounting, Thammasat University
11. Suluck Pattarathamas	Faculty of Commerce and Accounting, Thammasat University
12. Phongthorn Wrasai	Faculty of Economics, Thammasat University
13. Bhanupong Nidhiprabha	Dean, Faculty of Economics, Thammasat University
14. Pracha Khunnathamdee	Faculty of Economics, Thammasat University
15. Euamporn Phijaisanit	Faculty of Economics, Thammasat University
16. Sicha Thubdimphan	Faculty of Economics, Thammasat University
17. Pisut Kultanavit	Faculty of Economics, Thammasat University
18. Saipin Cintrakulchai	Vice Dean, Faculty of Economics, Thammasat University
19. Panit Wattanakoon	Research Assistant, Economic Research and Training Center
20. Rattanyu Dechjejaruwat	Research Assistant, Economic Research and Training Center
21. Roongthip Srisehtkul	Research Assistant, Economic Research and Training Center



Toward the Next Decade of Thailand's Fiscal Decentralization: Learning from the Past

Pracha Khunnathamdee, Thammasat School of Economics

A paper to be presented on

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TOWARD A NEXT DECADE OF THAILAND DECENTRALIZATION:

LEARNING FROM THE PAST

Pracha Koonmathamdee¹

ABSTRACT

Since the decade of 2000s, we have witnessed in the mixed results of Thailand decentralization. Reviewing the major changes and impacts are important to planners and policy makers in order to implement the "better" and "sustainable" decentralization policy and proper measures. This paper discusses a conceptual framework of Thailand decentralization based on public choices and principal-agent problem. Subsequently, this research brings in empirical analysis using stylized facts and policy gaps of current decentralization, and recommends a framework for next steps. Results in the last decade illustrated that Thailand decentralization process was not well completed, and intended functions to be transferred appear ongoing with difficulties. Recommendations for a next decade combine the recommendations for filling policy gaps in administrative and fiscal decentralization particular in the need for database and researches. Encouraging potential local governments in local government borrowing is required in order to increase local public good investment, reduce pressure in central government budgeting, and support local government responsibility and governance. Two issues needed more attention from relating governments are the Asian Economic Community (AEC) and the climate change problem. Finally, extending people understanding in the "real" decentralization still requires major drive from the central government and academics.

1. INTRODUCTION

Decentralization, in principle, suggests improvement of community development programs in local areas to better serve the needs and concerns of the local people as well as allocative efficiency in terms of improving welfare (Oates, 1972). Theoretically, the decentralization approach from the "bottom-up" affects public

¹ Faculty of Economics, Thammasat University. This paper is written for the 1st International Conference on International Relations and Development (2011 ICIRD), presented at Thammasat University, Bangkok, Thailand during May 19-20, 2011. This research paper is drawn and summarized from parts of my research project supported by the Thailand Research Fund (TRF). Views expressed in this article do not necessarily represent the views held by the institution where the author is affiliated and the TRF.

sector reform and political values. It also helps improve governance in the sense of local responsiveness and political participation (Bird and Vaillancourt, 1998). However, mixed directions of restructuring public sectors have happened throughout the world since the decade of 1980s. Many countries have continued to transfer decision-making from center to subnational governments. Because those countries have referred to government failures in public service delivery, they have promoted decentralization as a tool in order to reach the sustained growth and better services to local. Decentralization process publicizes a current international political and fiscal trend, including developing countries. For example, before 1990s, most Asian countries were highly centralized, however it has become a remarkable issue in this region.

At the same time, many countries have attempted to support international integration such as the European Union (EU) and Asian Economic Community (AEC). For the EU, a hybrid system of supranational independent institutions is a result of such integration. Identically, the AEC could end up with the new top level of government. These processes of centralization diverge from the concepts of government failures and local public goods which are the root of decentralization. These contrasting forces, as stated in Oates (2005) and Inman and Rubinfeld (1992), "raise the intriguing question of the future of the national governments".

Without exemption, Thailand is a country that adopts these two contrasting forces, being a part of AEC integration and decentralizing in the country government structure and budget. In the context of Thailand practices, it is an important role for scholars to understand a conceptual framework of the multi-level government. Learning from the past by reviewing the major changes and impacts could assist planners and policy makers better understanding the decentralization forest, not the tree. In addition, proper policies and measures could be implemented after taking into the account of the two contrasting forces.

My purposes in this paper are to discuss a conceptual framework of Thailand decentralization based on public choices and principal-agent problem. Stylized facts and policy gaps in the Thailand decentralization process are developed with the intention of increase understanding at a conceptual level of Thailand decentralization. The next section of this paper presents background of decentralization process in Thailand inclusive of administrative and fiscal decentralization and current structure of multi-level government. Section three

demonstrates theoretical and conceptual framework in the context of Thailand decentralization and ends up with the stylized facts in decentralization process of subnational governments. The last section concludes the paper and recommends a framework for a next decade of the ongoing decentralization. The framework incorporates the discussion of the other force of international integration, as a factor, whether it encourages or discourages Thailand decentralizing trend.

2. BRIEF BACKGROUND OF THAILAND DECENTRALIZATION

In Thailand, decentralization has been an active policy issue since 1992. Although the process of Thailand decentralization recorded its origin about the decade of 1890s (Charoenmuang, 1999 and McCleary et al, 2000), the major affected changes of Thailand public sector reforms launched as the result of the Constitution of the Kingdom of Thailand 1997². The highest legislation had authorized particular public sector reforms by decentralizing and transferring particular responsibilities from central government to local government units³. In addition, the most important legislation was the Decentralization Act of 1999⁴ (DA1999) and its Decentralization Plan which was legally effective in 2001. With the authority of the DA1999, the National Decentralization Committee (NDC) was established for not only directing specified functions to be transferred, but also governing process and its time frame. In addition, the NDC has served as a policy maker and a central government adviser for decentralization. For local government tasks, the NDC targeted those 6 major programs covering 245 functions shall be devolved to locale within 10 years. This process means the "Thailand administrative decentralization" and its details are presented in Table 1. After the DA1999, the Action Plan of 2001 denoted not only the assigning tasks, but also budget and other resources from the central to local governments. To be specific in monetary resources, the Plan of 2001 affirmed that the local governments should direct the share of net central government revenues not less than 35 percent within 5 years⁵. This process is the

² Up to this line, people might ask; why did this process of decentralization happen? Mektrairat (2003) already explained that the Thailand decentralization is a vital process arising with political reform after the 1992 coup d'état. The directions of the reform were (1) local government election, (2) democratic decentralization, and (3) independent of local authorities.

³ There were 10 sections in the Constitution of the Kingdom of Thailand 1997 supporting local government and decentralization.

⁴ The Act serves as the backbone of Thailand decentralization. There are 5 sections including, (1) the National Decentralization Committee (NDC), (2) local services responsibilities, (3) the allocation of taxes and duties, (4) the decentralization plan, and (5) measures for the transitional period.

⁵ In the Decentralization Act of 1999, Section 30 (4) states that

Determine the allocation of taxes and duties, subsidized fund and other income to local government organization in harmony with the proceeding according to the powers and

first framework of "Thailand fiscal decentralization". In summary, the DA1999 directs Thailand decentralization through the NDC by devolving functions, decentralizing budget, and monitoring processes.

2.1 Administrative Decentralization

The major devolution programs covering 245 functions are summarized as the following: (1) Public Infrastructure; (2) Local Services Related to Quality of Living; (3) Civil and Community Ordering, and Peace Maintenance; (4) Planning, Investment Promotion, Business, and Tourism; (5) Natural Resources and Environmental Management and Conservation; and (6) Art, Culture, Tradition, and Local Wisdom. Some of the functions, however, are not local compulsory, but local discretionary, e.g. primary and secondary education. Besides, many functions such as natural resource and environmental management, education, health care, and commerce have some difficulties in devolution, mainly in conflicts of incumbent institutions, legislations, and politics. Therefore, it does not overstate that Thailand administrative decentralization intimately requires devolution process.

It is useful to consider structure of Thailand administration for better understanding in administrative decentralization. Figure 1 presents the structure of organization both central administration and local administration. For the latter, as stated in the DA1999, the major institution for decentralization is the NDC as national agency under the prime minister's office. The NDC mainly provides rules and regulations for devolution of administrative functions and transfer formula, and monitoring and evaluating decentralization process. There are four types of Local Government Units (LGUs); Tambon (sub-district) Administration Organizations (TAO), Municipalities, Provincial Administrative Organizations (PAO), and Special Local Government Units (SGU). The Department of Local Administration (DLA) has straight supervised LGUs with the guideline of the NDC.

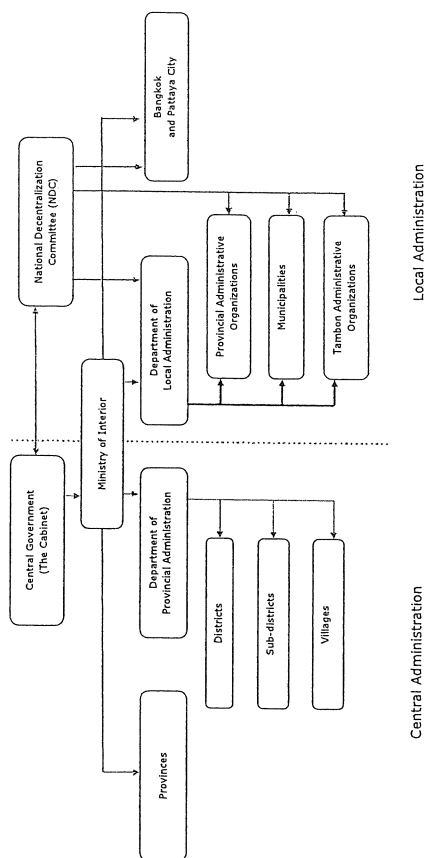
duties of each type of local government organization as appropriate. Within the period of not exceeding the year 2001, local government organization shall receive the increased revenue in the ratio of government revenue of not less than 20%, and within the period of not exceeding the year 2006, local government organization shall receive the increased revenue in the ratio of Government revenue of not less than 35%. Thus, by increased ratio according to the period of time appropriate for the development. Local government organization shall be able to proceed the public services by itself and by the fair allocation to local government organization in consideration with the income of that local government organization too.

Table 1 Functions to be transferred to local administration, classified into 6 broad categories and by types of work

Broad Category of Functions	Related Central Agencies	Work/Activities	Example of Activities
Public Infrastructure	87 topics; 7 ministries and 17 departments	Transport and Communication	Road construction, road maintenance, bridge, canal, bus station
		Public works	Irrigation, pipe water
		Public Facilities	Market place, city planning
		Occupational training	Program for occupational training
Quality of Life		Social welfare	Care for children, elderly, disabled, and HIV-infected
		Sport and exercise promotion	Public park, recreational sites, sport facilities, field and stadium
		Educational services	LGUs can provide school education-provided they pass certain guidelines
		Public health	Primary health care, disease prevention, and health promotion
Social order and community safety	17 topics; 6 ministries and 9 departments	Disaster prevention and relief	
		Public Safety	Registration of animals, motor vehicles, and business enterprises -- Given power to set fine for violators
Commerce planning, investment and tourism promotion	19 topics; 5 ministries and 6 departments	Local planning, investment plan, tourism promotion	Long-term plan, annual operational plan with local participation
		Integrated development planning	Joint projects/programs between LGUs and provincial administration, provincial clusters
		Data collection and information dissemination	Local tourism information
Natural resources and environment	17 topics; 4 ministries and 9 departments	Forest protection, environmental protection and pollution prevention	Monitoring the forest, waste collection, waste water treatment
		Monitoring public land	Prevention of encroachment on public land
Arts, culture, local wisdom and custom	2 topics; 1 departments	Historical heritage, folk museum	

Source: Varanyuwatana et al (2007)

Figure 1 Administrative structure of the Royal Thai Government



The links between the central and local administration associate to the NDC and the government agencies under the ministry of interior. Currently, LGUs interconnect to not only governments at the same level through its association, but also governments across levels and administration types through line central government agencies and the NDC.

Comparing the numbers of each LGU also represents the facts of local administration. The majority of the LGUs are the TAO which was 6,618 units in 2006 declining to 5,767 units in 2010. The trend of TAO number is decreasing by criteria of legislation. In contrast, the trend of municipality numbers is expanding as its increase from 1,160 units in 2006 to 2,008 units in 2010. The details of types and numbers of LGUs are presented in Table 2.

Table 2 Types and Numbers of Local Government Units

Types of Local Government	Number in 2006	Number in 2010
1. Tambon Administrative Organizations	6,618	5,767
2. Municipalities	1,160	2,008
2.1 City	22	25
2.2 Town	118	142
2.3 Tambon	1,020	1,841
3. Provincial Administrative Organizations	75	75
4. Special Local Government Units (Bangkok and Pattaya)	2	2
Total	7,855	7,852

Source: Department of Local Administration

2.2 Fiscal Decentralization

The fiscal decentralization relates to the link between local government budget and central government budget. By the DA1999, local governments should have their budget as the share of net central government revenues not less than 35 percent within 2006. The NDC and the Budget Bureau were two institutions incorporating in transferring budget from central to local under the specified functions and personnel. In addition, the NDC approved of several grant policies and shared tax policies in order to keep pace of the target of local government revenues. However, the fiscal decentralization target and the fiscal decentralization performance were mismatch as stated in Varanyuwatana et al (2007). In the middle of 2006, about 74 percent of assigning tasks was devolved and the rest was still in charge of the central government particular in education and health care functions.

Furthermore, the revenue assignment from the central to local was reported only about 25 percent of the central government net revenues which was far away from the target of 35 percent. Therefore, these were facts that the first framework of Thailand fiscal decentralization could not be completed.

After the coup in September 19, 2006, the 1997 Constitution was terminated, but the Constitution of the Kingdom of Thailand 2007 still gives attention to the decentralization process. However, there was a minor revision of the DA1999, but huge impacts for decentralization process. The Decentralization Act of 2006 (DA2006), as the revised version of the DA1999, mainly replaces Section 30 (4) with a new framework of fiscal decentralization. Beginning in fiscal year of 2007, the subnational government shall have its revenues not less than 25% of central government revenues and the ultimate goal for local budget is still not less than 35% of central government revenues. However, there is no time frame and proper measures for operating such the ultimate goal, which cause a possibility to delay the ultimate goal forever. For the grant policy, the DA2006 states that each local government shall have intergovernmental grants from the central government not less than the received amount in the fiscal year of 2006. Nevertheless, the intergovernmental transfer policies, issued by the NDC, have not been steady since the NDC establishment. The policies have perpetually changed by several reasons, including business cycles, natural distresses, and politics.

Considering the structure of local government revenues in Table 3 extends our understanding in fiscal decentralization. Table 3 indicates that the LGUs' command for revenues sharply increased after the fiscal year of 2001. This was largely achieved by a huge increase in intergovernmental transfers, not the productive own-sources of local revenues. The fiscal statistics demonstrate the following: (1) the local government budget is increasing from 99.8 billion in 2000 to 241.9 billion in 2004 and to 376.7 billion in 2008, but the budget is increasing at the decreasing rate. (2) From the fiscal year of 2006, the ratio of local revenues to central revenues is more likely to be around 25%. (3) Locally-collected taxes and the non-tax revenue had increased slowly over time. This could be because neither broadening local tax base nor increasing tax rate has taken place. (4) The amount of tax-transferred revenues increases over time, along with economic growth, but not drastically as there is virtually neither changing in the tax rates nor tax base.

Additional information relating to grant policy arrives in the study of Patamasiriwat (2010). The author employed municipality and TAO data to calculate tax and grant revenue per capita classified by total revenue per capita presented in Table 4. Tax revenue per capita varied from less than 500 baths to more than 20,000 baths with the average of about 2,000 baths. The grant revenue per capita varied from about 300 baths to about 6,000 baths with the average of about 1,000 baths. Patamasiriwat's major finding is that tax and grant revenue experience in positive relation, meaning fiscal disparities, and the author requested for grant policy revision.

Table 3 Local Government Revenues by Sources, Fiscal Years 2000-2008

Type of Revenue (billions of baht)	2000	2001	2002	2003	2004	2005	2006	2007	2008
Locally-collected revenues	19,475 (19.5%)	17,701 (11.1%)	21,084 (12.0%)	22,238 (12.1%)	24,746 (10.2%)	27,018 (9.2%)	29,110 (8.9%)	32,021 (9.0%)	35,223 (9.3%)
Taxes collected by central agencies and transferred to LGUs	45,238 (45.6%)	55,652 (34.8%)	58,144 (33.1%)	60,218 (32.7%)	82,623 (34.1%)	102,530 (34.6%)	110,189 (33.7%)	130,720 (33.8%)	138,676 (34.2%)
Shared taxes (VAT)	n.a.	12,669 (7.9%)	19,349 (11.0%)	35,504 (19.3%)	43,100 (17.8%)	49,000 (16.7%)	61,800 (18.9%)	65,300 (18.3%)	65,000 (17.3%)
Intergovernmental grants	24,400 (24.5%)	71,730 (43.2%)	77,073 (43.9%)	65,085 (35.0%)	91,438 (37.3%)	113,210 (39.2%)	126,013 (36.3%)	139,371 (36.0%)	147,840 (39.2%)
Total intergovernmental transfers (combining grants and shared taxes)	34,400 (34.5%)	86,399 (51.1%)	96,662 (55.0%)	101,590 (55.2%)	134,538 (55.6%)	164,211 (55.9%)	187,813 (54.4%)	204,674 (57.3%)	212,840 (56.5%)
Total revenue of local governments	99,302	159,753	175,850	184,056	241,948	293,749	327,113	357,444	376,740
Total revenue of central government	749,945	773,574	803,651	829,496	1,063,000	1,250,009	1,300,000	1,420,000	1,495,000
The ratio of local revenues to central revenues	13.11%	20.66%	21.88%	22.19%	22.7%	23.5%	24.1%	25.2%	25.2%

Note: Numbers of the share to total local revenues are shown in parenthesis.
Source: Compiled by the author from the Fiscal Policy Office and the Comptroller General's Department, Ministry of Finance and the Department of Local Administration, Ministry of Interior.

Table 4 Fiscal disparities, fiscal year 2009

Classification by total revenues	Frequency	Tax revenues	Grant revenues
<= 500	2	478.73	277.54
501-1000	77	910.75	493.57
1001-1250	980	1159.30	648.64
1251-1500	1864	1374.39	720.50
1501-1750	1382	1614.84	810.23
1751-2000	842	1865.36	899.10
2001-2250	535	2119.87	1038.46
2251-2500	465	2367.09	1200.00
2501-2750	355	2615.70	1379.78
2751-3000	277	2868.31	1509.23
3001-5000	780	3688.67	2068.33
5001-10000	188	6439.20	3001.14
10001-20000	27	13081.59	3754.97
20001 =>	2	23829.81	6038.83
Total/average	7776	2059.92	1055.36

Note: All revenues are per capita.

Source: Patamasiriwat (2010)

3. CONCEPTUAL FRAMEWORK AND STYLIZED FACTS IN THAILAND DECENTRALIZATION

Previous section gives us brief background of Thailand decentralization. That information comes across fields in economics and perhaps across disciplines such as political science. It is difficult to characterize in a simple and systematic way. This section, however, is an attempt to present theoretical background of Thailand decentralization. Employing public choices and political economy, and principal-agent problem diverge from the Oates' decentralization theorem. Oates (1972)

acknowledges that each level of government would attempt to maximize the social welfare of its respective community. Consequently, local governments shall provide levels of public outputs that meet the demand of the residents of their respective jurisdictions. Given internalize interjurisdictional externalities, each jurisdiction will attain a higher level of social welfare than one in which a central government provides the same level of public goods in all jurisdictions. In the contrary, public choice approach mentions that each government maximizes its own objectives. Furthermore, this research paper extends discussion of Thailand decentralization with principal-agent problem because the process contains imperfect information. With one or all of problems, it does not guarantee that each jurisdiction will reach the better level of social welfare. This section also offers stylized facts and policy gaps in Thailand decentralization. These substantiate good sources for policy recommendation for a better process of Thailand decentralization.

3.1 Public Choice Perspectives and Principal Agent Problem

With public choice approach, it is totally different from the Oates' decentralization theorem. Subnational governments as public decision-makers could maximize their utilities with their own objective functions. One type of this view is Niskanen approach; LGUs are maximizing the size of their budgets. This practice could be seen as mixed objectives of local governments i.e. power and influence development, large staffs, and higher salaries. However, from Niskanen's assumptions, a central government tries to rein them in. Brennan and Buchanan (1980), on the other hand, see these two levels of governments as one monopolist or "Leviathan". The leviathan simply tries to maximize the size of public sector by taking advantage of voters' unawareness. Under public choice approach, voters cannot trust the government to spend their tax money efficiently and must design methods to counter government demand.

Beyond the public choice theory, this research applies principal-agent problem to decentralization process. Theoretically, the problem relates with asymmetric information which is a type of market failures. General concept of the problem states "when you contract with people whose actions you cannot observe or evaluate, they may take advantage of you" (Perloff, 2004). In the context of decentralization, the principal-agent problem is not quite clear because of

assignments to the principal whether it is a central government or voters in the jurisdiction (Wildasin, 2004).

It is useful stating a simplified principal-agent model in order to write a suitable contract for decentralization. Although it is unclear for assigning the principal and the agent in general (Wildasin, 2004), the study of Patamasiriwat (2010), with the Thailand case, assigned the NDC and the Office of Auditor General (OAG) as the principal and the LGUs as the agents. However, in this article, we come across two possible cases in Thailand decentralization context where LGUs are designated as the agents in both cases. The central government is the principal because of its authority to direct the LGUs, by legislation, through the NDC and the OAG. Practically, the NDC direct LGUs by intergovernmental transfers as we found that the transfer policies had been changed annually. Electorates as the common principal, on the other hand, have authority to "recall it quit", as stated by laws.

CASE 1 A Central Government and a Local Government

Suppose a central government is the principal who has authority to hire or contract with a local government, to take some action, α , that increase the social welfare or social profit, π , from using his authority. In this model, the principal and the agent need each other. The social profit from local governance, π , depends on the governance effort, α , that local government performs. The social benefit may also depend on the outcome of a random variable, θ , that represents the state of nature:

$$\pi = \pi(\alpha, \theta).$$

There are two extreme cases; either some action is concerned or random variable is concerned. In the former, social benefit depends only on the agent's action, $\pi = \pi(\alpha)$ given on no uncertainty of random events or $\theta = 0$. The other case is social benefit depends only on the state of nature $\pi = \pi(\theta)$, such as in a good governance jurisdiction in which social benefit depends only on the state of nature likes natural disaster (flooding, landslides, or drought).

Theoretically, there are three types of contracts, fixed-fee social benefit, hire, and contingent contract that the principal utilizes one of those for monitoring the agent. Each type of contracts provides differently in production efficiency and moral hazard problem. However, as mention in Perloff (2004), the preferred contract is

the principal fixed fee social benefit contract because it results in production efficiency and no moral hazard problem.

CASE 2 Voters and a Local Government

In this case, voters or median voters are the "common" principal while a local government is still an agent. For simplicity, this paper assumes the same model;

$$\pi = \pi(\alpha, \theta).$$

However, the monitoring process in this case may possibly be absent because of the nature of the "common" adapted by the tragedy of the commons (Hardin, 1968).

Each model deals with mutual asymmetric information, but in different degrees. For the CASE 1, a central government or its agencies should have numbers of contracts at least equal to numbers of LGUs. These contracts are not free, but administrative costs. In addition, a good contract should have a set of key performance indicators, requiring a check and balance system and a huge annual budget. For the CASE 2, voters as the "common" principal are challenged by its nature. To be specific, it is costly for a person or a group to run the recall process while the agent has very much power particularly when the benevolent government assumption is rejected.

3.3 Stylized Facts and Policy Gaps in Thailand Decentralization

This research paper then utilizes stylized facts (SF) in order to discuss the previous and current results of Thailand decentralization with theoretical background. Taking into account of empirical findings, stylized facts will be mentioned following by supporting reasons and policy gaps. Because the three stylized facts proposed in this paper may differ from the intended objectives of decentralization, revisions of legislations and the roles of the line central agencies are needed. Three stylized facts are the following:

SF 1: An objective of Thailand decentralization is to deliver better public services, however, LGUs proceed a tendency minimum requirement level of the services, not the optimum level.

SF 2: An implicit objective of Thailand decentralization is to reduce inequalities, however, the negative is true particular in LGUs' receipts and performance.

SF 3: Conflicts of legislation, politics, and central administration not only delay the process of Thailand decentralization, but also reduce the level of success and perhaps decrease in social welfare.

We found that these stylized facts associate to "by design" not by default. The Thailand decentralization process has started from the concept of devolution in functions, budget, and personnel with the control of the central government using intergovernmental transfers. In theory, the central government might provide intergovernmental transfers to cover the difference between some minimum acceptable levels of local services and a normatively defined level of revenue raised from own sources (Bahl, Smoke, and Solomon, 2003). Although most of the Thailand intergovernmental transfers have been not tied to specific functions or programs allowing flexibility of LGUs for public service delivery, local government budgeting is the problem. It is the fact that LGUs difficulty predict their amount of grants and shared taxes because of several reasons e.g. political matters, annual transfer policy changes, and the treasury financial situations. Also the timing of intergovernmental transfers cannot be controlled by LGUs, but depending on the central government agencies. Additionally, LGUs practically run a budget surplus or at least a balanced budget. With the flexibility of LGUs for providing local public goods, budgeting process and practices, while central government could not provide a complete contract or an influencing incentives, LGUs proceed a tendency minimum requirement level of the services, not the optimum level (SF 1).

Generally, the central government has a major role in redistributing of income. In the decentralization context, the central government still cannot neglect this role. Theoretically, a more efficient structure of local government will be reached if the central government grants to high tax or low service localities in order to prevent mobility of tax bases. Therefore, the lower total local government revenues are, the higher intergovernmental grants obtain. Although the Thai central government allows general block grants supporting redistribution purpose, the amount of intergovernmental grants to LGUs does not support the redistribution role. Patamasiriwat's finding and grant and shared taxes policies from the NDC presented the evidences. Therefore, it is fair conclude that Thailand decentralization does not reduce inequalities (SF 2).

Conflicts of legislation appear to be one of the most difficulties in Thailand decentralization. Although the 2007 Constitution has granted 10 Articles to

support local government and its process, the Constitution has been suppressed by the present Acts or law. For example, the Article 286 of the 2007 Constitution⁶ allows people to request for "the issuance of local ordinances by local assembly", but the limitation of the procedure "shall be as provided by law". The latter quotation has caused the conflicts of existing legislation and the initiative or new law supported by the residents. Therefore, the intended objectives for decentralization could be deviated or changed by the existing law. For the politics, the incumbents of old fashion of administration and the national and local politics have caused a delay of decentralization process in the country. Not only in administrative administration as the delay of transferred functions, but also the annual changed intergovernmental transferred formula and regulations slow down the process as a result in politics. In addition, the current structure of administration instigates of unclear in some functions. Keeping both tracks of central and local administration costs "too much" for the country. It again reflects to the unclear of decentralization process with a chance of reducing social welfare. Because money is fungible, the central government could allocate budget from two tracks administration to only local government with the better system such as a check and balance based on KPIs and for provision of high quality of the national public goods. With all reasons, they cause the delay and reduction in the level of success, and the most concern is a possibility of decreasing in social welfare (SF 3).

4. LEARNING FROM THE PAST AND POLICY GAPS, AND

RECOMMENDATIONS FOR AN ONGOING PROCESS

This paper has no conclusion but a guideline and a reflection assisting the Thailand decentralization in a next decade. Therefore, this section is divided into two parts, learning from the past and policy gaps, and recommendations for ongoing process.

4.1 Learning from the Past and Policy Gaps

Our discussion from the previous sections states that Thailand decentralization is not a well completed process. It requires intention for good governance in administrative decentralization and fiscal decentralization with the theoretical

⁶ Article 286 of the 2007 Constitution states the following: the people, having the right to vote in any local government organization shall have the right to enlist the President of the local assembly a request for the issuance of local ordinances by the local assembly. The number of eligible persons, the rules and procedure for the enlisting and the examination thereof shall be as provided by law.

background of institutions and related asymmetric information theory. For administrative decentralization, each LGU must inform relating central government agencies in order to rank the priority of transferred functions categorized by broad categories with the current status and learning process of the difficulties or success for each function. This practice needs database and information technology systems for monitoring and supporting local government. At present, each agency has the system but not enough useful data. Therefore, this should be a concern issue of the NDC in order to receive the "real" information from the localities. Because each LGU is not the same, "adaptive governance" is required for better results. The policy gap in the administrative decentralization is the old fashion concept of "one size fits all". This should be concerned by the central government and its agencies, for example, a compulsory task for establishing of child-care center in each LGU. Practically, each LGU had spent its budget for structure and personnel for child care center. The central government has assumed that there is enough demand or it is a requirement, but this assumption may not be true for all location. Some localities may end up with a structure and high management budget but there is no guarantee for its quality or performance which is more important in managing a project. In addition, the central government should weigh the cost and benefit for keeping both tracks of administration.

For fiscal decentralization, the structure of local government receipts with high intergovernmental transfers is debatable, but broadening local tax base and increasing corrective taxes should be major concerns. In addition, the fiscal imbalance should be corrected using intergovernmental transfers, but the central government did in the negative way. The policy gap for fiscal decentralization is that the central government recognizes fiscal problems of LGUs by annual report from the NDC about perpetually changing intergovernmental transfers rules and criteria including monitoring results, but the central government had not intended to correct fiscal disparities. It is the fact that the decentralization process has been delayed as a result of political relationship. Therefore, it is a ripe time to reconsider revenue assignment to match local expenditure assignment in order to fill the fiscal gap and to strengthen the good governance for localities. Local governments should balance between budgetary needs based on expenditure assignment and the combined amount of local taxes, charges, and certain intergovernmental transfers from formula-based equalization. Exploring new environmental taxes and redesigning land and building taxes are requests for the better local government

receipts and reduction in inequalities.

4.2 Recommendations for an Ongoing Process

Recommendations for a next decade combine the recommendations for filling policy gaps in administrative and fiscal decentralization and also to change the stylized facts in a next decade. In addition, strengthening the LGUs is a requirement. To support further decentralization and capacity building in local administration, there should be a program to improve local databases and to promote basic and applied research. For administrative decentralization, some practices of the "one size fits all" or "father knows best" should be reconsidered as stated the earlier. In addition, the central and local relationships should be reconsidered in order to reallocate budget for better results or at least the central government should have a research relating to keep both tracks as a current system or keep only local administration. People need more information and explanation of these policy gaps from the central government.

For fiscal decentralization, the formula-based equalization grant, the initiative to broaden local tax bases and exploring the corrective taxes, and the initiative to enhance local capability in financial management and long term investment projects are this research recommendation. For the intergovernmental transfers, this is an immediate issue as there are wide disparities among thousands of LGUs and there is a sentiment that the grant allocation is biased in favor of big and economically prosperous LGUs. Because one of the objectives of intergovernmental transfer is to ensure minimum services provided by all local government units, regardless of their economic base, disparities should be reduced. For broaden local tax bases and exploring the corrective taxes, by information about local government receipts, broaden local tax bases and exploring the corrective taxes will generate more own-source revenues. An interesting surcharge or fee is the environmental charges attached to the containers. This tax is not only increase local revenues, but also decrease in expenditure for trash management.

Based on theoretical background and stylized facts, the central government and its agencies should support in strengthening local governments. This paper recommends for local government borrowing based on LGUs' demand. Allowing local governments direct access to capital markets is an important complement to the devolution of fiscal powers to local authorities. If properly designed, decentralization of borrowing powers can add to the gains in efficiency and

governance expected from fiscal decentralization. Alm and Indrawati (2003) observe that if local governments are given more independence in their tax and expenditure decisions, such independence may well extend to their use of borrowing. Local governments can use borrowing to better match current expenditures with current tax revenues, allowing temporary and unexpected swings in revenues to be smoothed without undue disruption in service provision. The role of local government in borrowing is expected to increase and gain in importance, accompanied by an improvement in the capacity of local governments to plan and manage their investment projects and to mobilize their own revenue sources to repay their borrowing. There is no law that prohibits Thai local governments from borrowing. Only the rules and regulations⁷ in practice made it very difficult for Thai local authority to borrow money and to incur debt. The case of lower-borrowing government to finance investment projects has led to an excessive demand for specific grant, which may be undesirable. Firstly, through political lobbying, the local administrative unit shall pay little effort to raise local revenue, from charges or taxes. In addition, the tax burden could be pushed outside the jurisdiction, tax exporting. There is a tendency that the proposed investment projects are oversized and the bad use of resources is evidenced in the many projects in which actual utilization is far below the full capacity. Secondly, the grant allocation project is not based on a just and efficient basis. In addition, the project based and specific grant as practice now is counterproductive to local institutional development, unfair and inefficient.

In the long run, local borrowing will strengthen local governance. It will induce institutional development and capability building on the part of local officials. In addition, there should be a consciously planned program to limit and to phase out the project-based and specific grant. At the same time, the plan should promote local understanding about the concept of fiscal discipline, the financial management skill to handle the investment project, to plan for cost-recovery, to set charges, and to pay for debt services, etc. Phasing out the specific grant should be taken in particular in the big and advanced LGUs (e.g., metro- and city-municipalities) so there will be more room for financing the "cooperative" investment projects by the small and least advanced TAOs. The metro-and city-

⁷ In the Municipality Act, the municipality that wants to borrow must seek an approval from the Minister of Interior. Nowadays, the power has been delegated to the provincial governor on behalf of the Minister.

municipalities and some leading TAOs should set a master project for other LGUs to follow.

Two issues needed more attention from relating governments are the Asian Economic Community (AEC) and the climate change problem. For the AEC, the labor mobility will increase demand for social service such as education, health care, and public safety and corrections, this issue requires some impact research and critical thinking not only the national impacts, but also local impacts. For the climate change and greenhouse gas reduction, it relates to the authority of the locale but the conflicts of legislation, politics, and administrations make the problem more difficult. There are signals that in a coming decade, LGUs could not be free from a part of the solution. Therefore, it is good idea for LGUs and the central government incorporating these two issues as the national topics and solving the problems together.

Last issue is a question about understanding in decentralization. From interviews with local authorities and empirical results, we found that the directions and attitudes toward the "real" decentralization of each LGU are not the same. In addition, the central government directions toward decentralization are changed periodically. This issue needs to be clarified by an active unit, for example, decentralization extension unit. With the good governance and attitudes, next steps of Thailand decentralization may yield the better results.

REFERENCE

- Alm, James and Sri Mulyani Indrawati (2003), *Decentralization and local government borrowing in Indonesia*, http://aysps.gsu.edu/publications/2003/decentral_indonesia.pdf
- Bahl, Roy, Paul Smoke, and David Solomon (2003), "Overview of the Local Government Revenue System", in *Restructuring Local Government Finance in Developing Countries*, Northampton, MA: Edward Elgar.
- Brennan, Geoffrey and James Buchanan (1980). *The Power to Tax: Analytical Foundations of a Fiscal Constitution*. Cambridge: Cambridge University Press.
- Bird, Richard M. and Francois Viallancourt eds. (1998), *Fiscal Decentralization in Developing Countries*, Cambridge University Press.
- Charoenmuang, Dhanet. (1999) *100 Years of Thailand Local Administration B.E. 2440-2550*. Bangkok: Koplfi.
- The Constitution of the Kingdom of Thailand, B.E. 2540 (1997).
- The Constitution of the Kingdom of Thailand, B.E. 2550 (2007).
- The Determining Plans and Process of Decentralization to Local Government Organization Act, B.E.

2542 (1999).

The Determining Plans and Process of Decentralization to Local Government Organization Act, B.E. 2549 Revision (2006).

Inman, Robert P. and Daniel L. Rubinfield. (1992). "Fiscal Federalism in Europe: Lessons from the United States Experience," *European Economic Review* 36, 654-660.

McCleary, William A., Sakon Varanyuwatana and Sasi-on Kam-on (2000). "100 years of local government in Thailand and Japan," *Thammasat Economic Journal*, 18 (March), 5-62.

Mektrairat, Nakarin. (2003) *A Comparative Study of Directions of International Local Administrative and Thailand*. Bangkok: Winnyuchon.

Musgrave, R. A. (1983). "Who should tax, when and what?" in Charles E. McLure, Jr. (ed.), *Tax Assignment in Federal Countries*, Canberra: Australian National University Press.

Oates, Wallace E. (1972), *Fiscal Federalism*, New York: Harcourt, Brace, Jovanovich.

Oates, Wallace E. (1977), "An economist's perspective of fiscal federalism," in W.E. Oates ed. 1977 *Political Economy of Fiscal Federalism*, Lexington, MA: Lexington Books.

Oates, Wallace E. (2005), "Toward a Second-Generation Theory of Fiscal Federalism," *International Tax and Public Finance*, 12, 349-373.

Pattamasiriwat, Direk (2010), *Fiscal Decentralization in Thailand: Tax Sharing and Grant Allocation Reform*, paper presented in the Proceedings of the First International Conference on Local Government, College of Local Administration, Khon Kaen University, Khon Kaen, Thailand, November 18-19, 2010.

Perloff, Jeffrey M. (2004). *Microeconomics* 3rd ed. Pearson Education, Inc.

Smoke, Paul (2005) "The Rules of the Intergovernmental Game in East Asia: Decentralization Frameworks and Processes" in *2005 East Asia Decentralizes Making Local Government Works*, Washington, D.C.

Varanyuwatana et al (2007). Decentralization and the Budget for Social Services at Tambon Administrative level, Economic Research and Training Center, Faculty of Economics, Thammasat university, Bangkok, Thailand.

Wildasin, David E. (2004). *The Institutions of Federalism: Toward an Analytical Framework*, "National Tax Journal" 57, 247-72.

Author: Siphath Lim

Chapter 5

Dollarization and the Effectiveness of Monetary Policy in Cambodia

Chapter 1

Introduction

1.1. Background

Cambodia firstly experienced a massive capital inflow of 1.7 billion of U.S. dollar in the early 1990s by the United Nations Transitional Authority in Cambodia (UNTAC) in order to prepare for national election which had never happened since a long history of civil strife. Because of the fragile banking system and regulation, the U.S. dollar became the de facto legal tender in Cambodia.

During the 1990s, due to the ineffectiveness of tax collection system, the revenue of the government was relied mainly on the state-owned enterprises. Large portion of the government revenue was spent on the payroll to the civil servants, especially the military forces. The imbalances between expenditures and incomes, the consequence of government deficit took place. The best and easiest way for the government to fulfill the deficit at that time was to print more money, seigniorage. The money supply growth was 240.9 percent in 1990, 28.6 percent in 1991, 214 percent in 1992, and 34.4 percent in 1993, whereas the exchange rate depreciated against U.S. dollar nearly 500 percent in the period of three years by increasing from 426.25 Riels per U.S. dollar in 1990 to 2,689 Riels per U.S. dollar in 1993. The expansionary monetary policy implemented by the government heightened inflation. The change of consumer price index was 57 percent in 1990, 121 percent in 1991, and 177 percent in 1992; and for the first six months of 1993 prices further increased by 80 percent (Ward, 1995).

After the first election in 1993, moving from a planned to a free market economy along with the shift from a socialist to a democracy regime, the Royal Government of Cambodia (RGC) started to restore macroeconomic stability as a mechanism to facilitate economics growth and alleviate poverty. With the assisting from the foreign donor countries and the restructuring of government system by reducing the large amount of employments of the government into the real term (mostly the military sectors), establishing legal frameworks, improving

tax collection system and budget management, creating and improving banking system and regulation, and increasing the quality of human resource development; in 1994, as a starting point, Cambodia had a macroeconomic stability with the inflation rate not more than 6 percent.

Since 1990, a lot of capital has flowed in Cambodia by foreign investors which were a main source of economic growth. As estimated by the World Investment Report from the United Nations Conference on Trade and Development (UNCTAD), the foreign direct investment (FDI) in Cambodia has increased from 38 million of U.S. dollar in 1990 to 1.6 billion of U.S. dollar in 2000, and has increased to 3.5 billion of U.S. dollar in 2007 (ADB Working Paper, 2008). During that period, the GDP growth rate was 6.5 percent in 1995, but declined to 5 percent in 1998 because of political turmoil.

After the second election in 1998, the coalition government was created which came up with a political stabilization as a key factor to increase the investors confident. The economic growth was 12.6 percent in 1999 and reached 13.3 percent in 2005. These high growths reflected the remunerations of economic and political stabilization after the third election in 2003. Because of the impact of the American economic crisis, the economic growth rate declined to 6.7 percent after the fourth election in 2008.

1.2. Objective of the Project

The main purposes of this study are reviewing the level of dollarization, the financial sectors in Cambodia, and evaluating the effective of monetary policy in Cambodia

1.3. Significance of the Research Question

What kind of policy is suitable for the Royal Government of Cambodia to implement in order to achieve a sustainable economic growth and stability?

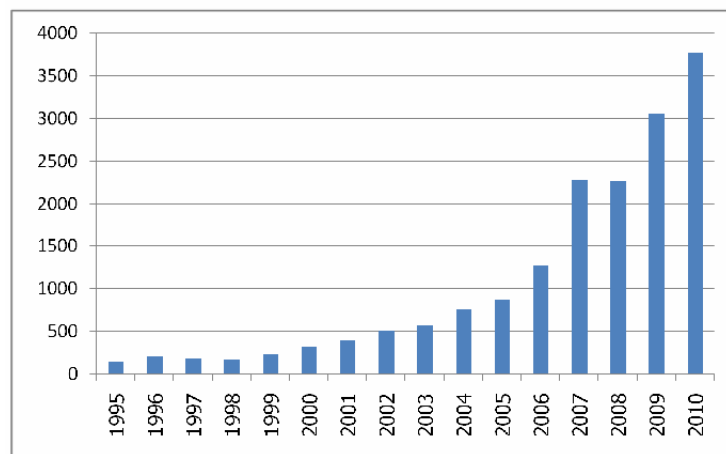
Chapter 2

Literature Reviews

2.1. Dollarization in Cambodia

Cambodia has become partially dollarize since the mid 1993 owing to the lacked of public confidence toward domestic currency due to high inflation rate and the unprepared of the National Bank of Cambodia (NBC) to cope with the flooded of 1.7 billion of U.S. dollar by the UNTAC. From the next one and haft decade because of the large inflow of capital from investors and foreign donors, the foreign currency deposits increased from 144.72 millions of U.S. dollar in 1995 to 3,771 million of U.S. dollar in 2010. Substantial increased of foreign currency deposits in the banking system indicated that the confident level of public to the banking sector in Cambodia has increased.

**Figure 1. Foreign Currency Deposits in Cambodia: 1995-2010
(Million of U.S. dollar)**



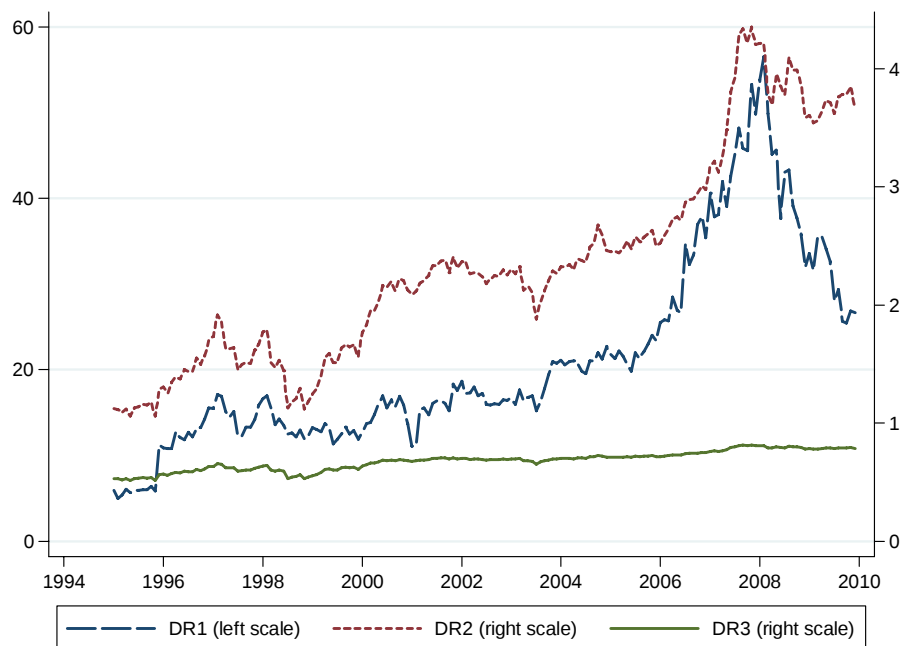
Source: National Bank of Cambodia.

The level of dollarization can be measured by three common dollarization ratios (DR) which is found by Vetlov (2001):

- DR_1 : residents' foreign currency deposits to domestic currency deposits;
- DR_2 : residents' foreign currency deposits to the sum of residents' domestic currency deposits and domestic currency in circulation; and
- DR_3 : residents' foreign currency deposits to broad money (M2).

As measure by DR_3 the degree of dollarization in Cambodia rose from 52.86 percent in January 1995 to 69.38 percent in December 2003. From 2004 to 2006, the degree of dollarization remained stable fluctuated between 70 percent and 74 percent. But in January 2008, the degree of dollarization rose up to 80.84 percent in 2010. The majority of the broad money consists mainly of foreign currency deposits which sometime reach up to 80 percent.

Figure 2. Dollarization Ratios in Cambodia: 1995-2010



Source: National Bank of Cambodia.

Cambodia has experienced dollarization for almost two decades. The costs and benefits of dollarization need to be considered. The main cost of dollarization is forgone seignorage which means that the National Bank of Cambodia as the monetary authority losses revenue from the right to issue a legal tender currency. Another importance cost is the ineffectiveness of the implementation of the monetary policy which the National Bank of Cambodia can not play a role as lender of a last resort owing to most of the bank holds cash U.S. dollar. However, the interest rate in the financial market can not be effectively controlled by the monetary authority. The interest rates on deposits and loans in the banking system are determined freely by the market mechanism.

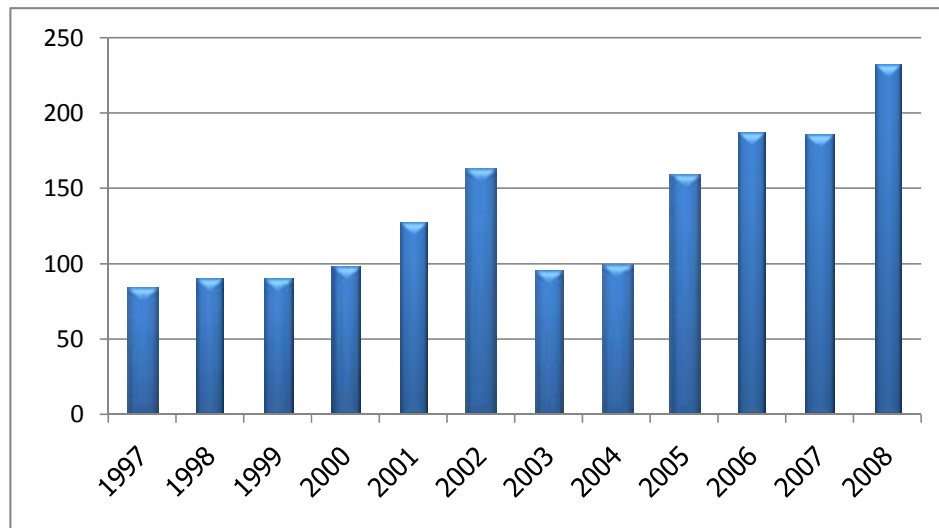
The dollarization is also providing some benefits to Cambodia. Firstly, protecting the investor from the exchange rate risk and economic spillover due to the bulk of trade transactions are payment in the U.S. dollars. Secondly, as the assets substitution, the dollarization offers another choice to the Cambodian people to switch from holding precious mental to the U.S. dollar. Thirdly, encouraging deposits and lending in U.S. dollar in the banking system.

De-dollarization is one of the policy strategies of the royal government of Cambodia. Cambodia became partially dollarize because of the experience of high inflation which caused the people wanted to hold foreign currency. It can be explained more clearly by the Granger causality test that inflation Granger cause dollarization. Therefore, as long as the inflation is still high, people still prefer to hold more foreign currencies comparing to domestic currency. To reduce the level of dollarization, the first thing that the central banks need to do is price stability. Currently, the price level in Cambodia is stable which reflected that holding Riel is not difference from holding foreign currency.

Of course, the dollarization limited the National Bank of Cambodia in the implementation of the monetary policy; therefore, the RGC relies mainly on the fiscal policy which is conducted by the Ministry of Economics and Finance (MEF) in order to fight with dollarization. To achieve this goal, the MEF and the NBC work closely together. After the restructuring of the government budget system in the mid 2005 the National Treasury of Cambodia and the MEF are responsible for the government budget planning, but the cash flow transactions are managed by the National Bank of Cambodia. This process is counted as one of the de-dollarization strategy of the royal government of Cambodia as the cash bills collected from the government revenue, for example taxes, the National Bank of Cambodia can control both bad and good quality banknotes. The bad quality banknotes were destroyed and replaced by reprinting the new one. The new printed banknotes and the good quality banknotes will flow out to the public when the government expenditures take place. As a result, when the domestic banknotes are nice and clean all the time, the Cambodian people should prefer to hold more domestic currency than foreign currencies.

As a developing country, since 1997, the government of Cambodia has received grants from the foreign donor countries in order to develop and reduce the level of poverty in the country. The amounts of the grants have been included in the government budgets which are stored at the National Bank of Cambodia. Thus, the international reserve of the NBC increased substantially.

Figure 3. Grants from Foreign Donors to Cambodia (Million of U.S. dollar): 1997-2008



Source: Asian Development Bank.

Even though most of the government revenues are in U.S. dollar, to de-dollarize as well as to encourage the people in using domestic currency, most of the government budgets were executed in domestic currency which is Riels. The government expenditures in U.S. dollar were used mostly for the international transactions. At the same time, the independent institutions such as Water Department of Cambodia and Electricity of Cambodia are also encouraged the people to pay the bills in Riels instead of U.S. dollar.

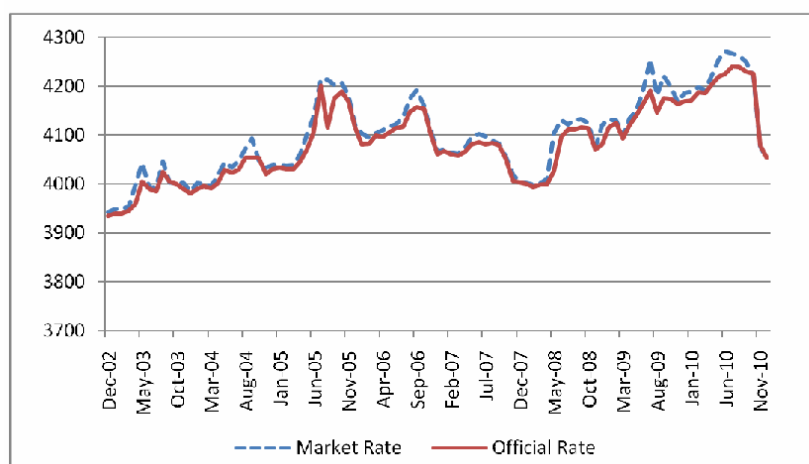
2.2. Financial Sectors in Cambodia

In early 1981, the Cambodia banking system was classified as a monobank. The People's Bank of Kampuchea played the role as the monetary authority as well as the commercial bank. There were provincial and municipal branches of the People's Bank of Kampuchea all over the country which functioned as the treasurer of the government and provided credit to the public. In 1991, the first commercial bank, Cambodia Commercial Bank, was created in the form of Joint Venture Bank for attracting investors and serving the activity of the UNTAC.

On January 30th, 1992, the National Assembly approved the Law on the Change of Organization's name and duty of the central bank of Cambodia, from the People's Bank of Kampuchea to the National Bank of Cambodia. According to the Law on the organization and Conduct of the National Bank of Cambodia which was approved by the National Assembly on January 26th, 1996, "the principle mission of the Central Bank is to determine and direct the monetary policy aimed at maintaining price stability in order to facilitate economic development within the framework of the Kingdom's economic and financial policy." One year after the approval of the Law on the organization and Conduct of the National Bank of Cambodia, on August 22nd, 1997, the National Assembly approved another law which was the Law on Foreign Exchange.

Since 1993, Cambodia has adopted managed floating exchange rate system which consisted of two rates, official exchange rate and market exchange rate. The market exchange rate is determined by the market mechanism. The National Bank of Cambodia accepts the market forces as a catalyst, thus a parallel market exchange rate existence of a privately based foreign exchange market. However, the National Bank of Cambodia quotes daily official exchange rates which apply mainly to the external transactions conducted by the government and state-owned enterprises. In addition, the official exchange rate is generally used by the banks and government institutions to record transactions in foreign currency for accounting purposes while the parallel market exchange rate is used for external transaction by the public.

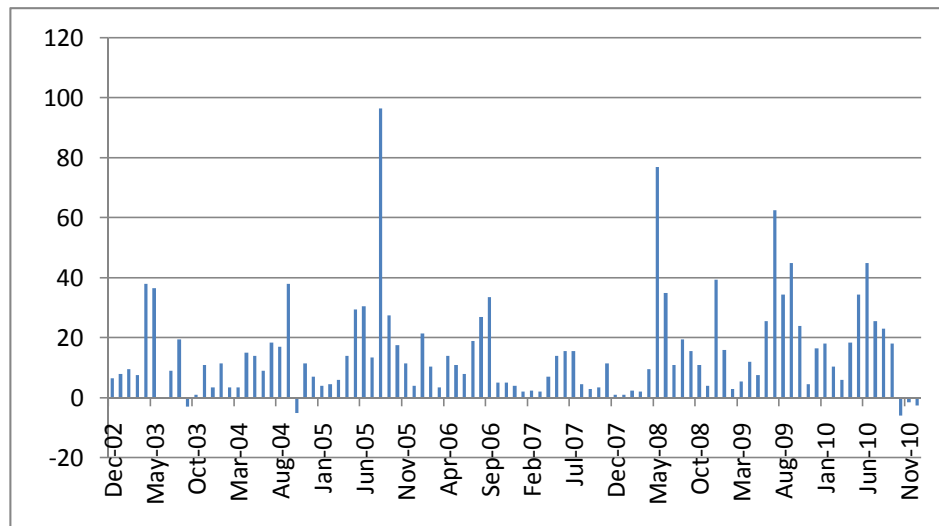
Figure 4. Cambodia's Exchange Rates (Riels/U.S. Dollar): 2002-2010



Source: National Bank of Cambodia.

In earlier periods, the spread between the two exchange rates was initially relatively wide (sometime the parallel rate exceed 30%). With the commitment of the National Bank of Cambodia, the spread between the official exchange rate and the market exchange rate has been narrowed down to not more than plus or minus one percent.

Figure 5. Spread Between Market and Official Rate: 2002-2010



Source: National Bank of Cambodia.

Since 1989, the banking system in Cambodia has switched from a monobank to a two-tiered banking system—the National Bank of Cambodia and the private banks. The private banks are classified as Commercial Banks, Specialized Banks, and Micro Finance Institutions (MFIs).

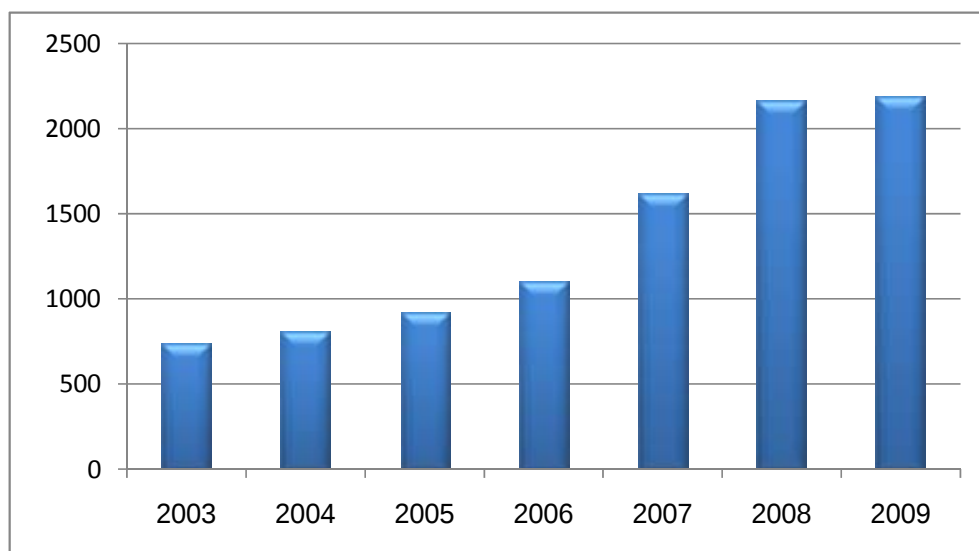
The National Bank of Cambodia is functioned as the monetary authority of the country which plays a very important role in conducting the monetary policy in order to achieve price stability and facilitate the economic growth. In general, three main monetary policy tools are used by most of the central bank in the world which are Open Market Operation (OMO), Reserve Requirement, and Discount Rate.

With the absence of government security and as a dollarized economy, the NBC mainly control the amount of money supply directly by buying and selling U.S. dollar in the domestic foreign exchange market. This instrument is called

“U.S. dollar auction” which is similar to the OMO. If the NBC known that the exchange rate in the domestic foreign exchange market, Riels per US dollar highly fluctuate from the target which mean depreciated too much, the NBC would sell the US dollars to the money changers in order to absorb Khmer Riels into the central bank so that the exchange rate should appreciate back to the previous level.

This process is proceeded backward if the exchange rate in the domestic foreign exchange market is highly appreciate. It is so-called unsterilized foreign exchange intervention because both international reserve and money supply circulated are affected (Mishkin, 2007).

Figure 6. Cambodia: Gross Official Reserve, 2003-2009
(Million of U.S. dollar)



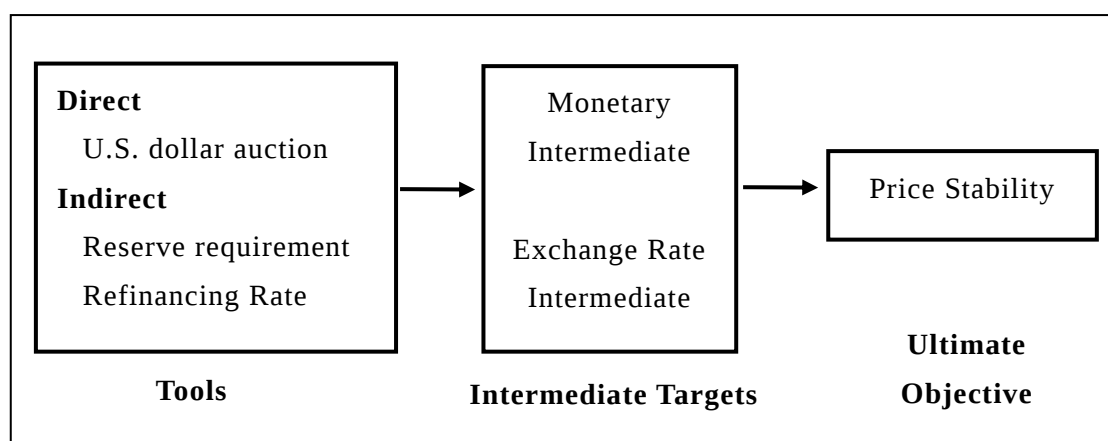
Source: National Bank of Cambodia.

The National Bank of Cambodia can control the amount of money supply in the market indirectly through reserve requirement, and refinancing rate which is generally known as discount rate. The reserve requirement is the rate of total deposits, both Riels and foreign currencies, which banks need to keep as a reserve ratio after providing credits to customers, whereas the refinancing rate is the rate which the NBC lend to the banks as the last resort. Both rates are not fixed; it is flexible under the economic situation.

The financial institutions, banks and MFIs, subject to reserve requirements are required to hold sufficient eligible assets, over the maintenance period, with the National Bank of Cambodia, to effectively support safe and sound operational liquidity management. Assets eligible for maintenance of reserves required are limited to daily balances held at the National Bank of Cambodia on the Institution's reserve requirement and clearing accounts, for Riel and foreign currencies (U.S. dollar, EURO, Thai Baht, etc.) required average reserve holdings. The minimum reserved requirement rates are 8 percent for Riel and 12 percent for foreign currencies on deposits and other borrowings base of banks and MFIs which are required to maintaining for the period of 14 calendar days at the National Bank of Cambodia. Cash on hand is not considered an eligible reserve asset to ensure compliance with minimum reserve requirement holdings (Prakas¹ of the NBC, 2009).

When the NBC applies reserve requirement and refinancing rate instruments, it should achieve the intermediate targets which are monetary and exchange rate targets. In practice, the National Bank of Cambodia losses one position as a lender of a last resort to the banking system owing to the resistance to dollarize, hence the refinancing rate is rarely used or completely useless under the current economic situation in Cambodia.

Figure 7. Monetary Policy Strategies of the National Bank of Cambodia



Source: Constructed by author.

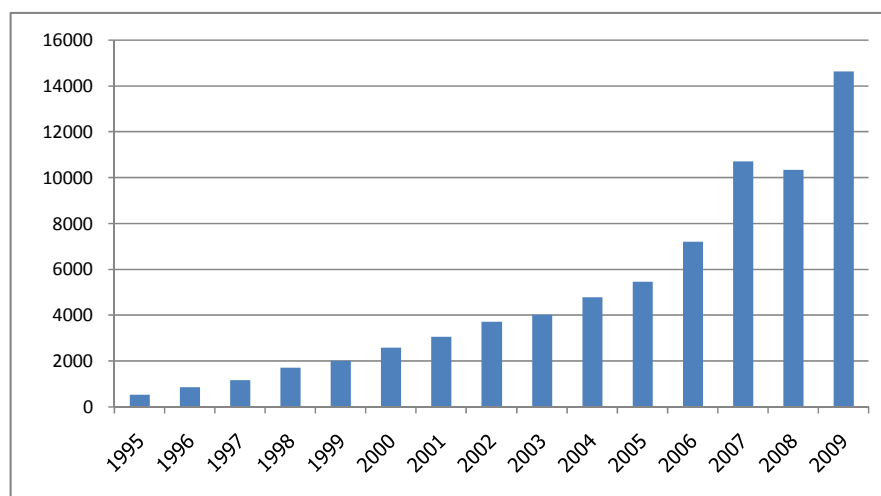
¹ Regulation announcement.

The conduct of the monetary policy in Cambodia is weak due to a strongly impact of the dollarization. As the monetary authority, the National Bank of Cambodia tries to strengthening banking system in order to increase the credit and public confidence.

To strengthening banking system, the National Bank of Cambodia is strictly control on banks and MFIs activities. On-site and off-site supervision of the Supervision Department of the National Bank of Cambodia are applied to all banks and financial institutions. Furthermore, in order to minimize liquidity risk in the banking system, the National Bank of Cambodia offers some facilities, which benefit to all banks and financial institutions; such as fixed deposits facility, overdraft facility, and currency swap facility. For liquidity management, the National Bank of Cambodia offers fixed deposits to financial institutions for the maturities of three, six, and twelve months. However, in case of liquidity shortage, the NBC also grants overdraft to banks and financial institutions (Prakas, 2009). In addition, to encourage agricultural loan in the rural area by micro finance institutions, the NBC offers currency swap by exchange Riel for U.S. dollar deposits.

Under the commitment of the National Bank of Cambodia, the banking system in Cambodia is stable. Currently, there are 27 commercial banks, 6 specialized banks, and 20 micro finance institutions. In the last fifteen years, however, the net foreign assets (NFA) of the banking system increased substantially.

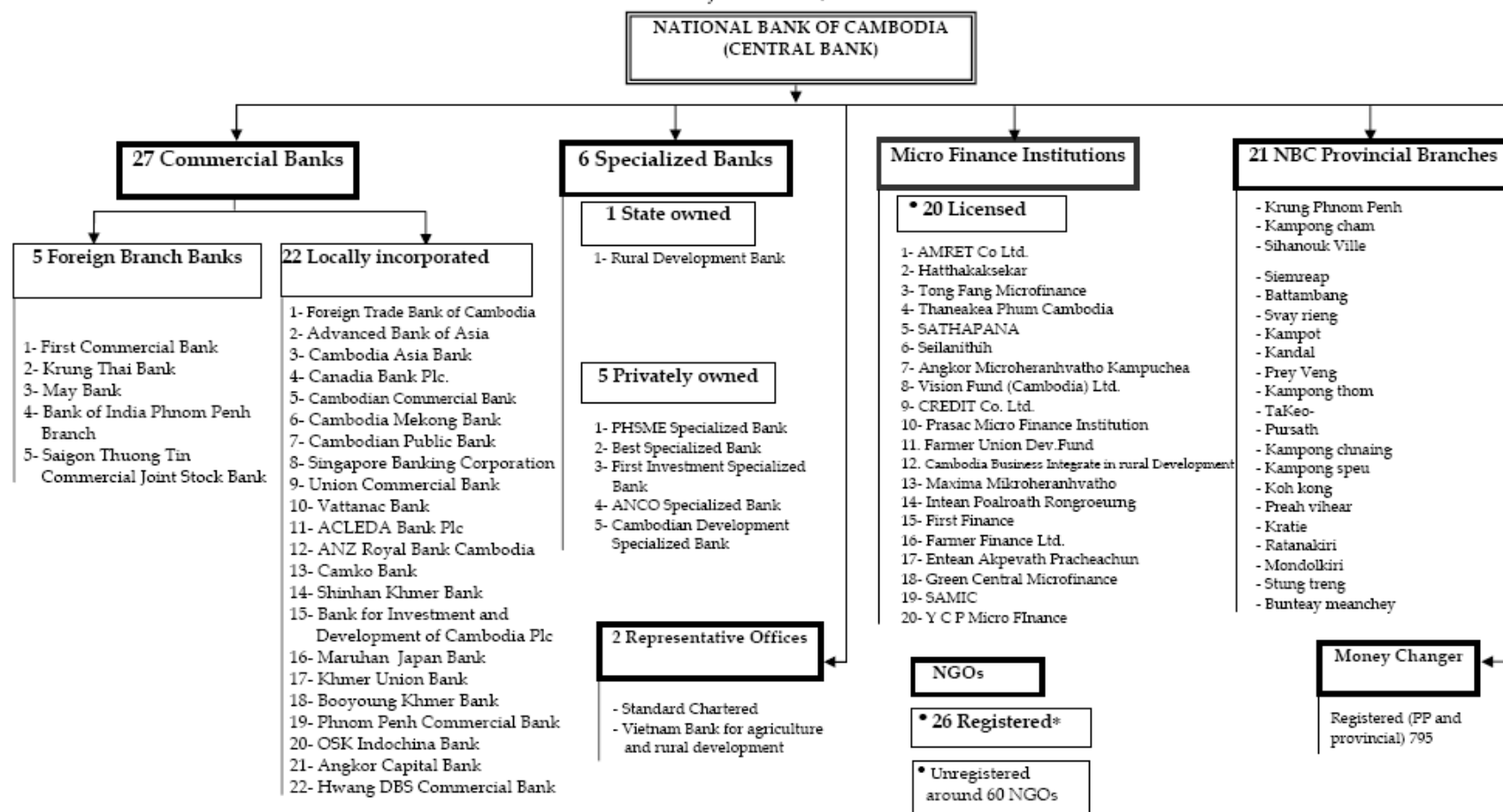
Figure 8. NFAs of Banking System (Million of Riels): 1995-2009



Source: National Bank of Cambodia.

Figure 9. Organizational Structure of the Banking System in Cambodia

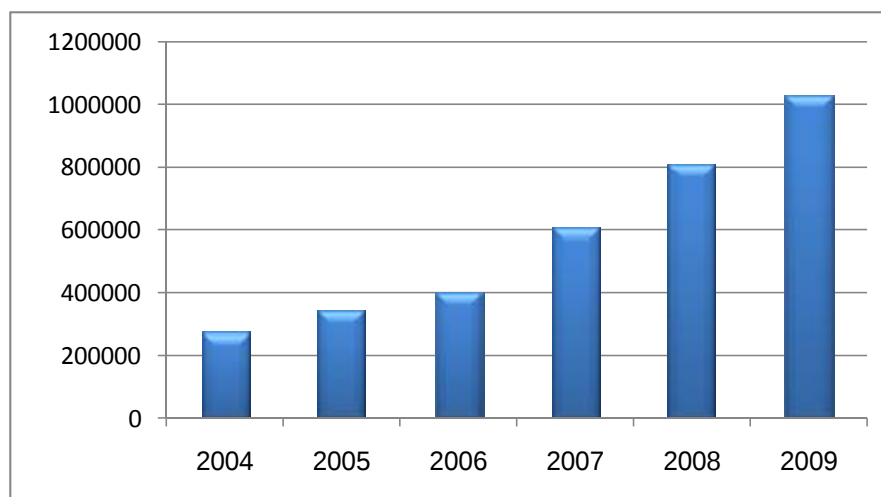
As of December 31, 2009



Source: National Bank of Cambodia

Financial sectors in Cambodia consists generally banks business. With the strengthening of banking system and regulation, the public confidence on financial services has increased. There were large increase of number of depositors in banks and MFIs in the last five years. In 2004, number of depositors was 272,406 which categorized as 122,984 MFIs depositors and 149,422 banks depositors. In 2008, number of depositors in MFIs decreased to 108,788 while number of banks depositors increased to 699,987. Totally, number of depositors reached 808,775 in 2008. Moreover, the total number of depositors increased to 1,030,956 in 2009, of which 927,997 bank's depositors and 102,959 MFIs' depositors.

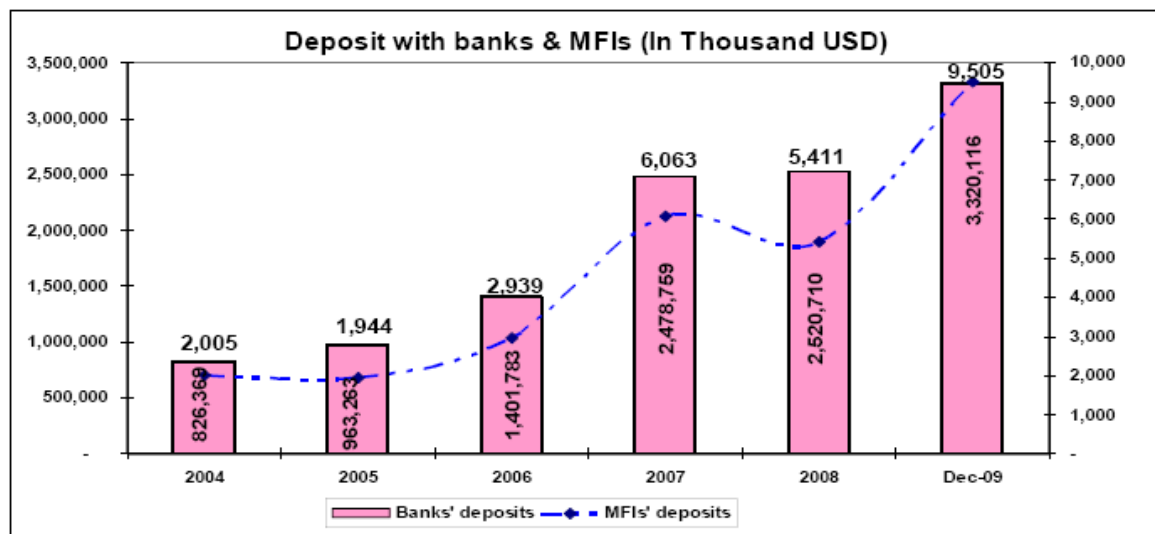
Figure 10. Number of Depositors in Banks and MFIs: 2004-2009



Source: National Bank of Cambodia.

Large increased of number of depositors in banks and MFIs has captured a lot of funds as a source of banks loan for investment in the country. The amounts of deposited funds critically increased particularly in banks from 2004 to 2007, but remain constant in 2008 as a result of economic crisis. However, the amounts of deposit started to increase again in 2009.

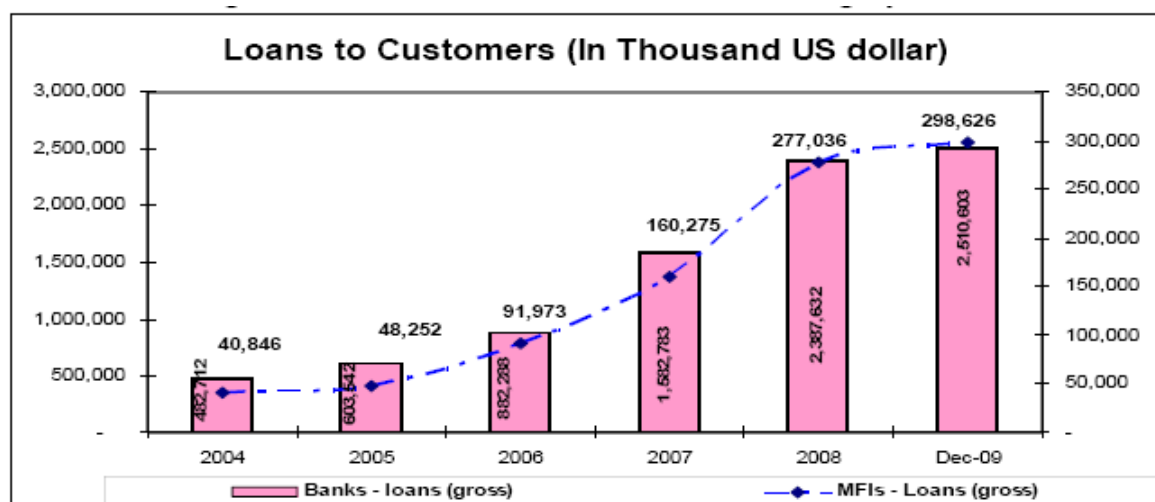
Figure 11. Deposit with Banks and MFIs: 2004-2009



Source: National Bank of Cambodia.

To facilitate economic growth, the royal government of Cambodia relies mainly on the micro finance institutions which can provide credit and financial services to the people all over the country especially to the poor people in rural area. As can be seen in Figure 12, from 2008 to 2009, the MFIs loans dominated banks loans.

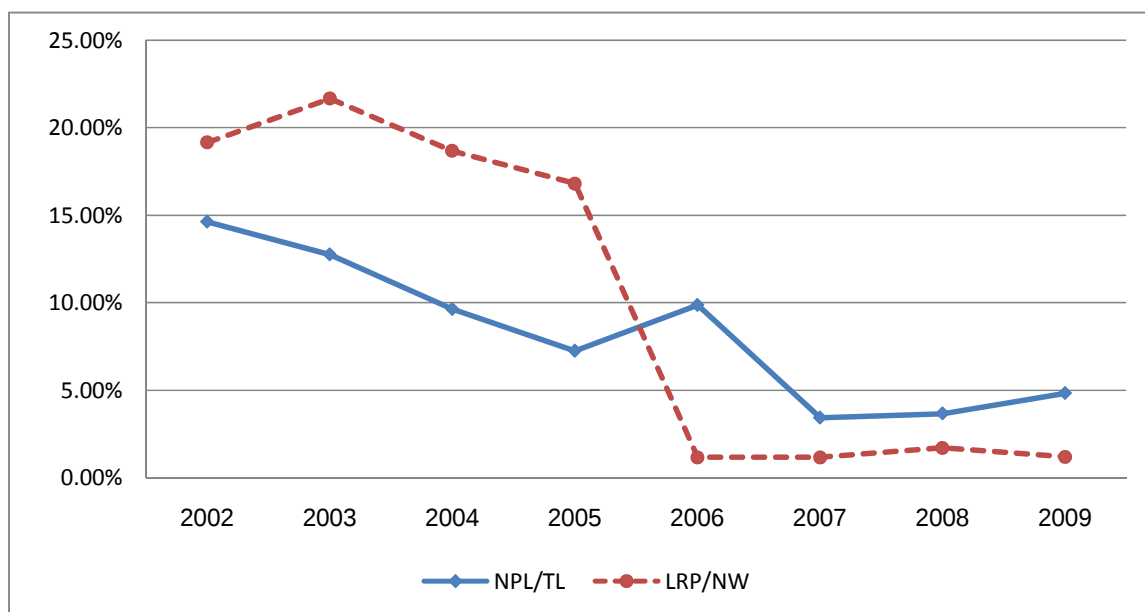
Figure 12. Banks and MFIs Loans: 2004-2009



Source: National Bank of Cambodia.

As response to the growth of banks and MFIs activities, non-performing loans (NPL) to total liabilities (TL) declined from 14.63 percent in 2002 to 7.26 percent in 2005, but increased to 9.87 percent in 2006 then declined to 3.44 percent in 2007 and slightly increased to 3.68 percent in 2008. At the same time, the ratio of loans to related parties (LRP) to net worth (NW) has declined from 21.68 percent in 2003 to 1.17 percent in 2006, and then increased to 1.71 percent in 2008. Nevertheless, the loans to related parties to net worth decreased to 1.20% while the non-performing loans to total liabilities increased to 4.84%, in 2009.

Figure 13. NPL and LRP of Banks and MFIs: 2002-2009



Source: National Bank of Cambodia.

Currently, there is no securities market in Cambodia. Cambodia accepted the International Monetary Funds (IMF) obligations of Article VIII, Sections 2, 3, and 4 on January 1, 2002, and maintains an exchange system that is free of restrictions on the making of payments and transfers for current international transactions. Exports and imports of foreign banknotes are not limited but are subject to prior notification beyond \$10,000. There are no limits on resident's balances of foreign currency accounts held in domestic banks, and the deposits may be used to settle all types of domestic obligations. Exporters and importers of goods and services must make payments for their commercial transactions with the rest of the world through authorized intermediaries (IMF Report, 2008).

The Cambodian people expected that the interbank/money and capital markets will be opened soon in Cambodia. The establishing of financial market, interbank/money and capital markets; is counted as one of the strategic plan of the royal government of Cambodia. With the funds supported by the Asian Development Bank (ADB) and the jointed group working between the Ministry of Economics and Finance, National Bank of Cambodia, Ministry of Commerce, and other related ministries or institutions; the Financial Sector Blueprint for 2001-2011 which was known as the Financial Sector Development Strategy (FSDS) was created in 2001 as a long-term government plan in order to build and enhance financial sector in Cambodia. The long-term mission and vision of the FSDS is the government reforms. Those include legal and judiciary reform, public administration reform, and public finance reform.

The improving of liquidity in banking sector is considered as a core strategy plan of FSDS in order to diversify liquidity risk. The establishing of interbank/money market should response to the minimizing/diversifying liquidity risk. The strategic plan in constructing interbank/money markets are separated into three phases. The first phase is to create the unsecured interbank lending which is subsequently used as a foundation of money market. The second phase is to enhance the use of financial instrument such as negotiable certificate of deposit (CD), repurchase agreement, and Treasury bills. The last phase is to broaden money markets with a regulatory framework for nonfinancial issuers of money market instruments such as commercial paper. Similarly to interbank/money market, the establishing of capital market is also separated into three phases. The first phase is to create an enabling environment of capital market. The second phase is to develop the foundation and procedure related to securities trading. The last phase is to build the preparatory work (FSDS, 2001).

As a key source in implementing and achieving the strategies and goals which are stated earlier, financial market infrastructure need to be developed by the royal government of Cambodia. According to FSDS (2001), four main parts must be taken into consideration such as accounting and auditing system, financial information infrastructure, and financial sector safety nets.

Since created the FSDS, the royal government of Cambodia has achieved a lot of things which complied with the determined plan of FSDS. All necessary

laws and regulations which related to the establishment of financial market in Cambodia have already approved by the National Assembly of Cambodia. With the achieving some progress of the long term plan, the FSDS was updated in 2007 and came up with new version which was Financial Sector Development Strategy 2006-2015.

Table 1. Laws Related to Financial Sector Development in Cambodia

Law	Approval Date by NA
Law on Financial Leases	May 27, 2009
Laws on Insolvency	December 08, 2007
Law on the Issuance and Trading of Non-Government Securities	September 12, 2007
Law on Anti-Money Laundering and Combating the Financial of Terrorism	April 30, 2007
Laws on Secured Transaction	April 06, 2007
Law on Government Securities	November 30, 2006
Laws on Commercial Arbitration	May 12, 2006
Law on Negotiable Instruments and Payment Transactions	October 24, 2005
Law on Commercial Enterprises	June 19, 2005
Law on Corporate Accounts, Their Audit and the Accounting Profession	May 24, 2002
Law on Insurance	June 20, 2000
Law on Banking and Financial Institution	November 18, 1999
Law on Foreign Exchange	August 22, 1997
Law on the Organization and conduct of the National Bank of Cambodia	January 26, 1996
Law on the Investment of the Kingdom of Cambodia	August 04, 1994

Source: National Assembly (NA) of Cambodia

Recently, the Security and Exchange Commission of Cambodia (SECC) has just provided provisional approvals for underwriters' licenses to at least three companies such as OSK Indochina Bank, Seoul-based Tong Yang Securities Company, and Canadia Bank, which allow them not only to buy and sell stock, but also to organize initial public offerings (IPOs). Each license for the underwriter needs to have \$9.5 million as a capital requirement, which would have restricted profitability. However, "Acleda Bank also received a stock brokerage license, which required \$1.5 million in capital and does not allow the organizing of public offerings." (The Cambodia Daily Press, August 2010). With the full set of laws and regulations and under the commitment of SECC, the Cambodia Security Exchange (CSX) is expected to open soon.

2.3. Dollarize and De-dollarize in Cross Countries Experiences

Dollarization mainly take place in the country which has political and economic instability especially hyperinflation such as in Liberia, Chile, Argentina, Brazil, Israel, Peru, Vietnam, and Laos. Liberia has had a dollarized economy since it was established in 1847. The Liberian people loss confident on local currency owing to poor macroeconomic management which means that the credibility of macroeconomic policies was performed weak. After a very long period of dollarization, the Liberia government attempts to de-dollarize through market-driven dedollarization. The very power strategy to de-dollarize is the developing of domestic financial market which introducing domestic currency denominated securities and reducing U.S. dollar denominated assets especially in the banking system. However, getting Liberian people to be familiar with the use of domestic currency by increasing the use of the Liberian dollar as a unit of account is also one of the crucial strategies of de-dollarize. The law requires that prices in Liberia be denominated in Liberian dollars and the Liberian dollar should be used for all accounting and financial reporting and official purposes in Liberia. The government also used some administrative force such as placing limits on U.S. dollar deposits or loans, and imposing a tax on U.S. dollar intermediation. Moreover, the improving of macroeconomic policy and prudential regulation have served Liberia well on the process of de-dollarize, Erasmus (2009).

Similar case also took place in Chile. Indexed instrument such as CPI-indexation was working well by the Chilean government to attract investor interest, but such an instrument was not working well in Argentina, Brazil, and Uruguay because of weak legal support for the indexation unit, and the difficulties in agreeing on a common indexation measure. While a clear orientation of monetary policy of the Chilean government toward price stability-through the introduction of inflation targeting but also with a clearer mandate helped reduce investor uncertainty as well as macroeconomic volatility. However, the CPI-indexation had also work well in the case of Israel. In addition, the Israeli government also had a successful experience with de-dollarize through the establishing of local currency-denominated government bonds, Plata (2008).

The market-based driving force is also working well as a policy option to de-dollarize in Vietnam because the foreign currency was function as a medium of exchange, a store of value, and a unit of account alongside the local currencies

which is similar case in Cambodia. In Vietnam, de-dollarization has been associated with a successful disinflation strategy. Two steps taken by Vietnam's policy makers during the 1990s were decisive. The adaptation of managed-floating exchange rate regime which allowed for exchange rate stability and the introduced a restrictive monetary policy based on targeting M2, which include foreign currency deposit (FCD), Goujon (2006).

The pass through effects from exchange rate changes to domestic prices is quite high under dollarization. The conservative fiscal and monetary policies, and active foreign direct investment (FDI) flows seem to have contributed to the solid economic performance of most dollarized economy countries. However, the insufficient data for macroeconomic analysis hamper policy operation. The Lao PDR has no quarterly data on gross domestic product (GDP), a monthly index of industrial production, monthly unemployment rates, and other important economic indicators which is similar to Cambodia except the quarterly data of GDP. In general, high frequency data on the real economy are in very short supply. On the other hand, in the absence of full control over interest rate in Cambodia, the central bank have to employ other policy instruments such credit controls, reserve requirement ratios, and the other instruments, Jinushi (2006)

It has also been found that price increase has a positive and statistically significant responds to an exchange rate shock in Argentina, the Lao PDR, and Peru. This indicated that price stability can be achieved through exchange rate stability, Plata (2008)

In Peru the Dollarization started with the inflationary process of the mids-70s and peaked during the hyperinflation of 1988-90 despite efforts to de-dollarize in 1985. With high inflation, the U.S. dollar started to be the preferred means of payments and store of value. Lending institutions also saw that dollars minimize the risk of capital losses. In 1985, while inflation was high, the government forced the conversion of foreign currency deposits to local currency resulting in capital flight and financial disintermediation. When the restriction on foreign currency deposits was lifted, re-dollarization was quick, and by the end-1990s, about 80 percent of deposits and credit were denominated in foreign currency. Since the introduction of the inflation targeting (IT) regime in early 2000s, Peru has experienced a gradual and sustained market-driven financial de-dollarization. The successful attempts to de-dollarize have been market-based and combined a track record of macroeconomic stability with other policies to enhance the attractiveness of the local currency. Moreover, Macroeconomic

stability, proxied by inflation, different measures of exchange rate changes, and sovereign credit risk, had a significant impact on de-dollarization in Peru. Taking advantage of buoyant economic conditions in recent years, the Peruvian government has pursued large fiscal surpluses (of about 2 to 3.3 percent of GDP per year) during 2006 and 2008. As a result, public debt has been reduced below 30 percent of GDP, one of the lowest level in the region. Last, thanks to stringent prudential regulations, Peru's financial sector is sound, as shown by its resilience during the recent global financial crisis. Several prudential measures introduced during the last decade have helped the de-dollarization process by lowering banks incentives to borrow and lend in foreign currency. In Peru, Banks are required to hold liquid assets equivalent to at least 8 percent in domestic currency and 20 percent in foreign currency of all their liabilities maturing during the next 12 months. In 2003, Peru launched a market-making program with the objective of developing a market for domestic public debt, consisting mainly of fixed-rate instruments in domestic currency. In line with this objective, Peru's public debt management strategy has been focused on developing a yield curve of government bonds in Soles and reducing the share of public debt denominated in foreign currency. As a result, government bonds in Soles have gained liquidity and the yield curve has been extended considerably. The inflation targeting framework and consolidated policy credibility of Peruvian government, reflecting strengthened institutions and a track record of prudent policies, have been key to keep inflation expectation well anchored, which are essential to the de-dollarization process. Moreover, the successful policy response during the global financial crisis has further increased currency credibility, Escribano (2003).

Chapter 3

Research Methodology

This study uses structural Vector Autoregressive (SVAR) in order to find the interrelationship between four variables money supply (M2), nominal exchange (NEX), gross domestic product (GDP), and consumer price level. The SVAR has the form as follows:

$$AY_t = c + \sum_{i=1}^T \Gamma_i Y_{t-i} + \varepsilon_t$$

Y_t is a vector of M2, NEX, GDP, and CPI. All variables are express in the form of logarithm. So, the first different represents growth. The Choleski decomposition has been imposed as follows:

$$\begin{aligned} e_{1t} &= \varepsilon_{1t} \\ e_{2t} &= a_{21}\varepsilon_{1t} + \varepsilon_{2t} + a_{23}\varepsilon_{3t} \\ e_{3t} &= a_{31}\varepsilon_{1t} \\ e_{4t} &= a_{41}\varepsilon_{1t} + a_{42}\varepsilon_{2t} + \varepsilon_{4t} \end{aligned}$$

The Choleski decomposition of VAR will generate impulse responded and forecast error variance decomposition which include also the structural shock as mention in the above matrix. The stability condition of the estimated VAR is also performed in order to check the stationary of the system. The period of the study is from 1998:Q1 to 2010:Q4. All data series are collected from International Financial Statistic (IFS) of International Monetary Fund (IMF), Ministry of Planning (MoP), and National Bank of Cambodia. However, the Augmented Dickey-Fuller test has been applied to all the series in order to check about the stationarity.

Chapter 4

Empirical Result

Firstly, the Augmented Dickey Fuller (ADF) tests for all the series are employed. The null hypotheses of the unit roots are failed to reject with significant level of 5 percent. The series are non stationary.

Table 1. Augmented Dickey-Fuller Test¹

Variables	t-value	
	Level	First Difference
M2	0.498	-4.75***
NEX	-1.994	-5.544***
GDP	-0.605	-6.449***
CPI	0.991	-5.918***

Note *** and ** are significant 1% and 5% level, respectively.

The null hypotheses of the unit roots are rejected with significant level of 5 percent for the first different of each series⁴. The series are stationary, $I(1)$. So, the VAR on the first difference can be run. The information criteria are used to determine the optimal lag of the VAR model.

VAR Lag Order Selection Criteria

Endogenous variables: DLOGM2 DLOGNEX DLOGGDP DLOGCPI

Exogenous variables: C

Sample: 1998Q1 2010Q4

Included observations: 47

Lag	LogL	LR	FPE	AIC	SC	HQ
0	431.5159	NA	1.48e-13	-18.19216	-18.03470*	-18.13291
1	460.1576	51.18946	8.65e-14	-18.73011	-17.94281	-18.43384
2	487.1001	43.56655*	5.52e-14*	-19.19575*	-17.77861	-18.66247*
3	492.2912	7.510547	9.10e-14	-18.73579	-16.68882	-17.96551
4	507.9352	19.97113	9.99e-14	-18.72065	-16.04384	-17.71335

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

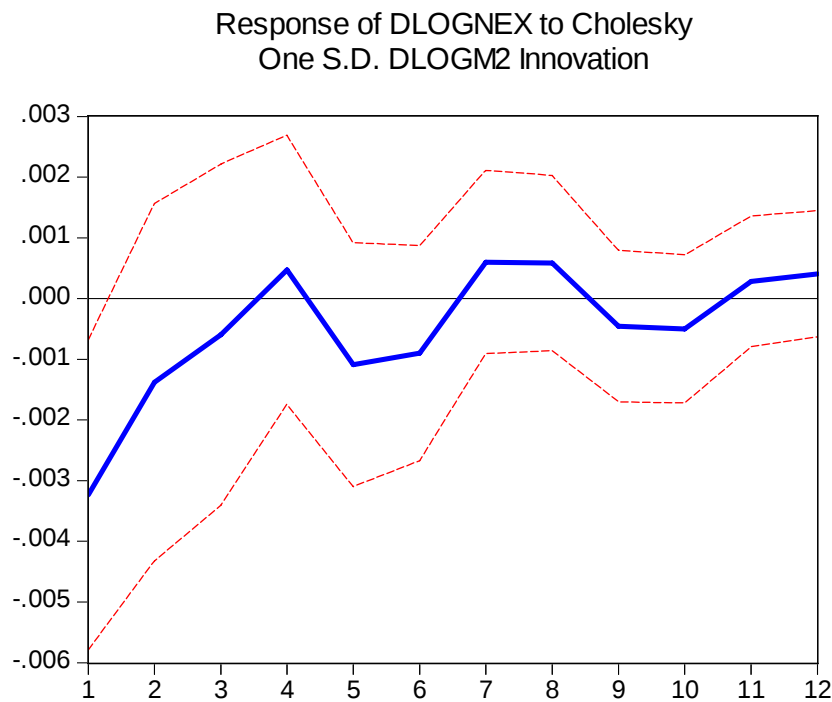
AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

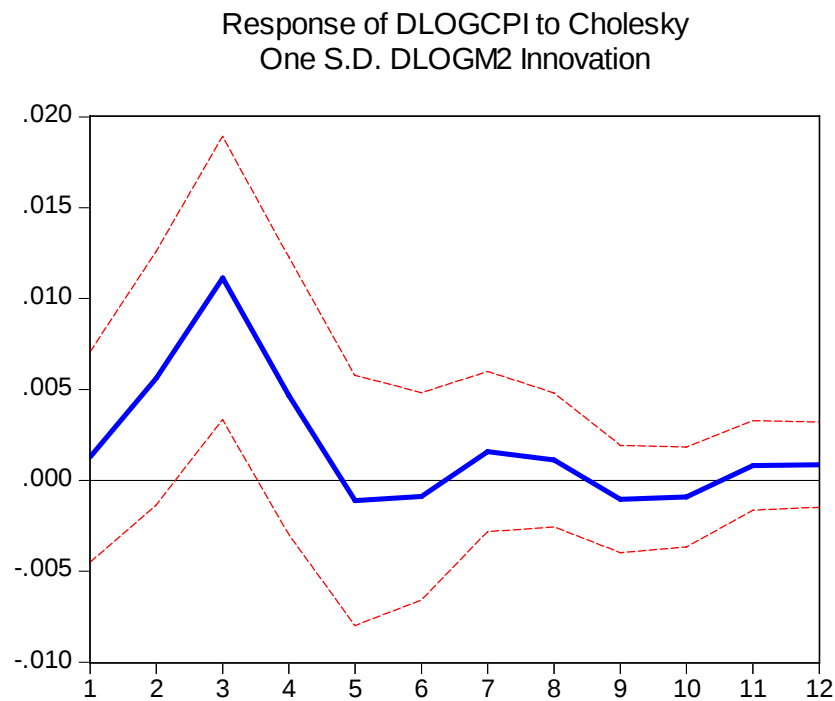
⁴ The Phillip-Perron test is also applied and the result is the same.

According Akiake Information, the optimal lag of the variable is two. After imposed the Choleski decomposition⁵, the impulse response which also include the structural shock can be generated as follows:

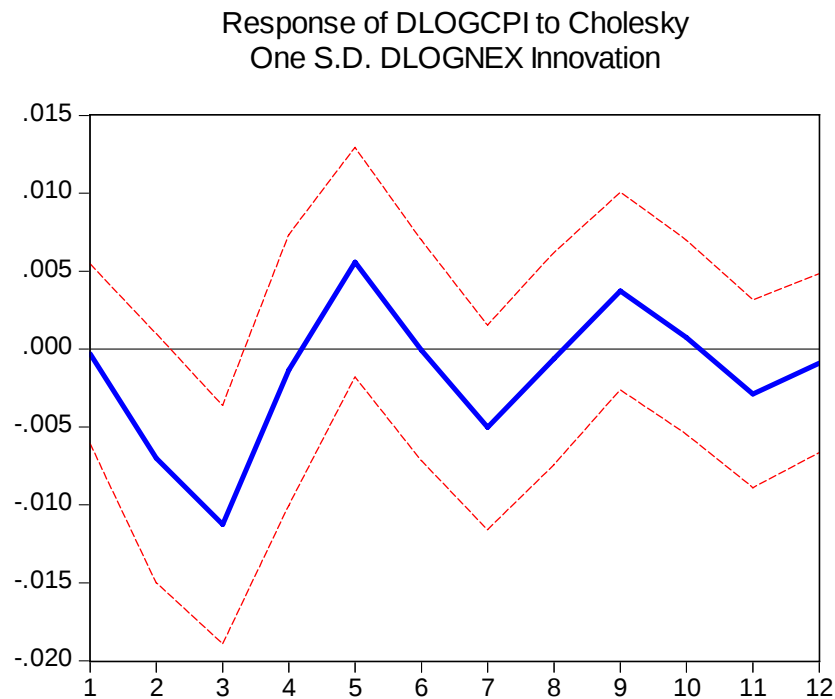


As can be seen from this figure, the response of exchange to broad money has some kind of cyclical. The broad money growth has no strong impact on the exchange rate depreciation. Actually, the exchange rate fluctuates in Cambodia in general happen by seasonality. In that period, the demand for Riel is increase in the market such as in the period of festivals (Chinese new year, Khmer new year, Ancestor festivals), farmer crop collection period (rice production collection) and tax paying period; the Riel would tend to appreciate, but when each of the period ended the demand for Riel will decline which could lead to strong negative shock on exchange rate in the domestic exchange market. This means that Riel might depreciate a lot. The National Bank of Cambodia always has a closer look on the movement of the exchange rate in the market, if the fluctuation of the exchange rate is high, U.S. dollar action will be applied.

⁵ The stability condition revealed that the system is stationary.



Broad money growth has a strong positive impact on inflation in the short run while in the long run it also has some kind of cyclical impact as the effect of broad money growth on exchange rate. So, changing in the amount of money supply would be effectively impact on the price level in the market.



The response of inflation to the exchange rate shock has similar sharp to the response of inflation to the broad money growth. According to forecast error variance decomposition of inflation, in the first fourth quarters, the variation inflation is explained almost equally of the three variables—broad money, exchange rate, and GDP—but after the fifth quarter, the variation of inflation is explained mostly by the variation of exchange rate (about 22 percent for every quarter).

Period	Variance Decomposition of DLOGCPI:				
	S.E.	DLOGM2	DLOGNEX	DLOGGDP	DLOGCPI
1	0.020255	0.402117	0.021270	24.27387	75.30274
2	0.023869	5.837806	8.606125	18.92048	66.63558
3	0.029833	17.65400	19.76858	16.26736	46.31006
4	0.031220	18.35452	18.23829	15.54665	47.86054
5	0.032127	17.45222	20.23187	16.91716	45.39875
6	0.032786	16.83030	19.42754	18.34568	45.39648
7	0.033243	16.59524	21.18097	17.92952	44.29428
8	0.033592	16.36349	20.77513	18.34877	44.51260
9	0.033825	16.23324	21.70474	18.11209	43.94994
10	0.034047	16.09429	21.47027	18.31212	44.12331
11	0.034181	16.02689	22.01393	18.17214	43.78704
12	0.034330	15.95151	21.89189	18.28374	43.87285
Cholesky Ordering: DLOGM2 DLOGNEX DLOGGDP DLOGCPI					

Chapter 4

Conclusion and Policy Implication

The degree of dollarization in Cambodia as measured by DR_3 has increased from 56 percent in 1995 to 80 percent in 2010 and has been classified as a highly dollarized economy in the region. The subsequent increase of the level of dollarization has put a lot of pressure on the National Bank of Cambodia in the implementation of monetary policy. Currently, the monetary authority relies mainly on exchange rate stabilization in order to control inflation, but because of macroeconomic complexity with highly level of dollarization; the monetary policy instrument was not working well in controlling the fluctuation of the exchange rate in the market.

The dollarization is high in the city; therefore diversified development with greater emphasis on agricultural and rural areas, where the Riel is commonly accepted, would help contribute toward a decline of dollarization. Some policy strategy for De-dollarization such as (i) a greater differential in reserve requirements in favor of Riel deposits, which would make bank intermediate in Riel more attractive and also mitigate bank's liquidity risks arising from a run on dollar deposits in the absence of a lender of last resort, (ii) a requirement for all retailers to list prices in Riel, and (iii) promoting the use of Riel for payments by circulating bills of larger denomination and introducing a clearance tax for checks dominated in foreign currency, should be considered by the Royal Government of Cambodia.

Development of an interbank money market (in both U.S. dollar and Riel) is an important strategy for reducing the vulnerabilities induced by a dollarized financial system, and for a more effective implementation of monetary policy. Successfully develop an interbank money market would create a space for moving away from exchange rate-based stabilization.

Diversified private sector-led growth is important for raising Cambodia's growth potential. Strengthening the investment climate, expanding market access through trade commitments, and enhancing rural infrastructure are all important to help Cambodia tap new market in the context of Asia rebalancing. The government's renewed emphasis on agricultural development and rural infrastructure investment could help broaden sources of growth and directly reduce poverty. However, improving business environment, such as the implementation of Anti-Corruption Law, would provide a better way for

Cambodia to attract more investors as the cost of doing business could significantly reduce which could improve Cambodia's international Competitiveness. Cambodia currently ranks 145th out of 183 under the World Bank's Doing Business Index, and 158th out of 180 under the Transparency International Corruption Perception Index (World Bank).

Many experiences from many dollarized countries revealed that de-dollarization through market driving based were working well. With the future establishment of capital market, the financial instruments must be issued in Riels.

However, strengthening banking system is a very important task for the National of Cambodia to implement beside the implementation of monetary policy. Currently, examinations of supervision department of NBC to banking system remain compliant-based and do not adequately assess risk, and there is inadequate offsite monitoring, limited follow-up of onsite examination findings, and weak enforcement of laws. Moreover, the classification of bank assets remains weak which derive the under estimate of non-performing loan (NPL) in the banking system. Addressing the acute shortages of human resources and lack of technical capacity is of paramount importance and very high on the NBC's agenda. Therefore, improving human resource development and building international cooperation with other central banks on bank supervision would help NBC carry out better bank supervision.

Better and faster data for key economic statistics in order to further enhance policy credibility and better inform business decision. All economic data should be uploaded and updated on time to all government's institutions website.

References

- Asian Development Bank (2008), Key Indicators of Cambodia. Retrieve 2009, from <http://www.adb.org/statistics>.
- Calvo, Guillermo A. and Carmen M. Reinhart (September 1999), “Capital Flow Reversals, the Exchange Rate Debate, and Dollarization,” *Finance & Development*, Volume 36, No. 3, (Washington: International Monetary Fund).
- Enders, W. (1995). *Applied Econometric Time Series*. New York: John Wiley and Sons Inc.
- Huot, P. (2009). “Cambodia: Coping with Dollarization”, Phnom Penh, Cambodia.
- Hamilton, J.D. (1994), “Time Series Analysis,” (Princeton University Press).
- Jayant, M. (2008). “Cambodia’s Persistent Dollarization: Causes and Policy Options.” Asian Development Bank, Working Paper Series on Regional Economic Integration No. 19.
- International Monetary Fund (2005). *International Financial Statistics*. Washington, DC: Author.
- International Monetary Fund (2009). *International Financial Statistics*. Washington, DC: Author.
- International Monetary Fund (2009). “Cambodia: 2008 Article IV Consultation—Staff Report; Staff Supplement; and Public Information Notice on the Executive Board Discussion”, IMF Country Report No. 09/47.
- Liang, Hong, Thomas Rumbaugh, Kotaro Ishi, and Atsushi Masuda, (August 2000), “Cambodia: Selected Issues” (Washington: International Monetary Fund).

Marciniak, Phillippe et al., “An Integrated Framework for Cambodia,” Chapter II—Macroeconomic Assessment, (Washington: International Monetary Fund), forthcoming.

Ministry of Commerce Cambodia (2001). “Macro Assessment, trade policy, trade facilitation, and poverty assessment”, A Pilot Study.

Mishkin, Frederic S. (2007). *The Economics of Money Banking and Financial Market*. Boston: Pearson Education, Inc.

National Bank of Cambodia. (1996), Law on the Organization and Conduct of the National Bank of Cambodia. Phnom Penh: NBC.

National Bank of Cambodia (2003). 4th Quarter Review. Phnom Penh: Author.

National Bank of Cambodia (2004). 4th Quarter Review. Phnom Penh: Author.

National Bank of Cambodia (2007). 1th Quarter Review. Phnom Penh: Author.

National Bank of Cambodia (2008). Annual Report. Phnom Penh: Author.

National Bank of Cambodia (2009). Annual Report of Bank Supervision Department. Phnom Penh: Author.

National Bank of Cambodia (2009). Economic & Monetary Statistics. Phnom Penh: Author.

National Bank of Cambodia (2009). Prakas on Overdraft Facilities Made Available by the NBC to Banks and Financial Institutions Facing Temporary Liquidity Shortages. Phnom Penh: Author.

National Bank of Cambodia (2009). Prakas on the Maintenance of Minimum Reserve Requirement in Banks and Financial Institutions. Phnom Penh: Author.

Prema-chandra Athukorala. Crisis, Capital Controls and Recovery in Malaysia, Research School of Pacific and Asian Studies. ANU, Australia.

Tam Bang Yu (2005). Capital Controls: The Case of Malaysia and Lessons for Vietnam. East-West Center Working Papers, Hawaii USA.

Sannisith (2005). Monetary Policy. Unpublished, National Bank of Cambodia, Phnom Penh.

Siphat Lim (2007), “The Impact of Exchange Rate Change on the Balance of Trade in Cambodia,” Master Thesis, Pannasastra University, Cambodia.

Siphat Lim (2010), “Money, Exchange Rate and Price Level in Cambodia: a Vector Autoregressive Analysis,” Master Independent Study, Thammasat University, Thailand.

Tal Nay, I. and Michel, D. (2007). “Dollarization in Cambodia”, Phnom Penh, Cambodia.

Zamaroczy, M.D. and Sa, S. (2002). “Macroeconomic Adjustment in a Highly Dollarized Economy: The case of Cambodia”, *IMF Working Paper*, WP/02/92. May.

EXCHANGE RATE AND CAPITAL INFLOW IN VIETNAM

Research project funded by the Thailand Research Fund

Research team: Nguyen Hong Son, Nguyen Manh Hung, Nguyen Thi Vu Ha

Draft Report as of May 2011

Executive summary

1. Capital flow is a powerful phenomenon in the current context of Vietnam. Although theories and empirical evidences in the world already noticed the impact of capital inflows on exchange rate movement, such impact has not been adequately examined in Vietnam. Vietnam's policies of capital control have been experimented for long time and continued in the post-WTO accession. The failure to alter inappropriate capital control policies may undermine price stability, slow down foreign trade, and result in the fall of the GDP. Vietnam's macroeconomic instability in 2008 provided a clear evidence.
2. Considering real effective exchange rate a crucial indicator that measures the health of the Vietnamese economy, this paper answers two questions: *i)* How has capital inflow impacted the movement of real effective exchange rate? and *ii)* What are the effective measures to cushion the effects of capital inflows on exchange rate?
3. Although targeting at nominal exchange rate policy has been so far an effective tool to intervene into the foreign exchange market, it may not solve all problems in the long run. Current policy to stabilize the foreign exchange market tended to move toward freer exchange rate mechanism and unavoidable depreciation of VND. Letting VND depreciate may help Vietnam boost up its export and reduce trade deficit. However, the depreciation of VND may have negative impact on other exporting economies, especially Vietnam's neighbors.
4. The lessons from Vietnam provide important policy implications for Lao PDR and Cambodia as the low-income countries in the Greater Mekong Sub-region and policy implication for the role of Thailand in sub-regional economic cooperation for the purpose of sustained economic growth.

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1. Introduction

Capital inflows are defined as the increase in net international indebtedness of the private and the public sectors during a given period of time (Leiderman and Reinhart, 1996). In order to manage capital inflows effectively, we must understand the differences between two types of inflows. One is inflows that are driven by fundamental economic factors and another is not. While the first type of capital flows is expected to be continuous overtime (if the economic fundamentals are good), the second type may be reversed in the future (Kawai and Takagi, 2008).

It is possible to see from the reality that capital will be poured into an economy once it becomes more integrated into the global financial market. This situation has created the pressure to push up the domestic currency's value against the US dollar. In order to mitigate this pressure, the Central Bank must intervene into the foreign exchange market to buy in the US dollar from the commercial banks. The increase of domestic currency supply has however triggered capital inflation. This is one of the important explanations for the occurrence of two-digit inflation rate in Vietnam in the period of 2007-2008.

Together with other macroeconomic policies, capital control policies are applied to change the scale and structure of the capital flows into Vietnam with the tendency of encouraging long-term capital sources, especially when much capital has been poured into the financial investment and real estate sector after Viet Nam became the member of the World Trade Organization (WTO). The pattern of capital flows into Vietnam requires that the government should carefully analyze the impacts of the capital control policy frameworks. The failure to alter inappropriate control policies may result in the fall of GDP below the long-term growth path and undermine price stability.

Considering the real effective exchange rate as a crucial factor that affects not only foreign trade but also growth and economic stability of Vietnam given that the country's economic growth depends heavily on trade, the research ask the following questions:

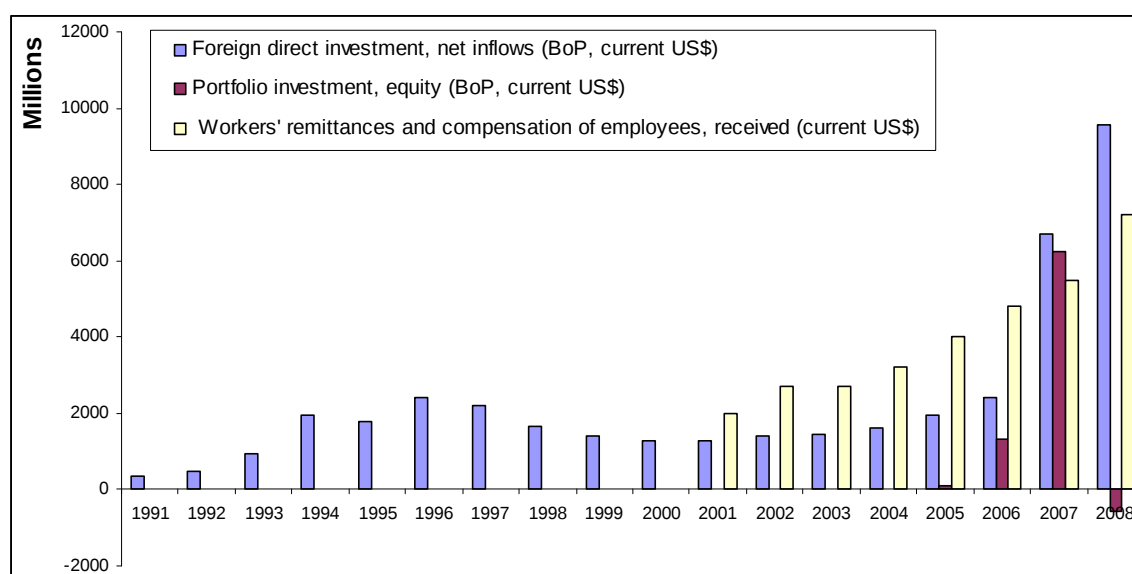
- *How has capital inflow impacted the movement of real effective exchange rate in Vietnam?*
and
- *What are the effective measures to cushion the effects of capital inflow on exchange rate?*

By answering these questions, the research expect to: i) Provide policy recommendations to the Vietnamese government with regards to the management of capital control, and exchange rate, especially in the current context of increased openness of the Vietnamese economy; ii) Provide policy implication to Lao PDR and Cambodia with regard to the similar issue from the case study of Vietnam; and iii) Provide policy implication for the role of Thailand in sub-regional economic cooperation for the purpose of sustained economic growth.

2. Overview of Capital Flows in Vietnam

Full time-series data on capital inflows into Vietnam is extremely difficult to acquire. Data on various components of capital inflows often face with discontinuity and inconsistency. This is not only caused by statistical inadequacy but also historical dissonance. For example, the data on official development assistance (ODA) is available only since 1993, when ODA was resumed, whereas data on FDI could be found for the earlier period, and portfolio data has not been officially collected until recently. Given this shortcoming, it is difficult to have a comprehensive picture of the capital inflows in Vietnam even though they have been acknowledged for years. However, it is possible to show that, as in the simple Figure below (Figure 2.1), the surge in capital inflows with three most popular and largest components -- FDI, ODA and portfolio investment -- has become an overwhelming phenomenon over the past few years, especially since Vietnam's accession into the WTO. This is also accompanied with the volatility as evidenced by the contraction of the portfolio component in 2008 under the impact of the global financial crisis.

Figure 2.1: Capital Flow into Vietnam, 1991-2008



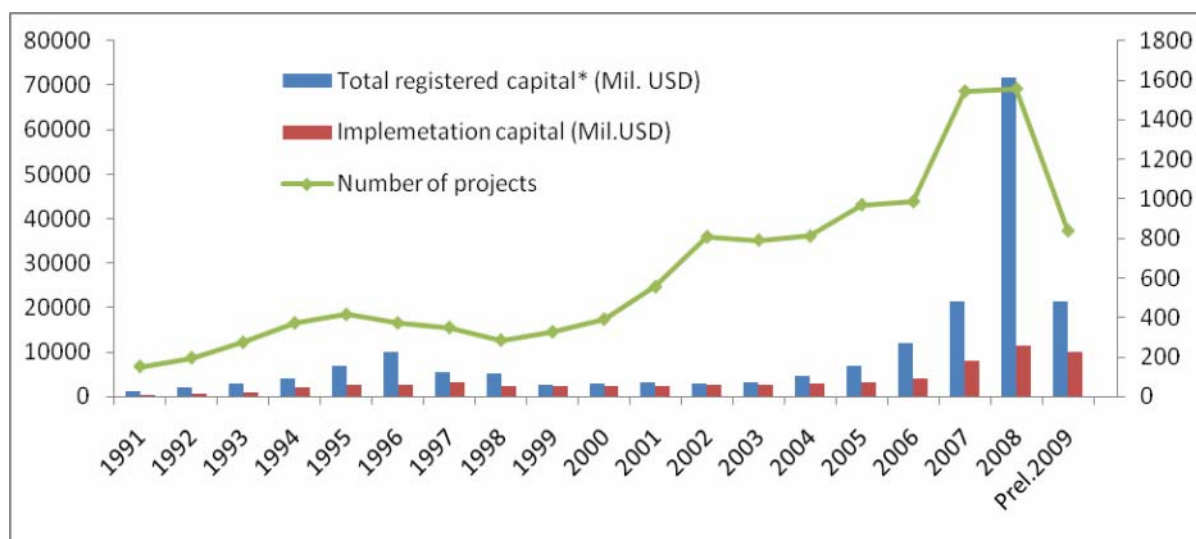
Source: World Development Indicator 2010

2.1. Foreign Direct Investment

In December 1987, Vietnam introduced its first-ever Foreign Investment Law to commence the efforts to attract foreign capital. From 1991 to 2009, Viet Nam received 11,995 FDI projects with the total registered capital of US\$ 191.2 billion, 35% of which were implemented. After peaking in 1996, FDI inflows into Viet Nam had declined following the Asian crisis. However, since 2004, it has expanded rapidly, reaching more than US\$ 12 billion and US\$ 21.3 billion in terms of commitments in 2006 and 2007, respectively. FDI inflow reached its peak again in 2008 with the total registered capital of US\$ 71.73 billion. In 2010, the implemented FDI reached US\$ 11 billion, increasing by 10% compared to 2009 (GSO, 2011). The surge of FDI in recent years reflects investors' confidence in Vietnam's economic reform and development prospect as well as the shift of FDI in labor-intensive

industries such as outsourcing logistics, electronics, garments and manufacturing from China to Vietnam (Vo, 2008).

Figure 2.2: FDI into Vietnam, 1991-2009

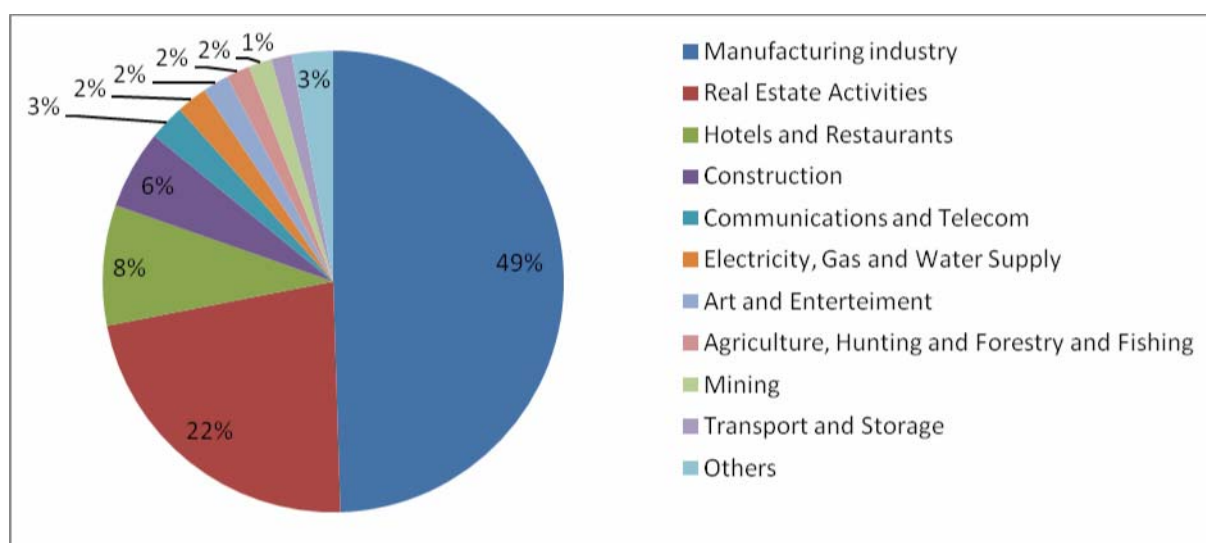


*Including supplementary capital to licensed projects in previous years

Source: Statistical Handbook 2009 - GSO

The registered (accumulated) FDI has been allocated mainly in manufacturing industry, real estate activities, hotels and restaurants, construction and communications and telecom. In the 1990s, FDI was concentrated in import substitution industries. Since 2000, it has been shifted to export manufacturing sector and services sector. From 2008 until now, FDI was poured into real estate businesses, creating a powerful factor to cause a boom in real estate.

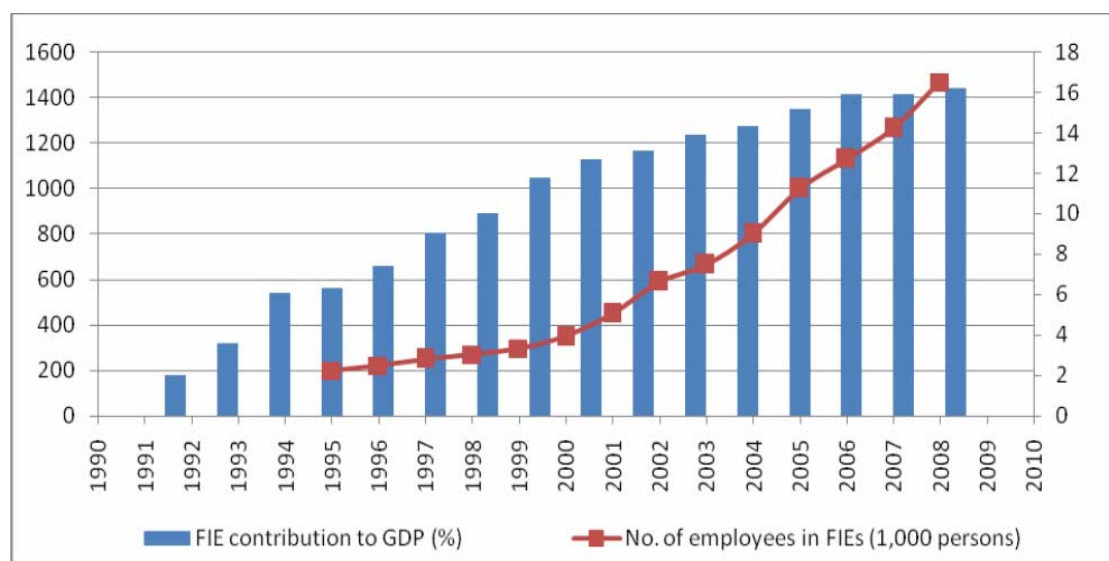
Figure 2.3: Share of FDI by Sector by 2009



Source: MPI, 2009.

The foreign invested enterprises (FIE) played an increasingly significant role in Viet Nam's economy. In 1995, FIEs directly employed 220,000 workers and accounted for 6.3% of the GDP. In 2007, these figures increased to 1,265,000 employees and 16.2% of the GDP. The growth rate of FIE sector was usually higher than other sectors in Vietnam. Moreover, the FIE sector is currently a dynamic force for Viet Nam's exports and the development of various manufacturing industries (Vo, 2008).

Figure 2.4: Foreign Invested Enterprises, 1990-2010



Source: MPI, 2010

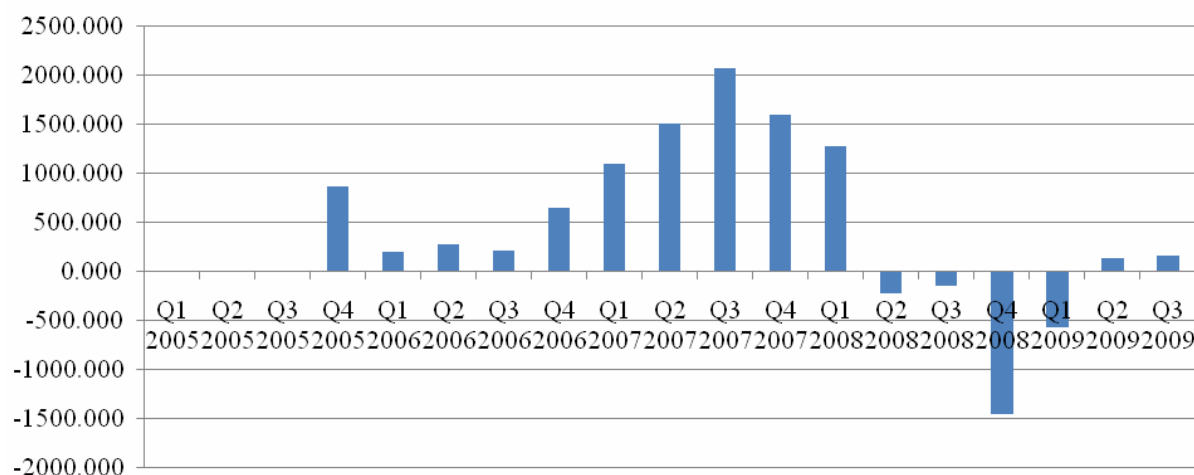
2.2. Foreign Portfolio Investment (FPI)

Since 2001, it has been known that FPI into Vietnam has increased with several funds in Vietnam having an average capital of US\$ 5-20 million each, but overall data of FPI is not available. FPI capital inflows in Vietnam increased rapidly in 2006, thanks to investments on the stock market by international financial groups and funds. Foreign investment funds brought in US\$ 2 billion worth of FPI into Vietnam at the end of 2006. Foreign portfolio inflows accounted for 2.2% and 10.4% of the GDP in 2006 and 2007, respectively. There were 436 foreign investors as of 2005, including 38 institutional investors and 389 individual investors.

The number of foreign accounts increased by nearly twenty-fold from 2005 to 8,140 in 2007. The trading volume of foreign investors is rather high, accounting for 21% of the total market trading volume in 2006. This number increased to 29% by the end of 2007. In 2007, the foreign trading value increased significantly to around 55% of total market trading value. In 2006, Vietnam had received around US\$ 1.3 billion of total FPI, of which 70% was invested in stocks, bonds and real estate, and 30% was held as deposits in the banking system. In 2007, FPI increased sharply to USD 7.4 billion (Vo, 2008).

After a sharp fall in 2008 due to the global financial crisis, the FPI has come back to local shares since the beginning of 2009. Vietnam's stock market now accounts for 40% of the GDP, with the listings of 555 companies and 926,000 trading accounts, including over 14,000 of foreign investors holding approximately US\$ 8 billion worth of Vietnamese shares (Security Investment Online, 4/8/2010).

Figure 2.5: Portfolio Investment – Liabilities (\$US Million)

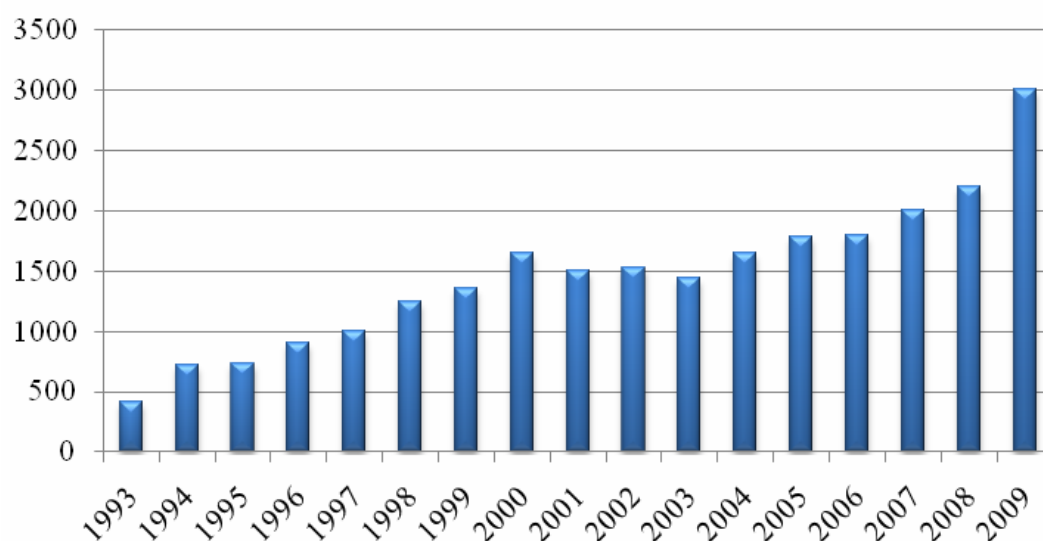


Source: GSO, 2010.

2.3. Official Development Assistance

Official development assistance (ODA) was resumed in 1993 and has also significantly contributed to investment and GDP growth in Viet Nam. From 1993–2009, total committed ODA for Viet Nam reached US\$ 50 billion, of which US\$ 41 billion was signed, and US\$ 19.7 billion was disbursed. In 2010, total disbursed ODA of Vietnam was US\$ 3.5 billion (GSO, 2011).

Figure 2.6: Disbursed ODA (US\$ Million)



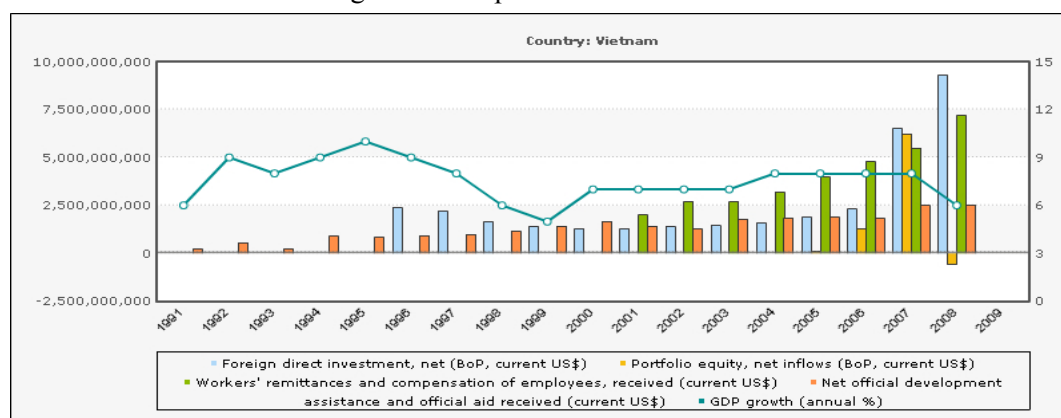
Source: GSO, 2010

ODA to Vietnam has focused on infrastructure development, poverty reduction (particularly in isolated areas), human resources development and institutional improvement. Besides, ODA has supported the enhancement and formulation of various important laws such as the Enterprise Law, the Land Law, the Investment Law, the Competition Law and the Anti-Corruption Law. ODA-financed projects also helped strengthen the managerial capacity of officials and the personnel of ministries, branches and local agencies, and improve their professionalism and English language substantially. However, the mobilization and utilization of ODA has been exposed to a typical weaknesses and limitations such as limited awareness and understanding on the nature of ODA, slow disbursement rates, weak institutional arrangement and human capacity for ODA management, limited monitoring and evaluation with regard to ODA projects and programs.

2.4. Impacts of Capital Flows

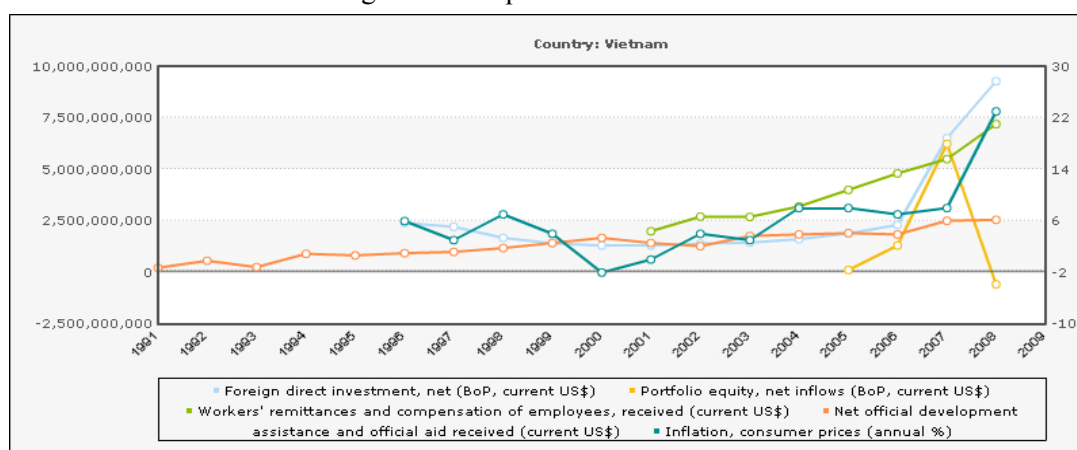
Available data provided by World Development Indicators 2009 preliminary showed that capital flow has become more associated with the movement of macroeconomic indicator such as GDP growth, inflation and current account of Vietnam, especially since 2005 (Figure 2.7, 2.8, 2.9). However, there have not been adequate efforts to examine this association phenomenon in details.

Figure 2.7: Capital Inflows and GDP



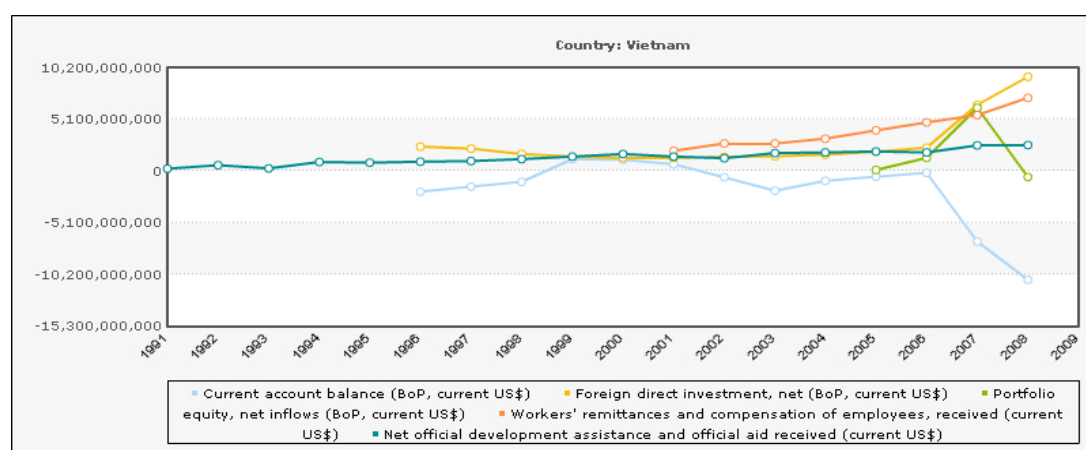
Source: World Development Indicator, 2009

Figure 2.8: Capital Inflows and Inflation



Source: World Development Indicator, 2010

Figure 2.9: Capital Inflows and Current Account



Source: World Development Indicator, 2010

In the past years, Vietnam already experienced the so-called mini-crisis which was caused by improper policies to manage capital flows as evidenced by the L/C crisis in the 1990s and high dollarization risk. This has forced the Vietnamese government to implement strong measures on capital control, among a few prioritized aims, to stabilize the foreign exchange market

Letter of Credit Crisis, 1996-1997: From 1992 to 1996, that VND savings interest rate was higher than the USD savings interest rate led the return on VND in terms of USD to become very high. Many citizens banked their money to the commercial banks. This led to a substantial increase in bank deposits, while credits were hardly expanded due to high lending rates and tight regulations on credit ceilings. Many banks had excessive reserves, even some banks refused to receive more deposits in VND. Letter of credit (L/C) was one important channel that helped banks to avoid credit ceilings which were set up by the State Bank of Vietnam (SBV) because up to that time L/C was excluded from credit ceiling, and only importers could obtain loans in foreign currencies. Besides, during this period, the exchange rate was very rigid, hedging tools were not available, and both banks and firms wanted to lend and borrow through L/C.

As a result, the increase in short-term loans dominated in US dollars borrowed by enterprises (both SOEs and private ones) pushed the stock of letters of credit to \$US 1.5 billion (accumulated) by the early 1997 (Diep, 2001). The costs of this type of external borrowing were high. The current account deficit was widened, reaching 9.2% of the GDP in 1996 (Vo 2010). Capital flows into speculative real estate market increased rapidly. Some banks had to declared default on the guaranteed short-term debts. Approximate 40% of L/C (equal 3% of the GDP) became bad debts. In this situation, the SBV had to use the foreign reserves to bail out these banks. Foreign reserves fell by 5 week of imports equivalently. Vietnam's sovereign credit rating was lowered from Ba3 to C (Vo, 2010). The imposing of lending rates in 1996 without proper consideration of domestic inflation and international interest rates in the context of rigid pegged exchange rates generated severe impacts on both microeconomic and macroeconomic management in Vietnam.

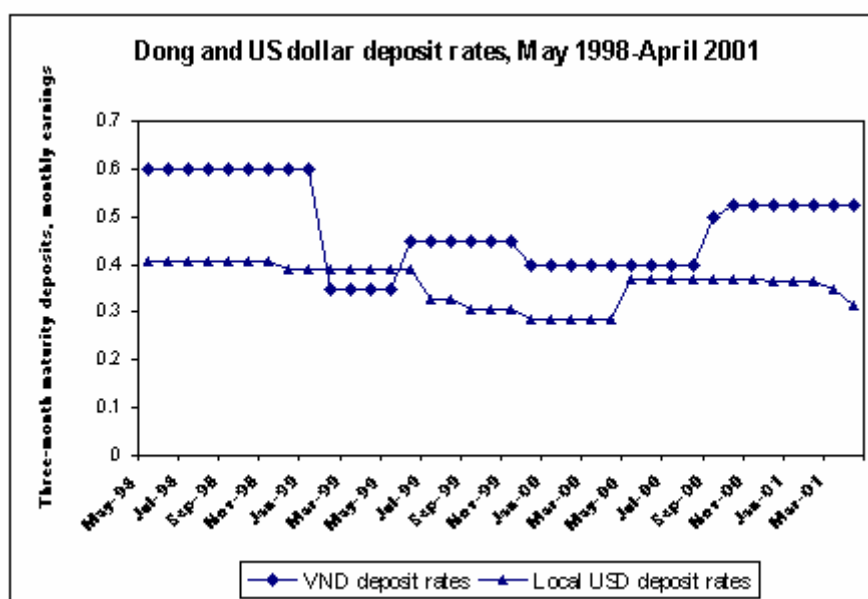
Table 2.1: Annual Saving Interest Rates of VND and USD, 1992-1997

Year	CPI-based inflation	VND nominal depreciation rate	VND savings interest rate	Real VND saving rate	Return on VND in terms of USD	USD savings interest rate	Different rates
	0	1	2	(3)=(2)-(0)	(4)=(2)-(1)	5	(6)=(4)-(5)
1992	17.5	-8.13	34.10	16.60	42.23	4.05	38.18
1993	5.2	2.62	20.40	15.20	17.78	3.20	14.58
1994	14.5	1.92	16.80	2.30	14.88	3.50	11.38
1995	12.7	-0.33	16.80	4.10	17.13	4.50	12.63
1996	4.5	0.33	9.60	5.10	9.27	4.80	4.47
1997	3.6	11.57	9.60	6.00	-1.97	5.00	-6.97

Source: Vo, 2010

Dollarization risk: Dollarization occurs when residents of a country extensively use the U.S. dollar or another foreign currency alongside or instead of the domestic currency. The amount of foreign currency deposits (FCDs) in Vietnam increased rapidly from VND 2.1 trillion in Dec 1989 to VND 91.1 trillion in Dec 2002 (Tuyet, 2003). It was a result of Vietnam's integration into the world economy. At the end of 1990s, the interest rate of VND was very low (negative sign in 2000) led the VND deposits become less attractive than USD. Thus, economic agents and particularly individual converted VND deposits to USD deposit and raised the volume of FCDs significantly. According to IMF's standard, Vietnam almost reached the threshold of highly dollarized economy.

Figure 2.10: VND and USD Deposit Rates



Source: SBV, quoted by Vo, 2010.

The degree of dollarization in Vietnam is always above 20% in comparison with 7-10% in other countries in Southeast Asia such as Thailand, Malaysia and Indonesia due to massive flow of remittance and foreign investment and increased export earnings over the past years (Le, 2008). It is expected that dollarization may rise further in the recent context of high inflation and volatility of the VND.

The phenomenon of dollarization as the consequence of capital inflows in Vietnam is suggestive for both Cambodia and Lao PDR. De Zamaroczy and Sa (2003) estimate that 96% of total money supply of Cambodia was U.S. dollar cash and deposits during period 1995-2000, the remaining 4% being riel cash and deposits. The survey implemented by National Economic Research Institute of Cambodia in 2001 shows that the currencies used for daily transactions (including cross border trades) in Cambodia consisted of Thai baht (26%), U.S. dollar (26%), Lao kip (21%), Vietnamese dong (16%) and Chinese Yuan (5%). The survey implemented by SBV and Japanese International Cooperation Agency (JICA) also found that unofficial foreign exchange markets in Vietnam were quite liquid and could handle a large amount of purchases and sales of cash in U.S. dollar.

In this paper, we examine the impact of capital inflow on the movement of real effective exchange rate. The latter is a crucial factor that affects not only foreign trade but also growth and economic stability of Vietnam. The focus on capital flows' impact on the real effective exchange rate bear important policy implications for Lao PDR, Cambodia and Thailand in terms of exchange rate policy coordination for sustained export-oriented economic growth.

2.5. Foreign Exchange Market and Foreign Exchange Rate

Before *Doi Moi*, Vietnam had a mono-banking system in which central banking and commercial banking activities were enmeshed. A three – tier exchange rate (ER) system existed: official ER for foreign trading, non-trading ER and internal ER used in business relations among banks and other domestic business entities. Those ERs were fixed by the government based on economic and granting agreements between the government of Vietnam and foreign countries. However, there was a paralleled informal/free foreign exchange market with higher ERs than those set by the government.

In March 1989, the multi-tier ER system was unified into a single official ER (OER) set by the SBV. The OER was adjustable in principle, based on inflation rate, interest rates, balance of payment (BOP) stance and the ER in the paralleled free foreign exchange market. Based on the OER announced by the SBV, commercial banks were allowed to set ERs for their own transactions within a band of (+/-) 5% around the OER. Almost at the same time, the effort to reform the banking system began. In May 1990, the State Council passed two banking ordinances¹ to transform the old mono-

¹ Ordinance on State Bank of Vietnam, and Ordinance on Banks, Credit Cooperative and Financial Enterprises

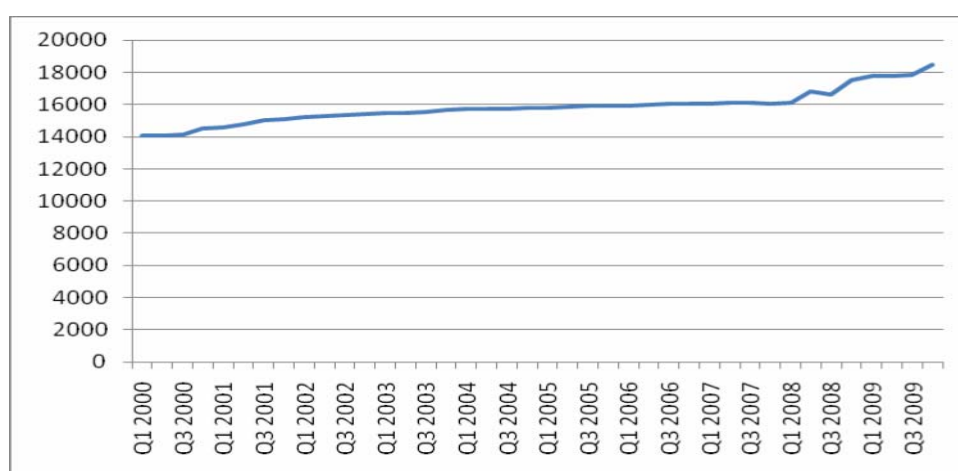
banking system to a new two-tier banking system with SBV serving as the Central Bank, and a system of commercial banks.

In 1991, OERs were set by auction – based on rates at two foreign exchange floors (in Ho Chi Minh city and Hanoi) where the SBV played a dominant role, by buying or selling large amounts of foreign exchange. However, since September 1994, the two foreign exchange floors were replaced with an inter-bank foreign exchange market in which the SBV still remained influential as the “last lender and last buyer” of foreign exchange. Although the SBV has made big attempts to stabilize the exchange rates, under the market pressure, since the mid-1990s, the ER band has been widened continuously.

Until the early 2000s, most popular measure to manage capital flow has been the interest rates. Since January 1991, domestic residents have been allowed to hold foreign currency deposits. In 1993, the SBV began to apply ceiling on lending interest rates. Control on the ceiling on lending interest rates in foreign currencies also implemented. In 1998, the fixed spread between deposit and lending interest rates was eliminated. However, three categories of ceilings on lending rates were still in place: short-term, long and medium-term loans and loans provided to the Credit Funds’ members. In 1999, three types of ceilings were merged into one type of ceilings on lending rate. In 2000, ceiling on interest rates was replaced by the basic monthly rate. In the same year, together with the change in the management of VND interest rates, the SBV allowed credit institutions to determine the foreign currency lending rates by the Singapore Inter-bank market rates (SIBOR). Since June 2002, the interest rate has been liberalized.

Massive inflows of capital into Vietnam over the past years have loaded mounting pressure on the ER of VND against the U.S dollar, and consequently on the exchange rate policy to stabilize the foreign exchange market. As showed in Figure 2.11, the nominal exchange rate (NEER) has been consistently increasing since the mid-2000s, experiencing a sharp rise during the 2007-2009 period.

Figure 2.11: Nominal Exchange Rate (VND)



Source: VCB, 2010.

More market-oriented instruments (e.g. sterilization, gradual adjustment of ER band) have been employed by the SBV in combination with administrative measures (Table 2.2). However, the instability of the exchange rates is rooted in chronic macro-economic weaknesses (e.g. trade deficit, fiscal deficit) which cannot be addressed within a few days.

Table 2.2: Policy Responses to Capital Inflows in the period of 2007 – 2009

Policy measures	Policy Responses
Sterilization:	- In 2007, foreign exchange reserves were quickly built up (from USD 11.5 billion in 2006 to USD 23 billion by the end of 2007). SBV attempted to sterilize the excess liquidity through the OMO and the increased reserve requirements in the second half of 2007. Sterilization was costly and ineffective. - Since June 2007, the SBV has raised the reserve requirement ratio. For VND deposits under 12 months, the compulsory reserve rate increased from 5% to 10%; for VND deposits between 12 and under 24 months, from 2% to 4%. Correspondingly, rates for foreign currency deposits are from 8% to 10% and from 2% to 4%. - Since 1 February 2008, the ratio of compulsory reserve requirements have been raised to 11% (from 10%) for VND and foreign currency deposits under 12 months. All official interest rates have been increased (from 8.25% to 8.75% for the basic rate) - On 17 March 2008, the SBV issued 365-day-bills worth VND 20,300 billion with a coupon of 7.8% and requested a compulsory purchase by 41 commercial banks. - July 2008, the reserve requirement level was lowered by 1 percentage point for VND and 2 percentage points for foreign currencies.
Greater ER flexibility	- Jan. 2007, the trading band of the VND/USD was widened from $\pm 0.25\%$ to only $\pm 0.5\%$ - Dec 2007, the trading band was widened to $\pm 0.75\%$ - 2008: the exchange rate management was relaxed by widening the trading band for USD/VND from $\pm 0.75\%$ to $\pm 1\%$ on March 10 and further to $\pm 2\%$ on June 27. The exchange rate trading band of USD/VND has been widened from $\pm 2\%$ to $\pm 3\%$ since November 7.
Fiscal tightening:	- By 2008, Viet Nam has had no serious intention of using fiscal policy as a policy complement to monetary and ER policies in response to capital inflows. Fiscal policy has followed the “golden rule,” meaning the budget should have savings, But budget deficit continued to be about 5% of GDP in 2007 and 2008 and the budget deficit cannot be financed by seigniorage. - On April 17, 2008, the Government released <i>Resolution No.10/2008/NQ-CP</i> detailing measures to restrain inflation, stabilize macro economy and ensure social security and sustainable growth. The government carried out a tight fiscal policy with different measures such as (i) cutting down public expenditure to further reduce budget deficit; (ii) reducing public investment, especially investments of state-owned groups and enterprises; and (iii) giving priority to investment in economic sectors. Inefficient public investment projects have been cancelled while new projects were postponed.

	- On December 11, 2008, the Vietnamese government released <i>Resolution 30/2008/NQ-CP</i> on urgent measures to deal with the economic recession, maintain economic growth and ensure social security. On fiscal policy, the government announced several measures to support SMEs in Vietnam. For example, SMEs may benefit from (i) 30% Corporate Income Tax (CIT) payable deduction; (ii) an extension of up to 9 months for the deadline of submission of the tax payables of 2009; and (iii) a temporary refund of 90% input Value Added Tax (VAT) for exported goods without justifiable payment documents. - In December 2008, the government has announced a fiscal stimulus package to compensate for the effects of the global economic recession.
Administrative measure:	- February, 2008, the SBV issued directive requested that all commercial banks not raise annual deposit interest rates more than 12% and promise to meet the liquidity of the banking system. The administrative measures, though temporary and necessary, can be seen as a step backward in the process of improving monetary instruments.

3. Review of Literature

3.1. Capital Inflows: Effects and Management Measures

An increasing foreign capital inflow has helped the host countries to achieve high economic growth but at the same time it has created problems such as inflation pressures, pushing up real exchange rate (with adverse effects on exports), loss of control over monetary policy, high dollarization (Greenville and Stephen, 2008; Kwan, 1998), lower domestic saving, and fall in the domestic interest rate or the cost of capital (World Bank, 1996). The impact depends on the volume of flows, the macroeconomic policy framework, the microstructure of the flows and incentives in the financial sector (World Bank, 1996).

Some empirical studies proved that dollarization brought economic stability and higher economic growth to Ecuador. However, there is much less agreement on the effects of dollarization on real economic variables, such as growth, employment and volatility. Countries with a hard peg mechanism -- including dollarized countries -- will have difficulties accommodating external shocks (Meade, 1951). This, in turn, will be translated into greater volatility, and may even lead to lower economic growth (Parrado and Velasco, 2002, Broda, 2001).

Besides macro problems, capital inflows can create financial stability risk (Kawai and Takagi, 2008). Capital inflows could affect the financial system by pushing up equity and other asset prices (the asset price inflation), reducing the quality of assets and negatively affect the balance sheets of the banks or finance companies (the capital inflow often comes through financial sector). Recent experience suggests that the impact of capital inflows on asset prices has been particularly significant (Greenville, 2008; Schadler, 2008).

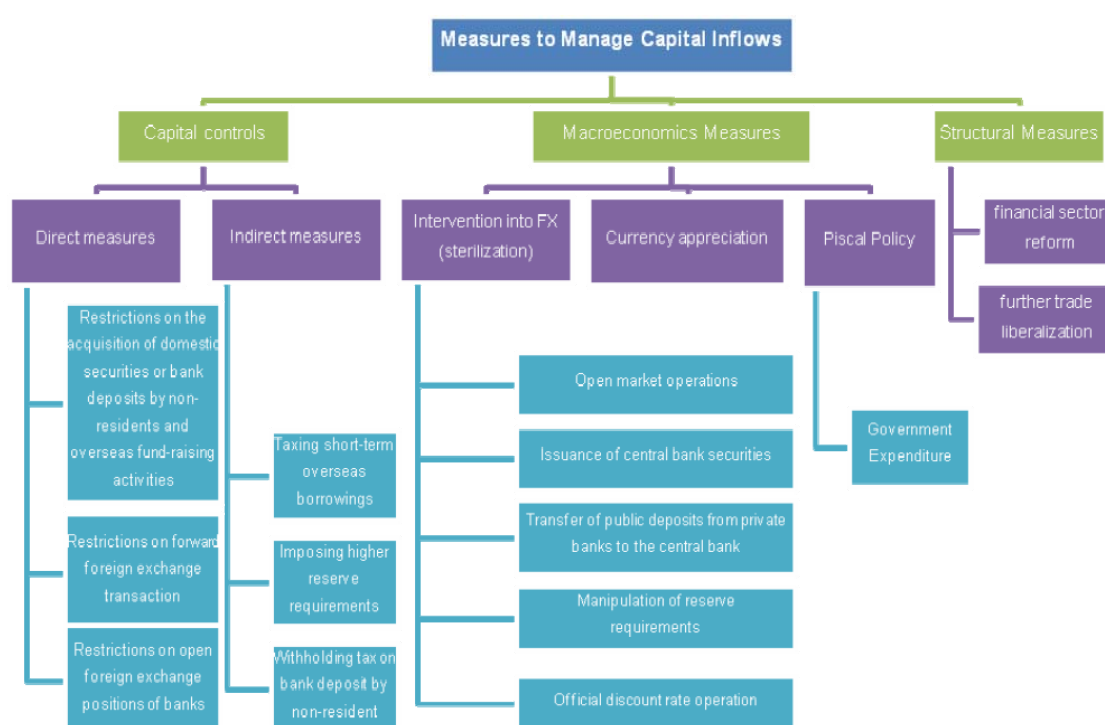
Foreign interest rates have been the “push” factor driving capital inflows and determining their magnitude but country creditworthiness has influenced the timing and geographic destination of the new capital flows (Fernandez-Arias and Montiel, 1995). However, capital inflows could reverse or stop suddenly, with a potential for the depletion of reserves or sharp currency depreciation. Schadler (2008) notes that about 15% of the capital inflow episodes over the past 20 years ended in crisis.

Measures to manage capital inflows are often examined in different ways and different dimensions. Some authors have looked at direct and indirect measures (Kwan, 1998) while others concentrated in macroeconomic and structural measures (Kawai, Fernandez-Arias and Montiel, 1995; Grenville, 2008; Schadler, 2008).

According to C.H. Kwan (1998), direct measures include restriction on the acquisition of domestic securities or bank deposit by non-residents and overseas fund-raising activities, forward foreign exchange transaction, and open foreign exchange positions of bank. Indirect measures comprise taxing short-term overseas borrowings, imposing high reserve requirements and withholding taxes on bank deposits by non-residents.

Macroeconomic measures to manage capital inflows are sterilized intervention (sterilization), greater exchange rate flexibility and fiscal tightening preferably through an expenditure cut (Kawai, 2008, Schadler et al., 1993; Fernandez-Arias and Montiel, 1995; IMF, 2007, Grenville, 2008; and Schadler, 2008). Structural measures include financial sector reform and further trade liberalization (Schadler et al., 1993; IEO, 2005).

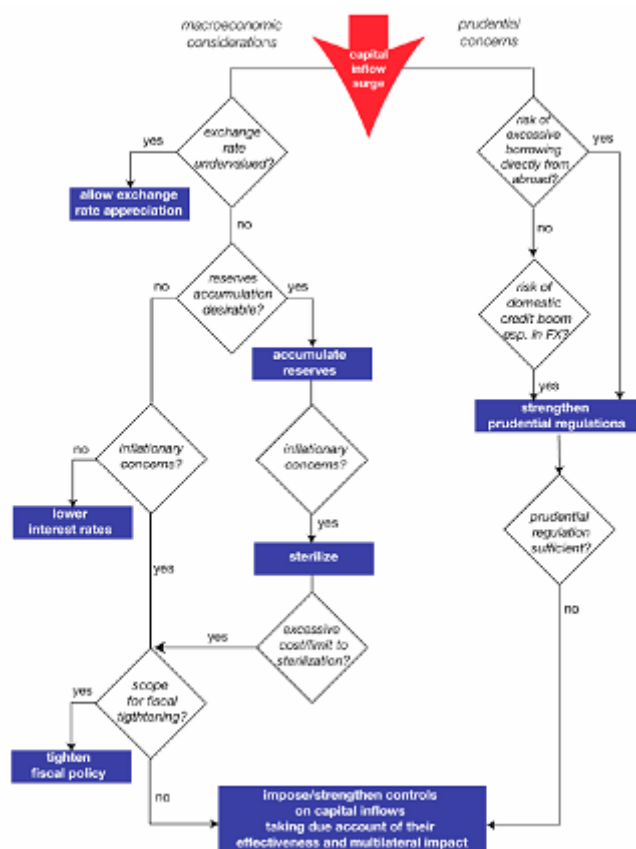
Figure 3.1: Measures to Manage Capital Inflows



Source: Nomura Research Institute. Coping with capital flow in East Asia

According to Jonathan D. Ostry (2010), although capital flows to developing and emerging market countries are generally welcomed, sudden surges can complicate macroeconomic management and create financial risks. Then, the appropriate policy response is likely to be multifaceted, according to the circumstances facing the country (Figure 3.1.2).

Figure 3.2: Coping with Surge in Capital Inflows: Macroeconomic and Prudential Consideration



Source: Jonathan D. Ostry (2010)

According to Asian Capital Markets Monitor 2010, to manage capital flows effectively an array of policy measures can be used as the following: *i)* Sound macroeconomic management: It is fundamental and provides an important backdrop for stable and beneficial capital flows; *ii)* Flexible foreign exchange regimes: This policy can help economies minimize shock consequences by a broader range of exchange rate; and *iii)* Temporary and targeted capital controls: It may be appropriate when transitory capital inflows add undue pressure on exchange rates, and pose risks to financial stability, and where macroeconomic policies are ineffective. The third option can have two types of measures:

- Direct (administrative) controls on the volume of inflows: The simplest measure would be an outright prohibition of cross-border capital movements. But, in practice, most controls would involve discretionary approval of certain types and amounts of flows. Moreover, the

imposition of administrative controls can be costly and prone to longer-term distortionary effects, particularly if the entrenched administrative apparatus makes it difficult to dismantle the controls later.

- Market-based instruments to change the composition of inflows: There are controls aimed at limiting particular types of capital flows by making such flows more costly. The most common instrument to do this is unremunerated reserve requirements (URR), which mandate that a certain percentage of inflow be deposited with the central bank. The cost of the deposit to the investor is related to the length of time the funds remain in the host country. The longer the funds remain in country, the lower the cost. Effectively, this is a type of tax that discourages short-term flows, altering the maturity composition of inflows, rather than preventing them.

3.2. Relationship between capital inflows and the real exchange rate

The link between capital inflows and the real exchange rate instability has been examined in a number of papers (Calvo, Leiderman, and Reinhart, 1993; 1996; Agénor and Hofmaister, 1996; Kwan, 1998; Edwards, 1998; Athukorala and Rajapatirana, 2003; Nwachkwu, 2007; Lartey, 2007; Sy and Tabarraei, 2009; Saborowski, 2009). These studies examined what types of capital inflows determined the instability of exchange rate and how to cushion the negative effects of capital inflows on exchange rate both theoretically and empirically. They mentioned the Dutch disease effects, which caused an appreciation of the real exchange rate in response to an increase in capital inflows.

The studies during the early 1990s were particularly interested in the Latin American financial crisis which was caused by massive capital inflows. The focal point shifted away from Latin America with the occurrence of the Asian financial crisis in 1997-1998. However, some studies in the early 2000s focused on managing capital inflows in Asia and tried to compare the effects of capital inflows on exchange rate in Asia and Latin America (Athukorala and Rajapatirana, 2003; Kawai, 2008; Grenville, 2008; Schadler, 2008). Recent paper expanded the geographical area to Sub-Saharan Africa (Nwachkwu, 2007; Lartey, 2007).

Unfortunately, in Vietnam, current studies on the relationship between capital management and the real exchange rate have been so far rare. To our knowledge, there are only a few researches that look at capital flows and capital flow management (Vo and Pham, 2008; Vo, 2010; To, 2009; Nguyen, 2005) whereas most of the existing studies deal with the individual component of capital inflow such as FDI, ODA, and portfolio investments in the security market. For example, Vo (2008, 2010) confirmed that capital inflow could have both benefits and risks for Vietnam, and policy responses to a surge in capital inflows were always constrained by the “impossible trinity.” He also blamed the capital inflows for some crises in Vietnam such as L/C crisis in 1996, and macroeconomic instability crisis in 2008. His paper, however, did not focus on the effects of capital inflows to the real exchange rate. To (2008) described the situation of capital inflows and outflows in Vietnam. Given this picture of capital flows in Vietnam, she however did not tell much about capital flow management. Similarly, exchange rate was also examined in the current researches in a very limited

extent (i.e. by tracing its movement). Some short articles have tried to analyze the link between exchange rate movement and some specific components of capital inflows (e.g. FDI, FPI) but only for a short period of time and based on qualitative assumption.

Popular quantitative methods to examine the relationship between capital management and the real exchange rate is developed based on the Salter-Swan-Corden-Dornbush model (Corden, 1994). For example, Athukorala, P. and Rajapatirana S. (2003) used it to explain the behavior of real exchange rate by capital inflows (FDI and other components) and a set of macroeconomic indicators chosen to represent policies implemented to compensate for the real exchange rate effect of capital flows, such as: i) government expenditure (represented for fiscal contraction), ii) excess growth in money supply (represented for sterilizing foreign exchange market interventions) and change in nominal exchange rate. Their model aimed to compare the effects of capital inflows on exchange rate and policy response between Asia and Latin America over the period 1985 to 2000. They found that the composition of capital inflows mattered in determining the impact on real exchange rate. The latter appreciated with rising levels of “other capital inflows” whereas FDI seemed to have a salutary effect on the real exchange rate.

Also based on Salter-Swan-Corden-Dornbush model, Lartey E.K. (2007) used a generalized method of moments (GMM) estimator to examine the link between capital inflows and the real exchange rate in Sub-Saharan Africa. The author classified the capital inflows into FDI, other private capital inflows and ODA (added one variables comparing with the model of Athukorala and Rajapatirana). To estimate the effectiveness of policy response of the recipient countries, Lartey (2007) also used such variables as government expenditure, excess money growth and openness of the economy. His results showed that an increase in FDI inflow led to a real appreciation in exchange rate whereas changes in “other capital inflows” did not affect the real exchange rate. The results also showed that an increase in ODA caused a real appreciation, the effect being greater than that associated with an increase in FDI. Hence, increase in the inflow of FDI and ODA caused Dutch disease effects in Sub-Saharan Africa.

Nwachkwu J., (2007) looked at the relationship between foreign capital inflows and the real exchange rate in Sub-Saharan Africa, using a pool of annual time series data for twenty-four primary exporting Sub-Saharan African (SSA) countries over the 1978 to 2001 period. His studies adopted the following functional baseline regression model proposed by Edwards (1988). In Nwachkwu model, real exchange rate was a variable that depended on aggregate net international capital inflows, the index of the external terms of trade, the ratio of gross domestic investment to GDP, the sum of imports and exports as a proportion of GDP, real GDP per capita, government consumption expenditure, total net domestic credit as a proportion of previous year’s GDP and the nominal or official exchange rate. His results show that external inflows had a negative impact on the real exchange rate with a further implication that the domestic production of tradable goods need not be adversely affected by the anticipated inflow of the large additional capital.

4. Model Specification

Based on Salter-Swan-Corden-Dornbush model and the above studies, we develop a distributed lag time series model to examine the relationship between capital inflows, policy responses and the real effective exchange rate during the 2000-2009 period. The dependent variable is real effective exchange rate (REERVCB). The independent variables are: (1) total capital inflows (SUMCAP), of which long-run and short-run impact on REERVCB is considered, (2) government expenditure (GEXP), (3) openness (OPEN), (4) excess money supply (EXMG), and (5) nominal effective exchange rate (NEERVCB). GEXP, OPEN, EXMG and NEERVCB are the covariates which represent the current policy responses to the impact of capital inflows on real effective exchange rate.

The original full model is expressed in functional form below:

$$\text{REERVCB}_t = \alpha_{1t} + \alpha_{2t}\text{SUMCAP}_t + \alpha_{2t-1}\text{SUMCAP}_{t-1} + \dots + \alpha_{2t-k}\text{SUMCAP}_{t-k} + \alpha_3\text{EXMG}_t + \alpha_4\text{GEXP}_t + \alpha_5\text{NEERVCB}_t + \alpha_6\text{OPEN}_t + \mu_t$$

in which, (with the signs expected for the regression coefficients in parentheses)

SUMCAP(-): total capital inflows (% GDP)

SUMCAP = FDI + OCFW, with:

FDI : Implemented FDI (% GDP)

OCFW : Capital Inflows excluding FDI (% GDP) =

[ODA + current transfer + Portfolio Investment + Other Investment] (% GDP)

EXMG (-): Excess Money Supply (%) = M2 growth (%) – GDP growth (%)

GEXP (-): Government Expenditure (%GDP)

NEERVCB (+): Nominal exchange rate (VND/USD)

OPEN (+): Openness = Exports of goods and services + Import of goods and services /GDP

REERVCB: (real effective exchange rate) = $\sum E_i w_i * P_i / P$ (VND/USD)² of which:

- i: Vietnam trade partners
- E: exchange rate (VND/trade partner currency) = E(VND/USD) x E(USD/Vietnam trade partner currency)
- w: trade weight between Vietnam and partner (%) = (export + import)_{Vietnam-partner} / total (export + import) of Vietnam
- P: the price index.

² We would like to use this formula for the calculation of real effective exchange rate instead of the one based on traded-goods prices and non-traded goods prices in the absence of readily available indices for the former and the latter. Athukorala (2003) constructed the following formula for the proxy of real exchange rate (RER): $RER = NER * (P_w / P_D)$, where P_w is an index of foreign prices, P_D is an index of domestic prices, and NER is nominal exchange rate.

An increase (decrease) in *REERVCB* indicates real depreciation (appreciation).

The model aims to test the following hypotheses:

- *Increased capital inflow leads to real appreciation of VND against the USD*
- *Increased excess money supply leads to real appreciation of VND against the USD*
- *Increased government expenditure leads to real appreciation of VND against the USD*
- *Increased nominal exchange rate leads to real depreciation of VND against the USD*
- *Increased openness leads to real depreciation of VND against the USD*

The rationale for the above expectations can be explained below:

First, the law of supply and demand in the foreign exchange market indicates that an increase in foreign currency flows produces an increase in foreign currency supply. The domestic currency will appreciate against the foreign currency (or the exchange rate between domestic and foreign currency decreases). Hence, if capital flows into Vietnam then the value of Vietnam dong will increase.

Second, according to the Dutch Disease Model (Corden, 1982), appreciation of the real exchange rate following capital inflows can be avoided by reducing demand through the fiscal contraction. In addition to this general demand contraction effect, reduction in government expenditure can have a favorable switching effect because government expenditure tends to be spent more on non-tradable goods (Athukorala, 2003).

Third, foreign capital flows will increase the supply of foreign currency and the domestic currency appreciates against the foreign currency. To reduce this impact, the central bank needs to buy excessive flows (it makes its foreign exchange reserves increase). This will increase domestic money base (of which foreign reserves are a part). There will be a stimulation of domestic inflation, followed by appreciation of the real exchange rate. The central bank offsets this effect by using the open market operations (for example: sale of bonds) or other monetary action to reduce domestic credit expansion. To test the effectiveness of such sterilized intervention in averting real exchange rate appreciation, we could use the variable of excess money growth, measured as the difference between the growth in M2 and real GDP growth.

Fourth, other things remaining unchanged, greater openness to trade tends to avert undue pressure for the appreciation of the real exchange rate; and if the nominal exchange rate increases, *centeris paribus*, then the real exchange rate will increase too.

All variables are quarterly collected from Q1 of 2000 to Q4 of 2009. We choose the year of 2000 as the beginning year of the time series to maintain the consistency and continuity of data collected. Because data on ODA is only available by annum, we use the cubic spline function to interpolate the corresponding quarters from 2000 to 2009. Data for foreign portfolio investment is not

available until Q1 2005 but until that time the amount of FPI is negligible. Data sources used for calculation are provided in the table below.

Table 4.1: Data Sources

Variable Name	Data Sources
REERVCB	Vietcombank and calculation by researchers
FDI	IFS
OCFW	IFS
EXMG	IFS
GEXP	Vietnam GSO
NEERVCB	Vietcombank
OPEN	IFS and Vietnam GSO

5. Results and Discussions

In close examination of the above-mentioned variables to fit into a robust time series regression, several variables (REERVCB, SUMCAP, FDI, and NEERVCB) are non-stationary, thus they are differenced in order to become stationary (DREERVCB, DSUMCAP, DFDI, and DNEERVCB).³

To examine the impact of capital inflows on real effective exchange rate, we develop polynomial distributed lag functions as in following steps:

$$(1): \text{DREERVCB}_t = \alpha_{1t} + \beta_t \text{DFDI}_t + \beta_{t-1} \text{DFDI}_{t-1} + \dots + \beta_{t-j} \text{DFDI}_{t-j}$$

$$(2): \text{DREERVCB}_t = \alpha_{1t} + \beta_t \text{OCFW}_t + \beta_{t-1} \text{OCFW}_{t-1} + \dots + \beta_{t-j} \text{OCFW}_{t-j}$$

$$(3): \text{DREERVCB}_t = \alpha_{1t} + \beta_t \text{DSUMCAP}_t + \beta_{t-1} \text{DSUMCAP}_{t-1} + \dots + \beta_{t-j} \text{DSUMCAP}_{t-j}$$

The distribution of the lagged effects is modeled by Almon lag polynomials, with the polynomial degree of one for all functions.⁴ The results of the regressed functions are showed in Table 5.1. The results indicate that although different types of capital inflow have impacts on real effective exchange rate, their impact occurs rather late. As showed in Table 5.1, the impact of FDI occurs only after three quarters (i.e. the impact of variable DFDI on DREERVCB becomes statistically significant only after lag 3); and the impact of non-FDI capital inflow occurs only after two quarters (the impact of variable OCFW on DREERVCB becomes statistically significant only after lag 2).⁵ Without distinguishing FDI and non-FDI, our model also show that the impact of total capital inflow (both FDI

³ see Appendix 3 for the unit root test results

⁴ see Appendix 6 (Table A6.1) for results of the estimated parameters of the lag distribution polynomial.

⁵ hereinafter we refer to significance at 5% level

and non-FDI) occurs only after five quarters (the impact of variable DSUMCAP on DREERVCB becomes statistically significant only after lag 5). When the lagged variables are statistically significant, the sign of their estimated coefficient is negative, indicating that capital inflow indeed lead to the real appreciation of VND against the USD. The Durbin-Watson probability for testing negative autocorrelation is 37%, 34%, and 20% for model 1, model 2 and model 3, suggesting that no autocorrelation correction is needed for these models.

Table 5.1: Regression results of polynomial distributed lag (I)

Model 1			Model 2			Model 3		
Variable DFDI	Lag distribution coefficient	t-Statistic (Prob)	Variable OCFW	Lag distribution coefficient	t-Statistic (Prob)	Variable DSUMCAP	Lag distribution coefficient	t-Statistic (Prob)
C	0.008	1.12 (0.27)	C	0.045	2.01 (0.052)	C	0.007	0.43 (0.67)
DFDI(0)	0.0016	0.55 (0.59)	OCFW(0)	0.0006	1.01 (0.32)	DSUMCAP(0)	0.0007	0.8 (0.43)
DFDI(1)	-0.0000	-0.04 (0.97)	OCFW(1)	0.0002	0.37 (0.71)	DSUMCAP(1)	0.0003	0.37 (0.71)
DFDI(2)	-0.0017	-0.86 (0.39)	OCFW(2)	-0.0003	-1.07 (0.29)	DSUMCAP(2)	-0.0001	-0.17 (0.86)
DFDI(3)	-0.003	-1.79 (0.08)	OCFW(3)	-0.0008	-2.68 (0.01)	DSUMCAP(3)	-0.0005	-0.77 (0.45)
DFDI(4)	-0.005	-2.5 (0.02)	OCFW(4)	-0.001	-2.88 (0.007)	DSUMCAP(4)	-0.001	-1.33 (0.19)
DFDI(5)	-0.0067	-2.84 (0.001)	OCFW(5)	-0.002	-2.74 (0.01)	DSUMCAP(5)	-0.001	-1.77 (0.09)
DFDI(6)	-0.008	-2.94 (0.001)				DSUMCAP(6)	-0.002	-2.07 (0.05)
DFDI(7)	-0.01	-2.94 (0.001)				DSUMCAP(7)	-0.002	-2.27 (0.03)
SSE	0.036		0.04			0.04		
DFE	29		32			29		
MSE	0.001		0.001			0.001		
SBC	-115.58		-125.82			-113.74		
AIC	-119.97		-130.49			-118.14		
Regress R square	0.23		0.21			0.18		
Total R square	0.23		0.21			0.18		
Durbin-Watson stat	2.18		2.24			2.36		
Prb> DW	0.37		0.34			0.2		

Next, to examine the effectiveness of the policy response to capital inflows we incorporate into model 3 above other policy variables (GEXP, OPEN, EXMG and NEERVCB) as following (model 1):

$$(1): \text{DREERVCB}_t = \alpha_{1t} + \beta_t \text{DSUMCAP}_t + \beta_{t-1} \text{DSUMCAP}_{t-1} + \dots + \beta_{t-j} \text{DSUMCAP}_{t-j} \\ + \alpha_3 \text{EXMG}_t + \alpha_4 \text{GEXP}_t + \alpha_6 \text{OPEN}_t + \mu_t$$

As showed in Table 5.2, the coefficients of variable DSUMCAP become statistically significant since its lag 5 with the negative sign. The sign of EXMG, GEXP and OPEN appear as expected (i.e. negative of EXMG and GEXP, and positive for OPEN). However, while the coefficient of variable EXMG is statistically significant, the ones of GEXP and OPEN are not.

Table 5.2: Regression results of polynomial distributed lag (II)

Variable	Model 1		Model 2		Model 3		Model 4	
	Lag distribution coefficient (coefficient for covariate)	t-Statistic (Prob)	Lag distribution coefficient (coefficient for covariate)	t-Statistic (Prob)	Lag distribution coefficient (coefficient for covariate)	t-Statistic (Prob)	Lag distribution coefficient (coefficient for covariate)	t-Statistic (Prob)
C	0.0015	0.03 (0.97)	0.003	0.54 (0.59)	0.008	-1.74 (0.09)	-0.02	-0.49 (0.62)
DSUMCAP(0)	0.0014	1.53 (0.14)	0.0014	1.72 (0.1)	0.0004	0.75 (0.46)	0.0006	1.12 (0.27)
DSUMCAP(1)	0.0007	0.84 (0.41)	0.0007	1 (0.32)	0.0000	0.17 (0.86)	0.0003	0.59 (0.55)
DSUMCAP(2)	0.0000	0.05 (0.96)	0.0000	0.07 (0.95)	-0.0003	-0.59 (0.56)	0.0000	-0.11 (0.91)
DSUMCAP(3)	-0.0006	-0.76 (0.46)	-0.0006	-0.99 (0.33)	-0.0006	-1.42 (0.17)	-0.0004	-0.9 (0.38)
DSUMCAP(4)	-0.0012	-1.47 (0.15)	-0.0013	-1.99 (0.06)	-0.001	-2.15 (0.04)	-0.0007	-1.61 (0.12)
DSUMCAP(5)	-0.0019	-2.04 (0.05)	-0.0019	-2.77 (0.01)	-0.013	-2.63 (0.01)	-0.001	-2.14 (0.04)
DSUMCAP(6)	-0.0026	-2.46 (0.02)	-0.0026	-3.3 (0.003)	-0.017	-2.91 (0.007)	-0.0013	-2.46 (0.02)
DSUMCAP(7)	-0.0032	-2.76 (0.01)	-0.0032	-3.63 (0.001)	-0.002	-3.04 (0.005)	-0.0017	-2.65 (0.01)
EXMG	-0.0009	-3.03 (0.005)	-0.001	-3.59 (0.001)	-0.0006	-3.05 (0.005)	-0.0005	-3.12 (0.004)
GEXP	-0.0000	-0.13 (0.89)						
OPEN	0.0000	0.08 (0.93)						
DNEERVCB					0.57	5.47 (0.000)	0.59	6.15 (0.000)
WTO							-0.02	-2.3 (0.03)

SSE	0.03	0.03	0.012	0.01
DFE	26	28	27	26
MSE	0.001	0.001	0.0004	0.0004
SBC	-115.5	-122.4	-142.8	-145.3
AIC	-124.3	-128.3	-150.16	-154.1
Regress R square	0.44	0.44	0.73	0.78
Total R square	0.44	0.44	0.73	0.78
Durbin-Watson stat	2.32	2.3	1.8	2.37
Prb> DW	0.24	0.22	0.71	0.19

Thus, the regression result of model 1 shows that we do not have enough evidence to say that (current) government expenditure and the level of openness of the economy have significant impact on real effective exchange rate or they can be effective meantime tool to respond to the impact of capital inflows on real effective exchange rate in Vietnam.

Next, we exclude GEXP and OPEN from the function (mode 2) and incorporate DNEERVCB as below (model 3). We exclude DNEERVCB from model 1 because its effects on DREERVCB may be strong, therefore overwhelming the effects of other variables (i.e. EXMG, GEXP, and OPEN).

$$(2): \text{DREERVCB}_t = \alpha_{1t} + \beta_t \text{DSUMCAP}_t + \beta_{t-1} \text{DSUMCAP}_{t-1} + \dots + \beta_{t-j} \text{DSUMCAP}_{t-j} + \alpha_3 \text{EXMG}_t + \mu_t$$

$$(3): \text{DREERVCB}_t = \alpha_{1t} + \beta_t \text{DSUMCAP}_t + \beta_{t-1} \text{DSUMCAP}_{t-1} + \dots + \beta_{t-j} \text{DSUMCAP}_{t-j} + \alpha_3 \text{EXMG}_t + \alpha_4 \text{DNEERVCB}_t + \mu_t$$

Table 5.2 shows that EXMG has significant effects on DNEERVCB in model 2. It further indicates that (in model 3), the effect of normal effective exchange rate on real effective exchange rate is quite strong. The coefficient of DNEERVCB is statistically significant, its sign is positive as expected, and its magnitude is quite large compared to the ones of other variable coefficients (DSUMCAP and EXMG). The inclusion of DNEERVCB into the function does not alter the effects of DSUMCAP and EXMG on DREERVCB. The coefficients of DSUMCAP become statistically significant after lag 4 with negative sign. The coefficient of EXMG is negative and statistically significant.

Looking at the surge of capital inflows into Vietnam since 2007 (see figure 2.1 and figure 2.2) after Vietnam's accession into the WTO, we would like to examine if joining the WTO may affect the movement of real effective exchange rate. In model 4, we incorporate the dummy variable (WTO), representing the difference between the prior and post WTO period, with the break time being the first quarter of 2007 (joining the WTO). The regression result of model 4 shows that the coefficient of variable WTO is statistically significant with negative sign, and its magnitude is relatively large. Thus, we have evidence to say that joining the WTO has an appreciation effect on real effective exchange rate of the VND (against the USD).

The Durbin-Watson probability for testing negative autocorrelation is 24%, 22%, 71% and 19% for model 1, model 2, model 3 and model 4, suggesting that no autocorrelation correction is needed for these models. The R squared of model 3 and model 4 are high, indicating a high level of goodness of fit of those models. The degree of the polynomial is one for all functions.⁶

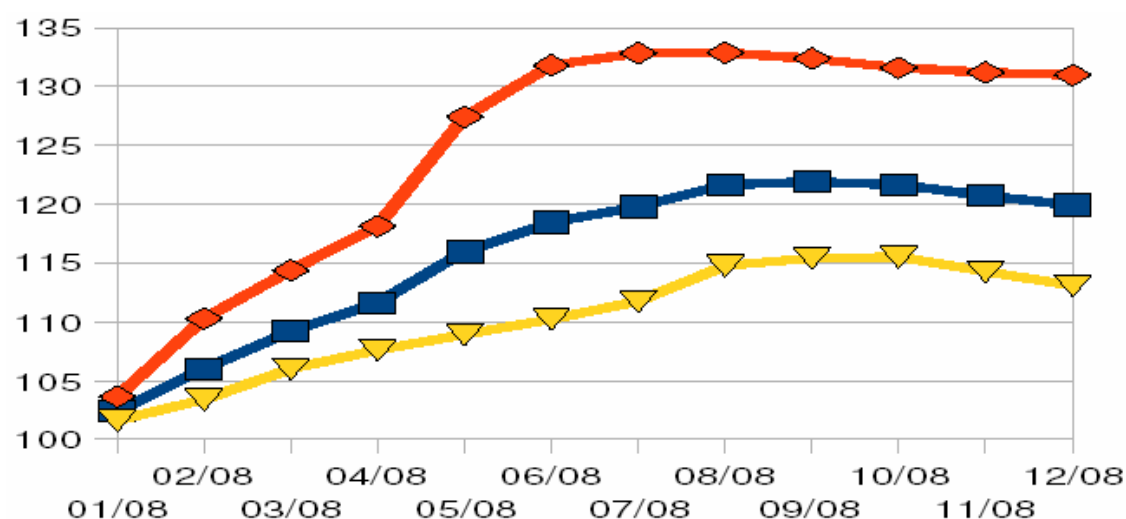
⁶ see Appendix 6 (Table A6.2) for results of the estimated parameters of the lag distribution polynomial.

Case study: Manipulating nominal exchange rate during the time of macroeconomic instability

After its WTO accession in 2007, Vietnam experienced a surge in foreign investment, together with a boom of the stock exchange (for FPI) and real estate sector (for FFDI). Rapid economic growth became overheated, peaking in Q4 of 2007 at the cost of high inflation. Contraction phase began in Q1 and Q2 of 2008. Soft landing of the economy did not happen in 2008 with the growth rate falling to 6.2% from 8.6% in 2007, and its prospect was gloomed by the global economic recession. The economy faced with surging inflation and twin deficits (fiscal and trade deficit).

Inflation which averaged 12.63% in 2007, increased dramatically in the first half of 2008, reaching above 20% for the whole year. Rising food commodity prices (20% in 2007 and 30% in 2008) contributed the increase of inflation. Besides, increasing capital inflows in this period generated asset price inflation, especially in real estate and land prices.

Figure 5.1: Monthly Inflation Rates in 2008



CPI: —■—

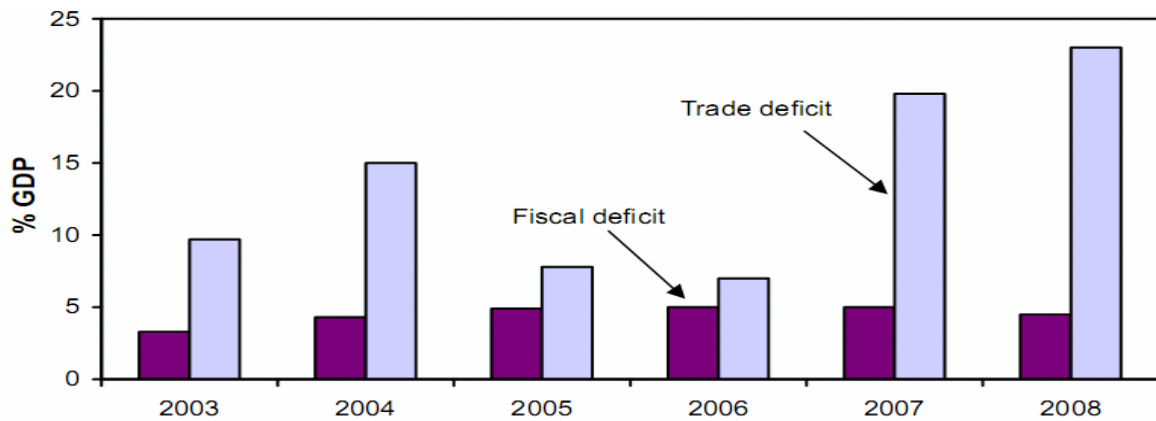
CPI taking into account salary increase: —◆—

CPI without taking into account salary increase: —▼—

Source: GSO. 2008. Quoted by Pham Van Ha, 2009.

The fiscal deficit accounted for 4.5-5% GDP while trade deficit reached US\$17.5 billion (or over 20% of GDP) in 2008, a signal of vulnerability to the economy (Le, 2009).

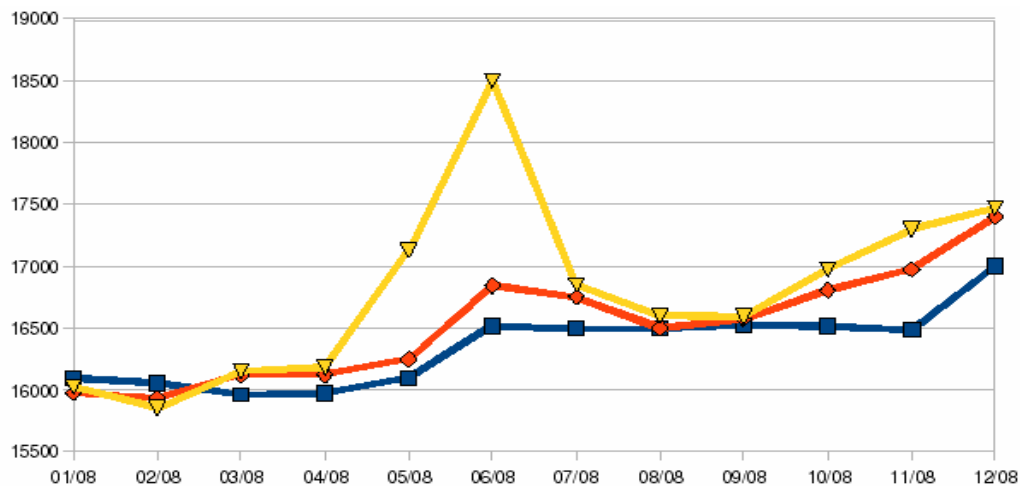
Figure 5.2: Vietnam's Twin Deficits, 2003-2008



Source: IMF, General Statistics Office of Vietnam

During the difficult time, the VND/USD exchange rate increased from 16,600 in Q3 of 2008 to 18,479 in Q4 of 2009 (GSO, 2009), making the VND lose almost 11% of its value against the US dollar. However, these official figures were still below the ones in the free market which already passed the 19,000 VND threshold.

Figure 5.3: Movement of Exchange Rate in 2008



Interbank rate (average):

VCB rate:

Free market rate:

Source: Ha, 2009. Quoted from SBV, 2009; VCB, 2009.

Interest rate policies: To combat the high inflation, the SBV was forced to raise the interest rates, and this work on par with the exchange rate policy. The interest rates were quickly adjusted in tandem with the rapid movement of the market. Following is the brief chronology of some relevant events:

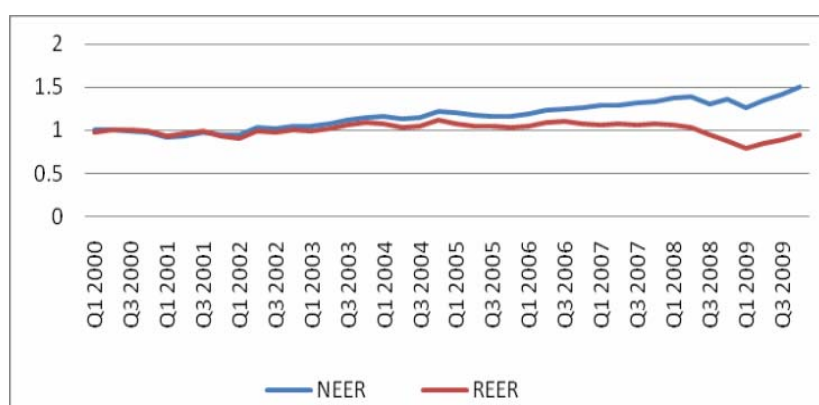
- February – June 2008: base interest rate was brought up from 8.25% to 14% to cope with the inflation, pushing the deposit rates and lending rates of commercial banks up to their peaks at 17-18% and 20-21% respectively in August-early September.
- September 2008: at the ease of inflation, SBV increased the interest rate of required reserve capital by commercial banks from 3.6% to 5% to provide the room for reducing lending rates.
- 1 February 2009: base interest rate was cut down to 7%.
- 1 March 2009: SBV reduced the required reserve ratio with respect to VND deposits (demand deposits and savings deposits) from 5% to 3%. Ratio for above-12-months deposits was 1%.
- 1 December 2009: base interest rate increased from 7% to 8% (recapitalization interest rate from 7% to 8%, and discount rate from 5% to 6%). The aim was to control the quality of credits by commercial banks and match with the exchange rate policy.

Exchange rate policy: Another policy prong is exchange rate. Although the VND has long been pegged to the US dollar, since the mid-2008, to relieve the pressure on the VND, the State Bank of Vietnam (SBV) took continuous adjustment toward a more flexible exchange rate mechanism:

- 27 June 2008: the band of exchange rate increased to 2% from 1%.
- 7 November 2008: the band increased to 3 percent from 2%.
- 24 March 2009: the band was extended to 5% from 3%.
- 26 November 2009: the interbank exchange rate band increased by 5.44% (at the same time, the US/VND exchange band was narrowed to 3% from 5%), thus increasing the ceiling of the exchange rate by 3.44% (at 18,500 VND per USD).

The fluctuation of exchange rates continued to last with a narrower band until the end of 2010. The gap between nominal exchange rate (NEER) and real effective exchange rate (REER) has been widened (Figure 5.4). That the imbalance between demand and supply of foreign currency leads to waves of speculation has showed that exchange rate is still the Achilles' heel of Vietnamese economy and a big risk to traders.

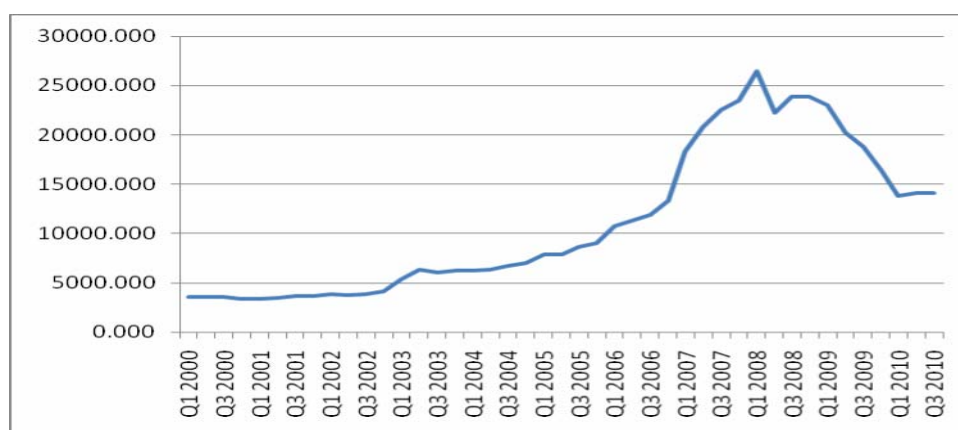
Figure 5.4: Nominal effective exchange rate and real effective exchange rate



Source: Vietcombank and calculation by authors

Tension in the foreign exchange market was only relieved after the government imposed strong sanction on illegal foreign exchange trading and devaluated 9.3% of the value of the VND against the USD in February 2011. However, prolonged mounting trade deficit plus the continuous intervention into the foreign exchange market has quickly depleted foreign reserve which had just experienced an accumulation because of increased capital inflows since 2007 (Figure 5.4). Citigroup estimated that Vietnam's foreign reserve fell down to almost US\$ 10 billion in the first months of 2001.

Figure 5.4: Foreign Reserve (US\$ billion)



Source: IFS data online, accessed April 2011.

6. Conclusion

In short, capital inflows have significant effects on real effective exchange rate of Vietnam, and this is a powerful phenomenon after the country joined the WTO. However, Vietnam has possessed only a few policy instruments to neutralize the effect of capital inflows on the real exchange rate (i.e. nominal exchange rate and money supply).

Although targeting at nominal exchange rate policy has been so far an effective tool to intervene into the foreign exchange market, it may not solve all problems in the long run under the impact of capital inflows. As it has been showed during the 2008 crisis, policy adjustment to cure the VND and stabilize the market tended to move toward freer exchange rate mechanism and unavoidable depreciation of VND. Letting VND depreciate may be good when Vietnam is facing with high trade deficit. Moreover, given the multifaceted impacts of capital inflow, exchange rate policy alone is not enough:

One, further depreciation of VND may have negative impact on other exporting economies, especially those in the regions (e.g. Laos, Cambodia, Thailand,...), thus triggering a “*race to the bottom*” of currency devaluation.

Two, the gap between nominal exchange rate and real exchange rate tells more than the effectiveness of the existing exchange rate policy. Rather, it indicates the macroeconomic weaknesses which are rooted in the twin deficits: high trade deficit and high fiscal deficit, which cannot be easily addressed. In the current context, there is a need for more appropriate export strategy, which should be targeted at generating high added values and reducing imported-input ratio. When the macroeconomic condition is stabilized, the wave of speculation on foreign currency will be dissipated.

Appendix 1: Exchange rate policy chronology 1989-2009

1989 - 1990:

- October 1989: Government issued Regulation on foreign exchange management.
- 15 March 1990: Circular 33 – NT/TT giving guidance to Regulation implementation,
- 13 September 1990: Direction 330 – CT expediting control over the use of foreign exchange
- 5 November 1990: Decision 96 – NH/QD to regulate Nostro Account

1991:

- 14 January 1991: Decision 08-NH/QD allowed domestic residents to hold foreign currency deposits
- April 1991: establishment of an official fund for streamlining foreign exchange flows to enable the SBV to stabilize the ER
- 25 October 1991: Decision 337/HDBT to tighten control over the use of foreign exchange
- August and November 1991: Establishment of foreign exchange transaction floors in Ho Chi Minh city and Hanoi. OERs were set based on auction in foreign exchange floors where the SBV played a dominant role, by buying or selling large amounts of foreign exchange.
- At the end of 1991: commercial banks were allowed to set their own ERs within a range which was 0.5% higher or lower than the announced OERs.

1992:

- 7 September 1992: Decision 192 192/NH/QD restricted foreign exchange in borrowing from abroad and lending to domestic businesses (followed by Direction 08/CT-NH, 9 October, 1992)
- 9 September 1992: Decision 175 –QD – NH restricted foreign exchange transfer through border entrance and exit controls

1994:

- 20 September, 1994: Decision 203/QD-NH to replace two foreign exchange floors with an inter-bank foreign exchange market in which the SBV still remained influential as the “last lender and last buyer” of foreign exchange
- October, 1994: Decision 396/QD-TTg to limit foreign exchange transactions by domestic sectors (OERs were set by the SBV based on interbank rates. The ER band within which commercial banks set their own ERs remained narrow at (+/-) 0.5% around the OER)
- Since February 1995: Decision No 48-QD/NH7 by the SBV to allow the overseas Vietnamese’s remittances to be kept in foreign currency bank accounts or in the form of foreign currency savings and to be withdrawn in foreign currencies or exchanged into VND.

1996:

- November, 1996: tax on overseas Vietnamese' remittances was abolished. Interest rates on Vietnam dong were gradually lowered to reduce conversion of US dollars into VND. The ER band was widened, from 0.5% to 1%.

1997:

- Feb, 1997: The ER band was widened continuously, from 1% to 5%
- Mid 1997, the SBV set strict limit on the amount of deferred L/C and tightened the controls over commercial banks' LC guaranteeing. To import restricted goods, deposit equivalent to 80 percent of each L/C was required instead of 0-30 percent previously
- 13 October, 1997: The ER band was widened from 5% to 10% ()

1998:

- 16 February 1998: Devaluation of VND under pressure of falling foreign exchange reserves and increases in BOP deficit, from VND 11,175/USD to VND 11,800/USD
- 7 August 1998: Devaluation of VND 12,998/USD (band was narrowed to 7%)

1999:

- 26 February 1999: Decision 65/1999/QD-NHNN to require ER be based on announced average interbank ERs of the previous working day, but the band has been tightened remarkably to 0.1%
- August 1999: Decision 170/1999/QD-TTg to (officially) encourage private foreign exchange transfer from abroad.
- 19 August 1999: Decision No.170/1999/QD-TTg to encourage and create favorable conditions for overseas Vietnamese to remit their money to Vietnam.
- Since 1999: the government has undertaken the demand-stimulus policy by expanding the public investment (mainly through the SOEs to offset a decrease in FDI) and easing monetary policy. The SBV loosened the monetary policy through lowering the lending ceiling rates five times, the refinancing rate four times and the discount rate three times during 1999 and the first half of 2000.

2006:

All official interest rates (basic, refinancing, and discount rates) were kept unchanged since the early 2006 until recently.

2007:

- January 2007: the trading band of the VND/USD was widened from $\pm 0.25\%$ to only $\pm 0.5\%$
- In 2007: foreign exchange reserves were quickly built up (from USD 11.5 billion in 2006 to USD 23 billion by the end of 2007). SBV only attempted to sterilize the excess liquidity through the OMO and the increased reserve requirements in the second half of 2007. Sterilization was costly and ineffective.

- Since June 2007: the SBV has raised its reserve requirements. For VND deposits under 12 months, the compulsory reserve rate increased from 5% to 10%; for VND deposits between 12 and under 24 months, from 2% to 4%. Correspondingly, rates for foreign currency deposits are from 8% to 10% and from 2% to 4%.
- Dec 2007: the trading band was widened to $\pm 0.75\%$

2008:

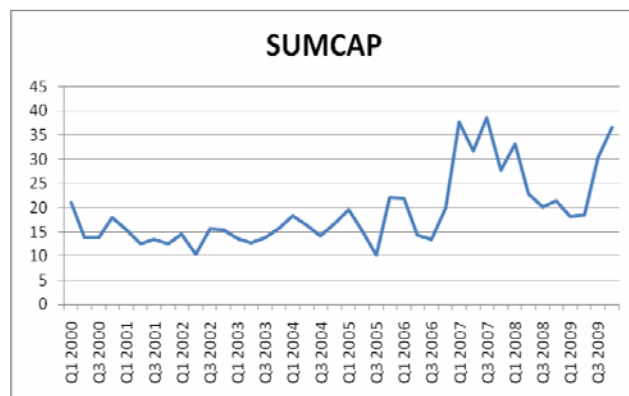
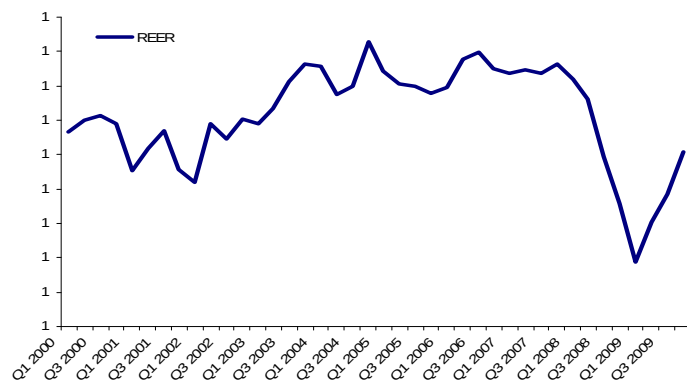
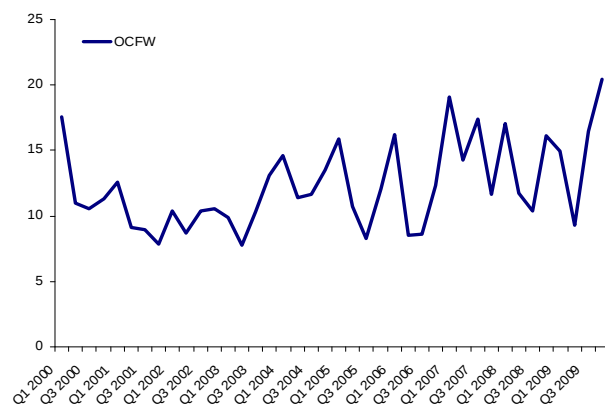
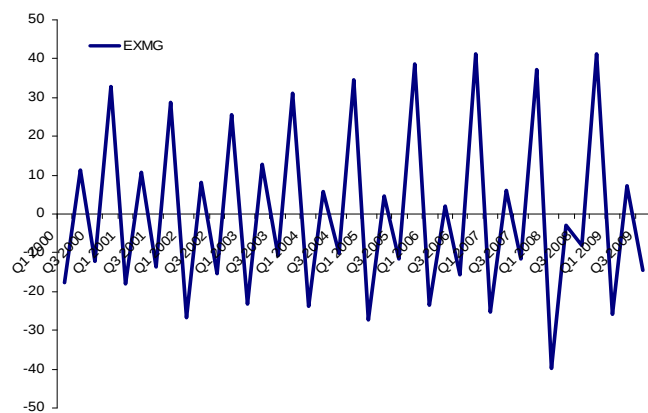
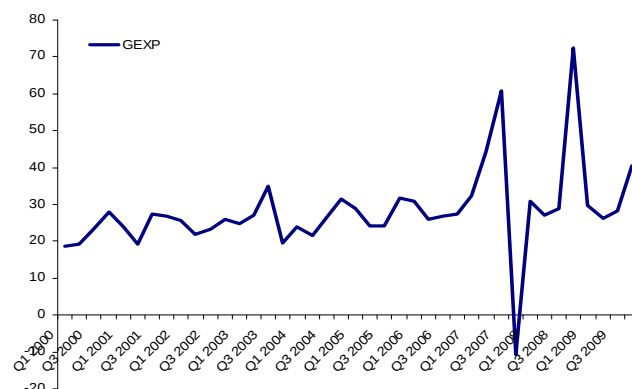
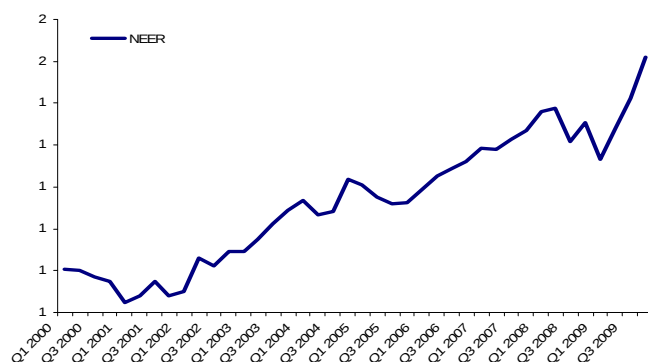
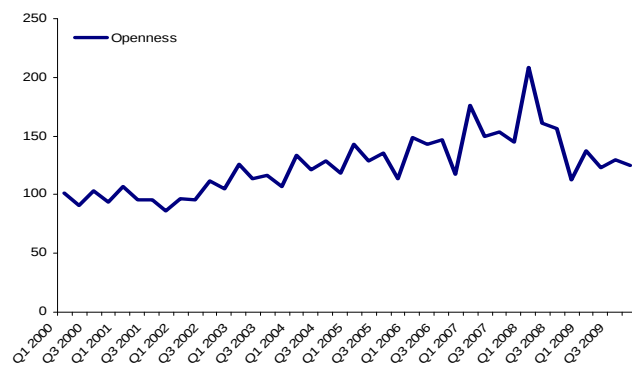
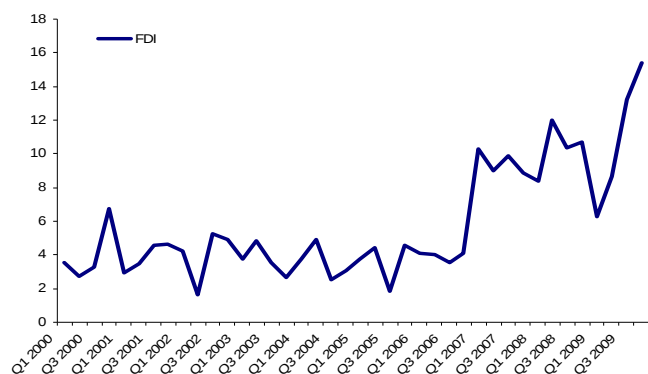
- January 2008: lending restrictions for stock investment changed from 3% of total loans outstanding to 20% of charter capital
- Since 1 February 2008: the rates of compulsory reserve requirements have been raised to 11% (from 10%) for VND and foreign currency deposits under 12 months. All official interest rates were increased (from 8.25% to 8.75% for the basic rate). All official interest rates have been increased, from 6.5% to 7.5% for the refinancing rate, from 4.5% to 6.0% for the discount rate, and from 8.25% to 8.75% for the basic rate
- In the second week of February 2008: the SBV decided to issue by 17 March 2008 365-day-bills worth VND 20,300 billion with a coupon of 7.8% and requested a compulsory purchase by 41 commercial banks.
- February – June 2008: base interest rate was brought up from 8.25% to 14% to cope with the inflation, pushing the deposit rates and lending rates of commercial banks up to their peaks at 17-18% and 20-21% respectively in August-early September.
- March 2008: the exchange rate management was relaxed by widening the trading band for USD/VND from $\pm 0.75\%$ to $\pm 1\%$
- April 17, 2008: Resolution No.10/2008/NQ-CP detailing measures to restrain inflation, stabilize macro economy and ensure social security and sustainable growth. The government carried out a tight fiscal policy with different measures such as (i) cutting down public expenditure to further reduce budget deficit; (ii) reducing public investment, especially investments of state-owned groups and enterprises; and (iii) giving priority to investment in economic sectors. Inefficient public investment projects have been cancelled while new projects were postponed.
- 27 June 2008: the band of exchange rate increased to 2% from 1%.
- July 2008: the reserve requirement level was lowered by 1 percentage point for VND and 2 percentage points for foreign currencies.
- September 2008: at the ease of inflation, SBV increased the interest rate of required reserve capital by commercial banks from 3.6% to 5% to provide the room for reducing lending rates.
- November 2008: the band increased to 3 percent from 2%.
- 11 December 2008: Resolution 30/2008/NQ-CP on urgent measures to deal with the economic recession, maintain economic growth and ensure social security. On fiscal policy, the government announced several measures to support SMEs in Vietnam. For example, SMEs may benefit from (i) 30% Corporate Income Tax (CIT) payable deduction; (ii) an extension of up to 9 months for the deadline of submission of the tax payables of 2009; and (iii) a temporary refund of 90% input Value Added Tax (VAT) for exported goods without justifiable payment documents.

- December 2008: the Vietnamese government has announced a fiscal stimulus package to compensate for the effects of the global economic recession. The total value of the stimulus package is about US\$6 billion (VND 100 trillion), accounting for 6.8% of the GDP.

2009

- 1 February 2009: base interest rate was cut down to 7%.
- 1 March 2009: SBV reduced the required reserve ratio with respect to VND deposits (demand deposits and savings deposits) from 5% to 3%. Ratio for above-12-months deposits was 1%.
- 24 March 2009: the band was extended to 5% from 3%.
- 26 November 2009: the interbank exchange rate band increased by 5.44% (at the same time, the US/VND exchange band was narrowed to 3% from 5%), thus increasing the ceiling of the exchange rate by 3.44% (at 18,500 VND per USD).
- 1 December 2009: base interest rate increased from 7% to 8% (recapitalization interest rate from 7% to 8%, and discount rate from 5% to 6%). The aim was to control the quality of credits by commercial banks and match with the exchange rate policy.

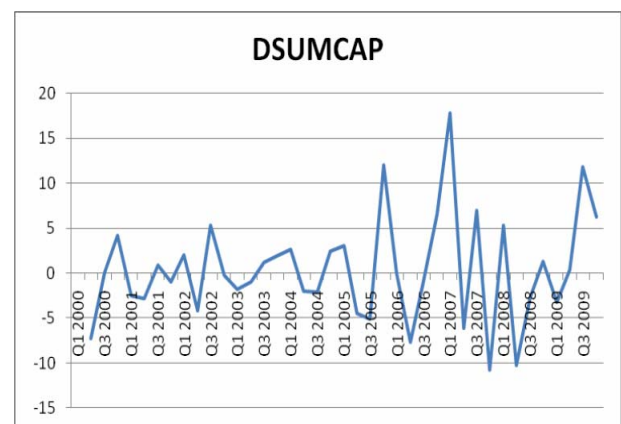
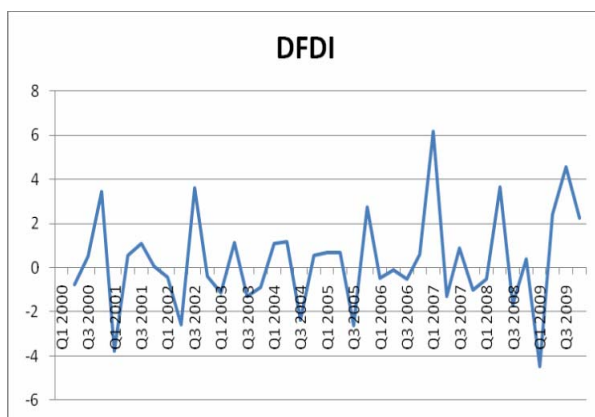
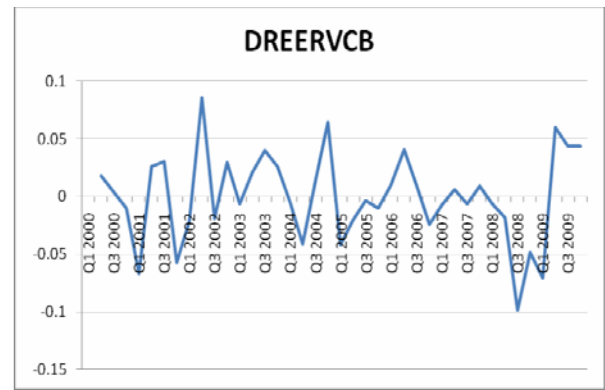
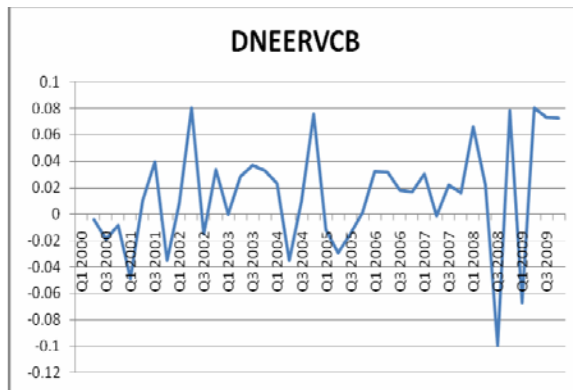
Appendix 2: Fluctuation in variables



Appendix 3: Unit Root Test (Augmented Dickey Fuller Test, $m = 3$) Results

Variables	Level without trend		Level with trend		First difference without trend		First difference with trend	
	ADF statistics	P-values	ADF statistics	P-values	ADF statistics	P-values	ADF statistics	P-values
REERVCB	-2.14	0.23	-2.1	0.53	-5.3	0.000	-5.21	0.000
NEERVCB	0.96	0.99	-2.99	0.15	-6.99	0.000	-7.33	0.000
FDI	-1.15	0.69	-2.73	0.23	-7.73	0.000	-7.82	0.000
OCFW	-3.02	0.04	-3.78	0.03				
SUMCAP	-2.03	0.27	-3.5	0.053	-7.17	0.000	-7.15	0.000
EXMG	-14.98	0.000	-14.82	0.000				
GEXP	-6.52	0.000	-7.36	0.000				
OPEN	-3.06	0.04	-4.58	0.004				

Appendix 4: Fluctuation of variables after differencing



Appendix 5: Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
DREERVCB	39	-0.0000173	0.03885	-0.0006760	-0.09857	0.08584	
DNEERVCB	39	0.01410	0.04121	0.54988	-0.09901	0.08024	
DSUMCAP	39	0.39768	5.87938	15.50961	-10.78925	17.81127	
OPEN	40	124.96625	25.60223	4999	86.56000	208.34000	OPEN
GEXP	40	28.10378	11.99175	1124	-10.60543	72.45453	GEXP
EXMG	39	0.03865	22.89801	1.50724	-39.95545	41.37764	EXMG
DFDI	39	0.30590	2.20510	11.93000	-4.47000	6.19000	DFDI
OCFW	40	13.52938	5.33593	541.17510	7.78726	28.70811	OCFW

Pearson Correlation Coefficients

	DREERVCB	DNEERVCB	DSUMCAP	OPEN	GEXP	EXMG	DFDI	OCFW
DREERVCB	1.00000	0.77818	0.03105	-0.16706	-0.13552	-0.31475	0.16985	0.01083
		<.0001	0.8512	0.3094	0.4107	0.0510	0.3013	0.9478
	39	39	39	39	39	39	39	39
DNEERVCB	0.77818	1.00000	0.27411	0.04613	0.23929	-0.15413	0.32587	0.22830
	<.0001		0.0913	0.7804	0.1423	0.3488	0.0429	0.1621
	39	39	39	39	39	39	39	39
DSUMCAP	0.03105	0.27411	1.00000	0.10182	0.36267	0.39155	0.59430	0.50608
	0.8512	0.0913		0.5374	0.0233	0.0137	<.0001	0.0010
	39	39	39	39	39	39	39	39
OPEN	-0.16706	0.04613	0.10182	1.00000	0.15669	0.30817	0.08239	0.59498
OPEN	0.3094	0.7804	0.5374		0.3343	0.0563	0.6180	<.0001
	39	39	39	40	40	39	39	40
GEXP	-0.13552	0.23929	0.36267	0.15669	1.00000	0.06861	0.12446	0.27626
GEXP	0.4107	0.1423	0.0233	0.3343		0.6781	0.4503	0.0844
	39	39	39	40	40	39	39	40
EXMG	-0.31475	-0.15413	0.39155	0.30817	0.06861	1.00000	-0.15519	0.30182
EXMG	0.0510	0.3488	0.0137	0.0563	0.6781		0.3455	0.0619
	39	39	39	39	39	39	39	39
DFDI	0.16985	0.32587	0.59430	0.08239	0.12446	-0.15519	1.00000	0.28699
DFDI	0.3013	0.0429	<.0001	0.6180	0.4503	0.3455		0.0765
	39	39	39	39	39	39	39	39
OCFW	0.01083	0.22830	0.50608	0.59498	0.27626	0.30182	0.28699	1.00000
OCFW	0.9478	0.1621	0.0010	<.0001	0.0844	0.0619	0.0765	
	39	39	39	40	40	39	39	40

Appendix 6:

Table A6.1: Estimated parameters of the lag distribution polynomial (I)

Model 1		Model 2		Model 3	
Variable DFDI	t-Statistic (Prob)	Variable OCFW	t-Statistic (Prob)	Variable DSUMCAP	t-Statistic (Prob)
DFDI ** (0)	-2.19 (0.04)	OCFW ** (0)	-2.03 (0.053)	DSUMCAP ** (0)	-1.06 (0.29)
DFDI ** (1)	-2.32 (0.03)	OCFW ** (1)	-2.07 (0.05)	DSUMCAP ** (1)	-2.43 (0.02)

Table A6.2: Estimated parameters of the lag distribution polynomial (II)

Model 1	t-Statistic (Prob)	Model 2	t-Statistic (Prob)	Model 3	t-Statistic (Prob)	Model 4	t-Statistic (Prob)
DSUMCAP ** (0)	-1.13 (0.27)	DSUMCAP ** (0)	-1.51 (0.14)	DSUMCAP ** (0)	-1.81 (0.08)	DSUMCAP ** (0)	-1.27 (0.2)
DSUMCAP ** (1)	-3.71 (0.01)	DSUMCAP ** (1)	-4.04 (0.00)	DSUMCAP ** (1)	-2.77 (0.01)	DSUMCAP ** (1)	-2.77 (0.01)

Appendix 7: Normality test

The null hypothesis of normality is not rejected at statistical significance level of 1%.

Moments

N	32	Sum Weights	32
Mean	0	Sum Observations	0
Std Deviation	0.01834642	Variance	0.00033659
Skewness	-1.1654013	Kurtosis	2.13968059
Uncorrected SS	0.01043433	Corrected SS	0.01043433
Coeff Variation	.	Std Error Mean	0.00324322

Basic Statistical Measures

Location		Variability	
Mean	0.000000	Std Deviation	0.01835
Median	0.000323	Variance	0.0003366
Mode	.	Range	0.08588
		Interquartile Range	0.01970

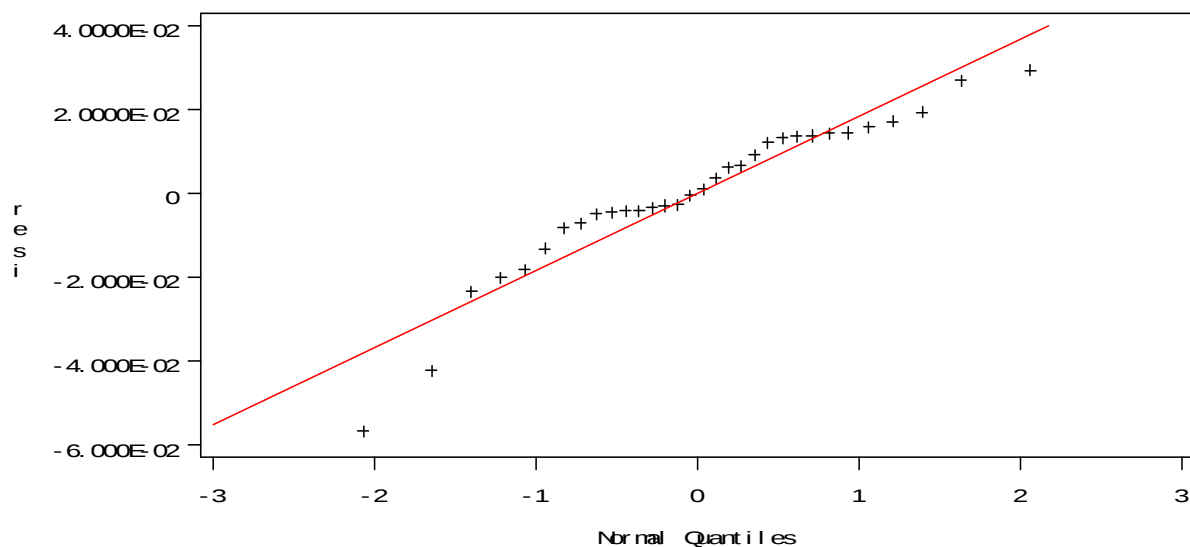
Tests for Location: Mu0=0

Test	-Statistic-		-----p Value-----	
Student's t	t	0	Pr > t	1.0000
Sign	M	0	Pr >= M	1.0000
Signed Rank	S	29	Pr >= S	0.5956

Tests for Normality

Test	--Statistic--		-----p Value-----	
Shapiro-Wilk	W	0.919555	Pr < W	0.0202
Kolmogorov-Smirnov	D	0.146755	Pr > D	0.0791
Cramer-von Mises	W-Sq	0.109983	Pr > W-Sq	0.0825
Anderson-Darling	A-Sq	0.741859	Pr > A-Sq	0.0482

qqplot:



References:

ADB, *Asia Capital Markets Monitor* MAY 2010

Athukorala, P. and Rajapatirana S. (2003). “Capital Inflows and the Real Exchange Rate: A Comparative Study of Asia and Latin America.” *The World Economy* Vol.26 (4), 613-37.

Atish Ghosh, Manuela Goretti, Bikas Joshi, Uma Ramakrishnan, Alun Thomas, and Juan Zalduendo (2008), “Capital Inflows and Balance of Payments Pressures—Tailoring Policy Responses in EMEs” *IMF Policy Discussion Paper*.

Atish R. Ghosh, Marcos Chamon, Christopher Crowe, Jun I. Kim, and Jonathan D. Ostry (2009), “Coping with the Crisis: Policy Options for Emerging Market Countries”, *IMF STAFF POSITION NOTE*

Calvo, G., Leiderman, L. and Reinhart, C. (1996). “Inflows of Capital to Developing Countries in the 1990s.” *Journal of Economic Perspectives* Vol.10 (2), 123-39

Calvo, G., Leiderman, L. and Reinhart, C.(1993b) “Capital Inflows and Real Exchange rate

Appreciation in Latin America: The role of External Factors”, *IMF Staff Papers* 40.

Calvo, G., Leiderman, L. and Reinhart, C. (1993a) “The Capital Inflows Problem: Concepts and Issues”, *IMF Paper on Policy Analysis and Assessment*, PPAA/93/10.

Christian Saborowski (2009), “Capital Inflows and the Real Exchange Rate: Can Financial Development Cure the Dutch Disease?” *IMF Working Paper*

Coden, W.M. (1982), “Exchange rate policy and resource boom”, *Economic Record* 58

Dubravko Mihaljek (2008), “The financial stability implications of increased capital flows for emerging market economies”, *BIS Papers No 44*

Eduardo Levy Yeyati, Sergio, L. Schmukler, and Neeltje, Van Horen (2008), “Crises, Capital Controls, and Financial Integration”, *ADB Institute Working Paper No. 121*

Edwards and Savastano, (1999), *Exchange Rate in Emerging Economies: What Do we know? What do we need to know*, in Anne O Kruger (ed), *Economic Policy Reforms: The Second Stage*

Edwards, S.(1998) “Capital Flows, Real Exchange Rates, and Capital Controls: Some Latin American Experiences”, *NBER Working Paper 6800*.

Eswar Prasad, Thomas Rumbaugh, and Qing Wang (2005), “Putting the Cart Before the Horse? Capital Account Liberalization and Exchange Rate Flexibility in China”, *IMF Policy Discussion Paper*

Goh Soo Khoo, Universiti Tunku Abdul Rahman, Perak Darul Ridzuan (2008), “The Composition of Capital Flows to Malaysia: Forecasting the Effects of Removing the Ringgit Peg”, *Journal of Economics, Banking and Finance – Malaysia*, Volume 2, Issue 1, 2008

Guonan Ma and Robert N McCauley, (2007), “Do China’s capital controls still bind? Implications for monetary autonomy and capital liberalization”, *BIS Working Papers*, No 233

International Monetary Fund. *International Financial Statistics*.

Jonathan D. Ostry, Atish R. Ghosh, Karl Habermeier, Marcos Chamon, Mahvash S. Qureshi, and Dennis B.S. Reinhardt (2010), “Capital Inflows: The Role of Controls”, *IMF Staff Position Note*

- José Darío Uribe¹, (2005), “Capital controls and foreign exchange market intervention in Colombia”, *BIS Papers No 23*, part 9
- Jurgen von Hagen and Jizhong Zhou, (2002), *The Determination of Capital controls in transition economies: which role do exchange rate regimes play?*
- Kenu Kohli, (2001), “Capital Flows and Their Macroeconomics Effects in India”, *IMF Working Paper*
- Kinga Z.Elo, *The effect of Capital Controls on FDI decision under country risk with intangible assets*
- Lartey. E.K., (2007) “Capital inflows and the Real Exchange Rate: An Empirical Study of Sub-saharan Africa”, *Journal of International Trade and Economic Development*, Vol.16, No2,pp.337-357.
- Leonardo Leiderman and Carmen Reinhart. *Capital Inflows to Latin America*
- Le Phuong Trang. 2008. Some features of dollarization in Vietnam
<http://www.saga.vn/Cohoigiaothuong/Thitruong1/forex/9470.saga>; accessed on December 10th, 2009
- Mahir Binici, Michael Hutchison, and Martin Schindler (2009), “Controlling Capital? Legal Restrictions and the Asset Composition of International Financial Flows”, *IMF Working Paper*
- Már Gudmundsson¹ (2008), “Financial globalization: key trends and implications for the transmission mechanism of monetary policy”, *BIS Papers No 39*
- Michael Frenkel, Christiane Nickel, Gunter Schmidt, and Georg Stadmann (2001), “The Effects of Capital Controls on Exchange Rate Volatility and Output”, *IMF Working Paper*
- Mouhamadou Sy and Hamidreza Tabarraei, (2009), *Capital Inflows and Exchange Rate in LDC: The Dutch Disease Problem Revisited*,
- Natalia T. Tamirisa (1998), “Exchange and Capital Controls as Barriers to Trade”, *IMF Working Paper*
- Nguyen Hong Son, 2005, *Managing the foreign private capital flows*, Public House: National Politics. Nomura Research Institute, *Coping with capital flow in East Asia*, Edited by C.H.Kwan, Donna Vanderbrink, Chiasiow Yue
- Nwachkwu. J., (2007), *Foreign Capital Inflows and the Real Exchange Rate in Sub-Saharan Africa*, University of Manchester, Institute for Development Policy and Management (IDPM).
- Pierre-Richard Agénor and Alexander W. Hoficmaister (1996), “Capital inflows and the real exchange rate: Analytical framework and econometric evidence”. *IMF Working Paper*
- Pham Van Ha. 2009. “Overview of Macroeconomic indices of Vietnam in 2008,” in *Vietnamese Economy 2008: Recession and Challenge for the Reforms*, Nguyen Duc Thanh e.d. CEPR. Hanoi, April, 2009.
- To Thi Anh Duong (2009) *Managing capital inflows and outflows in Vietnam and solutions to manage these in current state*. Research Project of Vietnam State Bank, code KNH 2008-09
- Vo Tri Thanh, 2010, *Managing Capital Inflows And Attracting FDI: Viet Nam Experiences And Lessons*, High level workshop on “Strengthening the response to the global financial crisis in Asia-Pacific: the role of macroeconomic policies” 22-24 June 2010, Phnom Penh, Cambodia
- Vo Tri Thanh, Pham Chi Quang, 2008, “Managing Capital Flows: The Case of Viet Nam”, *ADB Institute Discussion Paper No. 105*

World Bank, *Managing Capital Flows in East Asia*, 1996

Yasuyuki Swada and Pan A. Yotopoulos (2005), “Crises, and Capital Controls: A Theory and an Empirical Analysis on the Optimal Exchange Rate Regime in Emerging Economies”,
Stanford Institute for Economic Policy Research Discussion Paper No. 04-37

Macroeconomic Consequences of Thailand's Exchange Rate Policy

Bhanupong Nidhiprabha*

Faculty of Economics, Thammasat University

This paper examines Thailand's exchange rate policy and their implication on the effectiveness of macroeconomic policies over the past decades. It provides critical review on Thailand's exchange rate policy and draws important lessons from Thailand's mistakes on the choice of the exchange rate systems. Thailand's exports are fundamentally determined more by world income than the exchange rate. Any attempt to create undervaluation would be counterproductive and costly.

Keywords: Exchange rate policy; Thailand; effectiveness of macroeconomic policy

1. Introduction

In the first three decades of Thailand's economic development plans between 1961 and 1990, GDP grew steadily at an annual rate of 7 percent. During this period, trade volume rose from 35 to 75 percent of GDP. Rapid economic growth was achieved without sacrificing price stability. It can be argued that the fixed exchange rate system contributed significantly to trade expansion and rapid output growth in the early stage of Thailand's economic development. Initially the baht was pegged at 20.8 baht to the US dollar in 1963. It was kept at that level for ten years before it was revalued to 20 baht, when the Brentton Woods system broke down in 1973. The baht had been fixed at that level until the basket of currencies system was introduced in 1978. The currencies in the basket included the US dollar, Japanese yen, West German mark, UK pound sterling, Malaysian ringgit, Hong Kong dollar, and Singapore dollar. Then came the first devaluation in July 1981; the baht was devalued by 8.7 percent to 23 baht to the dollar. The second devaluation of 14.7 % took place in 1984. Devaluations in the 1980s were carried out as the last resort when other policies failed to correct the unsustainable current account deficit. But after the external disequilibrium was corrected by establishing a realistic exchange rate, the old habit died hard. The system of a basket of currencies of the Thai baht adopted after 1984 was supposed to give baht more flexibility. It turns out that the weight given to the dollar in the basket increased gradually up to July 1997. The currency-basket system set the exchange rate of the baht at 25.8 baht to the dollar at the end of June 1997. In practice, the baht had returned into the old regime of fixed exchange rate despite a de jury currency-basket system.

With increasing integration, the costs of maintaining a fixed exchange rate regime may outweigh its benefits. If monetary authorities envisage the virtue of maintaining exchange rate stability and competitiveness, intervention in the foreign exchange markets may reduce the effectiveness of macroeconomic policy.

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Although the fixed exchange system created stability of the exchange rate, the increasingly rising weight of the US dollar in the basket caused an appreciation of the baht when the dollar appreciated against other world currencies. Overvaluation of the baht resulted in the loss of competitiveness. The exchange rate was maintained by constant intervention in the foreign exchange markets. The fear of floating can be thought of as a reason for such intervention (Calvo and Reinhart, 2002). The fact that Thai financial institutions borrowed heavily in dollars, allowing the baht to depreciate substantially to correct the current account deficit would damage the balance sheets of banks and finance companies. The Bank of Thailand continued intervening in the spot and forward exchange markets despite the substantial loss in international reserves. Adverse consequences of the fixed rate had become more apparent after the confidence in the baht was further eroded by speculative attacks.

On July 2, 1997, the Bank of Thailand gave up defending the baht; the exchange rate plunged to 27.4 baht to the dollar. But that was just the beginning of the long slide of the baht. The value of the baht kept on declining and triggered the Asian financial crisis. Other regional currencies also suffered similar steep declines. When an exchange rate has been unrealistically fixed for so long, the cost would soon outweigh its benefits. After the float of the baht in 1997, the baht depreciated to a record low of 55 baht to the dollar in January 1998.

The baht continued to gain strength against the dollar, which depreciated to correct the unsustainable current account deficit of the US. The strength of the baht could have been more spectacular if there was no market intervention by the Bank of Thailand. As the level of international reserves kept on rising, the question arises whether the accumulated reserves can be put into good use such as financing budget deficit or repaying debts accumulated from the bailout of financial institutions. The principal reason for the intervention is the unwarranted fear that strong baht would hurt Thai exports and slow down economic growth. The central bank therefore must keep the baht at a competitive level. The Bank of Thailand still intervenes regularly to prevent the baht from rapid appreciation. As a result, the amount of international reserves increased to 138 billion dollar in 2009, from 26.9 billion dollars in 1997. During this period, the baht appreciated from 47.2 to 33.3 baht to the dollar.

Thailand was able to grow rapidly between 1960 and in the early 1990s because of strong growth in exports and investment. From 1990 to 2008, the share of exports in GDP increased from 40 % to more than 70%. After the collapse of financial institutions in 1998, investment ceased to be an important growth contributor. The share of investment in GDP declined from 40 % to 20 % in 2000. But exports still remained as the last engine of growth up to the 2008 global recession.

Thailand's imported raw materials are used to manufacture export products. If Thailand experiences export shortfalls, imports can be curtailed. Thus the global slowdown that shrinks the demand for Thai manufactured exports would not lead to current account deficit. Imports moved closely together with exports, implying that large parts of imports are raw materials used to manufacture exports products.

The contribution to growth of exports must not be exaggerated, as exports simultaneously lead to imports of raw materials. The structure of Thailand exports has considerably changed from agricultural commodities to manufactured products. Imported parts and components of electronic products are required to manufacture computer products such as hard disks and computers. It is not surprising that these industries create lower value added than agricultural and processed food exports that mainly utilize domestic raw materials. This important

realization would reduce the urge to maintain the baht unrealistically low in order to promote growth.

This paper examines Thailand's exchange rate policy and their macroeconomic impacts over the past decades. It provides critical review on the choice by the Bank of Thailand and draws important lessons from Thailand's mistakes on the choice of exchange rate systems. The paper is organized as follows. Section 2 discusses the impact of the transition from the fixed to managed flexible systems. Section 3 explores the relationship between export competitiveness and the exchange rate systems. Section 4 investigates the impact of intervention in the foreign exchange markets and capital controls. Section 5 deals with macroeconomic policy responses and examines Thailand's exchange rate policy during the global economic slowdown. Section 6 concludes.

2. Fixed vs. flexible exchange systems

In addition to containing foreign exchange risk to promote international transactions, the fixed exchange rate can provide steady growth path. Central banks therefore intervene regularly in the foreign exchange markets. There are theoretical arguments in favor of intervention in the foreign exchange market. There is a link between the variability of exchange rates and interest rates (Bilson, 1985). Since interest rate fluctuations are the causal factor to business cycle, as currency risk premiums increase, interest rates must increase to compensate for the risk. Thus the combination of real interest rate instability and real exchange rate instability must have an adverse effect on the economy. There are also internal factors such as domestic monetary shocks or political uncertainties that create currency volatility, which depends on the choice of exchange rate regime, provided that prices are stickier than the exchange rate (Hasan and Wallace, 1996).

Krugman (1989) further argued that the gains from international trade would be reduced since exchange rate instability blurs the price signals that are supposed to regulate international markets. When future exchange rates are uncertain, firms would be more cautious and delay investment, even when they face increases in demand for their exports. Here the case for the fixed exchange rate arises from the need to accumulate physical capital at the early stage of development; Thailand greatly benefited from the fixed exchange rate system between the 1960s and the early 1980s. In the early stage of economic development, a country can experience steady growth while maintain a fixed exchange rate.

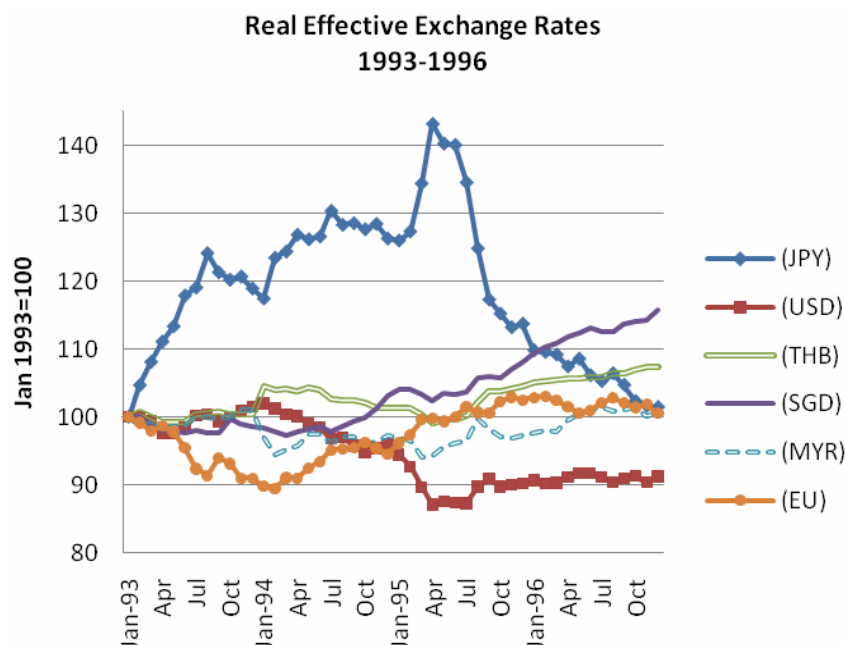
According to Friedman (1953), speculations are likely to be stabilizing as long as market participants are rational. When markets are efficient, there is no room for destabilizing speculation. However, as we have seen from the Asian financial crisis in 1997 and the US subprime loans crisis in 2008, speculative behaviors are not always stabilizing. There is no concrete evidence of efficient asset markets. In the case of Thailand, there are periods of the departure from the uncovered parity, which corresponds to high level of risk premiums. There exists a possibility that speculation might be destabilizing and the negative externality provides a reason for intervention.

Pegging an exchange rate can lead to unrealistic values when productivity and price levels change over time. The Purchasing Power Parity (PPP) may not provide a benchmark for the target exchange rate. Substantial departures from the PPP, even in a world of flexible exchange rate, can exist in the short run and even over decades (Obstfeld and Rogoff, 1995).

With considerable differential between productivity growths in tradable and non-tradable goods sectors, a country can experience rising relative prices of non-tradable goods, resulting in the appreciation of the real exchange rate. It is therefore impossible to pinpoint the exact equilibrium value of the exchange rate from deviations from the PPP. Nor can the current account deficit indicate an exact degree of overvaluation of the exchange rate. Investment-saving relationship and the level of public deficit also determine the current account position. Indeed, intervention in foreign exchange markets to obtain an appropriate value of the exchange rate must be exceedingly difficult, not to mention complications arising from the fact that changes in the exchange rate will also have an impact on domestic absorption.

A flexible exchange rate enables the baht to become more flexible in response to fluctuations in world trade volume. Broda (2004) provided evidence that short-run real output responses to real shocks are significantly smoother in floats than in pegs. Furthermore, Coudert and Couharde (2009) found that pegged currencies were significantly more overvalued than flexible currencies. Real exchange rate volatility had a negative impact on private investment (Bhandari and Rabindra, 2010). According to Kenen and Rodrik (1986), volatilities of real exchange rates reduced the volume of international trade. Exchange rate fluctuations constitute risks and uncertainties, which could disrupt international trade flows. Exchange rate volatility has a significant negative impact on the export flows to the world market (Chit, et al, 2010). Even when the nominal exchange rate remains unchanged, the real effective exchange rate can fluctuate as a result of the movements of major currencies. Relatively high inflation at home can bring about the loss in international competitiveness.

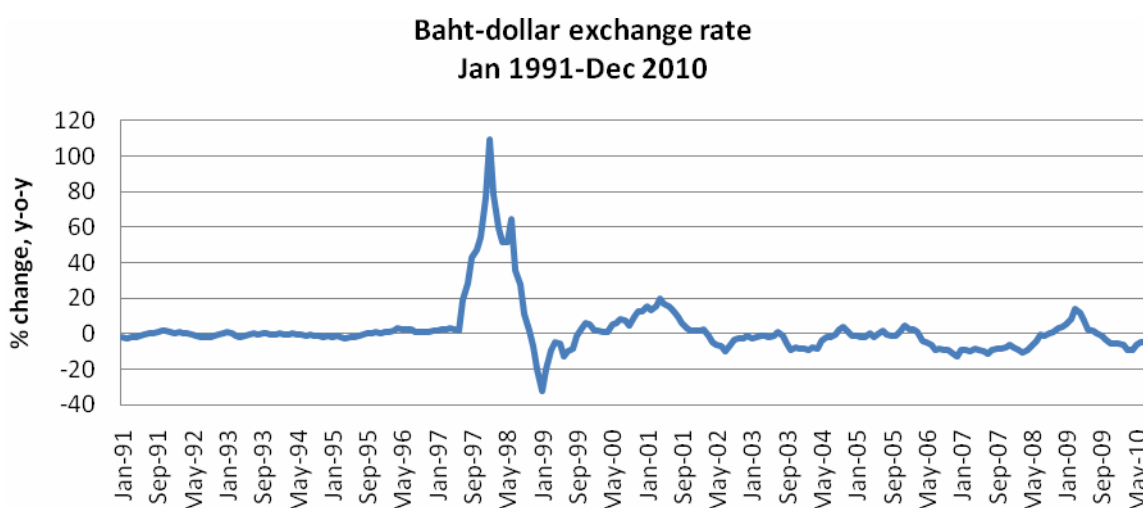
Figure 1: Real Effective Exchange Rates: 1993-1996



Source: International Financial Statistics

The real effective exchange rate of the baht had appreciated more than important trading partners since 1994 (Figure 1), after Thailand embraced capital account liberalization, which encouraged borrowing in foreign currencies. By the end of 1996, except the Singapore dollar, the real effective exchange rate of the baht appreciated more than the yen, the ringgit, and the US dollar. The fixed exchange rate of the baht to the dollar did not reveal the erosion of Thailand's competitiveness.

Figure 2: Fluctuations of the baht: January 1990-December 2010



Source: The Bank of Thailand

The continued strength of the dollar in 1995 caused overvaluation of the baht, which was corrected by a free fall of the baht against the dollar in the second half of 1997. Figure 2 illustrates the wide swings of the baht after the float in July 1997. By 1999, the baht began to depreciate once again but the degree of depreciation was greater than the appreciation. It seems that there was asymmetric intervention to maintain the bath stability.

Table 1: Fear of Appreciation

	Jan 1991- June 1997	June 1997- Dec 1999	2000-2010
Appreciation	-1.12	-11.93	-5.94
Depreciation	1.21	40.87	5.90
Overall	0.05	14.47	-0.02
Source: Bank of Thailand and Author's calculation			

As Table 1 indicates, The Bank of Thailand intervened less when the baht depreciated and more when the baht appreciated. From 1991 to June 1997, on the year-on-year average based on monthly percentage change, the baht appreciated against the dollar by 1.12 percent, while it depreciated by 1.21. As a result the baht maintained its par with the dollar during the fixed

exchange rate system. Between June 1997 and December 1999, the baht depreciated by 40.9 percent on the average, as opposed to a 11.9 percent rate of appreciation on a monthly basis. During the period 2000 and 2010, the average rate of appreciation was 5.94, while the depreciation was 5.9 per cent. Indeed, the figures in Table 1 demonstrates that the Bank of Thailand intervene regularly to maintain the baht stability, despite the trend of dollar depreciation against major currencies. Thus the behavior of the Bank of Thailand remained unchanged before and after the financial crisis in 1997.

3. Export competitiveness and exchange rate regimes

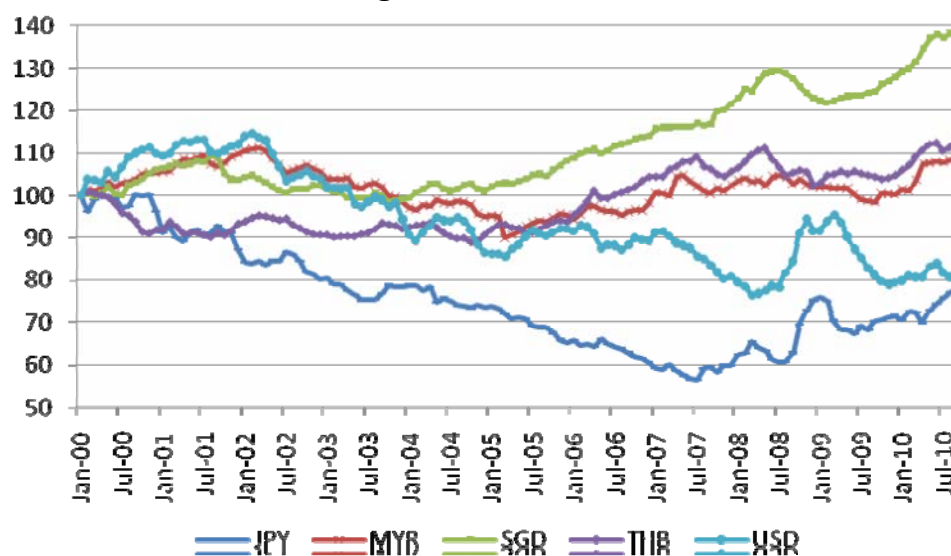
Aside from the possibility of retaliation by other competitors, devaluation does not ensure a long-lasting effect on international competitiveness, which depends on its productive labor force, saving, and technological progress. It is possible that a strong currency is associated with export competitiveness of that country. A country with high rate of saving and rapid productivity growth will experience a real exchange rate appreciation, while commanding a considerable degree of international competitiveness. It has always been suggested that Thailand needs a weak baht to help exporters to gain competitiveness. Since changes in the price of foreign currencies have a profound effect on prices of all commodities, the impact of changes in foreign exchange rates on the rest of the economy must be evaluated. Implication on income distributive issue must be examined at which it involves income transfers between exporters and importers, tradable and non-tradable sectors, creditors and debtors of foreign currencies.

Flexibility in the real wage rate in Thailand could explain why Thailand was able to maintain the fixed exchange rate for so many years¹. According to Obstfeld (1998), before the crash in 1997, Thailand had been a puzzle since it was very rare for countries to observe the fixed exchange rate discipline longer than five years. Flexibility of wages and prices would not necessitate Thailand to rely on flexible exchange rates as a means to correct macroeconomic imbalances. Furthermore, conservative fiscal policy (fiscal surplus) prior to the 1997 crisis helped mitigate monetary expansion caused by capital inflows. Monetary base growth was prevented from being explosive, threatening price stability under the fixed exchange rate system with open capital account. With many policy objectives, the fixed exchange rate system, previously worked so well as a domestic anchor, must be sacrificed.

A depreciation of the real effective exchange rate does not always imply a gain in price competitiveness. What is important is not only the direction of the movement but also its gap between the actual and equilibrium real exchange rates. A real depreciation would not improve competitiveness much if the actual real effective rate is significantly overvalued. A real appreciation may not necessarily imply a loss in competitiveness if it reflects productivity gain.

¹ The flexibility of the wage rate continued in the late 2000s. Domestic demand grew 2.3 % and 4.1 % in 2007 and 2008, respectively, while the real wage rate rose by 0.7% and 4.8%. When domestic demand contracted by 6.6 % in 2009, real wage rate declined by 1.6%. See Nidhiprabha (2003) for the discussion on wage flexibility and implication on the trade-off between inflation and unemployment.

Figure 3: Real Effective Exchange Rates: 2000-



2010

Source: International Financial Statistics

Between 2001 and 2005, the real effective exchange rate of the baht depreciated by 10 percent (Figure 3). The weakened baht helped the Thai economy recover from the recession through strong export growth. This depreciation had a lot to do with the strength of the dollar in the early 2000s. While the real effective exchange rate of the yen depreciated from 2000 to 2007, the weakening of the dollar began only after 2003². The weaknesses of both currencies gave rise to real effective appreciation of the baht that began in 2005—an episode that led to the adoption of capital controls in Thailand in December 2006. By 2007 the yen started climbing and the dollar started appreciating in the following later, leading to depreciation of Thailand's real effective exchange rate, relieving the upward pressure on the baht.

Since 2005, the real effective exchange rate of the Thai baht has moved closely with the Malaysian ringgit, while the real effective exchange rates of the yen and the dollar moved in the same direction. By 2009, the dollar and the yen depreciated by 30 and 20 percent respectively, while the Singapore dollar appreciated by 30 percent, compared to the level of the real exchange rates in 2000.

When monetary authorities allow the baht to fluctuate more freely, it will be difficult to target a specific level of real effective exchange rate—let alone its direction³. The real effective exchange rate of the baht always moves in an opposite direction of the yen and the dollar, while the impact of the dollar movement has become increasingly more dominant. The implication of this long-term relationship is that the interest rate policy that the Bank of Thailand employed to target the real effective exchange rate may not be effective since the real effective exchange rate of the baht is determined by key currencies. When the real effective rates of the dollar and the yen depreciate, the real effective rate of the baht would

² The impact of the dollar decline on the US current account deficit was not apparent until 2008, when the US economy entered the recession.

³ For evidence on temporary movements of the real dollar rates and interest rate differentials, see Nakagawa (2002).

appreciate accordingly. Liew et al (2009) also found that the influences of domestic and foreign monetary policy on exchange rates of Thailand can hardly be neglected. With more open capital account, the Bank of Thailand has to choose between targeting the exchange rate or the money supply. Capital controls permitted the Bank of Thailand to pursue monetary policy to deal with internal equilibrium adjustment. At the end of 2006, capital control was utilized to delay the baht appreciation against the dollar.

4. Market intervention and capital controls

A fixed exchange rate system together with an open capital market is incompatible with independent monetary policy. This is a lesson Thailand has learned so well after the currency crisis in 1997. The fixed exchange rate functioned well with monetary autonomy and a certain degree of capital controls. When capital controls were relaxed in 1993 to liberalize capital account, monetary autonomy was sacrificed. Trade reform can improve efficiency and resource allocations. However, as Bhagwati (1998) pointed out, there was a big difference between trade and capital flows liberalization. Capital account liberalization does not always lead to welfare improving because financial infrastructure is not ready to cope with capital inflows. Lack of financial supervision and prudential rules and regulations on financial institution led to excessive lending and property bubbles. Eichengreen (2000) suggested that the Chilean-styled capital control should be retained until banks' risk management practices and regulatory oversight have been upgraded. Capital control is found to be sufficiently supported by both economic theory and empirical evidence as a means to address some macroeconomic problems associated with short-term capital flows (Montecino and Cordero, 2010).

The exchange rate is determined by trade and capital flows, in addition to external factors and exchange rate expectations. Exchange rate movements can be thought of as an indicator of country risks. A sharp plunge in the value of baht would signify the government's mismanagement of the economy. The sharp deterioration of the external value of baht in the last quarter of 1997, to some extent, reflected the loss in policy credibility of the ruling government during the turmoil period.

Since capital controls are costly to enforce and they may reduce welfare arising from intertemporal consumption, total capital control is out of the question. Nevertheless, to the extent that excessive short-term capital flows also raise the possibility to a financial crisis, limiting these hot money flows should be done through establishing prudential regulations on foreign borrowing of the private sector.

The flexible exchange rate system also sends a signal to the private sector that borrowers of foreign capital must internalize some of the costs of failing to hedge against unanticipated movements of exchange rates. The need for strict capital controls was reduced as capital flight declined. Flexibility in foreign exchange rates guarantees that there is no serious misalignment of the exchange rate. As such the chance of experiencing capital flight would be reduced, provided that both economic fundamentals and political stability prevail. Recent evidence provided by Dubas (2009) indicated that an intermediate exchange rate regime between a pure float and a hard peg is most effective in preventing exchange rate misalignment. In addition, welfare level of a small country under a freely floating regime was in general higher than that under other regimes (Akiba et al, 2009).

The movement of the effective exchange rate is still determined by the dollar/baht rate because of the dominance of the dollar in international trade transactions. Depreciation of the baht against the yen slowed down the appreciation of the nominal effective exchange rate of the baht. As a result, the nominal effective rate did not appreciate as much as the baht dollar exchange rate. Market intervention cannot maintain the competitiveness of the baht (when using the effective rate measurement).

According to Taylor (2001), an appreciation of the exchange rate, through inertial effects of exchange-rate transmission and the existence of a policy rule, will result in a decline in interest rate today. Even though the exchange rate is not directly in the policy rule, because of the appreciation of the exchange rate today, the probability that the central bank will lower the interest rate in the future will increase as inflationary expectations would be revised downward. Monetary-policy rules that react indirectly to the exchange rate might work better than the rules that react directly to exchange rate changes. In this framework, if the Bank of Thailand does not resist the baht appreciation, there would be less need for the Bank of Thailand to initiate interest hikes to curb inflation.

The intervention cannot slow down the baht appreciation, which was caused by the weakness of the dollar itself. The Bank of Thailand cannot resist the trend of baht appreciation through intervening in the foreign exchange markets⁴. Figure 4 indicates that increased intervention, as measure by the ratio of net forward position as percentage of total reserves, did not stop baht appreciation.

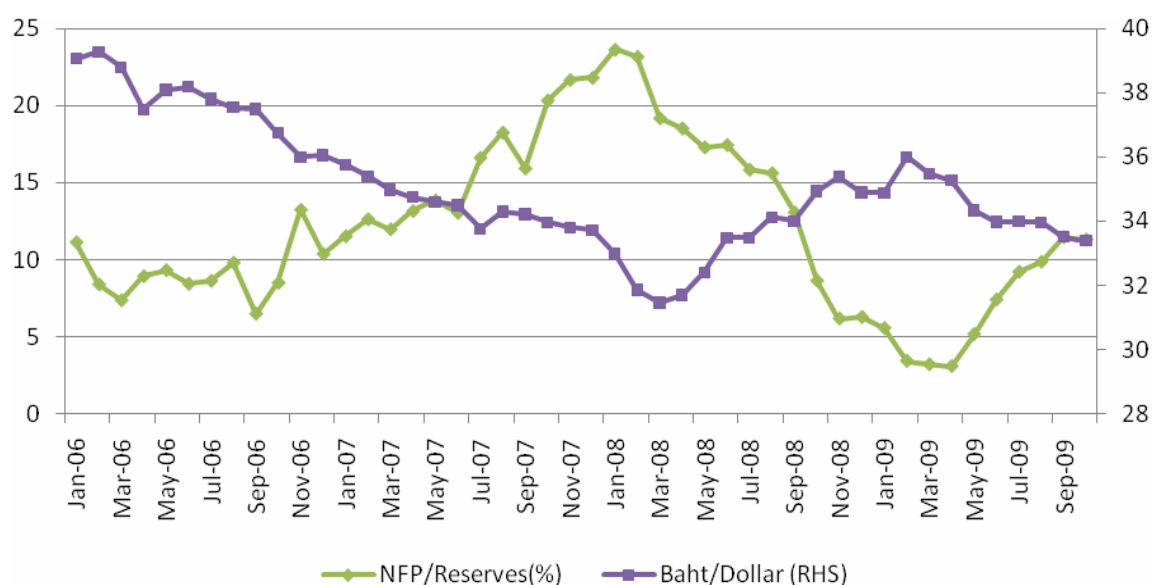
As the clear trend of baht appreciation emerged at the beginning of 2006, exporters did not want to hold dollars for long after receiving payments. Figure 4 shows that, as the weakening trend of dollar continued, the Bank of Thailand suffered enormous financial loss in buying the dollar forward in order to reduce the pressure on the baht. From January 2003, when the net forward position (NFP) was a few percentages of total reserves, the intervention was intensified as the baht appreciated in 2006 and 2007. By January 2008, the amount of net forward position of the Bank of Thailand peaked at 24 % of total reserves.

The international reserves were accumulated every month; the Bank of Thailand would have to sterilize capital flows by issuing bonds to mop up excess money supply⁵. By doing so, it built up pressure on the interest rates. As the federal funds rate was cut continuously to prevent recession in the US, the Bank of Thailand was not able to maintain high interest rates to fight inflation, because the widening uncovered interest differentials would further induce capital inflows and currency appreciation.

⁴ Cointegration analysis indicates that the ratio of net forward position to total reserves moves in line with the rate of change of the baht exchange rate.

⁵ By 2011, The Bank of Thailand is able to issue bonds without seeking the approval of the Ministry of Finance.

Figure 4: Forward market intervention by the Bank of Thailand

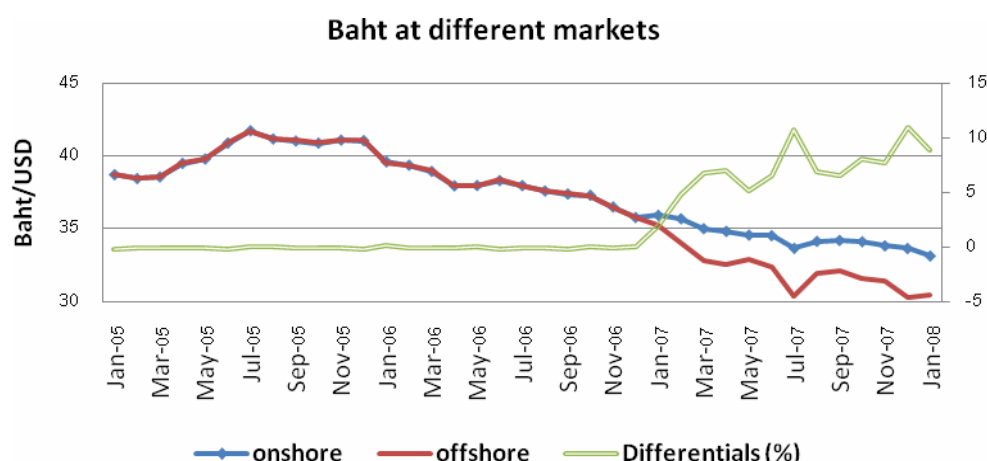


Source: Bank of Thailand

In a desperate attempt to prevent baht appreciation, a zero-interest reserve requirement of 30% on short terms flows was imposed in December 2006. In effect, there was a separation between the onshore and offshore markets of the baht (Figure 5). Since, the strength of the baht was caused by portfolio inflows; it was not surprising that the Bank of Thailand attempted to stem the flows of portfolio investment by imposing the Chilean-typed capital controls. The Bank of Chile imposed a 30 % unremunerated reserve requirement (URR) in 1991 to curb short-term capital inflows, which tended to cause domestic currency appreciation. Although the URR did not reduce capital inflows nor stop currency appreciation, it changed the composition of the inflows from short to longer maturity. Forbes (2007) found evidence that the Chilean URR increased financial constraints for small firms and misallocation of resource took place because the control discriminated against short-term projects and firms that depend heavily on bank credit.

Investors in the stock markets were against the capital controls because the control measure inhibited capital inflows to the stock market. The URR measure led to the collapse of the stock market and prompted the Bank of Thailand to exempt portfolio investment from the capital controls, just one day after the announcement of the measure. The Bank of Thailand further relaxed and exempted debt instruments and forward covered transactions from the URR.

Figure 5: Separation of foreign exchange markets



Source: Bank of Thailand

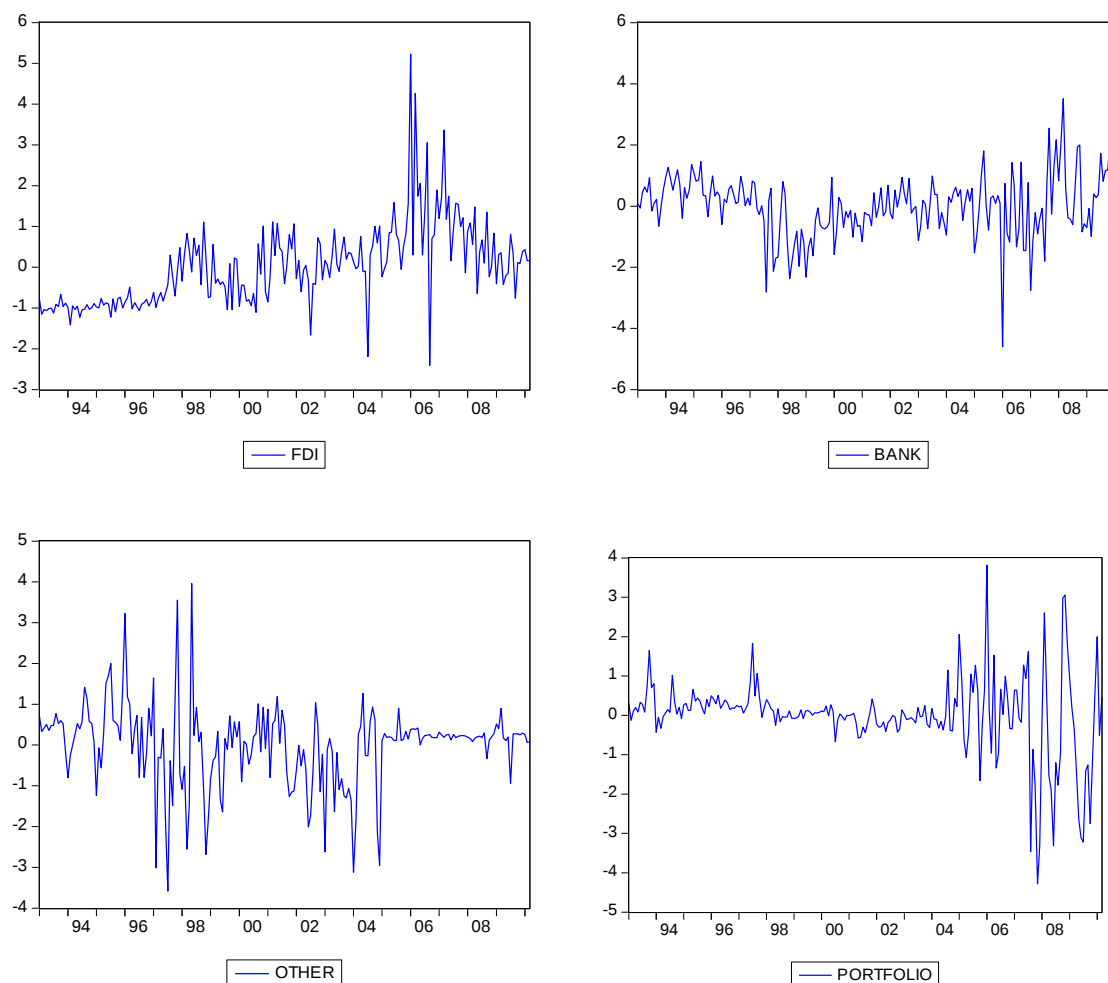
There is no evidence that the capital controls imposed in 2008-2009 had significantly slowed down the appreciation as the Bank of Thailand hoped. There are also unintended effects of the capital controls. Asiedu and Lien (2004) found the evidence that capital controls deter foreign direct investment in East Asian countries. In 2007, although foreign investment in Thailand increased, the percentage increase is much lower than neighboring countries such as Malaysia and Vietnam. However, Coelho and Gallagher (2010) suggested that, by employing Columbia and Thailand as case study, there is still a role for capital control in the 21st century, but such controls should be more sophisticated than in years past. The fact that capital controls are envisaged as anti-globalization by investors, among other policies of the military-installed government, the Chilean-style capital control measure became counterproductive and costly in terms of financial losses of the Bank of Thailand. In addition, exporters would have no incentives to improve their efficiency, since they have been relying on undervalued currencies. Moral hazard arises as exporters believe that the government would help them by keeping competitive exchange rates.

Figure 6 shows deviations of different types of capital flows from its trend. Portfolio investment, bank flows, and foreign direct investment fluctuated wildly after the imposition of capital controls in December 2006. On the contrary, other types of capital flows (OTHER) experienced a significant decline in its volatility. These flows were deposited in non-resident baht accounts, which can be later used for speculative purposes in currency and bond markets. These flows were related to the speculation that the baht would eminently devalued. The irregular flows returned to normal after the massive devaluation in 1998.

It is not surprising to see wider fluctuation of portfolio investment in the aftermath of capital controls. A striking finding is that foreign investment, which is not supposed to fluctuate widely, became more volatile. It suggests that foreign investors are affected by uncertainty and policy inconsistency of the Thai government after the restriction of capital flows. The capital control was a wrong policy applied for the wrong season. Thailand had maintained an open-door policy to foreign investors. The authorities believed that capital controls would have no impact on long-term investors as the policy was applied only to short-term flows and for a specific duration. Little did the authorities know are those animal spirits of investors do not distinguish between short-term and long-term control measures. When policy becomes

inconsistent with past expectations, risk premium was heightened resulting in massive capital flights from the stock market.

Figure 6: Volatility of capital flows (normalized values)



Source: Bank of Thailand

The Stock Exchange of Thailand recorded the single biggest one-day loss of 820 billion baht in its history—a decline by 14.8% within one day after the announcement of the measures. Finally, on March 3, 2008 the Bank of Thailand abandoned the capital controls, reasoning that the economic situation had returned to normality and there was no need for such controls. After the fear of global recession subsided in late 2009, capital inflows into the stock market resumed and the baht regained its strength⁶. It is important to understand the macroeconomic policy consequences of the attempt to maintain the weak baht.

5. Macroeconomic policy responses to global recession

Despite the global slowdown that began in 2007, Thai exports, due to agricultural commodity booms, maintained high growth until the first half of 2008. The collapse of the exports in 2009 led to a deeper cut in imports as the oil price also declined sharply in the first half of 2009. It is argued here that the demand for Thai exports depend more on foreign income than

⁶ The Stock Exchange Index of Thailand rose to 43.8 % in February 2, 2011 from December 30, 2010.

relative prices. When compared to changes in income level of importing countries, changes in exchange rates have lesser impact on Thailand's exports level. Since income elasticity of Thailand's exports is high, its economy is vulnerable to world demand shocks.

As the world interest rate has considerably declined to a very low level, there is a limit to stimulate domestic demand to offset the contracted world trade. Expansionary fiscal policy is called upon in time of recession. Bond-financing budget deficit would be ineffective if the crowding-out effect is so strong that it induces capital inflows and causes currency appreciation. On the other hand, deficit spending financed through foreign borrowings or pump-priming can stimulate the economy during recession in the absence of the crowding-out effect.

According to the Mundell-Fleming model, fiscal policy employed under the fixed exchange rate regime is less effective than when it is employed under the flexible exchange rate system. On the other hand monetary policy is more powerful under the flexible exchange rate system. This conclusion is based on the assumption that a country will experience balance of payments surplus after employing expansionary fiscal policy. Likewise, the conclusion on monetary policy ineffectiveness assumes that the country will experience balance of payments deficit after pursuing easy monetary policy. Therefore an exchange rate appreciation mitigates the expansionary effect of fiscal policy, while a depreciation of the exchange rate enhances the expansionary effect of the monetary policy.

It is argued here that fiscal policy under a certain degree of exchange rate flexibility can be effective under a certain circumstance. Imagine the case when expansionary fiscal policy leads to a deficit in the balance of payments. This is not unusual if the income elasticity of demand for imports is very high; while the responsiveness of capital flows to interest rate differentials is very low. The slow responses of capital flows to changes in interest rates can be attributed to high transaction costs, risk premiums, and capital controls. The exchange rate adjustment after fiscal expansion brings about currency depreciation instead of appreciation. The exchange rate effect would intensify the multiplier effect of fiscal policy through increased net exports. In sum, the effectiveness of fiscal expansion depends on its impact on the balance of payments and the resulted exchange rate changes that can intensify or nullify the first round effect of fiscal policy expansion.

During fiscal contraction, output reduction leads to larger reduction in imports, while falling interest rates would not be able to create capital outflows to offset the fall in imports. The resulted surplus in the balance of payments would imply currency appreciation and magnify the output contraction effect of the fiscal austerity through reducing net exports. The bottom line of this analysis is that fiscal policy may not be totally ineffective under the situation in Thailand, where the income elasticity of demand for imports is high and capital flows are not so sensitive to changes in interest rate differentials.

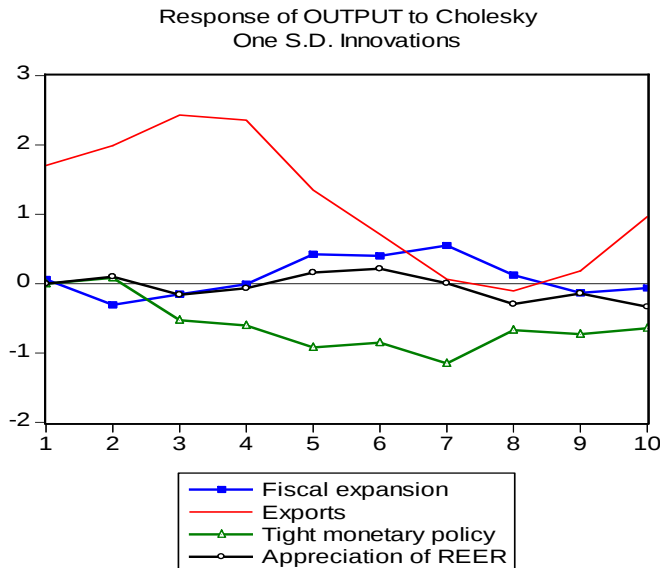
In order to examine the impact of policy changes on output, a vector autoregressive model of five macroeconomic variables is employed. It is imperative to understand the impact of various policy responses to recession. The VAR model can suggest the relative strength of monetary and fiscal policy when the policy interest rate is allowed to adjust. Monthly data from January 1993 to May 2009 are utilized in the model which includes output (manufacturing production index), exports, fiscal spending (FISCAL), the Bank of Thailand's key policy rate (BOTRATE), and the real effective exchange rate (REER). All data are obtained from the Bank of Thailand.

A VAR model is implemented to examine the effects of certain shocks to macroeconomic variables. All the equations that contribute to figure 7 and 8 are listed below. The length of the lags, suggested by the Akaike Information Criterion, is four months.

$$\begin{aligned}
 OUTPUT_t &= \sum_{i=1}^4 \mu_{1i} OUTPUT_{t-i} + \sum_{i=1}^4 \alpha_{1i} FISCAL_{t-i} + \sum_{i=1}^4 \beta_{1i} EXPORT_{t-i} + \sum_{i=1}^4 \gamma_{1i} BOTRATE_{t-i} + \sum_{i=1}^4 \delta_{1i} REER_{t-i} + \varepsilon_{1t} \\
 FISCAL_t &= \sum_{i=1}^4 \mu_{2i} OUTPUT_{t-i} + \sum_{i=1}^4 \alpha_{2i} FISCAL_{t-i} + \sum_{i=1}^4 \beta_{2i} EXPORT_{t-i} + \sum_{i=1}^4 \gamma_{2i} BOTRATE_{t-i} + \sum_{i=1}^4 \delta_{2i} REER_{t-i} + \varepsilon_{2t} \\
 EXPORT_t &= \sum_{i=1}^4 \mu_{3i} OUTPUT_{t-i} + \sum_{i=1}^4 \alpha_{3i} FISCAL_{t-i} + \sum_{i=1}^4 \beta_{3i} EXPORT_{t-i} + \sum_{i=1}^4 \gamma_{3i} BOTRATE_{t-i} + \sum_{i=1}^4 \delta_{3i} REER_{t-i} + \varepsilon_{3t} \\
 BOTRATE_t &= \sum_{i=1}^4 \mu_{4i} OUTPUT_{t-i} + \sum_{i=1}^4 \alpha_{4i} FISCAL_{t-i} + \sum_{i=1}^4 \beta_{4i} EXPORT_{t-i} + \sum_{i=1}^4 \gamma_{4i} BOTRATE_{t-i} + \sum_{i=1}^4 \delta_{4i} REER_{t-i} + \varepsilon_{4t} \\
 REER_t &= \sum_{i=1}^4 \mu_{5i} OUTPUT_{t-i} + \sum_{i=1}^4 \alpha_{5i} FISCAL_{t-i} + \sum_{i=1}^4 \beta_{5i} EXPORT_{t-i} + \sum_{i=1}^4 \gamma_{5i} BOTRATE_{t-i} + \sum_{i=1}^4 \delta_{5i} REER_{t-i} + \varepsilon_{5t}
 \end{aligned}$$

The impulse response function (Figure 7) indicates that export shocks exert the strongest impact on output. Both positive and negative shocks bring about massive changes in output level. It is not surprising that the Thai economy suffer from recession in 2009 as exports collapsed. Can exchange rate depreciation spur growth through exports? Currency shocks do not have a significant impact on output growth.

Figure 7: Impact on output from shocks and policy responses



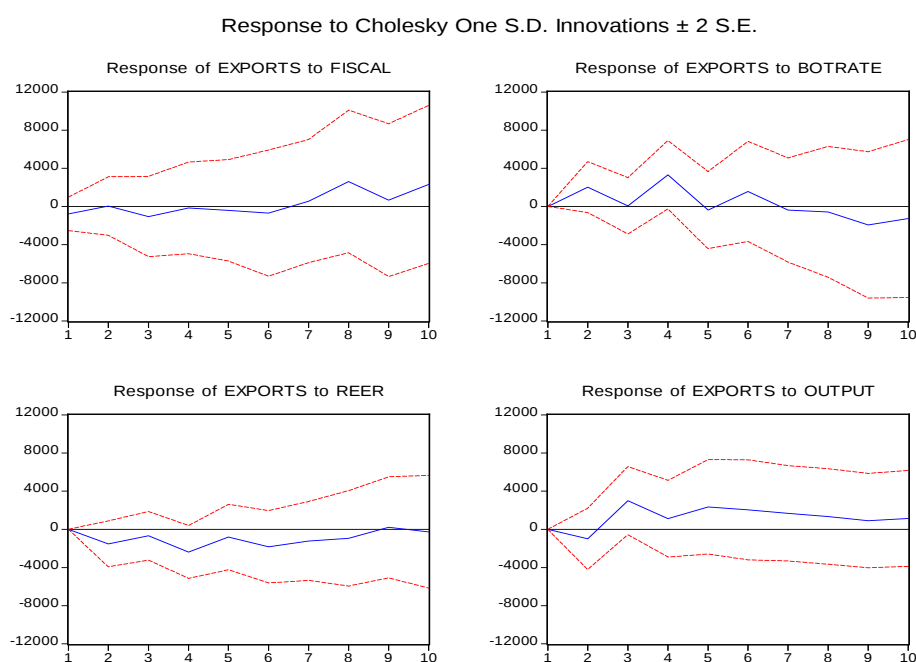
Appreciation of the real effective exchange rate may not lead to a heavy loss in competitiveness. Real exchange rate movements depend on domestic and foreign price levels. Exchange rate changes also affect the cost of imported raw materials and therefore would affect net exports and GDP relatively less than the shocks from fiscal and monetary policy instruments. An important implication of this finding is that if we allow the real effective

exchange rate to adjust to external disequilibrium, its impact on real output will be gradual and smoother than in the fixed exchange rate regime. Indeed, a more flexible exchange rate can insulate the economy from external shocks.

The analysis of the impulse response function suggests that monetary policy can be effective under the current exchange rate regime. A rise in the key interest rate can lead to contraction in output. Thus monetary policy is an effective policy instrument to stabilize the economy. The implication of this finding is that as long as the Bank of Thailand can maintain the interest rate gap between domestic and foreign interest rates, there is a room for monetary policy to maneuver. The capital mobility of the Thai economy is far from perfect. Expansionary monetary policy can be employed to counteract the collapse in exports more effectively than fiscal stimulus (Figure 8). Fiscal policy is less effective in terms of stabilization objective. The expansionary effect of fiscal stimulus will become apparent after five months lag and will die off after three quarters.

Since export shocks create the greatest impact on output, we must understand how exports are affected by fiscal and monetary policy instruments. Figure 8 reveals that fiscal stimulus has minimal impact on exports. Exports are not unfavorably affected by fiscal expansion. An appreciation of the real effective exchange rate indeed reduces the level of exports. Nevertheless, this negative impact dies off within three quarters. If fiscal expansion gives rise to pressure on the price level, real exchange rate appreciation can thwart export growth. Figure 8 also illustrates that monetary tightening does not always lead to export slowdown, simply because the real effective exchange rate is not affected much by tight monetary policy. View in this light, given other factors remain constant, monetary policy can be a powerful tool for stabilizing the economy as the baht has become more flexible than in the past.

Figure 8: Export responses to various shocks

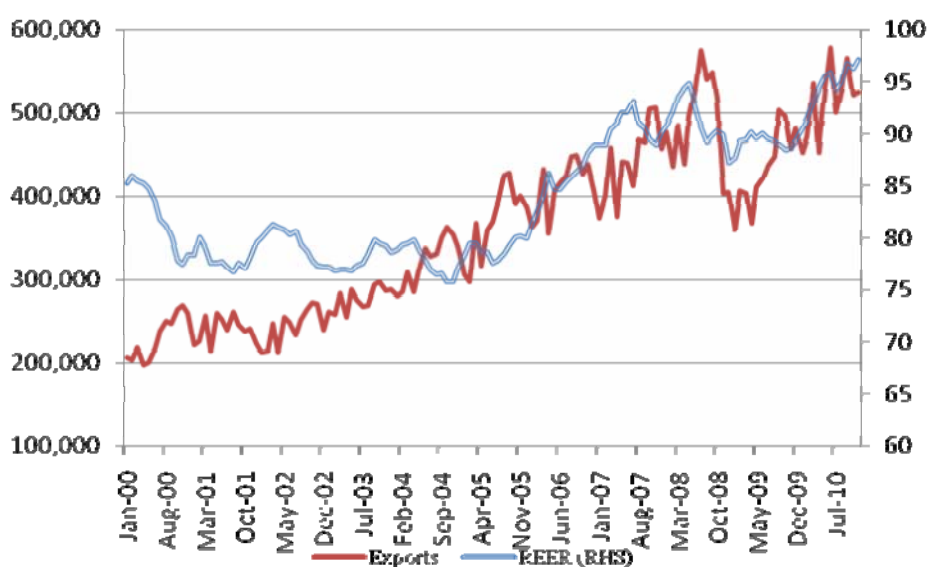


Exports are largely responsive to output growth. With expansion in capacity output and greater degree of capital utilization, exports can be raised. The implication of this finding is that instead of engineering a weak exchange rate, exports can be raised in the long run through promoting flows of capital into productive sectors. Any measures that hinder capital inflows and foreign direct investment can reduce export growth in the long run. Political unrest and uncertainty, capital controls, protectionism, and policy inconsistency would entail the reduction of long-term capital flows and thereby reducing exports in the long run.

Thai monetary authorities are not willing to let the exchange rate adjust to equilibrate external imbalances. The burden of the adjustment falls on output. If the real exchange rate is allowed to appreciate in response to surplus in the balance of payments, export growth can slow down to prevent overheating the economy. Likewise, if the real exchange rate depreciates in response to deficit in the balance of payments, exports can be enhanced to stimulate the economy. The exchange rate is such an important macroeconomic policy variable that we cannot deprive of its equilibrating role.

Figure 9 illustrates that exports continued its rising trend despite the appreciation of the real effective exchange rate between 2005 and the first half of 2008. The global financial crisis led to a steep decline in exports in the last quarter of 2008 and continued into 2009 before it rebounded in 2010, when the world economy started to recover. During this period the real effective exchange rate also depreciated, partly as a result of the price deflation and economic contraction in 2009. When the Thai economy experienced a V-shaped recovery in 2010, as a result of revival of export and consumption demand, inflation started to pick up and led to the appreciation in the real exchange rate. After 2000, exports and the real effective exchange rate were positively correlated. Hence the strength of the baht does not necessarily imply poor performance in exports. The output effect on Thailand's exports from world business cycles is more pronounced than the substitution effect resulted from exchange rate changes.

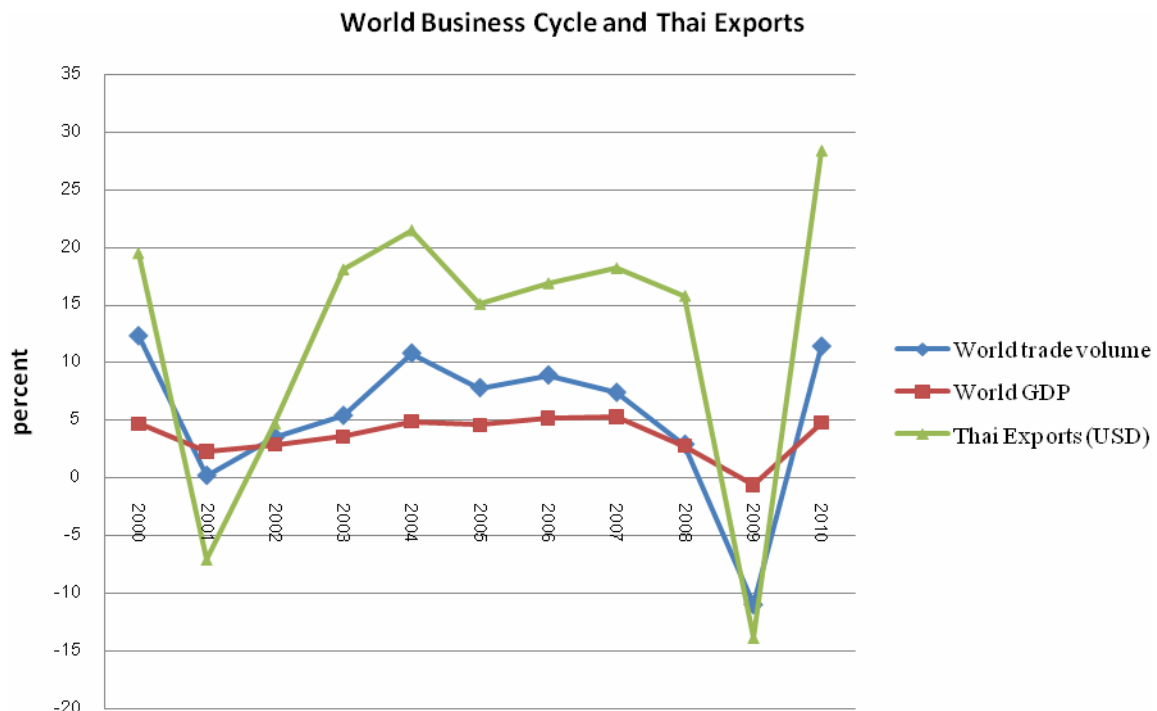
Figure 9: Exports and REER



Source: Bank of Thailand

It is evident from Figure 10 that Thailand's exports are dictated by world income and world trade volume, which fluctuates more than world business cycle, but the Thai exports were even more sensitive to world output growth than the world trade. The collapse of Thai exports in 2009 was due mainly to the world recession rather than the baht appreciation. On the other hand, the sharp rebound of Thailand's exports by 28 % in 2010 can be attributed to the strong recovery of the world economy. It is a wishful thinking that undervalued currency can stimulate exports. It is a policy mistake to try to resist the baht strengthening when the world economy rebounds⁷.

Figure 10:



Source: Bank of Thailand

During the period of continued appreciation of the baht, the Bank of Thailand was under the pressure to resist the baht appreciation to protect exporters. The Bank of Thailand intervenes less in the forward market and thus allows the baht to appreciate against the dollar. The Bank of Thailand has gradually raised its policy interest rate to discourage inflationary pressure. There is a concern that the enlarged interest rate differential between the key policy and the federal funds rates would induce more capital inflows and further strengthen the baht.

In October 2010, the government revoked the 15 percent withholding exemption on interest and capital gains earned by foreign investors. The motivation of this policy is to prevent baht speculation as there was a surge capital flows in the bond market. Tax instrument was called upon to slow down the baht appreciation. Again this policy instrument is likely to fail to reduce capital flows, because the inflows are the result of portfolio investment in response to anticipation of capital gains in the Thai stock market.

⁷ Nidhiprabha (2010) provides evidence that sustained economic recovery requires growth in the world trade volume and enhanced business confidence.

The Bank of Thailand has promoted direct investment abroad to lessen the pressure on the strengthening baht. Listed firms are permitted to invest abroad. The ASEAN Economic Community framework for 2015 would ease the restriction on outward portfolio investment. With uncertainties in the recovery of the US economy and sovereign debt crisis in Europe, there would be more volatility of the baht. As such the Bank of Thailand still ponders the use of various kinds of capital control measures to curb capital inflows, hoping that they may have some deterrent effect on speculators.

6. Conclusions

Thailand benefited from the fixed exchange rate system between the 1960s and the 1980s when Thailand experienced steady growth rate while maintaining a fixed exchange rate to promote international trade. At the early stage of development, exports were the main growth driver. As the country developed further, other growth drivers such as investment and consumption became principal sources of growth. Exports contributed less to growth as imports also increased together with exports. There was a tendency to keep the exchange rate at a competitive level to propel export growth. When the country relied more and more on foreign capital flows to finance investment-saving gap, the current account deficit became unsustainable. For the Bank of Thailand, it was difficult to allow the baht to depreciate, because it would threaten the banking sector, which borrowed heavily in foreign currencies.

Nevertheless, maintaining the overvalued exchange rate of the baht for too long led to a drastic exchange rate adjustment that culminated into currency and banking crises in 1997. In the early 1990s when Thailand experienced rapid capital inflows, the Bank of Thailand did not permit the baht to appreciate against the dollar. If the baht had appreciated, the overheated economy and the ensuing economic crisis could have been avoided. During the period of 2006-2009, the baht was undervalued once again and the Bank of Thailand did not permit the baht to appreciate by the market force because of the concern that exports and economic growth could be jeopardized. A currency appreciation mitigates the impact of oil price shocks and would not have considerable impact on export growth, which is mainly dictated by the world trade volume. An unrealistic exchange rate policy to protect exporters for currency appreciation may result in moral hazard and discourage the incentive to enhance competitiveness through productivity improvement obtained from importation of capital goods.

Capital controls are instruments usually employed during currency crises. The fourteen-month capital control that began in December 2006 was unnecessary and ineffective. Furthermore it may have adverse consequences on foreign direct investment if it sends the wrong signal to investors who are worried about policy commitment to open capital markets.

The interest rate policy cannot be used to target the value of the baht. Foreign exchange market intervention by the Bank of Thailand was intensified when the baht appreciated against the dollar during the period 2006-2009. Intervention in foreign exchange markets was ineffective, because the baht/dollar exchange rate is determined by movements of major currencies and capital inflows to the stock market. An attempt to sterilize the flow would be costly and ineffective in the long run. When exchange rate changes are not allowed to correct current account disequilibrium, adjustments have to take place through output level. With more flexible exchange rate movements, the burden of adjustment would not fall solely on output fluctuations.

References

- Akiba, H., Iida, Y. and Kitamura, Y. (2009). The Optimal Exchange Rate Regime for a Small Country. *International Economics and Economic Policy*, 6, 315-343.
- Asiedu, E. and Lien, Donald (2004). Capital Controls and Foreign Direct Investment. *World Development*, 32, 479-491.
- Bhagwati, J. (1998). The Capital Myth. *Foreign Affairs*, 77, 7-12.
- Bhandari, R. and Upadhyaya, K. P. (2010). Panel Data Evidence of the Impact of Exchange Rate Uncertainty on Private Investment in South-East Asia. *Applied Economics*, 42, 57-61.
- Bilson, J. (1985). Macroeconomic Stability and Flexible Exchange Rates. *American Economic Review*, 79, 62-69.
- Broda, C. (2004). Terms of Trade and Exchange Rate Regimes in Developing Countries. *Journal of International Economics*, 63, 31-58.
- Calvo, G. A. and Reinhart, C.M. (2002). Fear of Floating. *Quarterly Journal of Economics*, 117, 379-408.
- Chit, M., Rizov, M. and Willenbockel, D. (2010). Exchange Rate Volatility and Exports: New Empirical Evidence from the Emerging East Asian Economies. *World Economy*, 33, 239-263.
- Coelho, B. and Gallagher, K. (2010). Capital Controls and 21st Century Financial Crises: Evidence from Colombia and Thailand. Working paper series number 213, Political Economy Research Institute.
- Coudert, V. and Couharde, C. (2009). Currency Misalignment and Exchange Rate Regimes in Emerging and Developing Countries. *Review of International Economics*, 17, 121-136.
- Dubas, J. M. (2009). The Importance of the Exchange Rate Regime in Limiting Misalignment. *World Development*, 37, 1612-1622.
- Gallego, A.E. and Hernandez, L.F. (2003) "Microeconomic Effects of Capital Controls: The Chilean Experience during the 1990s" *International Journal of Finance and Economics*, 8 (3), 225-253
- Eichengreen, B. (2000). Taming Capital Inflows. *World Development*, 28, 1105-1116.
- Forbes, K.J. (2007) "Once cost of the Chilean capital controls: Increased financial constraints for smaller traded firms" *Journal of International Economics*, 71(2), 294-323.
- Friedman, M. (1953) The Case for Flexible Exchange Rates. Essay in Positive Economics. 157-203, Chicago, University of Chicago Press.
- Hasan, S. and Wallace, M. (1996). Real Exchange Rate Volatility and Exchange Rate Regime: Evidence from Long-term Data. *Economic Letters*, 52, 67-73.

Kenen, P. B. and Rodrik, D. (1986). Measuring and Analyzing the Effects of Short-term Volatility in Real Exchange Rates. *The Review of Economics and Statistics*, 68, 311-315.

Krugman, P. (1989). The Case for Stabilizing Exchange Rates. *Oxford Review of Economic Policy*, 5, 61-72..

Liew, V. K.S., Baharumshah, A. Z. and Puah, Chin-Hong (2009). Monetary Model of Exchange Rate for Thailand: Long-run Relationship and Monetary Restrictions. *Global Economic Review: Perspectives on East Asian Economies and Industries*, 38, 385-395.
Montecino, J. A. and Cordero, J.A. (2010). Capital Controls and Monetary Policy in Developing Countries. Center for Economic and Policy Research. Report, April.

Nakagawa, H. (2002). Real Exchange Rates and Real Interest Differentials-implications of Nonlinear Adjustment in Real Exchange Rates. *Journal of Monetary Economics*, 49, 629-649.

Nidhiprabha, B. (2010) Effectiveness of Thailand's macroeconomic policy response to the Global Financial Crisis. *ASEAN Economic Bulletin*, 27(1), 121-135.

Nidhiprabha, B. (2003) Thailand Macroeconomic Policy after July 1997. *Asian Economic Papers*, 2(1), 158-168.

Obstfeld, M. (1998). The Global Capital Market: Benefactor or Menace? *Journal of Economics Perspectives*, 12, 9-30.

Obstfeld, M. and Rogoff, K. (1995). The Mirage of Fixed Exchange Rates. *Journal of Economic Perspectives* 9, 73-96.

Taylor, J. B. (2001). The Role of the Exchange Rate in Monetary-Policy Rules. *American Economic Review*, 91, 263-267.

Yip, S.L. (2002). Singapore's Exchange Rate Policy: Empirical Foundations, Past Performance and Outlook. *The Singapore Economic Review*, 47, 173-182.

Fiscal policy for growth and stability: Lessons from Thailand

Bhanupong Nidhiprabha

Thammasat University

ABSTRACT

Fiscal policy can be employed to promote growth and stability. To stimulate growth in the aftermath of the global recession, sufficient fiscal space is needed to carry out effective stimulus package. Fiscal burden must be considered in addition to the impact of fiscal stimulus on price stability. The role of tax automatic stabilizer and the ability to cut current spending to balance the budget must be seriously taken into account when formulating fiscal stimuli. Although expansionary fiscal policy can be utilized during recession, it would be more effective when implementing the stimulus under the condition that the government can maintain public confidence. The rules of fiscal sustainability must be strictly observed all the time to ensure price stability and long-term growth.

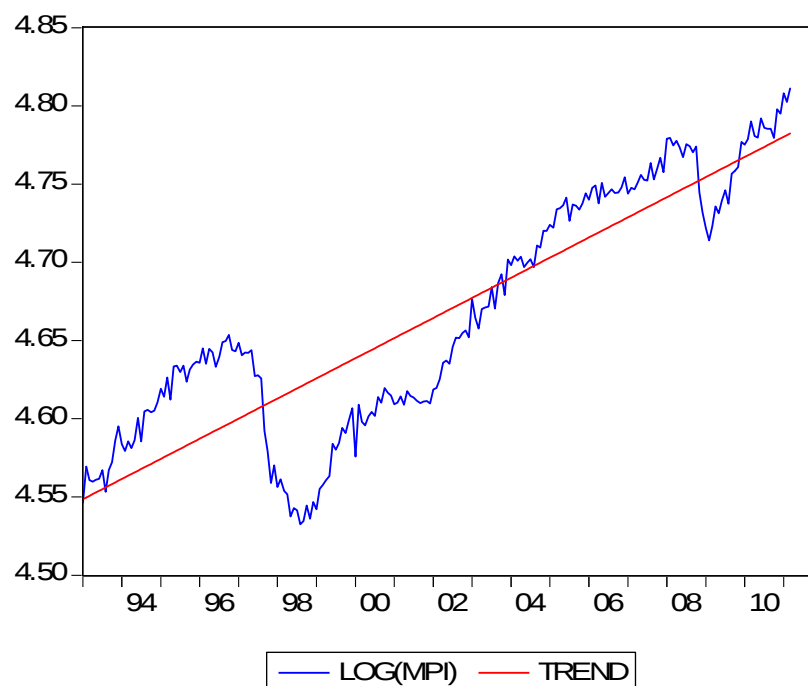
1. Introduction

Most countries that suffered from the global financial crisis between 2007 and 2009 employed expansionary fiscal policy to counteract the shortfall in exports. In developing countries where monetary policy instruments have some limitations, fiscal stimulus is the only policy measure available to compensate the declining export demand from advanced countries. Thailand's exports continued increasing in 2008 despite the impact of the global economic slowdown that began in 2007. The temporary commodity boom and the food price crisis gave rise to such impressive performance of Thai exports in 2008. From 2000 to 2008, the increasing trend of exports was evident. However, when the global financial crisis finally hit the Thai economy, exports declined sharply in 2009. This was also the period when domestic investment and consumer spending were subdued. Thus the contraction of both external and internal demand caused real GDP to decrease by 2.3 % in 2009. It was the first time that the Thai economy experienced a recession since the massive output contraction of 10 % in the aftermath of the currency and financial crises in 1998. The recession was short-lived, although massive value of financial assets was destroyed during the meltdown of financial institutions. It was the rapid growth exports that restored growth. Since the Asian

financial crisis did not spread to the rest of the world, Thailand was able to export its way out of recession through currency devaluation.

But it was different in 2009 as advanced economies could not import from Asia as they were trying to maintain their wealth through raising saving and subsequently reducing imports. Furthermore, appreciation of the baht made it difficult for Thai exporters to reap the benefit they once gained during the 1997 Asian financial crisis. During this episode many Asian scholars started questioning the Asian traditional model of growth, arguing that Asian countries should depend less on exports and pay more attention to the role of domestic demand.

Figure 1: Trend of Manufacturing Output, 1993-2011



Source: Bank of Thailand

Deviation from the long-term growth path can be viewed in Figure 2, where the boom and bust cycles are demonstrated. A mild recovery from the global financial crisis can be observed in 2010. We examine whether the expansionary policy contributed to this V-shaped recovery.

Figure 2: Deviation from trend growth path

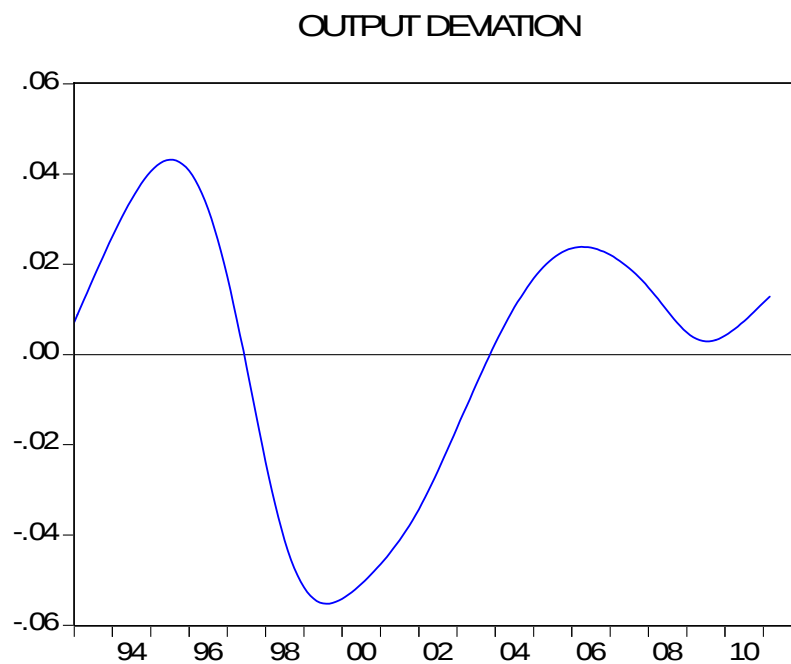
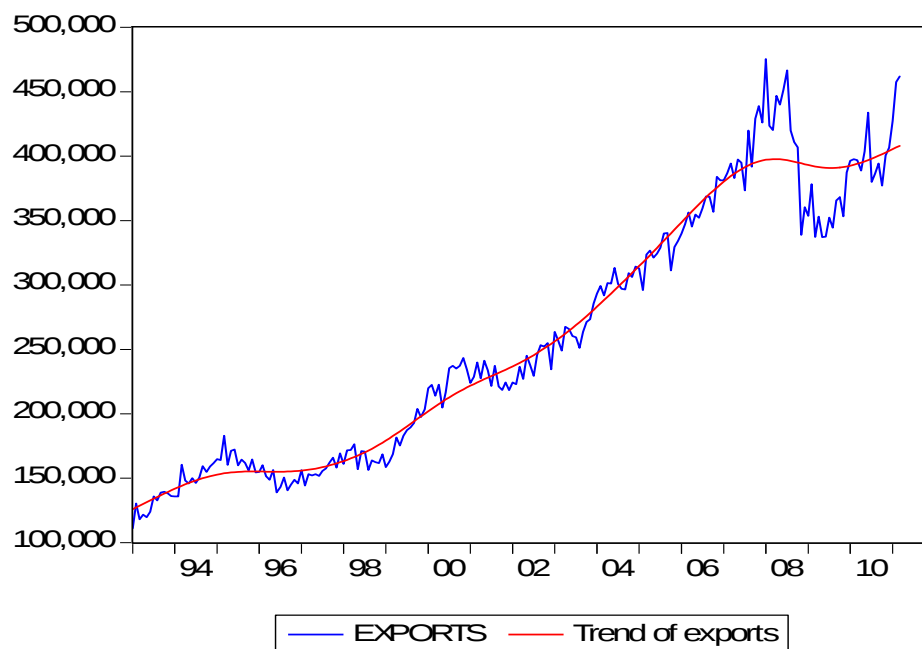


Figure 3: Global financial crisis and Thailand's export slump



Source: The Bank of Thailand

By the first half of 2010, it became clear that manufactured exports rebounded sharply. It is reckoned that the impact of global financial crisis has previously been overestimated. The robust growth of India and China generated strong export demand for goods from Thailand. Whether the export recovery can be sustained depends to a large extent on economic recovery in advanced countries. If developed economies experience a double-dip recession in the near future, developing countries must brace for another round of export contraction and they must increase volume of trade among themselves. The possibility of having a market substitution from advanced economies to emerging countries in Asia is limited, because a large part of the final demand for manufactured goods is originated from developed areas.

Even if there is a remote possibility of having a double-dip recession in developed economies, the important role of domestic demand must be emphasized. In particular, if domestic investment and consumption are weak as a result of uncertainties and pessimism, the government must act and stimulate the economy appropriately and efficiently. When the world economy recovers, public spending must return to its normal pattern observed the pre-global financial crisis. The collapse of exports in 2009 can be thought of as a temporary shock, the long-term output level should not be affected once exports return to its normalcy. As Figure 3 shows, the trend of exports has not yet returned to its trend growth path. Nevertheless, the long-term output growth remained unaffected by the declining trend of reduced exports.

It should be noted that exports and imports move together in the long run. Increased exports generate income, which in turn lead to higher demand for imports. In addition, manufactured exports require imported parts and components. The emerging pattern of infra-industry trade causes both imports and exports of manufactured goods move together. The reduction in exports gives rise to a fall in imports of raw materials; thus the impact of exports collapse on the current account is not severe. Even if exports collapse, the adverse impact on GDP will not be as much as the fall in exports because imports also decline. The implication is that governments should not take drastic fiscal measures to react to temporary export shortfalls, because the impact on GDP must be considered by the falling level of net exports rather than gross exports.

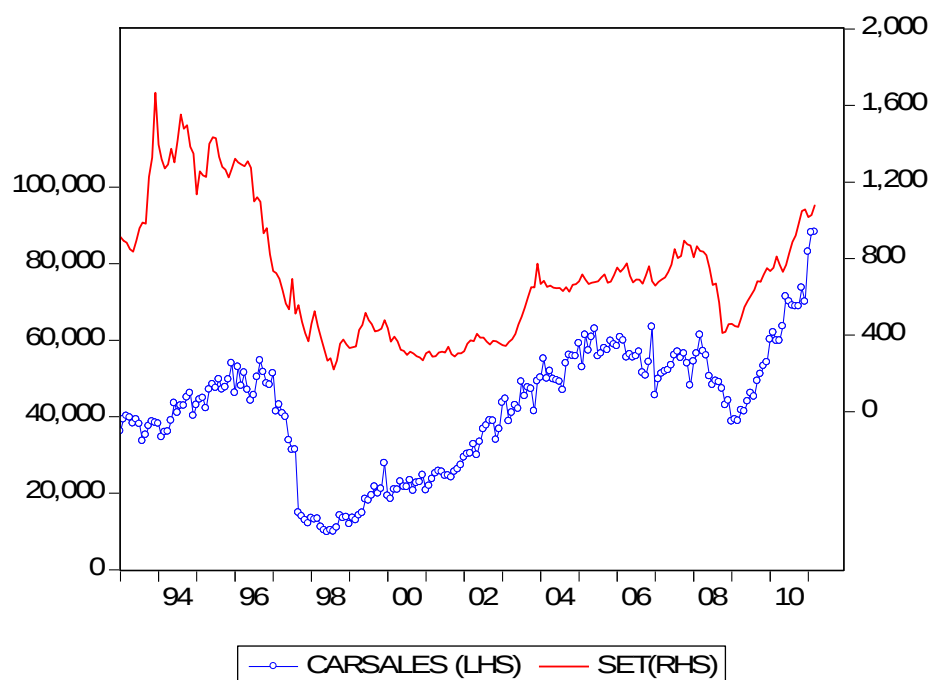
This paper addresses the role of fiscal policy whether it can be employed to stabilize the short-term fluctuations of output. It focuses on the relationship between fiscal and macroeconomic variables. Section 2 discusses the role of domestic demand and fiscal policy.

Section 3 highlights the importance of fiscal automatic stabilizers. Section 4 examines the rules for fiscal sustainability. Sector 5 analyzes the impact of fiscal expansion on growth and price stability. Concluding remarks are provided in the last section.

2. Domestic demand and fiscal measures

The movement of stock prices is a good indicator of investor confidence. It is obvious that the global financial crisis between 2007 and 2009 depressed market sentiment considerably. However, by the fourth quarter of 2010, the SET index has gained the lost ground since its peak in 2007. Confidence has returned and other stock markets in the region experienced the similar sharp rebound in the stock markets. Sales of automobiles reflect consumer confidence since the decision to buy durable goods is determined by similar factors that dictate the demand for physical investment. Expected or permanent income, the cost of capital, and fiscal incentives determine the desired level of capital stock. We can use the number of cars sold domestically as a proxy for consumer confidence. Both proxies for investor and consumer confidence, shown in Figure 4, move together during the downturn and upturn. The sluggish movement of the SET index in the early 2000s reflected poor sentiment during the mild recession in the US, when the bubble burst in the Wall Streets due to the dot-com share prices and the 911 incidence. These were not the factors affecting domestic consumer demand in Thailand as much as they were for the stock markets. The number of cars sold in Thailand thus continued increasing from 2000 to 2005, reflecting rising consumer confidence. After the military coup in 2006, subsequent political turmoil led to erosion of consumer and investor confidence. The global financial crisis took the severe blow on business and consumer confidence in 2008.

Figure 4: Consumer durable goods and asset prices



Source: Bank of Thailand

Table 1: Wealth effect on durable consumption

Pairwise Granger Causality Tests

Sample: 1993M01 2011M3

Lags: 5

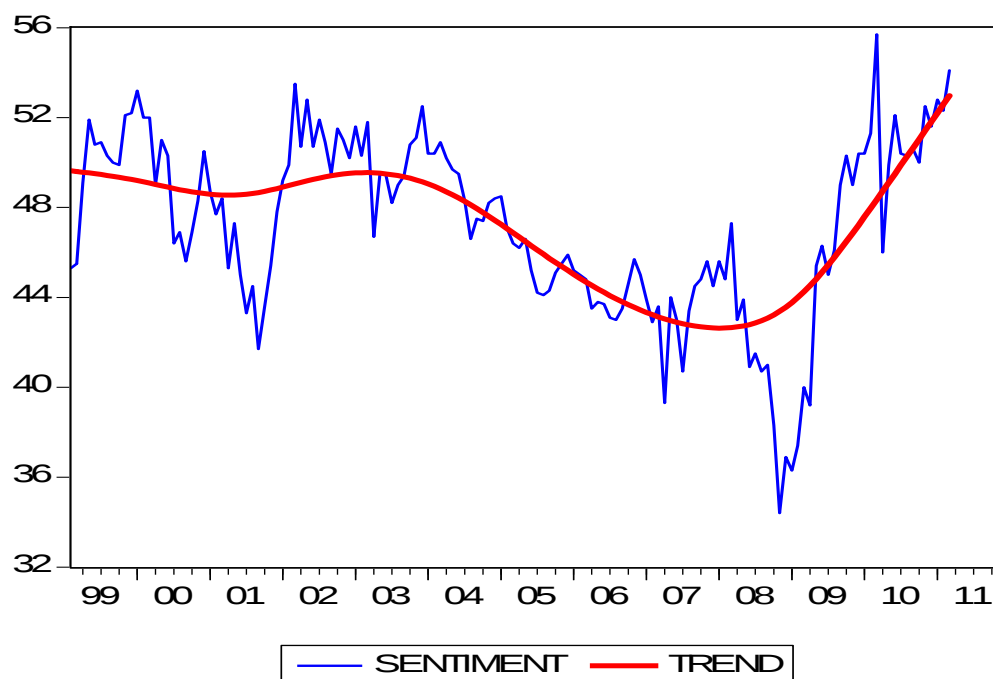
Null Hypothesis:	Obs	F-Statistic	Prob.
D(SET) does not Granger Cause D(CARSALES)	213	2.30661	0.0458
D(CARSALES) does not Granger Cause D(SET)		1.14532	0.3377

Because of excess liquidity in the banking system, the low interest rate and ample bank credit were available to consumers and investors. Fiscal expansionary measures that give rise to public deficit would not create crowding-out effect. Fiscal stimulus undertaken during this period will be effective without having to depend on coordination of expansionary monetary policy.

It is argued here that fiscal policy will be more effective during the time that consumer and investor confidence is strong. On the other hand, when business sentiment is low,

expansionary impact of fiscal deficit will have minimal impact on the economy. The multiplier impact will be reduced if investors and consumer decide to postpone their investment until the period of uncertainty and risk has passed.

Figure 5: Business sentiment: 1993-2011



Source: Business Sentiment Index, Bank of Thailand

Akerlof and Shiller (2009) extend the concept of Keynes' animal spirits of investors to include confidence or self-fulfilling phenomenon, fairness, money illusions, criminal behavior, and stories that media tell them. With this extended definitions of animal spirits, the success of policy stimulus also depend on its psychological impact.

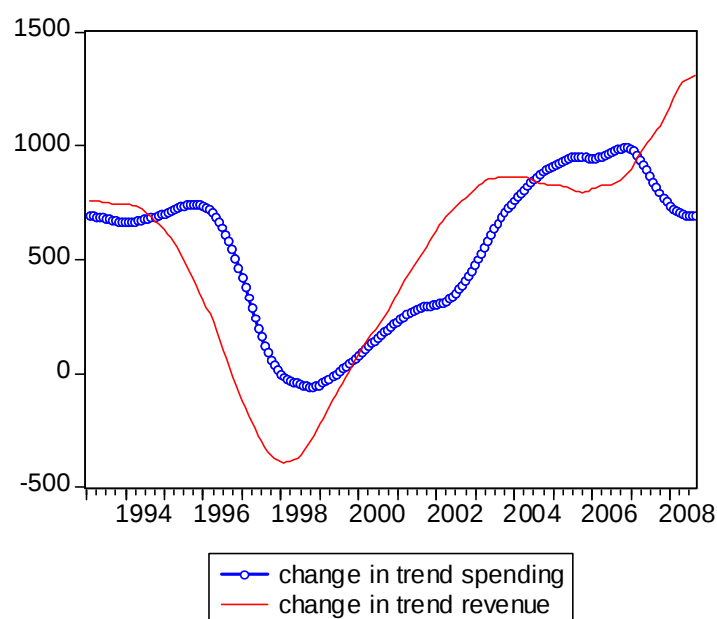
Fiscal stimulus at the period of the lowest level of confidence in 2008 would be relatively ineffective (Figure 5), compared to the period of normalcy. One might argue that budget deficit can help to improve the business confidence and therefore should be welcome during the recession. On the other hand, running a large budget deficit could lead to loss of confidence as the enlarging budget would further lead to huge public debt and the inevitability of a tax hike in the future. Whether running the budget deficit can lower and raise the business confidence depends on sustainability of public debt.

3. Automatic fiscal stabilizers

The primary budget (budget that excludes interest payments) is prone to be in surplus during the time when the economy is growing above its natural growth rate and tend to be deficit when it is declining below its natural level. Figure 5 illustrates the co-movement between the amount of value added tax and manufacturing output index. Thus budget deficit is a natural consequence of recession and so is the budget surplus during the boom. But the expenditure side of the budget must be counter-cyclical to make fiscal automatic stabilizer work.

By removing cyclical components from actual public spending and revenue, utilizing monthly data from January 1993 to December 2008, we can obtain the long-term trends of public expenditure and revenue. Using the first difference of these trend variables, we can find a pattern of fiscal stance which reflects the outcome from both discretionary fiscal policy and the automatic fiscal stabilizers (Figure 6).

Figure 6: Fiscal stance shown by structural budget



Source: Bank of Thailand

The positive difference between changes in trend spending and trend revenue suggests fiscal expansionary policy stance. The large budget deficit in the late 1990s turned around into surplus in the 2000s. The deficit was sustainable because of the rapid increase in tax

revenues during the recovery and the ability to trim down public spending. Investment in infrastructure was postponed while tax capacity was enhanced. A sharp deterioration in fiscal position took place in 2009, but tax collection in 2010 was above the expected level. The automatic tax stabilizer is at work. In some countries, it is difficult to cut down budget deficit because of the inability to curtail public spending.

The structure of the spending matters for long-term growth. If a large part of government spending is on current rather than capital spending, it would be very difficult for the government to curtail total spending as it would affect social welfare of those who used to receive such benefits from the government. On the other hand, if the budget consists of a large portion of capital spending, it would be relatively easier for the government to cut down the deficit. Political economy involves here as current consumption includes military spending, health, education, and social welfare.

It is possible that high revenue leads to higher public spending and vice versa. If public goods are normal, rising GDP per capita would imply an increase in the demand for public goods. On the other hand, some governments may want to spend first by issuing bonds or printing money, but they have to raise taxes later. Thus the causation can run both ways between tax revenue and public spending.

Employing monthly data from January 1993 to March 2011 to examine whether taxation leads public spending or vice versa, we find that government spending does Granger cause taxation and vice versa (Table 2). The finding indicates that Thailand's fiscal policy was conservative because spending was constrained by tax capacity. The reason behind this fiscal prudence is related to conservative budgetary laws of conservative fiscal policy.

Table 2

Pairwise Granger Causality Tests

Sample: 1993M01 2011M3

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
D(GREV) does not Granger Cause D(GEXP)	216	3.79160	0.0241
D(GEXP) does not Granger Cause D(GREV)		4.44311	0.0129

Source: Calculation is based on 125 observations of data monthly data from January 1993 to March 2011.

The budgetary law states that the proposed amount of expenditure cannot exceed 20 % of anticipated revenue. One can argue that this rule would limit the size of fiscal stimulus during the period of economic depression, which requires very large fiscal stimulus. When all engine of growth are shut down, there is an urgent need to apply large fiscal deficit. However, relaxation of this rule would enable politicians to profligate the budget and employ populism policy for their own benefits. We have seen that the global economic recession is a temporary shock; therefore we should not amend fiscal rules for the benefit of the incumbent government.

It should be emphasized that fiscal stimulus can also be done through tax reduction in addition to increased spending. The impact on fiscal burden will be the same. In theory tax financed budget deficit is less expansionary than bond-financed budget deficit. If bonds are net wealth and wealth has a significant impact on private consumption, bond-financed budget deficit can lead to more expansionary impact when bonds holders start spending because they feel wealthier by holding more government bonds.

Discretionary policy can be delayed because of implementation lags caused by lengthy parliamentary process of budget approval. It is argued here that if a country has established fiscal automatic stabilizers, fiscal policy can be stabilizing and it does not have to depend on a long-delayed budgetary process. Let's examine the role of automatic stabilizers in both taxation and expenditure when they change in response to changes in output and prices. Cointegration analysis indicates the existence of long-run relationship between fiscal variables, output, and the price level.

Table 3: Revenue and expenditure elasticities (Jan 1993-March 2011)

Normalized cointegrating coefficients (standard error in parentheses)

LOG(GREV)	LOG(MPI)	LOG(PRICE)
1.000000	-1.069934	0.369542
	(0.11029)	(0.23105)

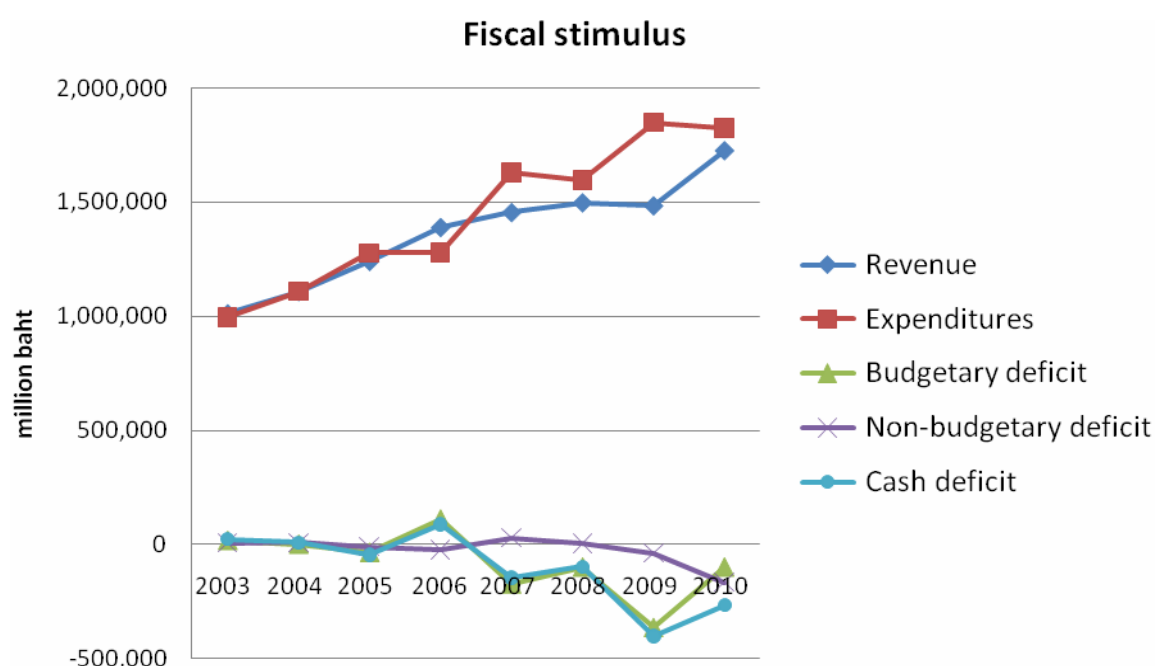
Normalized cointegrating coefficients (standard error in parentheses)

LOG(GEXP)	LOG(MPI)	LOG(PRICE)
1.000000	-0.523711	-1.147858
	(0.14104)	(0.29576)

If fiscal policy can be employed for growth and price stability, we must recognize the feedback effects from growth and inflation to tax revenue and spending. Elasticities of expenditure and revenue can be calculated with respect to output and price levels from the normalized cointegration coefficients. As reported in Table 3, between 1993 and 2011, there was no statistical significant impact of changes in prices on government revenue, but public spending increased faster than the increase in the price level. Inflation caused an increase in budget deficit, given the constant level of output.

Fortunately inflation rate was subdued during this period. A small budget surplus was observed in 2006 (Figure 7). This was due mainly to political upheavals relating to changing governments that slowed down budget utilization. It turns out to be a blessing in disguise since it provided ample fiscal space prior to experiencing the global recession in subsequent years.

Figure 7:



Source: Fiscal Policy Office

Public spending did respond to output and price levels (Table 3). On the revenue side, inflation did not significantly lead to lower tax revenue, while output growth raised it. The output elasticity is greater than one, implying that revenue rose faster than output¹. This is a nice feature of automatic tax stabilizer during the course of economic expansion, because output expansion does not lead to an increase in public spending as fast as revenue collection. Consequently, fiscal stabilizers work on the revenue side; the budget becomes surplus during economic booms and deficit during economic slumps.

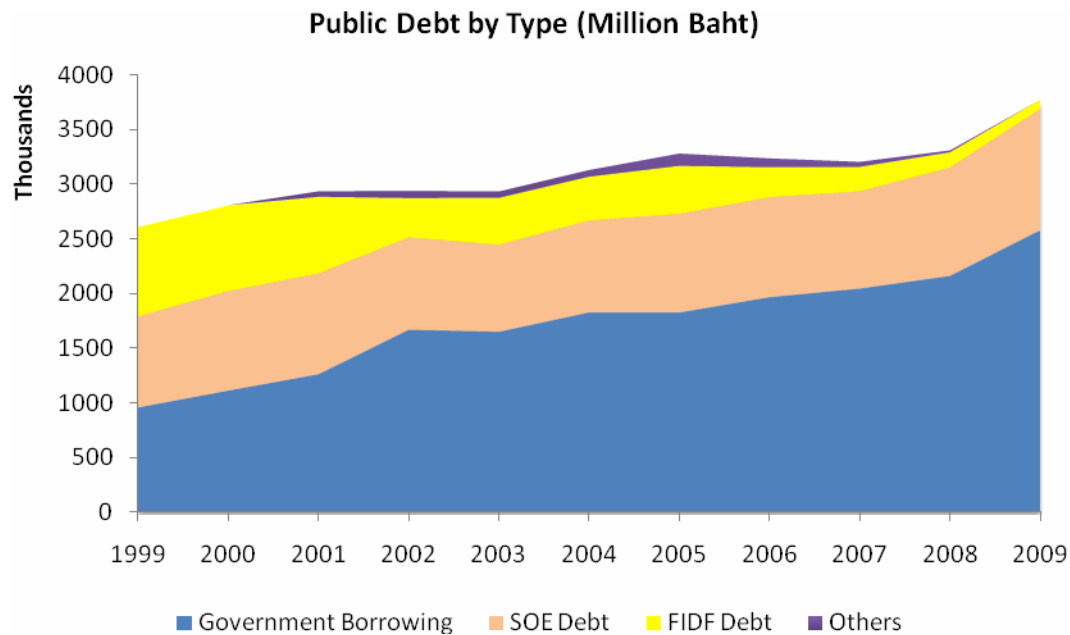
This finding also points out to an important policy implication; fiscal deficit tends to be destabilizing during high inflation. It is imperative that public spending must be controlled during high inflation to avoid giving more inflationary pressure to the economy. Inflation can be spiraling if the government wants to maintain the level of real spending during high inflation. The situation can become worse if the inflation is led by energy and food price inflation which produces output contraction.

4. Rules for fiscal sustainability

The budget deficit experienced after the financial meltdown in 1998 caused public debt on the rising trend (Figure 8). Economic contraction reduced tax revenue during the downturn. The continued budget deficit since 2007 raised the level of public debt. In addition, the government bailed out troubled financial institutions through Financial Institution Development Fund (FIDF), but this type of public debt has continued declining as financial institutions underwent structural changes and emerged stronger. They were not affected much by the global financial crisis of the period 2007 and 2009.

¹ Mourmouras and Rangazas (2009) views that the relative size of government spending and taxation increases as an economy develops because of the structural transformation from traditional to modern production, rising public infrastructure investment, and less democratic governments in many of today's developing economies.

Figure 8:

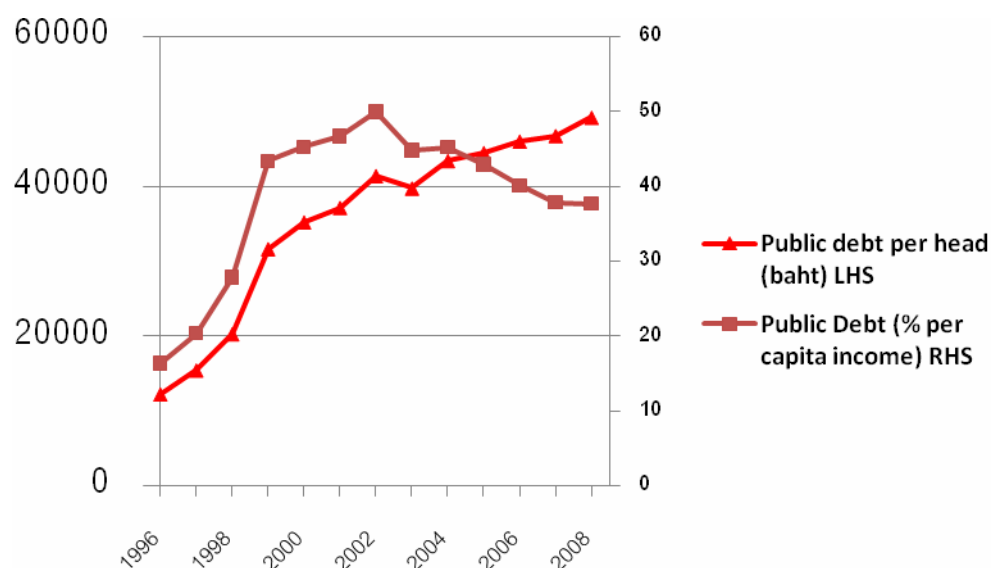


Source: Fiscal Policy Office

If the primary deficit cannot be contained, public debt will keep on rising and would threaten the sustainability of the fiscal system. To stabilize debt-to-GDP ratio, the primary deficit must be cut and GDP growth rate must exceed the real rate of interest. Thus during economic recovery, the government must ensure that fiscal stimulus can bring about economic growth rate that is higher than the real interest rate.

Figure 9 illustrates that public debt per head of the Thais in 2008 rose to 50,000 Baht --a fivefold increase from the level in 1996. Since per capita income increased faster than the amount of debt, the level of debt per head as a percentage of per capita income peaked in 2002 has declined steadily.

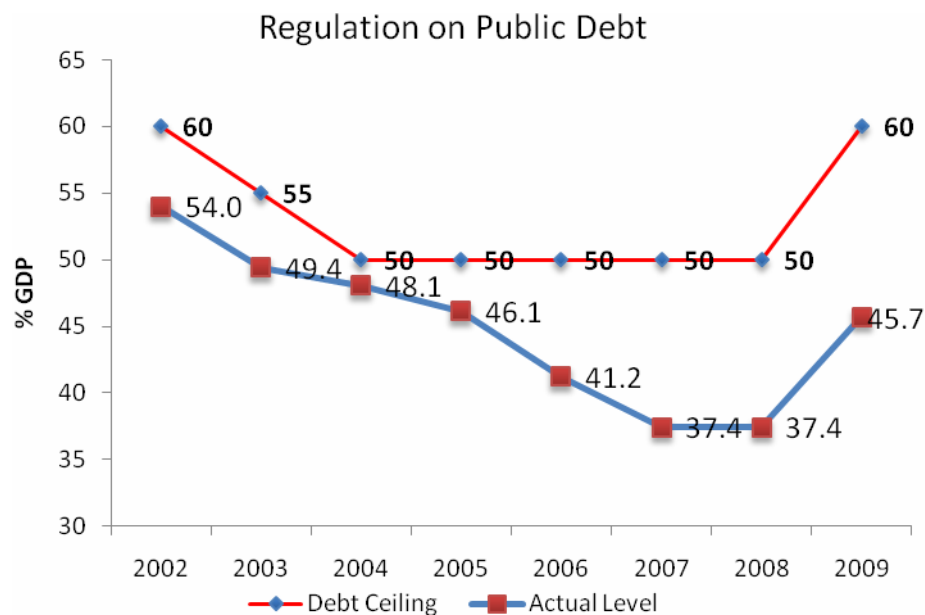
Figure 9: Public debt burden



Source: Fiscal Policy Office

Because the level of per capita debt has been declining, the Thai government still has room to employ fiscal stimulus to counteract future impact of the global recession. This ample fiscal space is basically the result of fiscal discipline. There are at least three rules of fiscal sustainability that the Thai government observed in the past. Some of the rules have been changed to make more room for fiscal expansion. For example, the rule that regulates the level of public debt to GDP level was altered. It was made less stringent from the maximum level of 60% in 2002 to 50 % in 2004 and it was maintained at that level until 2008. To accommodate fiscal expansionary policy, the maximum debt was raised to 60% in 2009. The actual debt-GDP ratio increased substantially to 45.7 % in 2009, which was still below the original 50% ceiling. With the rapid recovery, there is no need for the government to make the rule less stringent. There has never been a single incidence of breaching this rule in the past. There was a historical reason for this conservative policy which went back for many decades. Aversion to hyperinflation and fear of foreign invasion were the reason for such conservative fiscal policy.

Figure 10

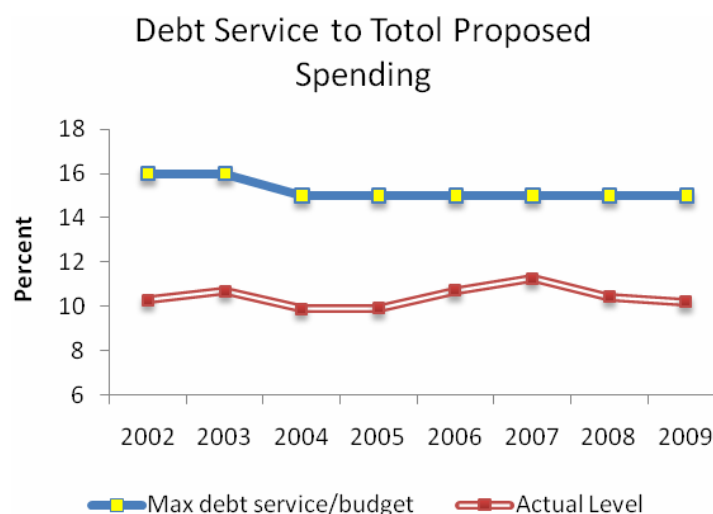


Source: Fiscal Policy Office

Since high debt causes a rapid rise in interest payments, another rule of fiscal sustainability was institutionalized by imposing ceiling on debt service as percentage of total planned expenditure. The ceiling was made more stringent after 2003 by lowering the maximum debt service from 16 %to 15% of total budget. Again the Thai government was able to control the debt service within the ceiling. The plentiful liquidity in the money market enabled the government to borrow at the very low rate of interests.

Another rule on foreign borrowing is worth mentioning. The debt-service ratio applies to foreign borrowing. In recent years, foreign borrowing declined while exports grew rapidly in the last decade. There is no problem in keeping the foreign debt-service to exports ratio within the permissible range.

Figure 11



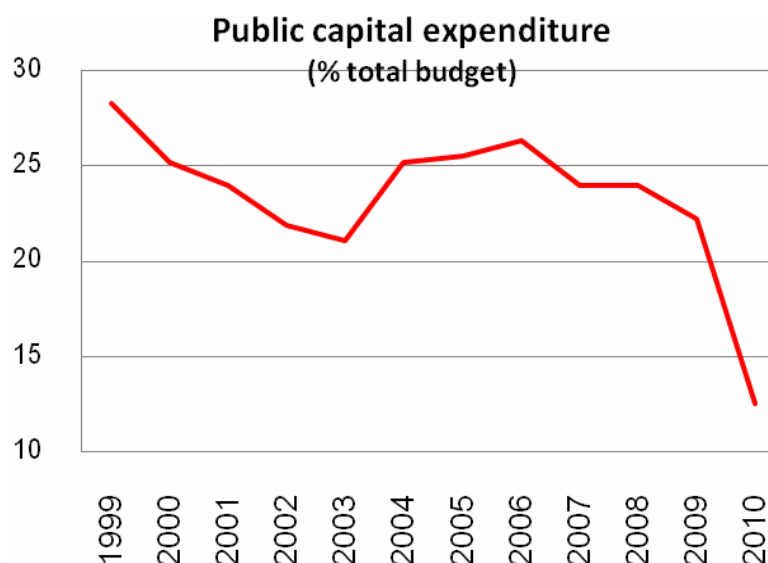
Source: Fiscal Policy Office

As mentioned earlier, fiscal spending structure matters for long-term growth. Public infrastructure can increase productivity in the private sector and enhance long-term growth. Public investment in transportation and communication has a super natural high rate of return to the economy. If public investment is complementary to private investment, increased public investment can lead to crowding-in-effect. In contrast, high public consumption relative to public investment can retard growth. Empirical evidence of cross-country investigation indicates that growth can be jeopardized if public consumption increases faster than public investment.

The rule of fiscal sustainability is concerned with this issue. It imposes a minimum level of public investment, requiring that it must not fall below 25 % of total budget. Since 2008 the budget allocated to public investment has fallen below the required level (Figure 12). If we take into account of depreciation of public capital stock, the net public investment would not be much higher than the break-even level of public investment. Consequently, the long-term growth of the Thai economy can be adversely affected².

² Akitoby and Stratmann (2008) examine the effect of fiscal policy on sovereign risk spreads in emerging markets. Financial markets also react to the composition of spending. Cuts in current spending lower spreads more than cuts in investment.

Figure 12



In the short-run, we will not see the impact of a slowdown in public investment. However, in the longer term, the tradeoff between present and future consumption will become apparent in terms of growth, efficiency, and international competitiveness. Fiscal sustainability is ensured if rules and regulations are strictly observed. The rules also give importance to long-term growth. Time inconsistency of fiscal policy is similar to the problem of monetary policy. In this case, both the government and people who are receiving the benefit of present consumption through populism programs of fiscal stimulus are happy, but in the long-run the fiscal policy that departs from the rule of adequate capital spending will retard growth³. Yakovlev (2007) provides empirical evidence that increased defense budget at the expense of budget for other development goals can be detrimental to economic growth.

5. Evaluation of the short-run impact of fiscal policy

Shocks by nature are random and temporary. Give it time; the economy can gravitate back to its natural output level. The speed of the adjustment back to the long-term growth path depends on the efficiency of the labor market as well as the flexibility of wage and price levels. In the short-run where rigidities exist, the economy achieves equilibrium but remain at the output which corresponds to lower than the full employment of labor. Usually monetary

³ Using data on 42 developing countries from 1975 to 2001, Vergne (2009) finds the evidence that election-year public spending shifts towards more visible current expenditures, in particular wages and subsidies, and away from capital expenditures.

policy is employed for short-term stabilization, while fiscal policy is a tool for long-term growth. But when the policy interest rate is close to zero, there is no room for further cut in the cost of borrowing. In addition, if the economy is subjected to pessimism, the low cost of fund would not encourage firms to expand their plant sizes.

During the global recession, fiscal policy was called upon to stimulate domestic demand during the period of ineffective monetary policy measures. It is important to emphasize that expansionary fiscal policy employed to counteract short-term fluctuations must be withdrawn after the economy is on its recovery path. If not, it can be a burden to the government and result in adverse impact on the economy. The risk and adverse consequences of withdrawal of fiscal spending consequences must be considered before implementing fiscal expansion in response to insufficient aggregate demand.

If the short-term expansionary impact of fiscal policy is large, then it would be appropriate to stimulate the economy using tax or public spending measures. But we also need to consider other alternative means of enhancing aggregate demand to make sure that fiscal policy is the most efficient tool of stabilization.

A Vector Autoregression model is used to evaluate the short-term impact of Thailand's fiscal stimulus. The VAR model utilizes the monthly data from January 2000 to August 2010; it consists of seven variables: public spending (G), tax revenue (Tax), private investment (Invest), private consumption (Cons), Real Effective Exchange Rate (REER), Business Sentiment Index (BSI), and Core price index (CORE). All data are obtained from the Bank of Thailand. The BSI variable captures expectations of investors and consumers. As argued earlier, the effectiveness of fiscal and monetary policy depends on business and consumer confidence. The real exchange rate is included as it is affected by the domestic price level. The core consumer price index is used since it excludes exogenous factors such as prices of fresh food and energy. Private consumption is an index constructed by the Bank of Thailand. It includes spending activities involving imported consumer goods, households' electricity usage, value added tax revenue, car sales and fuel consumption. The private investment index constructed by the Bank of Thailand includes activities in construction and capital formation, i.e., construction area permitted in municipal zones, imported capital goods, and domestic sales of machinery, cement, and commercial cars. Both private and consumption indexes represent the domestic demand, which would be directly and indirectly affected by increased government spending.

The impulse response function of the impact on price stability is shown in Figure 13. The price level is positively related to output level as can be expected from the dynamic aggregate supply function. Price level increases in response to increased consumption more than an increase in public spending. A rise in investment does not cause inflationary pressure as much as other components of aggregate demand. Investment involves imported capital goods which is a leakage from the domestic economy. The fact that traded goods prices are exogenously determined by the world price level explains why an increase in domestic investment does not create inflationary pressure as much as domestic consumption and public spending. Furthermore, enlarged plant and equipment means higher output capacity which would by itself lower the upward pressure on the price level.

A tax hike initially raises the core inflation rate but the impact dissipates within two months when the contractionary impact takes effect. It is clear that taxation can lead to a slowdown in private consumption; thereby reducing the inflationary pressure. Therefore, fiscal policy can be used to stabilize the price level and it should be used to cool down inflationary pressure during the boom. An increase in public spending financed by tax increase has lower inflationary pressure than other methods of deficit financing. We now turn to analyze the impact of fiscal policy measures on output level.

The impulse response function reveals that the impact of fiscal policy stimulus has expected outcome: increased government spending leads to higher output, while increased tax revenues lead to output contraction (Figure 14). Fiscal stimulus through either reducing tax or increasing public spending can spur growth during the slowdown⁴. This expansionary impact dies off slowly within a year.

⁴ Libaˆnio (2009) views that it is misleading to treat growth as entirely determined by supply-side variables, since aggregate demand and output growth influences the trajectory of labor supply and productivity in the long run.

Figure 13: Impacts on price stability of various shocks

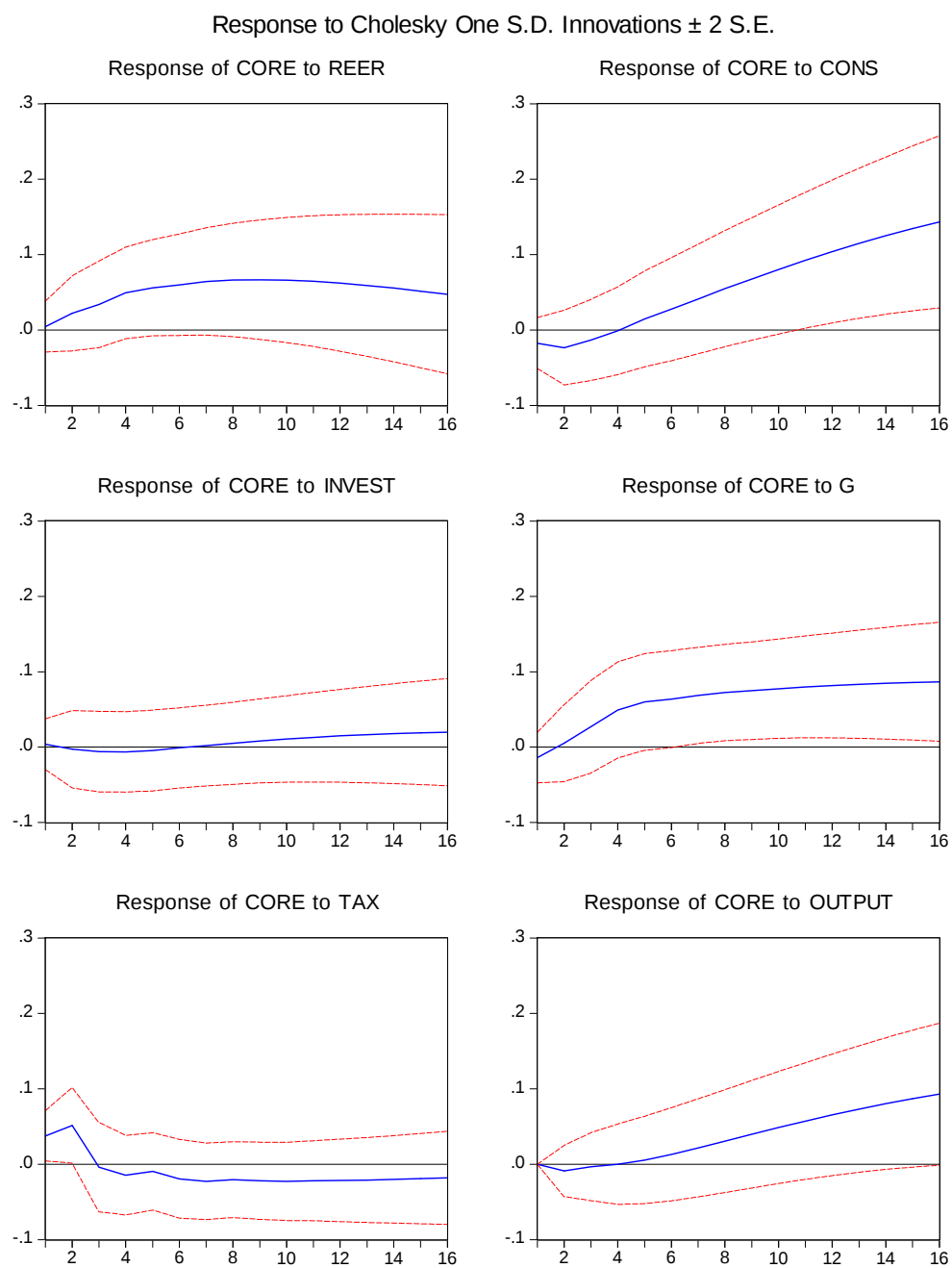
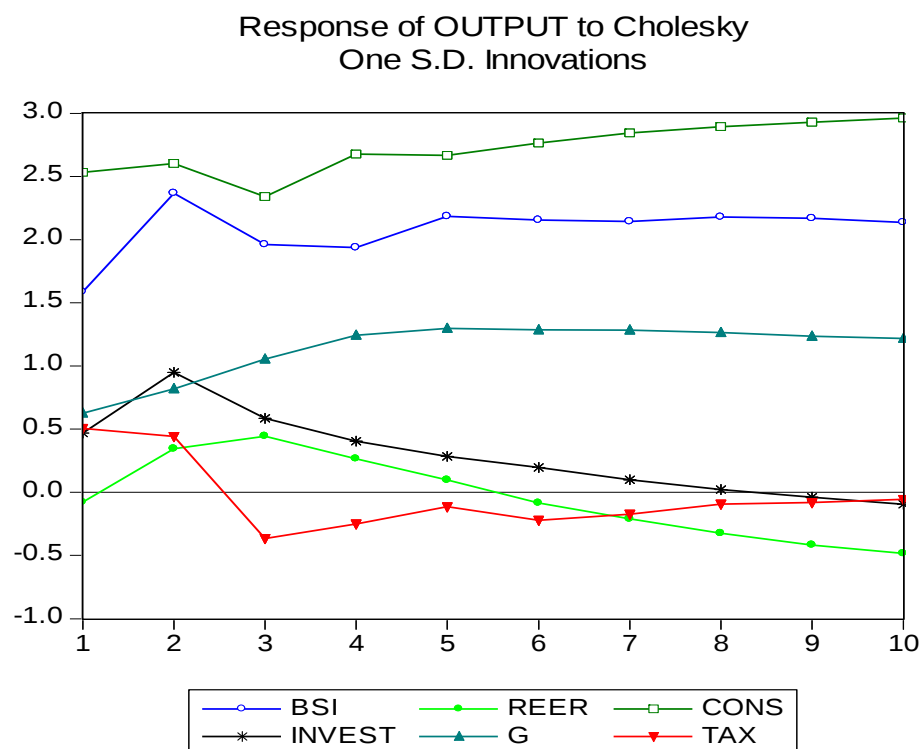


Figure 14: Expansionary impact of fiscal policy stimulus



Output is also affected by the real exchange rate appreciation, but the contractionary impact becomes apparent only after six months. The government has some time to compensate the output contraction as a result of the loss of international competitiveness. In the real world where other factors are also changing, the contractionary impact of currency appreciated can be mitigated by other policy measures.

Fiscal and monetary policy instruments can be coordinated to achieve an optimal policy mix that can address the problem of losing international competitiveness. Fiscal incentives for investors such as tax incentives for investment and a temporary reduction in consumption tax can boost domestic demand. These measures are temporary by nature and should be withdrawn after export demand returns to its normal growth path.

Figure 14 shows that consumption has the highest expansionary impact on output—much larger than public spending. Thus any measures that enhance private consumption can ensure a fast recovery. The main factor attributing to the 2009 recession in Thailand is the loss of consumer confidence. The political turmoil and uncertainties give rise to pessimism (Figure 4) and a sharp decline in private consumption. Figure 14 confirms this conjecture. An

improvement in business confidence affects output trajectory. The expansionary impact of an optimistic view is even stronger than public spending. It is important therefore to nourish business sentiment, which can be obtained through establishing laws and order.

Good governance and the effective legal infrastructure are requirements for maintaining business sentiment. If the outcomes of legal disputes are envisaged as fair and logically justified, outcomes of judiciary process would not be unexpected. Thus the risks of unexpected outcome from legal institutions can be minimized. In time of crisis, if the government cannot maintain confidence in the private sector, a mild recession caused by a fall in export demand can lead to a severe depression. When consumers and investors postpone their spending, output would contract and magnify the fall in exports. Similarly a pickup in export demand can lead to a V-shaped recovery provided that consumer confidence is strong.

The growth collapse episode in Thailand is consistent with the observation that good political institutions help prolong growth spells. Growth decelerations are found to be associated with macroeconomic instability, conflict, and export collapses (Hausmann, Rodriguez, and Wagner, 2006). The military coup in September 2006 has derailed growth process in Thailand, confirming the hypothesis that growth is affected by democracy (Tavares and Wacziarg, 2001). Existing literature on the role of institutions on growth duration points to the relationship between sustained growth episode and distributional conflict and weak domestic institutions that cannot handle shocks (Berg and Sachs, 1998; Rodrik, Subramanian and Trebbi, 2004). Poor institutions create economic and political turmoil which make countries more crisis-prone and growth more volatile. The success of fiscal policy undertaken to stimulate growth in the short-run and to promote long-term growth depends largely on the quality of institutions.

6. Concluding remarks

Fiscal policy can become an effective means to spur growth during the time when consumer and investor confidence remains strong. When business sentiment is low, expansionary impact of fiscal deficit will have minimal impact on the economy. The ability of legal institutions to maintain peace and withhold the rule of law is crucial for political stability. Maintaining favorable business environment is important in preventing the propagation of global recession to severe economic contraction.

Thailand's fiscal policy was conservative because spending was constrained by tax capacity. The reason behind this fiscal prudence is related to conservative budgetary laws. Debt-to-GDP is low, providing fiscal space for the government to counteract the future external shocks. Thailand has established fiscal automatic stabilizers from the revenue side rather than from expenditure. The discretionary fiscal expansion has some limitation. Moreover, fiscal policy employed to counteract short-term fluctuations must be withdrawn after the economy is on its solid recovery path. Otherwise, it can be a burden to the government and result in long-term growth. The risk and adverse consequences of withdrawal of fiscal spending must be considered before implementing fiscal expansion in response to insufficient aggregate demand.

Public spending must be controlled during high inflation to avoid fueling inflationary pressure. Inflation can be spiraling if the government insists on maintaining the level of real expenditure during the time of high inflation. Furthermore, structure of public expenditure matters for long-term growth. Rising share of current spending is detrimental to growth in the long run.

Continued fiscal deficits enlarge fiscal burden and raise public debt. But this burden can be minimized if the government succeeds in restoring consumer confidence and improve business sentiment. The finding of the paper indicates that there can be a less costly means of fiscal stimulus to achieve the same impact on growth.

References

- Akerlof, G. A., and Shiller, R.J. (2009). *Animal Spirits*. Princeton, NJ: Princeton University Press
- Akitoby, B. and T. Stratmann (2008) "Fiscal Policy and Financial Markets." *The Economic Journal* 118(533) 1971-1985.
- Alesina, A. and Perotti, R. (1996) "Fiscal discipline and the budget process," *American Economic Review*, 86(2), 401-406.
- Berg, A. and Sachs, J. D. (1988) "The debt crisis: Structural explanations of country performance," *Journal of Development Economics*, 29(3), 27-306.
- Hausmann, R., Rodriguez, F., and Wagner, R. (2006) "Growth Collapses," Working Paper No. 136, (April) Cambridge, Mass: Center for International Development.
- Libaˆnio, Gilberto A. (2009) "Aggregate demand and the endogeneity of the natural rate of growth: evidence from Latin American economies, *Cambridge Journal of Economics* 33, 967–984
- Mourmouras, Alexandros and Rangazas, Peter (2009) "Fiscal Policy and Economic Development" *Macroeconomic Dynamics*, 13(4), 450-76
- Rodrik, D., Subramanian A., and Trebbi, F. (2004) "Institution rule: The primacy of institutions over geography and integration in economic development" *Journal of Economic Growth*, 9(2), 131-65.
- Tavares, J. and Wacziarg, R. (2001) "How democracy affects growth" *European Economic Review*, 45(8), 134-78.
- Vergne, Clemence (2009) "Democracy, Elections and Allocation of Public Expenditures in Developing Countries" *European Journal of Political Economy*, 25(1), 63-77
- Yakovlev, P. (2007) "Arms trade. Military spending and economic growth," *Defense and Peace Economics*, 18(4), August, 317–338.

EXCHANGE RATE AND MONETARY POLICIES IN VIETNAM

**By: Dr. Nguyen Ngoc Thanh,
Dr. Pham Van Ha**

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1. Introduction

Vietnam has undergone an enormous change since it adopted an economic reform policy in the mid-80s of the last century. The first decade of the new millennium has seen an unprecedented change in the socio-economic landscape of the country. The economy has grown rapidly and it has deeply engaged into economic integration. In 2007, Vietnam has become a member of WTO, a step seen by many as the country's turning point in its economic policy towards a more market-oriented economy. Yet, this opening and economic reform has also posed a lot of challenges to the country. Increased trade and investment flows to the world and increasing exposure to external shocks requires a new skills and approach to macroeconomic management. Recent macroeconomic turbulences and the global financial crisis show the need to have better understanding of macroeconomic policies, particularly monetary policy, exchange rate policies, and their links.

This study will evaluate the effectiveness and limitations of monetary policy and exchange rate policies in maintaining high growth and price stability since 1991 up to now in order to draw policy lessons to Vietnam and as well as experiences to Cambodia, Lao and Thailand. In particular, the research is focused on analyzing: the relationship between Money supply (M2) and output (GDP), and relationship between inflation and unemployment; the impacts of exchange rate on imports and exports; and the links between money supply, inflation and exchange rate.

Review literature

There were many materials, articles relating the topic of monetary and exchange rates policies. In this paper, we will review only some article concerning directly to the effect of exchange rates on trade flows and the links between money supply, inflation, and exchange rates in the world and in Vietnam.

To analyze the effects of exchange rates and prices on trade flows, Bahmani-Oskooee (1986) estimated the magnitude and time path of the trade flows to

changes in the exchange rates and prices for seven countries (Brazil, Greece, India, Israel, Korea, South Africa and Thailand) in the period (1973-1980). His export and import demand functions included relative prices and effective exchange rates, and the Almond lag procedure was imposed. He found that “imports and exports reactions were quicker and the total response time was shorter when an exchange rate, rather than relative prices, caused a change in international prices” (Bahmani-Oskooee, 1986: 122) .

Tegene (1991) used two three variable VAR models to examine the response of exports and imports to small changes in relative prices and effective exchange rates. This study showed that the responses of both imports and exports to changes in relative prices are larger than to changes in exchange rates and the effect of exchange rate shocks to be shorter than for relative price shocks.

Deyak et al (1993) analyzed the adjustments of Canadian import demand to changes in income, prices and exchange rates. Their model specification used a polynomial lag structure, which allows them to examine long run elasticities and short run adjustments of imports to change in these variables. Quarterly data from 1958 to 1989 were used in this study. The results showed that the long run effects of exchange rate changes are similar in magnitude to those of domestic and foreign price effects. In the short run, imports react more quickly to change in both prices than to change in exchange rates.

Chua and Sharma (1998) investigated the dynamic response of imports and exports to changes in domestic prices, foreign prices and real effective exchange rate for Korea, the Philippines, Singapore and Thailand. These authors used VAR models and cointegration analysis to examine the long run relationship and short run dynamic of these variable. Quarterly data from 1974 to 1995 were used. The result showed that domestic and foreign prices have a larger impact on trade flows than the real effective exchange rates in all cases. There was no evidence for significant differences in the response time of import demand to shock in prices and exchange

rates... and in the countries where trade is highly restricted, the response of imports and exports to changes in prices is larger than in countries where trade is freer, etc

Deravi et al (1995) used a three vector autoregressive model of exchange rates, price level, and money supply (M2) to trace the link between these variables. There are only three of the above variables used in this model because: “In modeling the monetary approach to exchange rates, we purposely have chosen not to expand the system to include short and long term interest rates and other monetary or financial variables that might impact the behavior of exchange rates” (Deravi et al. 1995:43). In this model, Granger Causality tests, variable decomposition and impulse response were analyzed and their results showed that exchange rates and price level were monetary phenomena and money supply Granger causes both these variables. The variance decomposition results suggested that the money supply and exchange rates contributed to around 10% of inflation rate variation for order 1... and impulse response analysis also indicated that a depreciated dollar leads to a higher rate of inflation over a two year period.

Thanh and Kalirajian (2005) also estimated the effects of prices and exchange rates on the trade flows in Vietnam based on the model of Bahmani-Oskooee (1986). Quarterly data had been used from 1992 to 1998. The result showed that exchange rates and world income had larger effect on exports than prices in the long run in Vietnam in 1990s; this mean that the devaluation could stimulate exports over the long run, but in the short term, price effect on exports were larger than the exchange rate effects. Response of import demand to change in relative import prices were definitely larger than to change in the exchange rates. In fact, devaluation would not have any significant effect on the imports. Marshall-Lerner condition for the successful use of devaluation to improve exports and trade balance in Vietnam held for the 1990s.

Thanh and Kalirajian (2006), had used VAR model of three variables: money supply (M2), Inflation (CPI), and Exchange rates with quarterly data from 1992 to 1998 in Vietnam. The empirical results of this paper show that there has been two-

way causality between money supply growth and inflation, exchange rate and inflation, and money supply growth and exchange rate in Vietnam in the 1990s. Both the long run and short run results of this paper suggest that devaluation can be implemented to encourage exports and to improve current account balance and BOP, and also to reduce the real exchange rate appreciation in the short run.

2. Exchange rate and Monetary policies in Vietnam

Prior to 1989, Vietnam had a mono-bank system with the State Bank of Vietnam (SBV) acted as both a central and a commercial bank, which had a complete structure from central to local level with the headquarters in Hanoi and their branches in most cities, provinces and districts. In May 1990, under two decrees of law from the State Council, a two-tier banking system was established and it consisted of the SBV in the first tier and state owned commercial banks (SOCBs), other commercial banks, finance and insurance companies, credit cooperatives and people's credit funds in the second tier. The SBV became the central bank of Vietnam, the "bank of banks", which conducts the monetary policy to stabilize the value of the currency, assure safe banking activities, a secured system of credit organizations, and boost the socio-economic development in conformity with socialist orientations (The Law on the State Bank of Vietnam dated December 12, 1997 and the Amended Law on the State Bank of Vietnam, dated June 17, 2003). Since 1990, the SBV has to actively adjust its monetary policy and exchange rate policy to guide the economy successfully overcomes the 2 Asian and the current Global Financial crises.

2.1 The period before Asian Crisis (1997-1998):

Vietnam entering the 1990s with the experiences of hyperinflation from the second half of the 1980s. During the period from 1991-1997, Vietnam undertook a major stabilization effort in which restrictive monetary policy and fiscal policy played a key role¹, which has resulted in a manageable range for most of the time since 1996. Bringing inflation back under control was considered one of the most

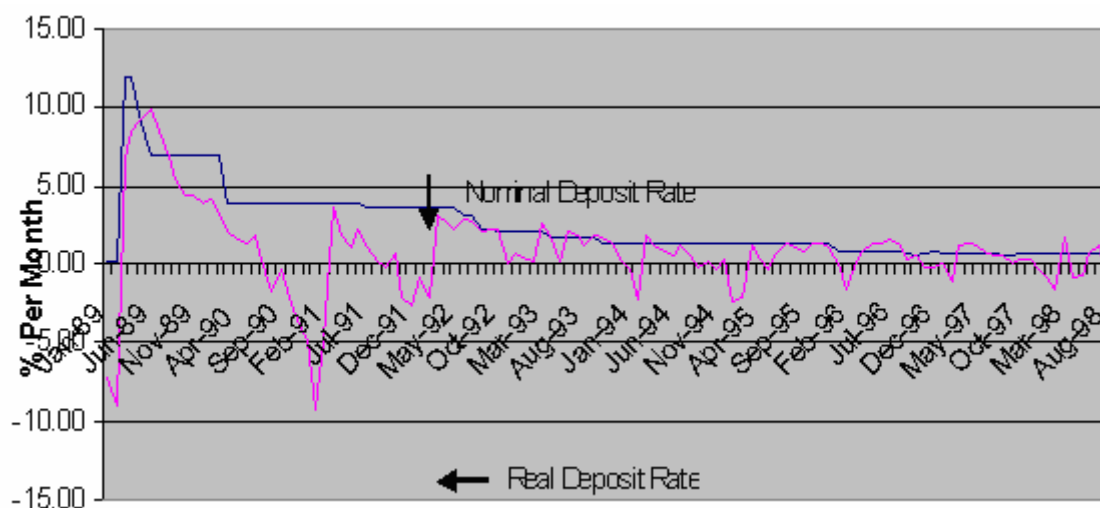
¹ Camen and Genberg, 2006

impressive successes in the early days of reform in Vietnam². Anti-inflation measures included the introduction of positive real rates of interest. The efforts also being helped with a greater fiscal discipline and tighten budgets.

2.1.1 Monetary policy

In the period before March 1992, the SBV set the interest rates for each type of official lending and deposit. The nominal deposit interest rates (DRs) in this period were set at a very low level, about 0.25 percent per month or 3 percent p.a., but they were pushed up suddenly to a very high level in March and April 1989 (12 percent p.m. or 144 percent p.a.) to combat with the hyperinflation in that period. After the surge, the rate reduced step by step to 3.5 percent p.m. (42 percent p.a.) in March 1992 (Figure 1). The situation with the DRs happened to the short-term lending rate (SLRs), medium and long-term lending rates (MLRs) in that period as well. With inflation under control, the deposit rate gradually reduced to 9.6% p.a in 1996.

Figure 1: Monthly Deposit Interest Rate (01/1989-08/1998)



Increasing the nominal DRs was a method used by the SBV to absorb the cash in circulation; it helped to bring down inflation from about 300 percent p.a. in the late 1980s to more than 10 percent in 1992. A high real deposit rate stimulated

² Le Dang Doanh 2002

the households to shift their wealth into financial savings. The money supply growth in the period has reduced from 78.7% in 1991 to 22.7% in 1996 (ADB 2010). The gap in the monetary market was thus closed and interrupted the inflationary pressure.

2.1.2 Exchange rate policy

Before 1990, the Vietnamese exchange rate regime was a fixed exchange rate regime with a multiple exchange rate system: the official exchange rate for external trade; the remittances rates for Vietnamese living abroad; and the non-commercial transaction rate (e.g. tourism, services of foreign experts, and remittances for foreigners)³. Perceiving that the fixed exchange rate regime with multiple rates was not appropriate in the transition to a market oriented economy and to promote exports and investment, the government decided to unify the three exchange rates in March 1989. Therefore, in the period from March 1989 to August 1991, exchange rate were unified and adjusted following the market. Since September 1991, exchange rate has been gradually determined by market forces. This exchange rate policy also helps the government to manage foreign exchange that a part of monetary management to lower inflation and contribute to promote foreign trade and investment.

With tight Monetary policy combined effectively with fiscal policy through a stabilization program, inflation was brought down from 308.2 percent in 1988 to 34.7 percent in 1989, and although it soared to more than 60 percent p.a. during 1990-1991, it was brought down again and maintained at around 10 percent or single digit level during the period 1992-1997. During that time, real GDP grew at a high average rate of 7.9 percent p.a., annual growth rate of exports and imports were around 28 percent to 30 percent.

³ See Brahm (1992).

2.2 The period of Asian financial crisis (1997-1998) and its aftermath

The Asian financial crisis started from Thailand in July 1997 and swept through Southeast Asian countries, causing a recession in these economies that were called The Asian miracle before. While other neighboring economies were heavily affected by the financial crisis, Vietnamese economy was affected *by the "lag" effect*. In 1997, while the average economic growth of these economies was 5.5 percent, Vietnam still achieved the growth rate of 8.2 percent. In 1998, while most of the other economies experienced negative growth, GDP of Vietnam still grew at 5.8 percent, the highest in the region. However, growth rate of Vietnam declined to from 2-3 percent to compare with average growth rate of 7.9 percent during period from 1990 to 1996. The lowest economic growth of Vietnamese economy is 4.8% in 1999, before the economy recovered to its high economic growth path in 2004-2007.

Inflation also increased from 3.6 percent in 1997 to 9.2 percent in 1998. The crisis also affected foreign trade of Vietnam, export growth rate declined from 41 percent in 1996 to 24.8 percent and 2.4 percent in 1997 and 1998, respectively. Similarly, Import growth rate also went down from 39 percent in 1996 to minus 0.2 percent in 1997 and minus 0.1 percent in 1998. FDI also declined to 60 percent and 70 percent in 1997 and 1998, respectively to compare with 1996.

2.2.1 Monetary policy

During the crisis period and its aftermath, interest rate policy was liberalized step by step and interest rates were gradually reduced to combat recession. From January 1996 to December 1997, based on the development of the money market demand and supply of credit and low inflation, the SBV abolished the floor on deposit rates (free to be determined by the banks and credit organizations). However, the SBV still set the ceiling on lending rates and the spread between the lending rates and deposit rates was set at 0.35 percent p.m. (4.2 percent p.a.). The

special interest rates were replaced by different ceilings for lending rates for urban and rural areas.

The refinancing rate had also been reduced in the aftermath of the crisis. From March 1997 to January 1999, the refinancing rates were set in a range from 1.1 to 0.9 percent p.m. (or 13.2- 10.8 percent p.a.) for all other credit institutions. These rates were lower than the nominal short, medium and long-term lending rates in the period 1997-1998. During 1999, when the inflation was closed to zero (0.1 percent pa); the new refinancing rates were reduced four times from 1.1 percent p.m. to 0.5 percent p.m. (13.2 percent to 6 percent p.a.). These are also lower than the nominal SLR and MLR in 1999. This policy may extend more credit to the economy in order to stimulate investment and economic growth.

The reserve requirement (RR) is also has been used to boost the economy. Since March 1, 1999, the RR has been reduced to 7 percent (from 10% previously), and then continuously to 6 and 5 percent in June and July 1999 for all deposits of less than 12 months maturity.

With the relax in the monetary policy attitude, the money supply growth has risen from 26.1% in 1997 to a peak 56.2% in 2000. The M2/GDP ratio therefore has increased from 26% in 1997 to 94.7% in 2006 (ADB 2010). The money growth has facilitated economic growth during that period.

Table 1: Money and macroeconomic indicators in 1997-2006 (% p.a.).

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Money supply (M2) annual change, percent	26.1	25.6	39.3	56.2	25.5	17.6	24.9	29.5	29.7	33.6
M2 percent of GDP at current market prices	26.0	28.4	35.7	50.5	58.1	61.4	67.0	74.4	82.3	94.7

Consumer price index	3.2	7.8	4.3	-1.6	-0.5	4.0	3.2	7.8	8.3	7.1
GDP growth rate	8.2	5.8	4.8	6.8	6.9	7.1	7.3	7.8	8.4	8.2
Export growth rate	26.6	1.9	23.3	25.5	3.8	11.2	20.6	31.4	22.5	22.7
Import growth rate	4.0	-0.8	2.1	33.2	3.7	21.8	27.9	26.6	15.0	22.1
Overall budgetary surplus/deficit (%/GDP)	-3.9	-1.6	-3.3	-4.3	-3.5	-2.3	-2.2	0.2	-1.1	1.3

Source: ADB (2010).

2.2.3 Exchange rate policy

Vietnam faced intense pressure to devalue Dong in the aftermath of the crisis as devaluations were going around the region. The SBV had to widen the trading band around the VND to USD rate from ± 1 percent to ± 5 percent on 27 February 1997, and then again to ± 10 percent in October 1997 to make exchange rate more flexible to market conditions (in the country and region) and facilitate forex transactions.

In 1998, the economy faced more difficulties as a result of the financial crisis such as the lack of foreign exchange supply, that the competitiveness was relatively poor due to the heavily devaluation by neighboring countries, and that exports were slow. The SBV introduced two measures to cope with these difficulties. First, Decision 37/1998 QD-TTg promulgated on February 14, 1998 required resident business organizations to surrender 80 percent of their new foreign exchange (forex) earnings to commercial banks within 15 days of receipt (when they need forex, they could buy back the forex according to interbank rates at that times). Second, official exchange rates were devalued from VND 11, 175: US\$1 to VND 11, 800: US\$1 on February 16 and the band of ± 10 percent were maintained. On 7 August 1998, the official exchange rates were set to VND 12,999: US\$1 (which mean that the official

exchange rate was devalued by more than 16 percent compared to the period prior to February 16) and the band were narrow to ± 7 percent. Therefore, from August 7, the official exchange rate was devalued by more than 23 percent compared to the period prior to February 16. This measure put the exchange rate closer to the market rates (interbank and free market rates), created conditions for balancing the demand of forex for enterprises and banks, and reduced the incentives for speculation and hoarding of forex. It also ceased the pressure on dong devaluation and encouraged exports, narrowed trade deficit.

A further encouraging step towards more competitive exchange rate was the announcement by the SBV on 26 February 1999 that abolished the official rate. The government would influence the exchange rate through the interbank markets. This arrangement made the management of the exchange rate more flexible.

In short, the successful devaluation of the official exchange rate was supported by cutting budget deficit and tightening domestic credit. If supporting policies had been lacking, the devaluation may have result in only temporary reduction of parallel market premium. This is suggested from theories and evidence from many countries (Dosworth et al. 1996) and in the case of Vietnam, this is not exceptional; during the time of financial crisis in 1997 and 1998, M2 grew at rates of 26 and 25 percent p.a., budget deficits were relatively low (Table 1).

2.3 The period of Global financial crisis and aftermath (2007-2011)

The current global crisis, which begun with the collapse in U.S. sub-prime mortgage market, wept out the global financial system and Vietnam is not an exception. Even before the crisis's commencement, Vietnam started facing massive challenges at the beginning of 2008: stock markets slumped; inflation pressure has been buiding-up with the high money supply growth in the aftermath of the Asian crisis: the cumulated inflation in the first 3 months of 2008 surpassed 9 percent, then shortly reached to 15 percent in May and 23.3 percent per annum (p.a.) in December. Trade deficit mounted to US\$ 14 billion.

The crisis helped bringing down inflation in 2009 as the commodity prices felled world wide. Nevertheless, as the country growth engine – the export – has slumped the country faced a massive pressure to maintain its much needed economic growth. The economic growth in the first quarter of 2009 was at a record low level 3.1% p.a.. To combat the economic slowing down, monetary (and fiscal policy) was on the expansionary again mode with a massive government stimulus package.

2.3.1 Monetary policy

In the period from 2007 (just before the global crisis) to 2011, the monetary policy in Vietnam experienced 3 distinguishable sub-periods: The tightening monetary period, from late 2007 to September 2008; The somewhat loosening monetary period and demand stimulus, from September 2008 to the first half of 2010; The second tightening monetary period from the second half of 2010, especially at the beginning of 2011 the monetary policy turn precautious again to cope with the rising trend in inflation.

Since January 2007 the SBV has raised the interest rates including the base rate, lending rate ceiling, etc to response to inflation. Within 9 months (January to September 2008), base rate was increased 3 times, from 8.3 to 8.8, 12, and 14 percent p.a.. Similarly, lending rate ceiling also increased from 14.6 to 18 and 19.5 percent p.a.. This response of SBV was timely and effective. Inflation started to fall sharply in June after climbing to the peak of 28.3 percent p.a. and then the SBV reduced base rate and lending rate ceiling to 7 and 10.5 percent in February 2009, respectively.

During the 2009 and the first half of 2010, the targets of monetary policy were combining the inflation control and economic growth. The SBV still maintaining the base interest rate from 7-8%pa and lending rate from 12% pa until April 2010, and since May 2010, lending rate was phasing out and the commercial banks can apply bargaining lending rates' policy with their customers. As a result,

Economic growth rate in 2009 was about 6.5%; inflation has been controlled at 6.5% pa in 2009.

At the end of 2010, the inflation pressure is mounting again, the State Bank of Vietnam is again return to precautious policy stance and allow the deposit rate of the commercial banks risen beyond 12%. The monetary policy point of views is even more tightening in the beginning of 2011 with the credit growth target revised down to 20% from 29,81% in 2010.

Along with the base interest rate, the rediscount and refinancing rate were also increased to 7.5 percent and then 13, 15 percent in January-September 2008 period, from a low level 6.5 to 4.5 percent p.a. prior to January 2008.

The reserve requirements were also actively revised to reflex the change in monetary policy point of view in 2007-2011. During the period of 2000 to 2007, reserve requirement rates were set below 5 and 8 percent p.a. for non-term domestic and foreign currencies deposits. Since June 2007, these were increased to 10 percent for all no term currency and for deposits, which has maturity longer than 12 months. It was continuously to rise to 11 percent and 5 percent respectively until October 2008 and then began to reduce to 8 and 5 percent in September 2008. Now (may of 2011), the reserve requirements are set below 3% for Vietnamese Dong deposit and below 6% for foreign currencies deposits. The surge in foreign currency reserve requirements recently is to combat the dollarization that drain the official foreign exchange reserve in the past since 2009.

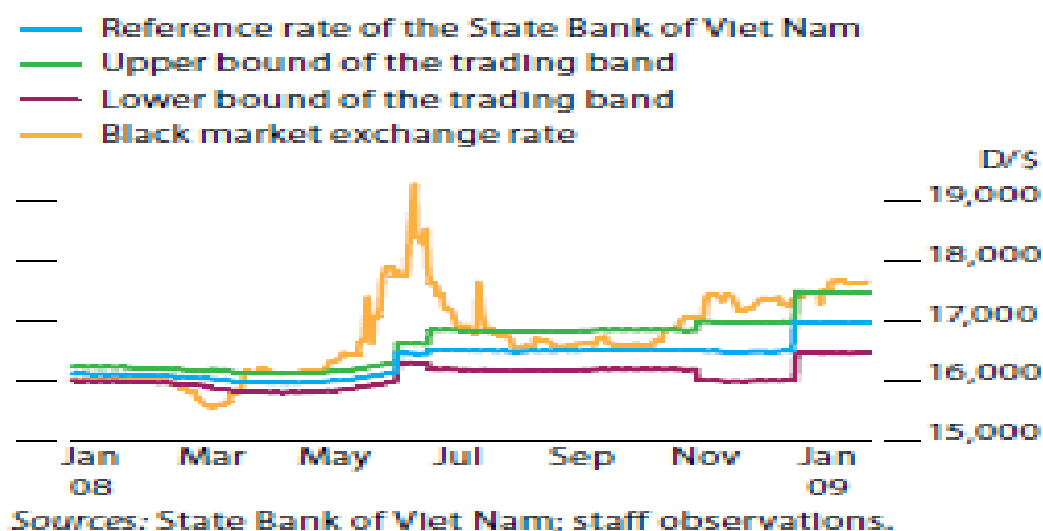
Additionally, the SBV also actively conducted open market operations to adjust the money supply.

2.3.2 Exchange rate policy

During 2008, Viet Nam maintained a de facto crawling peg exchange rate regime with a trading band in relation to the US dollar and the band was 3 times expanded to +/-3 percent from +/-0.75 percent of interbank rates since December

2007 to November 2008. So the cumulative devaluation for 2008 is 5.25 percent possibly to help dampen inflation pressure and encourage exports (Figure 2).

Figure 2: Exchange rate⁴

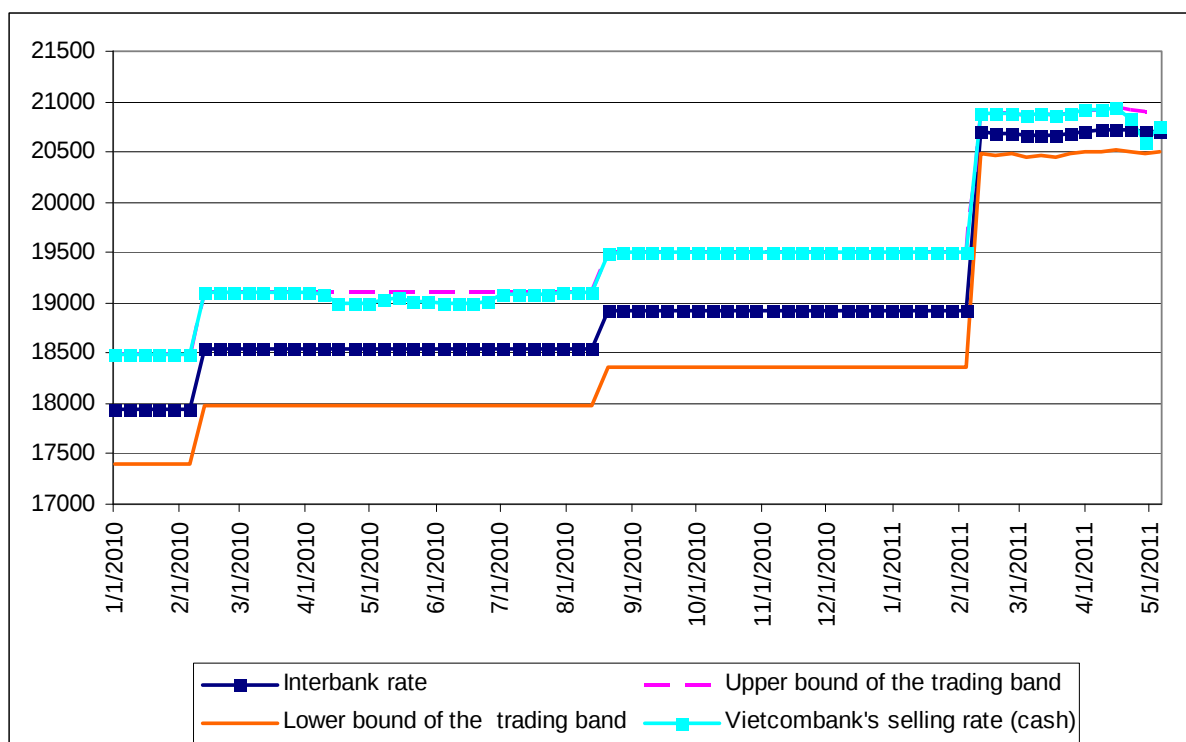


In 2009, the exchange rate policy of the State bank of Vietnam is pointed toward exchange rate stability with the trading band has been adjusted only 2 times: from +/-3 to +/-5 in March and back to +/-3 in November. The interbank rate has also been kept relatively stable with only one significant correction (5.5% adjustment at the time of narrowing down the trading band, see Figure 3). Totally, throughout the year, the interbank rate has been depreciated 5.7%.

The market was however in tension, the buying rate of commercial banks are frequently found at the ceiling rate, and the State bank had to be very active in market intervention. The official foreign exchange reserve reduced significantly, from (estimated) 23 billions USD at the end of 2008 to (estimated) 14.1 billions USD at the end of 2009 (IMF 2010).

Figure 3: Exchange rate development in 2009-2010

⁴ From Asian Development Outlook, 2009



Source: State Bank of Vietnam (2011), Vietnam Foreign Trade Bank (2011).

In 2010, the stability was again in the center of exchange rate policy. The interbank rate has been adjusted significantly only 2 times: 3.3% in February and 2% in August. The tension in the market has been loosening a bit in May and June with the buying rate of commercial banks below the ceiling. The market was in tension again with the Vietcombank's buying rate peaked at the ceiling at the end of the year when the liquidity was needed for import to prepare for the New Year Holidays.

In 2011, after 5 months keeping the interbank rate stable, the State Bank of Vietnam adjust the interbank market 9.3% and narrow down the trade band to +/- 1% from +/- 3%. The bold adjustment is aimed to fix the tension in the foreign exchange market by narrowing down the central rate and the buying rate of the commercial bank and to address the country's trade deficit problem. The market reaction is mixed in the first weeks of the adjustment. The Vietcombank's buying rate is quickly peaked at the new ceiling again. The tension in the foreign exchange market has cooled down only when the SBV took a bold measure to reduce the USD deposit rate to 3% p.a (vs 14% p.a. deposit rate in Vietnamese Dong) at the end of April 2011.

2.3.3 Other policies

As the impacts of the global financial crisis become prominent, in early December 2008, the Government announced to launch a fiscal stimulus package of about US\$1 billion and then the second US\$8 billions packages to prevent economic recession, encourage consumption and investment, create jobs and reduce unemployment, and supporting SMEs.

The bold fiscal stimulus packages with the money expansion help the Vietnamese economy escape a recession during and after global crisis. Nevertheless, huge fiscal and monetary stimulus also create problems. Inflation has risen to the double digit number again (11.75 % p.a. in 2010). That prompt the government to go to tighten policy mode again in 2011.

2.4 General Assessment of the achievements and shortcomings of Monetary Policy during the reform process

2.4.1 The achievements of SBV in conducting monetary policy

Through conducting monetary policy during three critical periods, the SBV obtained some impressive achievements as follows:

- All the ultimate targets of monetary policy were achieved. Inflation was brought down and macroeconomic stability was maintained, economic growth rate was around 7 percent during 20 years, which was the second highest growth rate in the region, unemployment was in a low range of 4 to 6 percent p.a., and external balance was adequate.
- Monetary instruments have been used effectively and more rely on indirect instruments, which were effective instruments for a modern central bank.

- Exchange rate policy was managed flexibly which contributed to the success of monetary policy implementation.
- Monetary policy was combined effectively with fiscal policy to curbing inflation (when inflation occurred).

2.4.2 Shortcomings

- The level of independence of the SBV has been very low. The SBV usually accommodate the fiscal policy like the case in the first period, and every year the SBV has to supply the substantial amount of credit to the state budget; and according to the regulation, this credit must be returned within a fiscal year; in fact this credit was never paidback on time then this will increase money base and pressure on inflation. (COE, 2008)
- Weak forecasting in the financial sector. Therefore, the SBV was in some ways to response passively to the overheating of economic growth and the phenomena of financial crisis.
- The conducting monetary policy in the last period was not consistent, and this reflects the lack of professional techniques in conducting precisely and smoothly monetary policy.

3. Econometric Analysis:

The section is focused on the empirical evaluation of the monetary policy (in particular the money supply and the exchange rate policy) on the Vietnamese import, export and other key macroeconomic indicators.

3.1 World demand for Vietnamese export:

3.1.1 Model specification:

Long run model for the world demand for Vietnamese export (hereafter export demand model):

The export demand of the world for a country's export depends on the relative prices of the country's export, the exchange rate and the world income. In log linear form, the export demand can be expressed as of the following;

$$\ln X = \alpha + \beta \ln YW + \gamma \ln \left(\frac{PVNX}{PWXT} \right) + \delta \ln E + \varepsilon \quad (1)$$

Where:

$\ln$ is the natural log operator

X is the index volume of the country's export to its trading partners

YW is weighted average of real GDP of the country's trading partners

$PVNX$ is the country's export price index

$PWXT$ is the world's export price index

E is the exchange rate. It is defined as the number of units of domestic currency per unit of foreign currency.

The parameters of export equation are:

β is the income elasticity. We expect $\beta > 0$, since an increase in world income should increase demand for export.

γ is the price elasticity of the export demand. γ is expected to be negative as lower export price should boost the export demand.

δ is the exchange rate elasticity of the export demand. As the exchange rate is defined as the units of domestic currency per unit of foreign currency, δ is expected to be positive. An increase in the exchange rate (depreciation) should promote export.

In the case of Vietnam, we use the relative price index ($PVNX/PWXT$) instead of $PVNX$ per se to take into account the relative price of Vietnamese export

in comparison of the world export price. Here we assume some product differentials, so that the Vietnamese export can deviate from the world export price. Furthermore, in constructing $PWXT$ we consider only the primary export price index to reflexes the composition of the Vietnamese export (mostly primary goods, less manufactured goods).

As all the variables in Equation (1) are expected to be non-stationary, Equation (1) is the long run relationship between export demand, income, prices and the exchange rate. The long run relationship will be verified if the residuals of the regression results from Equation (1) are stationary, and the short-run ECM model can also be estimated.

Error-Correction Model for export demand:

$$DLnX_t = \rho\varepsilon_{t-1} + \sum_{i=1}^n DLnX_{t-i} + \sum_{i=0}^n DLnYW_{t-i} + \sum_{i=0}^n DLn\left(\frac{PVNX_{t-i}}{PXWXT_{t-i}}\right) + \sum_{i=0}^n DLnE_{t-i} + \omega_t \quad (2)$$

Where

D is the first difference operator.

ε_{t-1} is the residuals from the long run relationship equation estimation and represents the error-correction term

ω_t is the disturbance term.

If the residual term ε_t is stationary, we expect $-1 < \rho < 0$.

3.1.2 Data description:

The data are quarterly collected for the period from 1992Q4 to 2009Q4.

The volume of export (X) is constructed by adding-up import (in USD) from Vietnam's trading partners (12 countries included: Australia, Canada, France, Germany, Japan, Korea, Republic of, Netherlands, Singapore, Sweden, Thailand, United Kingdom, United States). The import data is taken from the IMF's DOT

database. Some missing values (export to Singapore in 1993Q1) are calculated by simple average of the two closest quarters.

YW is weighted average of real GDP of the 12 Vietnam's trading partners. Data is retrieved from the IMF's IFS database. The quarterly data for Thailand's GDP from 1992Q4 to 1993Q4 is taken from (ABEYSINGHE T. and RAJAGURU G., 2004). The GDP of a country is taken as the share of Vietnamese export to that country (as in the above).

$PVNX$ is Vietnam export price index calculated from the world commodities' indices from IMF (5 commodities' indices has been used: Edibles Index (food); Index of Beverages, Coffee, Cocoa, and Tea; Index of Agricultural Raw Materials; Average Petroleum Spot index of UK Brent, Dubai, and West Texas; Index of Industrial Inputs with Vietnamese export composition as weights. The Vietnamese export composition share is the yearly data from the General statistical office of Vietnam. The composition is assumed to be uniform in a year.

$PWTX$ is NON FUEL COMMODITIES INDEX from commodities' price index database of the IMF.

We consider two exchange rates in the paper: one is the nominal effective exchange rate and the nominal exchange rate itself. The nominal effective exchange rate is calculated by weighted average of the nominal rates (from IMF's IFS database) with the weights are the import from the 12 trading partners.

The nominal cross rates are calculated from the relevant rate in USD and the VND/USD rate. To reflex real market rate in Vietnamese, we choose the rate quoted by Vietcombank of Vietnam (VCB), the leading commercial bank in Vietnam. Besides the fact that it is one of the leading commercial banks in Vietnam, Vietcombank always takes the largest share in the interbank foreign exchange market in Vietnam. Therefore, the Vietcombank rate is the most important rate in the foreign exchange market in Vietnam.

3.2.3 Empirical results and interpretations

Unit root tests

As variables in the export demand function are expected to be non-stationary, the unit root tests are applied to all variables. Table 2 shows the tests' results. Augmented Dickey-Fuller tests confirm that all variables are integrated of order 1. With the results the 2-steps co-integration estimation of the export demand function can be carried out.

Table 2: Unit root test for the export demand function.

	LnX	LnYW	LnPX	LnNEERVCB	LnVCB
Level variables					
Augmented Dickey-Fuller test statistic	-0.702757	-0.799113	-1.688115	-0.331818	-0.357106
Lag Length:	0	7	0	0	0
First Difference					
Augmented Dickey-Fuller test statistic	-11.52712***	-3.663767***	-7.812392***	-9.256024***	-8.034855***
Lag Length:	0	6	0	0	0

Source: Author's calculation.

Estimation results

2 variants of the long-run relationship of the export demand function are estimated: one with the nominal real effective exchange rate and the other with the Vietcombank rate. The nominal effective exchange rate version of the export demand function shows a better result than the Vietcombank rate version, with the exchange rate coefficient (δ) is significant when NEER is used instead of VCB. The fitness coefficient (R2) is also slightly better in the case when NEER is being used.

The income elasticities are significant and have correct (positive) signs in both equations. The magnitudes of the income elasticity in both equation are nearly the same at 6.7 (see Table 3), that means keeping everything else unchanged, 1 percent increase in world income will lead to 6.7% increase in Vietnamese export to the 12 partners countries.

The export demand relative price elasticities are not significant in both equations. The export demand relative price elasticity even has an incorrect sign in the case when the Vietcombank rate is being used. The facts that both price elasticity are insignificant maybe due to the use of world commodity prices instead of the Vietnamese export price index. Unfortunately, the Vietnamese export price index is not published quarterly; therefore it is desirable for the Vietnamese Statistical Office to collect and public the export price index on quarterly, even monthly basic to improve trade policy analysis in Vietnam.

The nominal real effective exchange rate is important in the determination of export demand of Vietnamese goods with the exchange rate elasticity of export demand is significant at 5%. The elasticity is valued at 0.63 that means keeping other things constant, 1% increase in the nominal effective exchange rate will lead to 0.63% increase in the demand of Vietnamese goods in the 12 partner's countries.

Table 3: Long-run export demand model estimation results.

Model	With NEER	With VCB
LN _{YW}	6.653624***	6.670597***
LN(PVNX/PWTX)	-0.181976	0.046628
LNNEERVCB (or LNVCB)	0.634514**	0.420858
C	-0.533358***	-0.514416***
R-squared	0.971184	0.969003
Adjusted R-squared	0.969854	0.967572
F-statistic	730.2194	677.3164
Durbin-Watson stat	1.290312	1.163536

Source: Author's calculation.

The long run estimation results are similar to the findings in Thanh and Kalirajan (2005). The coefficient sign are similar, while the magnitudes are not too far different. The coefficient of the world income is slightly higher in our case (6.65 vs. 6.49) and the exchange rate impact (to the export demand) is lower in our case (0.63 vs. 0.94). Our findings also confirm the findings of Thanh and Kalirajan (2005) on the importance of relative price level of Vietnamese export to the export

demand: it is still insignificant. Thank to the fact that our sample is much bigger (from 1992Q4 to 2009Q4 vs. 1992Q4 to 1998Q4) our estimation results clearly further improve the findings of Thanh and Kalirajan (2005).

Residuals co-integration test

The above inference of long run estimation results can only be valid if the residuals from the estimation are stationary. In that case, we can say that the above variables are co-integrated and the long run equations represent long run relationship between the export demand of Vietnamese goods, the world income, the relative export prices, and the exchange rate. The long run relationship can be confirmed in Table 4. The Augmented Dickey-Fuller test statistics show that the residuals from the estimation equation with nominal effective exchange rate are stationary at 5% significance level and the residuals from the estimation equation with Vietcombank rate are stationary at 10% significance level.

Table 4: Unit root test of the residuals from long run model estimations.

	With NEER	With VCB
Level variables		
Augmented Dickey-Fuller test statistic	-3.180562**	-2.677521*
Lag Length:	4	4

Source: Author's calculation.

Short-run Error-Correction Model

With the favorable results in residuals unit roots testing, we can go ahead with the short-run error-correction estimation.

Table 5 shows the results from the short-run co-integration estimation. The adjustment coefficient is slightly higher in the case of the nominal effective exchange rate. Nevertheless, both coefficients have a correct sign and magnitude (negative and greater than -1) and are significant at 1% significance level.

The change in the world income in current quarter (over the last quarter) is the only factor that has a short-run significant impact (at 5% level) on the export demand of the Vietnamese goods and services in the case when nominal effective exchange rate is being used. The change in the world income in current quarter also has a significant short-run impact (at 5% level) on the export demand of Vietnamese goods and services in the case of Vietcombank rate. In both cases, the coefficients of the change in the world income have an expected positive sign. That means, in the short-run the export demand of Vietnamese goods and services will increase (toward its long run equilibrium level) as the world income increases.

Interestingly, the change in relative price in the last quarter will have a significant short-run impact (at 10% significance level) when the Vietcombank rate is being used despite the fact that the relative price has no significant long-run impact. Nevertheless, the coefficient has a wrong sign (an increase in relative price in the last quarter will have a positive short-run impact on the export demand of Vietnamese goods and services). The fact supports the previous observation that the model with nominal effective exchange rate maybe preferable to the model with Vietcombank rate in the case of the export demand model.

Table 5: Error-Correction Model for export demand.

Model	With NEER	With VCB
RES(-1)	-0.351118***	-0.304992***
D(LNX(-1))	-0.042920	-0.047027
D(LNYW)	2.045529**	1.794538**
D(LNYW(-1))	-0.101050	-0.126800
D(LN(PVNX/PWTX))	0.265439	0.342023
D(LN(PVNX(-1)/PWTX(-1)))	0.451888	0.525534*
D(LNNEER) or D(LNVCB)	0.239924	0.670225
D(LNNEER(-1)) or D(LNVCB(-1))	-0.095497	0.360193
R-squared	0.178489	0.148125
Adjusted R-squared	0.081022	0.047055
Durbin-Watson stat	2.134420	2.143360

Source: Author's calculation.

The estimation of the export demand model suggests that the nominal effective rate is preferred to the bilateral USD/VND exchange rate as a tool of trade

policy. The world income is the most important factor that defines the world's demand of Vietnamese goods and services. An increase in the world's income will have a positive impact both in the long and short-run on Vietnamese export. On the other hand, a recession in the world economy will impose many difficulties on the Vietnamese export. The findings support Thanh and Kalirajan's (2005) that the exchange rate and world income had larger effects on Vietnamese export than export prices in the long run.

3.2 Import demand function:

3.2.1 Model specification:

Long run import demand model

The import demand for a country is, first of all, a function of domestic real income. Secondly, the import demand is expected to be negatively related to the difference between the price of domestically produced good and the price of imported good. In the model, we also consider the effect of trade openness by adding the import penetration ratio. And finally, we also examine the effect of the exchange rate on the import demand (the relationship is expected to be negative). Accordingly, the long run import demand function for Vietnam is followed:

$$\ln M = \alpha + \beta \ln IND + \gamma \ln \left(\frac{PVNM}{PD} \right) + \delta RIPR + \lambda \ln E + \varepsilon \quad (3)$$

Where

M is the index of the volume of Vietnamese imports from 12 trading partners.

IND is the volume of industrial production and proxies the country's income. The industrial production is used to proxy the income as the quarterly GDP was not available during 1990s. The share of industry in GDP has risen from 30 to proximately 40% now a day.

$PVNM$ is the import price index

PD is the domestic price index proxies by CPI

$RIPR$ is the import-penetration rate

E is the exchange rate

And ε is the error term.

β is the income elasticity (or industrial production elasticity), which is expected to be positive as an increase in income will lead to more import.

γ Is the relative price elasticity. γ is expected to be negative as higher relative price of the imported goods will reduce the demand on imported goods.

δ is the coefficient of penetration rate and is expected to be positive as more trade openness will lead to higher import demand.

The elasticity of import demand to the exchange rate (λ) is expected to be negative to reflex the fact that devaluation of the domestic currency will have a negative impact on the import.

With the results from estimation of long run equation we can construct the short-run error correction model:

$$DLnM_t = \varphi_0 + \rho\varepsilon_{t-1} + \sum_{i=1}^n \varphi_{1i}DLnM_{t-i} + \sum_{i=0}^n \varphi_{2i}DLnIND_{t-i} + \sum_{i=0}^n \varphi_{3i}DLn\left(\frac{PVNM_{t-i}}{PD_{t-i}}\right) + \sum_{i=0}^n \varphi_{4i}DRIPR_{t-i} + \sum_{i=0}^n \varphi_{5i}DLnE_{t-i} + v_t \quad (4)$$

Where

D is the differential operator.

ε_t is the residuals from long run equation estimation

v_t is the residuals of the short-run co-integration equation

The adjustment coefficient ρ is also expected to be in $[-1,0]$.

3.2.2 Data description

IND is the index of industrial production. Data is taken from GSO, Vietnam.

PVNM Vietnam import price index calculated from the world commodities' indices with Vietnamese import composition as weights.

PD is the Vietnam's CPI also from GSO.

RIPR is the Vietnam's real import-penetration ratio and is defined in the following formula:

$$RIPR = \frac{IMPORT}{(IND + IMPORT - EXPORT)} \quad (5)$$

To avoid the correlation between RIPR and the residuals from long run model (ε) problem we do not use the total country's export and import, not the import and export from the above 12 partner countries. The IMPORT and EXPORT statistics is from the IMF's DOT database.

The exchange rate (both VCB and NEER) are as of the above (export demand model section).

3.2.3 Empirical results and interpretations

Unit root tests

Augmented Dickey-Fuller Tests show that all variable of the import demand equation are integrated of orders one. Table 6 shows that the null hypothesis of non-stationary can be rejected at 1% significance level with the first differenced data, while such a hypothesis can not be ruled out for the level data.

Table 6: Unit root test for the import demand function.

	LnM	LnIND	LnPVNM	LnCPI
Level				

variables				
Augmented Dickey-Fuller test statistic	-0.692890	-0.095391	-1.006433	0.862268
Lag Length:	0	3	2	5
First Difference				
Augmented Dickey Fuller test statistic	-12.05210***	-11.36001***	-6.266928***	-3.699323***
Lag Length:	0	2	1	4

Source: Author's calculation.

3.2.4 Estimation results

Long-run Model

With the unit root test results, we can go ahead with the estimation of long-run import model. Unlike the case of export demand model, in the import demand function the version with Vietcombank rate is preferred to the case where nominal effective exchange rate is being used. Nearly all coefficients (except the coefficient for S4) are significant at least at 5% level in the case where the Vietcombank rate is being used. Meanwhile, there is only 3 coefficients in the case of nominal effective exchange rate are significant. Other statistics, for example R2, DW, F-statistic are also better in the model with the Vietcombank rate.

The estimation result is a no surprise because of the dollarization of the Vietnamese economy. Nearly all Vietnamese import from the world is being paid in USD; therefore the exchange rate between USD/VND is much more important to the import demand rather than the nominal effective exchange rate.

Table 7: Long-run import demand model estimation results.

Model	With NEER	With VCB
LNIND	0.775141***	1.156681***
LN(PVNM/PD)	0.043542	-0.217785**
RIPR	0.666025***	0.633357***

LNNEER (or LNVCB)	0.314340	-1.436916***
C	-0.714611***	-0.661865***
R-squared	0.983705	0.986901
Adjusted R-squared	0.982687	0.986082
F-statistic	965.9000	1205.431
Durbin-Watson stat	1.056444	1.398418

Source: Author's calculation.

The income elasticity (or industrial production elasticity) of the import demand is significant (at 1% level) and has correct sign in both equations. The coefficient is greater in the Vietcombank rate equation. 1% increase in domestic income (or industrial production) will lead to 1.16% increase in import in the Vietcombank rate equation, while the same increase in income will only generate 0.78% increase in import when the nominal effective exchange rate is being used.

The relative price elasticity (between imported and domestically produced good $PVNM/PD$) of import demand is significant (at 5% level) and has the correct sign only in the case when the Vietcombank rate is being used. 1% increase in the relative price will reduce the import demand by 0.22%.

The coefficient of trade openness is significant (at 1% level) and has the correct sign in both cases. The magnitude is also approximately equal: 0.67 in the case of nominal effective exchange rate and 0.63 in the case of Vietcombank rate.

The exchange rate elasticity of import demand is only significant (at 1% level) and has a correct sign in the Vietcombank rate equation. The results from Table 7 show that import is very sensible with the VND/USD exchange rate, 1% increase in the exchange rate will reduce import by 1.44%.

Our long run estimation results (with VCB rate) are looked more favorable than the previous estimation in Thanh and Kalirajan (2005). All the coefficients of the import demand function in our case have expected signs and are significant (with the exception of the seasonal dummy variables S_4). On the other hand, Thanh and Kalirajan (2005) found the coefficients of $\ln IND$ (proxy for income level) and exchange rate ($\ln E$) is insignificant. Furthermore, the coefficient of the domestic

income (proxy by IND) is expectedly found significantly positive in our case, a much better result than Thanh and Kalirajan's (2005) findings (negative). The coefficient of the exchange rate is also much higher in magnitude in our case than in Thanh and Kalirajan (2005) (-1.44 vs. -0.26). The coefficient of the trade openness (proxy by RIPR) is slightly lower in our case (0.63 vs. 0.93).

Residuals co-integration test

The above results of long-run estimation equation are only valid when the residuals from estimation of that equation are stationary. Table 8 confirms the hypothesis (residuals are stationary) for both equation (with VCB or NEER) at 1% significant level.

Table 8: Unit root test of the residuals from long run import model estimation.

	With NEER	With VCB
Level variables		
Augmented Dickey-Fuller test statistic	-4.822855***	-5.871496***
Lag Length:	0	0

Source: Author's calculation.

Short-run model

The favorable unit root testing of the residuals allow us to estimate the short-run error-correction version of the import demand function. Table 9 reports the results of the short-run equation estimation.

The coefficients of the lag residuals are both significant at 1% and have appropriate value. The adjustment coefficient is -0.38 in the case of nominal effective rate, while the deviation from long-run equilibrium value of the import demand is adjust quicker in the case of the Vietcombank rate, which equal to -0.67.

Current income has a short-run significant impact (at 1% level) on the import demand. The coefficients also have a correct sign in both cases: an increase in

current income will lead to a short-run increase in import demand. The magnitudes of the coefficients in both equations are also closed to each other.

In the case of VCB equation, the past relative price (between imported and domestically produced goods) has a significant (at 10%) short-run impact on the import demand. The sign of the coefficient is positive indicate that the import demand-price dynamics maybe complicated and oscillates around the steady state value.

Finally the current trade openness will have a significant impact on the adjustment process of the import demand. In both cases, the coefficients are significant at 1% level. The sign of the coefficients is also having a correct positive sign, indicates that an increase in trade openness in the current quarter will temporarily increase the import demand.

Table 9: Error-Correction Model for import demand.

Model	With NEER	With VCB
RES(-1)	-0.384024***	-0.670169***
D(LNM(-1))	-0.208169	-0.054165
D(LNIND)	0.733024***	0.823438***
D(LNIND(-1))	0.182589	-0.075267
D(LN(PVNM/PD))	0.109927	0.048206
D(LN(PVNM(-1)/PD(-1)))	0.110026	0.273108*
D(LNNEER) or D(LNVCB)	0.299356	0.484831
D(LNNEER(-1)) or D(LNVCB(-1))	-0.134466	-0.021452
D(RIPR)	0.487416***	0.509073***
D(RIPR(-1))	0.043382	-0.052135
R-squared	0.561016	0.624195
Adjusted R-squared	0.491703	0.564858
Durbin-Watson stat	1.861185	1.781892

Source: Author's calculation.

In conclusion, the nominal VND/USD rate is more important in determination of the import demand than the nominal effective exchange rate. If we use the VND/USD rate from Vietcombank (the largest bank in Vietnam), the estimation results show that the income, relative price (between imported and

domestically produced goods), trade openness, and the exchange rate all have significant impact in import demand determination. The findings are more theoretically favorable than findings from Thanh and Kalirajan (2005) that devaluation would not have any significant effect on the import. The longer sample size which covers more open period of Vietnamese economy evidently contributes to the findings.

3.3 Inflation exchange rate money supply model:

3.3.1 Model specification:

To analyze the interaction between inflation, exchange rate and the money supply, we employ the three variable vector error correction models. The model can be represented in the vector form as followed:

$$D \ln Y_t = \psi_0 + A \otimes B D \ln Y_{t-1} + \sum_{i=1}^p \psi_{1i} D \ln Y_{t-i} + e_t \quad (6)$$

Where

D and Ln is the differential operator and natural logarithm operator as the above.

Y_t is a three elements vector of inflation (proxies by CPI), money supply (M2) and the exchange rate (Vietcombank rate VCB): $Y_t \equiv \begin{pmatrix} CPI \\ M2 \\ VCB \end{pmatrix}$

A is the 3x3 matrix of adjustment coefficients.

B is also 3x3 matrix of coefficients of long run models.

ψ_{1i} is p 3x3 matrices of short-run coefficients

e_t is the 3 elements vector of residuals.

3.3.2 Data description

The quarterly money supply (M2) data comes from 2 sources. The data for the period from 1995 onward is taken from the IMF' IFS database. The data earlier than 1995Q1 is taken from the State Bank of Vietnam.

CPI is quarterly inflation rate from GSO website.

The exchange rate is the Vietcombank rate as defined in the above sections.

3.3.3 Empirical results and interpretations

Unit root & cointegration tests

Before the VECM analysis can be done, the data have to be checked by the unit root and cointegration test. Table 10 shows that, the Augmented Dickey-Fuller test confirms all the variables (CPI, M2, VCB) are integrated of order 1. Therefore the VECM analysis can be done for the variables to identify the short and long run dynamics of the three variables.

Table 10: Unit root test for the inflation, exchange rate and money supply model.

	LnM2	LnCPI	LnVCB
Level variables			
Augmented Dickey-Fuller test statistic	1.087956	0.862268	-0.357106
Lag Length:	0	5	0
First Difference			
Augmented Dickey-Fuller test statistic	-6.621107***	-3.699323***	-8.034855***
Lag Length:	0	4	0

Source: Author's calculation.

Note: The unit root test for CPI and VCB are provided here for convenience reference.

Co-integration test

Table 11 show the result of the co-integration rank test for the three variables. The test strongly rejects the hypothesis of no co-integration vector, but can not reject the hypothesis that there is at most 1 co-integration vector. This suggests that there is one co-integration vector among three variables.

Table 11: The co-integration test for inflation, exchange rate, and money supply.

Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.372820	42.18270	29.79707	0.0012
At most 1	0.175107	12.32531	15.49471	0.1420
At most 2	8.11E-05	0.005191	3.841466	0.9416

Note: Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's calculation.

Estimation results

The long-run and short run coefficients of the VECM are estimated simultaneously. The results of the estimation are in Table 12 and Table 13 respectively.

The co-integration vectors

The estimation for long-run coefficients of VCB and M2 are both significant at 1% level. The coefficient of M2 has an opposite sign with the CPI and the exchange rate means that an increase in money supply can causes both CPI and the exchange rate to rise.

Table 12: The long-run co-integration vector of the inflation, exchange rate, and money supply model.

Cointegrating Eq:	
LNCPI(-1)	1
LNVCB(-1)	1.400115
	(0.28306)
	[4.94641]
LNLM2(-1)	-0.356603
Standard errors	(0.03618)
t-statistics	[-9.85751]
C	-0.205360

Note: The numbers in round brackets are the standard deviations.

The numbers in square brackets are the t-statistics.

Source: Author's calculation.

Long run coefficient of the LnM2 in the normalized cointegration vector is slightly lower than the estimation in Thanh and Kalirajan (2006)⁵. However, the coefficient for LNVCB has an opposite sign with that of Thanh and Kalirajan (2006). In theory, because any variable in the cointegration vector can be on the right hand side, the coefficient of LnCPI and LnVCB can also have a same sign. This is because (keeping other things the same) an increase in M2 will lead to both price level and exchange rate increase in the long run. Our estimation is, therefore, not contradict with the theory. The difference in the sign of LnVCB maybe because of the fact that the exchange rate regime of Vietnam becomes more and more floating as the reform goes on. The nature of the exchange regime in Thanh and Kalirajan's (2006) observation period (from 1992Q4 to 1998Q3) is different from our (from 1992Q4 to 2009Q4).

The short run model

Table 13 shows the results of the estimation for adjustments and short-run coefficients. The adjustment is significant only in the case of CPI equation. In the CPI equation, the past CPI has significant impacts on its short-run adjustment process with the coefficients of the first difference in the past 1st and 4th period are significant at 1% level. The exchange rate (past 4th period) also has an effect on the short-run adjustment process with its coefficient is significant at 5% level. In the

⁵ In Thanh and Kalirajan (2006) the estimated coefficient for LnM2 is -0.407.

case of the exchange rate equation only past fourth quarter has a significant (at 5% level) positive impact on its short-run adjustment. Meanwhile, in the case of M2, only CPI has significant impact on its short-run adjustment process (past first and fourth quarter).

Table 13: The short-run co-integration model of the inflation, exchange rate, and money supply.

Error Correction:	D(LNCPI)	D(LNVCB)	D(LNM2)
CointEq1	-0.136932	-0.035719	0.116147
	(0.03376)	(0.03416)	(0.07882)
	[-4.05562]	[-1.04552]	[1.47361]
D(LNCPI(-1))	0.552611	0.047319	-0.717264
	(0.12678)	(0.12828)	(0.29596)
	[4.35886]	[0.36887]	[-2.42356]
D(LNCPI(-2))	-0.142793	-0.021479	0.009231
	(0.15883)	(0.16071)	(0.37078)
	[-0.89903]	[-0.13365]	[0.02490]
D(LNCPI(-3))	-0.080702	0.073177	-0.479543
	(0.15587)	(0.15772)	(0.36387)
	[-0.51774]	[0.46397]	[-1.31789]
D(LNCPI(-4))	0.505882	-0.030598	0.704628
	(0.13157)	(0.13313)	(0.30714)
	[3.84493]	[-0.22983]	[2.29414]
D(LNVCB(-1))	0.139142	-0.055381	-0.418734
	(0.14587)	(0.14759)	(0.34051)
	[0.95390]	[-0.37522]	[-1.22972]
D(LNVCB(-2))	0.131668	0.258508	-0.330269
	(0.14983)	(0.15161)	(0.34977)
	[0.87878]	[1.70513]	[-0.94425]
D(LNVCB(-3))	0.198245	0.406974	-0.194166
	(0.15588)	(0.15773)	(0.36389)
	[1.27178]	[2.58023]	[-0.53358]
D(LNVCB(-4))	0.365511	0.230900	-0.623495
	(0.15386)	(0.15568)	(0.35917)
	[2.37561]	[1.48313]	[-1.73591]

D(LNM2(-1))	-0.067965	0.027953	0.174871
	(0.05715)	(0.05783)	(0.13341)
	[-1.18925]	[0.48339]	[1.31076]
D(LNM2(-2))	0.055296	-0.016840	-0.225943
	(0.05927)	(0.05997)	(0.13835)
	[0.93301]	[-0.28082]	[-1.63311]
D(LNM2(-3))	0.096326	0.079699	0.054978
	(0.05910)	(0.05980)	(0.13796)
	[1.62989]	[1.33275]	[0.39850]
D(LNM2(-4))	0.021930	0.055821	0.088095
	(0.05103)	(0.05163)	(0.11912)
	[0.42975]	[1.08109]	[0.73952]
C	-0.010645	-0.009076	0.081297
	(0.00936)	(0.00947)	(0.02184)
	[-1.13770]	[-0.95867]	[3.72211]
R-squared	0.572345	0.232120	0.404231
Adj. R-squared	0.461155	0.032471	0.249332
Sum sq. resids	0.011550	0.011825	0.062941
S.E. equation	0.015199	0.015379	0.035480
F-statistic	5.147445	1.162641	2.609632

Note: The numbers in round brackets are the standard deviations.

The numbers in square brackets are the t-statistics.

Source: Author's calculation.

Granger causality tests:

The Granger causality test is carried out to see what variable can predict other variables. Table 14 shows that M2 Granger causes CPI and the Vietcombank exchange rate at 5% significance level. That means past growth in the money supply can explain the current inflation and exchange rate movement. Meanwhile, CPI also Granger causes Vietcombank rate and M2 at 10 and 1% significance level respectively. The results show that the dynamics of money supply and inflation can help prediction of movements in the exchange rate. The relationship of the three variables can be explored more when we consider the variance decomposition and impulse response function bellosed.

Table 14: The pair-wise Granger causality tests for inflation, exchange rate, and money supply.

Null Hypothesis:	Obs	F-Statistic	Probability
LNVCB does not Granger Cause LNCPI	64	0.32331	0.89676
LNCPI does not Granger Cause LNVCB		2.20572	0.06729
LNM2 does not Granger Cause LNCPI	64	2.58259	0.03656
LNCPI does not Granger Cause LNM2		3.91098	0.00432
LNM2 does not Granger Cause LNVCB	64	2.88577	0.02236
LNVCB does not Granger Cause LNM2		0.85069	0.52027

Note: 5 lags included.

Source: Author's calculation.

Variance decomposition

Table 15 shows that at the forecast horizon of 5 quarters, 87% of variation in LnCPI is explained by its own shock, 5.4% by the shock in LnM2 and approximately 1% explained by LnVCB. These results are not contradictory with the findings of Granger causality tests. The results are reverse in the long run, with 93.8% of variation in LnCPI explained by LnVCB and less than 1% explained by LnM2.

Table 15: Variance Decomposition of LNCPI.

Period	LNCPI	LNVCB	LNM2
1	100.0000	0.000000	0.000000
2	99.86586	0.080102	0.054037
3	99.04280	0.462014	0.495184
4	93.49275	1.127990	5.379262
5	87.28755	1.068330	11.64412
6	83.71575	1.915003	14.36925
7	79.74878	4.953172	15.29804
8	72.62987	10.90957	16.46057
9	64.91738	17.71429	17.36832
10	57.72385	25.50579	16.77036
20	19.56892	75.26894	5.162143
30	12.38261	84.69275	2.924632
40	9.470245	88.43660	2.093152
50	7.973220	90.37543	1.651349
60	7.049426	91.57301	1.377562
70	6.419828	92.38932	1.190849
80	5.963545	92.98093	1.055520
90	5.617549	93.42952	0.952927

100	5.346209	93.78132	0.872467
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Source: Author's calculation.

On the other hand, at the forecast horizon of 5 quarters, 95.9% of variation in LnVCB is explained by its own shock, 3.6% by the shock in LnM2 and approximately 0.5% explained by lnCPI. The situation is similar in the long run. 90% of variation in LnVCB is explained by its own shock after 100 quarter, 9.3% by the shock in LnM2 and approximately 0.35% explained by lnCPI.

Table 16: Variance Decomposition of LNVCB.

Period	LNCPi	LNVCB	LNm2
1	0.148382	99.85162	0.000000
2	0.503739	99.10474	0.391523
3	0.308994	99.25710	0.433910
4	0.562175	97.73543	1.702392
5	0.510153	95.87517	3.614681
6	0.397812	94.84945	4.752738
7	0.318596	94.09937	5.582032
8	0.258956	93.24849	6.492559
9	0.220231	92.67820	7.101568
10	0.193082	92.42509	7.381832
20	0.175281	91.95352	7.871202
30	0.253280	91.17945	8.567267
40	0.292588	90.85185	8.855561
50	0.312695	90.65878	9.028528
60	0.325436	90.54081	9.133758
70	0.334108	90.45935	9.206540
80	0.340476	90.39967	9.259850
90	0.345340	90.35412	9.300545
100	0.349175	90.31817	9.332651

Source: Author's calculation.

The variance decomposition results are different from Thanh and Kalirajan's (2006) findings in two ways. First the convergence in our sample is much longer than that of Thanh and Kalirajan (2006). The main source of disturbance in CPI is the exchange rate, which is different from Thanh and Kalirajan's (2006) CPI itself. The different can be explained similarly with the argument from the long run cointegration vector above: in the period from 1992-1998 the exchange rate regime

of Vietnam is much more rigid than in the latter period. Therefore, for the whole period from 1992Q4 to 2004Q4, the exchange rate is more volatile and flexible. That makes the convergence speed lower, and perhaps, the volatility in the exchange rate became more important to the price level.

Impulse responses

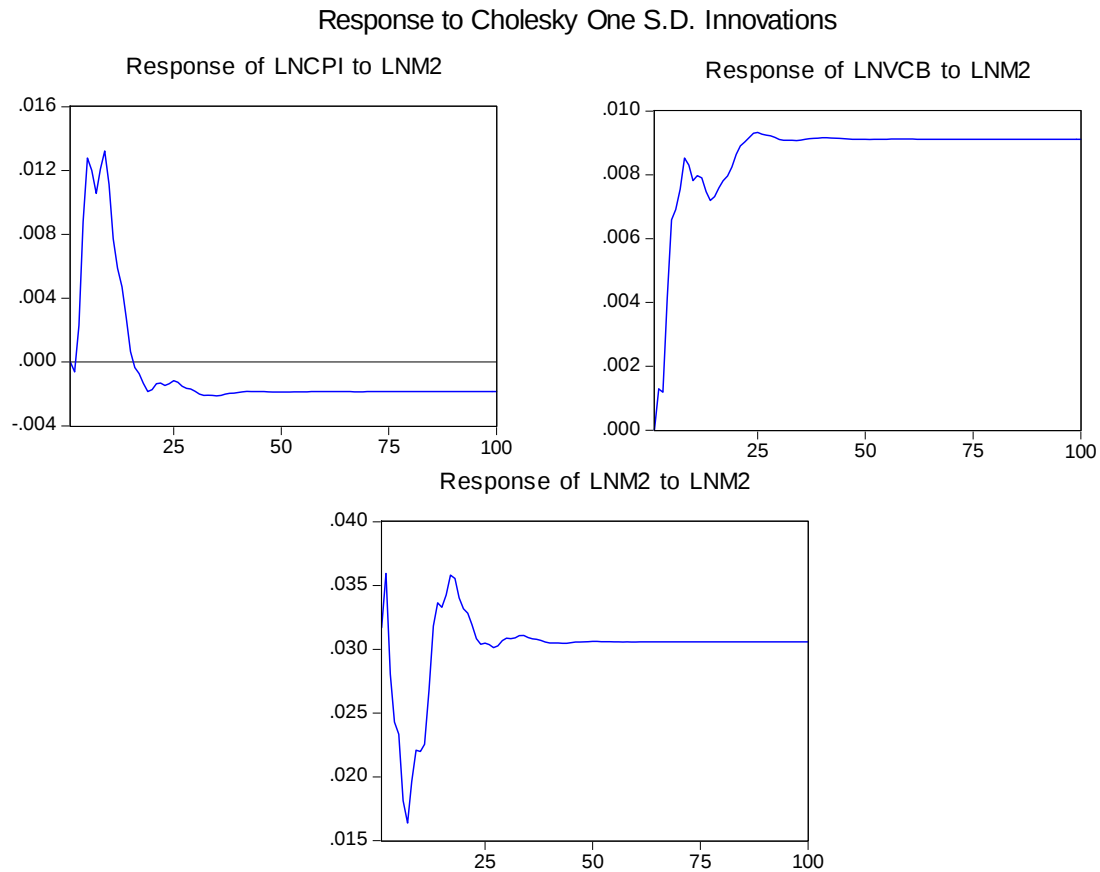
In order to evaluate the response of CPI and exchange rate when we have a shock to LnM2. Figure 4 shows the response of inflation, exchange rate, and M2 after One S.D. Innovations to LnM2.

VCB responses very quickly to the shock and rises in the next quarter. It fluctuate a bit after 8 quarters and stays permanently at a higher level.

CPI on the other hand responses to the rise in money supply only in the second quarter. Price level rises until 9th quarters (although fluctuate a bit) before descending to even a lower level than that at time zero.

Money supply (being affected by CPI and VCB) also fluctuates. With a slow response of CPI in the first quarter after the shock, money supply increase a bit more in the second quarter. Nevertheless, with the rise in both price level and exchange rate, money supply declines after the second quarter until the 8th quarter. As the price level falls after the 9th quarter, money supply rises again and stays at a bit lower than the initial one standard deviation shock.

Figure 4: Response to Cholesky One S.D. Innovations to LnM2.



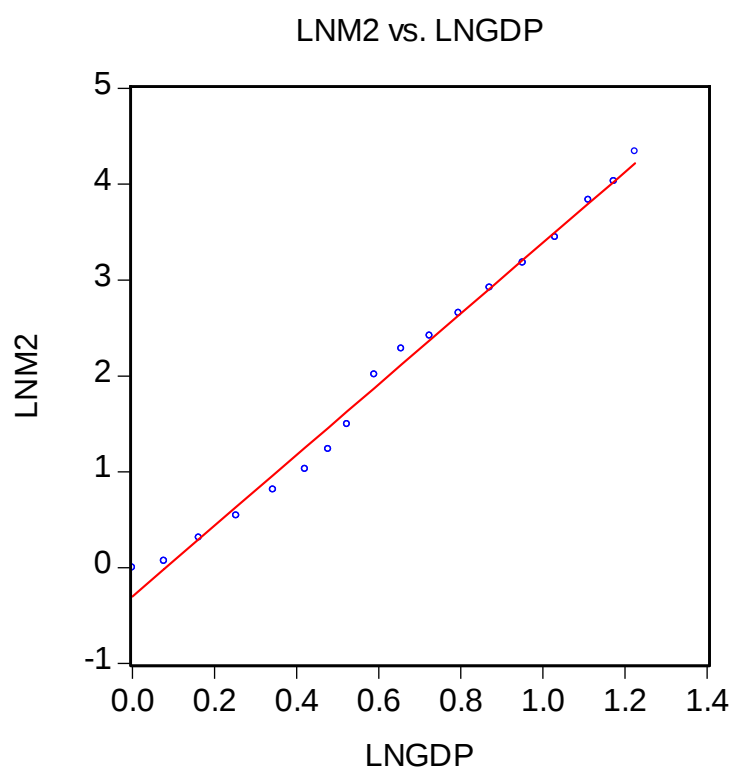
In conclusion, the money supply seems to have big short run impact to price level and the exchange rate. The result is not contradict with Thanh and Kalirajan's (2006) findings. Nevertheless, in the long run the paper finds that 90% of variation in the exchange rate is explained by its own shock. The is somewhat different from Thanh and Kalirajan's (2006) findings that the variation of CPI explained by its own shock. In addition to Thanh and Kalirajan's (2006) findings, the paper's impulse response graph also shows that in the long run the exchange rate will likely to stay at a higher level after a positive shock to money supply, while price level may not.

3.4 Impact/effectiveness of these policies on key macroeconomic indicators:

3.4.1 Money supply (M2) and output (GDP):

To access the relationship between money and the output we draw the scatter diagram between the log of GDP and M2 with a regression line. Figure 4 shows a clear positive correlation between money and GDP. The figure clearly supports the hypothesis that money should increase to accommodate growth in the output.

Figure 5: Long-run relationship between output and money.



Source: Author's calculation.

The Granger Causality Tests (see Table 17) also confirm the positive relationship between money and output. Furthermore, the tests also show that GDP is Granger causes Money (M2) but not vice versa.

Table 17: Pairwise Granger Causality Tests between money and output.

Sample: 1992 2009

Lags: 1

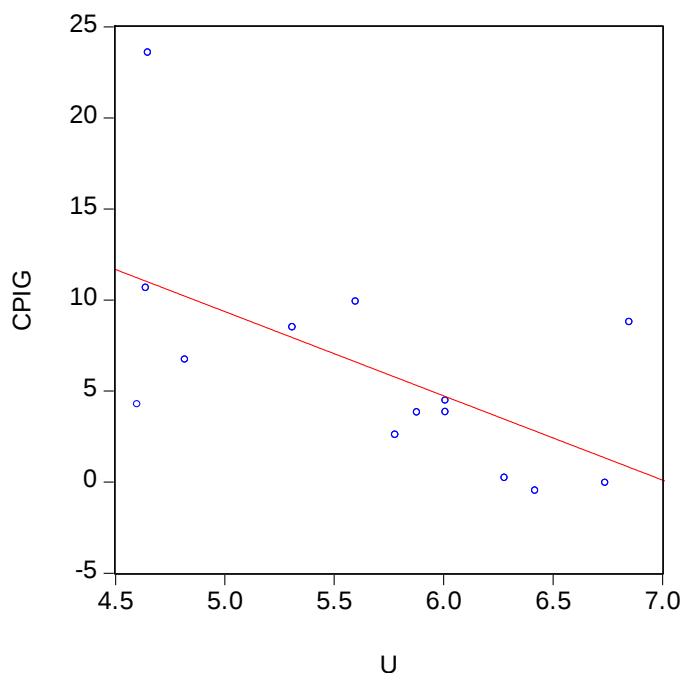
Null Hypothesis:	Obs	F-Statistic	Probability
LNM2 does not Granger Cause LNGDP	17	1.19926	0.29195
LNGDP does not Granger Cause LNM2		5.32721	0.03678

Source: Author's calculation.

3.4.2 Inflation and unemployment:

The unemployment rate in Vietnam is being collected and published only on a yearly basis and from 1996 only and only the unemployment rate for the urban area is available due to the difficulty in defining unemployment in the rural area. Therefore, in the paper we use the unemployment rate for the urban area as a proxy for the country's unemployment level. The data is taken from the website of the General Statistical Office of Vietnam. The relationship between inflation and unemployment is expected to be negative. Figure 6 seems to verify the negative relationship.

Figure 6: Relationship between unemployment and the inflation rate.



Source: Author's calculation.

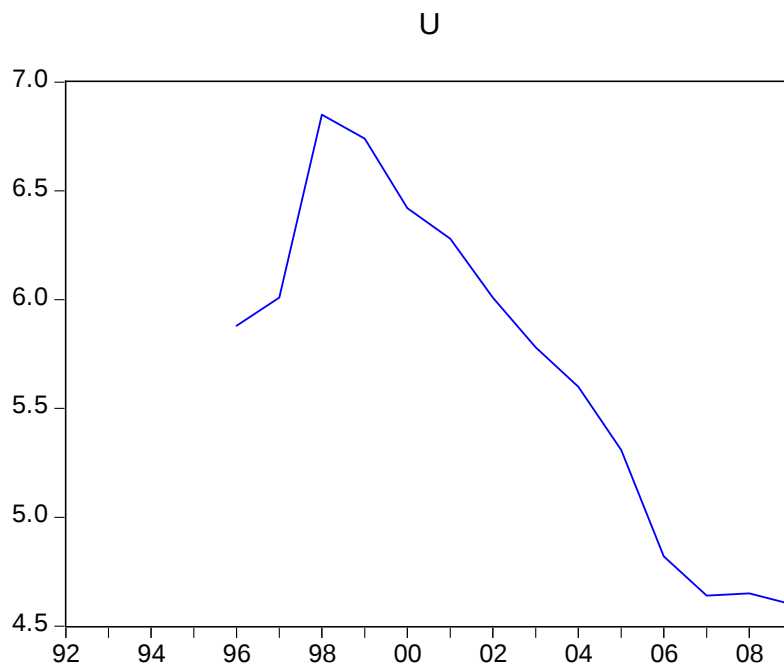
To further explore the relationship between inflation and unemployment, we follow Nidhiprabha (no date) to calculate the Phillip curve equation. From the inflation, exchange rate and money supply model we know that CPI is $I(1)$. Then CPIG (inflation rate) will be an $I(0)$ process. The unit root test for the log of unemployment rate (U) with no trend fails to reject the hypothesis that U is nonstationary. However, as Figure 7 suggests that there may be a trend in the U series we check the hypothesis of U has a unit root with a trend and intercept. The test rejects the hypothesis at 1% confidence level. Nevertheless, the figure shows that the presence of a trend is because of the sample size that is too small. With a bigger sample size, a temporal trend (from 1998 to 2007) can not dominate as unemployment rises and falls with economic cycles. Hence we do not need to add a trend in our estimation. Furthermore, we should also aware of the fact that the sample size is very small (14), the probability may not be accurate.

Table 18: Unit root test for the unemployment rate.

	U (no trend)	U (trend)
Level variables		
Augmented Dickey-Fuller test statistic	-0.547072	-7.327884
Probability	0.8487	0.0005
Lag Length:	1	1

Source: Author's calculation.

Figure 7: The log of unemployment rate in 1996-2009.



Source: General Statistical Office of Vietnam.

The unit root test allows us to calculate the Phillip curve as followed:

Table 19: The Phillips curve estimation.

Dependent variable CPIG	
LNU	-5.455596**
Standard errors	(2.325035)
t-statistics	[-2.346458]
CPIG(-1)	-0.176140
Standard errors	(0.278609)
t-statistics	[-0.632212]
C	38.42585**
Standard errors	(14.46078)
t-statistics	[2.657246]
R-squared	0.360881
Adjusted R-squared	0.244678
F-statistic (p=0.085251)	3.105596
Durbin-Watson stat	2.348136

Source: Author's calculation.

The Phillips curve seemed has been verified for the Vietnamese urban unemployment. The estimation results show that to reduce unemployment by 1% the trade off in inflation rate may be as high as 5.46%.

In conclusion, the section confirms the accommodative role of the monetary policy in Vietnam. The M2 movements should be closely followed (or be accommodative with) the growth rate of the economy. The conclusion is also confirmed by the Phillips curve estimation. The higher growth will generally raise the price level in the short-run.

4. Conclusion and policy implications

4.1 Conclusions

Monetary policy conducting by the SBV through three critical periods was successful and contributed to maintaining macroeconomic stability and achieving economic growth. The evolution of monetary policy has been significantly through choosing targets, using the right monetary instruments that were more rely on indirect instruments, managing flexible exchange rate policy, coordinating with other policies and finally all ultimate targets of monetary policy have been mainly achieved.

4.2 Policy Implications

The independence of the SBV, which should be considered through, adjusted and added more functions in order to improved the effectiveness of monetary policy.

Being aware of the importance role of the Forecast in the financial sector and developing a forecast system a soon as possible.

Monetary policy should be conducted consistently, precisely and regulated smoothly to the shake of the financial sector and the economy.

The coordination with other policies such as fiscal policy, exchange rate tool and policy to encourage the development of economy in the long run will be a key factor in implementing successfully monetary policy.

The nominal exchange rate is important as a tool for controlling imports but the nominal effective exchange rate is preferred to VND/USD exchange rate in promoting export. This implies the trade deficit is rather more difficult to deal with than just devaluation of VND/USD exchange rate.

The world economic growth is important to promote Vietnamese export. This suggests that financial stimulus packages maybe justified overcoming a fall in export as a result from the world recession.

The empirical finding that trade openness is important to the import demand suggests that the country should choose a gradual trade liberalization to avoid a surge in import. The fact also implies that industrialization policy should be considered with the trade liberalization to avoid excessive dependence to import, which could exposure the country vulnerable to external shocks.

The empirical findings show that the money supply can have very large short-run impact on exchange rate and inflation, though exchange rate and price level maybe trading-off in the long run. These suggest that the credit growth maybe an effective tools for controlling the exchange rate and price level in Vietnam in the short run. Therefore, the State Bank of Vietnam should keep the monetary policy tight after the February 2011's devaluation to avoid the rise in price level, which will nullify the exchange rate adjustment and creating pressure for further exchange rate devaluation.

Furthermore, the trade-off between exchange rate and price level and the importance of the exchange rate in price level determination suggest that more flexible exchange rate regime is needed in the long run to avoid the price distortion in the economy.

In addition, the empirical fact that the money supply should accommodate output growth and the supporting evidence for the Phillips curve in Vietnam suggest that the State Bank of Vietnam should pay more attention on the money supply growth to control inflation.

REFERENCES

- ABEYSINGHE T., RAJAGURU G., 2004 “Quarterly Real GDP Estimates for China and ASEAN4 with a Forecast Evaluation”, *Journal of Forecasting* 23, 431–447.
- ADB., 2009. “South East Asia: Vietnam,” *Asian Development Outlook*.
- Asian Development Bank (ADB), 2010. “Key indicators for asia and the pacific 2009”, Online at: www.adb.org/statistics.
- Bahmani-Oskooee, Mohsen, 1986. "Determinants of international trade flows : The Case of Developing Countries," *Journal of Development Economics*, Elsevier, vol. **20**(1), pages 107-123.
- Brahm, L.J., 1992. *Banking and Finance in Indochina*, Woodhead- Faulkner Press, New York.
- Chua, S. Y. and Sharma, S. C. (1998), An Investigation of the Effects of Prices and Exchange Rates on Trade Flows in East Asia. *Asian Economic Journal*, **12**: 253–271.
- COE - VNU., 2008. *Inflation in Vietnam today: Causes and Solutions*, Publishing House of Vietnam National University, Hanoi
- Deravi, K., Gregorowicz, P., & Hegji, C. E. (1995). Exchange rate and the inflation rate. *Quarterly Journal of Business and Economics*, **34**(1), 42–54.

- Deyak, T.A., Sawyer, W.C., and Sprinkle, R.L. (1993). A comparison of the demand for imports and exports in Japan and the United States. *Journal of World Trade*, **27**, 63-74.
- Dodsworth, J.R., Spittaller, E. Braulke M. Lee. K.H., Miranda, K. Mulder, C. Shishido, H. and Srinivasan, K., 1996. Vietnam Transition to a Market Economy. Occasional Paper No. 135. International Monetary Fund, Washington DC, March.
- IMF., 2010. Vietnam: 2010 Article IV Consultation—Staff Report and Public Information Notice, Country Report No. 10/281
- James G. MacKinnon, Alfred Haug, and Leo Michelis, "Numerical Distribution Functions of Likelihood Ratio Tests for Cointegration", *Journal of Applied Econometrics*, Vol. 14, No. 5, 1999, pp. 563-577.
- State Bank of Vietnam, 2011, "Exchange rate announcement", Online at: <http://www.sbv.gov.vn/vn/CdeQLNH/tygia.jsp>, Accessed date: 20/2/2011.
- Tegene, Ababayehu, 1989. "On the Effects of Relative Prices and Effective Exchange Rates on Trade Flows of LDCs," *Applied Economics*, Taylor and Francis Journals, vol. **21**(11), pages 1447-63, November.
- Thanh, Nguyen Ngoc, Kalirajan, Kaliappa, 2005. The Importance of Exchange Rate Policy in Promoting Vietnam's Export, *Oxford Development Studies* Vol. 33 (2005) No. 3&4 pp.511–29.
- Thanh, Nguyen Ngoc, Kalirajan, Kaliappa, 2006. Can devaluation be effective in improving the balance of payments in Vietnam? *Journal of Policy Modeling* 28 (2006) 467–476.
- Vietnam Foreign Trade Bank, 2011, "Foreign Exchange rates", Online at: <http://www.vietcombank.com.vn/ExchangeRates/>, Accessed date: 20/2/2010.

THE EFFECTS OF GOVERNMENT SPENDING ON OUTPUT IN VIET NAM¹

Vu Quoc Huy

University of Economics and Business

Viet Nam National University

Paper presented at **Bangkok Policy Forum**

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Introduction

The effects of fiscal policy has been a controversial topic with competing views and mixed empirical evidence. For a long time, using VAR model to assess the effects of fiscal policy was not as popular as for monetary policy. In recent years, however, there has been a growing body of literature using structural VAR model for fiscal policy effects assessment. Most of the literature on the effectiveness of fiscal policy has been written in an advanced economy context, although most of the theoretical discussions and arguments can carry over to a developing country setting. There is a view that developing country economic activity is more likely influenced by supply-shocks to it that leaves fewer opportunities to use fiscal policy for demand management. Nevertheless, there has been also growing number of studies applying this SVAR method for economies in transitions as well as for developing countries and provide interesting results. This paper represents an attempt to make a quantitative assessment of the effects of the government spending in Viet Nam using a structural VAR model.

The paper is organized as follows. Section 1 provides a brief literature review, documenting recent development in using structural VAR for assessing the effects of fiscal policy. Section 2 presents a summary of key steps in identifying and constructing a SVAR model. Section 3 shows data sources and variable construction. Key time-series tests are presented in this Section. Section 4 shows preliminary results of applying this method to examining the effects of government spending in Viet Nam on output, using quarterly data from 2000:1. These results show that the government spending has a rather limited and quickly fading effect on the industrial output. Moreover, the government spending has different effects on state-owned and the private sector. While the response of the state-owned sector to the government spending is far more positive and long-lasting, that of the private sector is rather limited and negative. The results also show that government spending composition matters as long as its effects on output and price concerned.

1. A brief literature review

There have been a growing number of studies on the effects of fiscal policy in recent years using structural VAR model. Based on Blanchard and Perotti (2002) work, a number of studies were taken to examine the effects of fiscal policy on the economy using more or less an uniform approach of a structural VAR. Table 1 summaries some these studies.

Heppke-Falk, Tenhofen and Wolff (2006), for example using a structural VAR model with 5 variables to study the effects of fiscal policy in Germany from 1974:1-2004:1 have found that a government expenditure shock triggers an output increase, boosts private consumption but not private investment. On the other hand, they found that government investment has stronger effects on macroeconomic activity than government personnel expenditure, while indirect tax shocks seem to have weaker effects than direct tax shocks. Fernández and Hernández de Cos, (2006) in a similar 5-variable SVAR study on Spain, using quarterly data from 1980Q1 to 2004Q4 have come to a conclusion that increases in government expenditure have a positive impact on economic growth in the short term, but the effect turns negative in the longer term. Both government expenditure and net tax increases generate public deficits in the medium term but they have opposite impact on the price level and output. The government expenditure shocks lead to increase in price level while net-tax increases trigger a negative short-term price response. Finally, these authors conclude that the responses of GDP or prices are found to differ significantly depending on the spending or tax component considered. In another study using similar approach to the case of Pakistan, Shaheen and Turner (2008) find similar conclusions for fiscal policy impact for Pakistan. These authors nevertheless show some weakness of the SVAR approach, arguing that the results obtained from a SVAR model may lose their accuracy over longer horizons and should be treated with caution. The structural VAR approach was also used to analyze fiscal policy effects in some middle-income and developing countries. Restrepo and Rincón (2006) for example apply this model to Chile and Columbia; Štiková (2006) uses this model for Czech Republic. The results obtained from these studies also sensible and these authors believe that the SVAR approach can be considered as a good tool for assessing fiscal policy effects.

Table 1 Summary of features of the fiscal SVAR literature.

Paper	Variables used	Identification method	Country	Sample period
Blanchard and Perotti (2002)	Taxation per capita, government spending per capita, output per capita	Variable order based on institutional events	US	1974Q1-1997Q4
Perotti (2002)	Taxation per capita, government spending per capita, output per capita, inflation, short term interest rate		US, UK, West Germany, Canada, Australia	vary
Claus et al (2006)	Taxation per capita, government spending per capita, output per capita	As Blanchard and Perotti (2002)	NZ	1982Q3-2004Q3
Favero and Giavazzi (2007)	GDP per capita, GDP deflator, government expenditure per capita, taxation per capita, debt		US	1960Q1-2006Q2
Chung and Leeper (2007)	Output, GDP deflator, short term interest rate, long term interest rate, money base, taxation, government spending, debt		US	1947Q2-2006Q2
Rezk, Avramovich and Basso (2006).	current public expenditure (PE), tax revenues (TR), gross domestic product (GDP), unemployment (UNE) and inflation (INFL) rates.		Argentina	1984Q1-2005Q2
R.Giordano, S. Momigliano, S. Neri and R. Perotti, (200x).			Italy	
Restrepo and Rincón, (2006).	net taxes, government spending on wages, goods and services and investment, and real GDP.		Chile and Colombia	1990Q1-2005Q2
Štiková (2006)	real GDP, government spending, government revenue, change in net CPI and three month PRIBOR		Czech Republic	1996Q1-2006Q1
Heppke-Falk, Tenhofen and Wolff, (2006)	real GDP, GDP-deflator, nominal short-term interest rate, real government direct expenditure and real government net revenue		Germany	1974Q1-2004Q4
Shaheen and Turner (2006)	public expenditure, net taxes, GDP in real terms, consumer price index and interest rate of government bonds		Pakistan	1973Q1-2008Q4
Fernández and Hernández de Cos, (2006).	Public expenditure, net taxes, GDP in real terms, GDP deflator and three-year interest rate of government bonds		Spain	1980Q1-2004Q4
Rarytska, O. (2003)	Government expenditures, government revenues, total output and price level		Ukraine	1998M8-2002M3

Source : Adapted from Mardi Dungey and Renée A. Fry (2007) and updated by the author

2. Model specification

Following Blanchard and Perotti (2002), Heppke-Falk, Tenhofen and Wolff (2006) and Fernández and Hernández de Cos (2006) and many others, I will use a four-variable structural VAR model to analyze the effects of government spending and taxes on output and price in Viet Nam during the last decade.

The standard reduced form VAR model is:

$$X_t = B(L)X_{t-1} + U_t$$

Where X_t is the vector of variables; $B(L)$ is an autoregressive lag polynomial and U_t is the reduced form innovation. Four variables which are used in this model are total industrial output, price index, government revenue and government total expenditures. The reason for using total industrial output instead of GDP is simply that the former is available while the latter is made published only from 2004:4 so the time span is not long enough for modeling. Attempt to interpolate to get quarterly GDP data from the annual ones proves to be undesirable as pointed by Shaheen and Turner (2008), for example.

Following Perotti *et al.* (2005), we identify the fiscal shocks by imposing contemporaneous restrictions on the vectors U_t , in order to derive a vector of ‘structural’ fiscal shocks, which are orthogonal to each other and to the variables of the model. The formal representation of this structural VAR is as follows:

$$AU_t = BE_t$$

where the shocks E_t are independent and identically distributed with covariance matrix equal to one.

In this four-variable model, only two fiscal shocks associated with two fiscal variables are considered. They are e_t^r : government revenues/taxes shock and e_t^g : government spending shocks.

$$u_t^r = \alpha_{ry}u_t^y + \alpha_{r\pi}u_t^\pi + \beta_g^r e_t^g + e_t^r$$

$$u_t^g = \alpha_{gy}u_t^y + \alpha_{g\pi}u_t^\pi + \beta_r^g e_t^r + e_t^g$$

According to Perotti (2005) these equations reflect three components: the structural policy shocks, which are uncorrelated with each other and with all other structural shocks in the economy; the automatic response of net taxes and government spending to innovations in output and price and finally the systematic discretionary response of policymakers to output and price.

We define cyclically-adjusted (CA) fiscal shocks as follows

$$u_t^{r,CA} \stackrel{\text{def}}{=} u_t^r - (\alpha_{ty}u_t^y + \alpha_{t\pi}u_t^\pi) = \beta_g^r e_t^g + e_t^r$$

$$u_t^{g,CA} \stackrel{\text{def}}{=} u_t^g - (\alpha_{gy}u_t^y + \alpha_{g\pi}u_t^\pi) = \beta_r^g e_t^r + e_t^g$$

In the next Section we will describe what data we use for this model

Identification Strategy and Estimation Procedure

Perotti (2002; 2005 and 2006) applied a four-step estimation procedure for structural VAR model. This four-step procedure is used by most studies that use the Blanchard and Perotti's approach to assess the effects of fiscal policy. The procedure can be briefly described as follows:

Step1. Establishing a formal representation of the reduced form residuals from the standard VAR model to establish relationship between these residuals and structural shocks to government revenues/taxes and expenditure. Recall that the formal representation of the standard VAR model with 2 fiscal variables has the following form:

$$u_t^r = \alpha_{ry}u_t^y + \alpha_{r\pi}u_t^\pi + \beta_g^r e_t^g + e_t^r$$

$$u_t^g = \alpha_{gy}u_t^y + \alpha_{g\pi}u_t^\pi + \beta_r^g e_t^r + e_t^g$$

where e_t^r and e_t^g are the structural shocks to the government taxes and expenditures, respectively.

Since the reduced form residuals u are correlated with structural shocks e , it is not possible to estimate this formal representation. So it needs a new approach which is reflected in Step 2.

Step2. Estimating cyclically adjusted (CA) reduced form of fiscal shocks using external/exogenous elasticities. The cyclically adjusted (CA) residuals $u_t^{r,CA}$ and $u_t^{g,CA}$ of government revenues and government expenditures are computed by the following formula:

$$u_t^{r,CA} \stackrel{\text{def}}{=} u_t^r - (\alpha_{ry}u_t^y + \alpha_{r\pi}u_t^\pi) = \beta_g^r e_t^g + e_t^r$$

$$u_t^{g,CA} \stackrel{\text{def}}{=} u_t^g - (\alpha_{gy}u_t^y + \alpha_{g\pi}u_t^\pi) = \beta_r^g e_t^r + e_t^g$$

All coefficients $\alpha_{r\pi}$, α_{ry} , $\alpha_{g\pi}$ and α_{gy} are obtained from external sources or can be estimated outside from this VAR model, but using the same database. The computed cyclically adjusted (CA) residuals $u_t^{r,CA}$ and $u_t^{g,CA}$ are then considered as inputs to estimate two coefficients β_g^r and β_r^g in the next step

Step 3. Estimating structural shocks β_g^r and β_r^g .

It is not possible to estimate both β_g^r and β_r^g with limited information from computed $u_t^{r,CA}$ and $u_t^{g,CA}$ as obtained in Step 2. Here is a crucial assumption about the ordering of structural shocks of fiscal variables. Setting $\beta_g^r = 0$ means that tax decision comes first, where setting $\beta_r^g = 0$ means the spending decision prevails. We follow Perotti (2005, 2006) and many others to suggest that spending decision comes first. A Grange causality test, presented later in this paper tends to support this decision. In this case, β_g^r can be estimated by OLS in the following equation:

$$\begin{aligned} u_t^{r,CA} &= e_t^r \\ u_t^{g,CA} &= \beta_g^r e_t^r + e_t^g \end{aligned}$$

Step 4. Estimating the rest of the VAR model

In this step, the remaining equation for other macroeconomic variables is estimated using the previous information. In our four-variable model setting, there are two remaining equations with four coefficients to be estimated. They are as follows:

$$\begin{aligned} u_t^y &= \alpha_{yr} u_t^r + \alpha_{yg} u_t^g + e_t^y \\ u_t^\pi &= \alpha_{\pi y} u_t^y + \alpha_{\pi r} u_t^r + \alpha_{\pi g} u_t^g + e_t^\pi \end{aligned}$$

As Perotti *et al.* (2005) these two equations can be estimated by OLS method using the previously estimated series of e_t^{r*} and e_t^{g*} as instruments for u_t^r and u_t^g

The result of this four-step estimation procedure allows construct the matrix A and matrix B of the structural VAR model and now we have the system as

$$Au = \begin{bmatrix} 1 & 0 & -\alpha_{yr} & -\alpha_{yg} \\ -\alpha_{\pi y} & 1 & -\alpha_{\pi r} & -\alpha_{\pi g} \\ -\alpha_{gy} & -\alpha_{g\pi} & 1 & 0 \\ -\alpha_{ry} & -\alpha_{r\pi} & 0 & 1 \end{bmatrix} \begin{pmatrix} u_t^y \\ u_t^\pi \\ u_t^g \\ u_t^r \end{pmatrix} = Bu = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & \beta_r^g & 1 \end{bmatrix} \begin{pmatrix} e_t^y \\ e_t^\pi \\ e_t^g \\ e_t^r \end{pmatrix}$$

When this structural VAR is estimated and identified, we can get impulse responses to evaluate dynamic effects of a structural shock.

Exogenous Elasticity Estimation

As studies show the results of structural VAR model depend on different assumptions on the system and its parameters. Estimation of core coefficients underlying the formal representation of the model therefore is crucial for the results. While a uniform method of estimation is generally applied for those coefficients that can be estimated within the system, , exogenous or external elasticities are derived from different sources and different methods are applied depending mostly on available information and some institutional knowledge (Perotti et al. (2006) and Heppke-Falk, Tenhofen and Wolff, (2006)). Table 2 summaries some of these approach. Most authors use a simple OLS regression with different lags when internal data are used. Very few used error-correction model for this purpose. Robustness check and sensitivity analysis, however have been quite common to check the final results.

Table 2 Summary of features of the fiscal SVAR literature.

Paper	Variables used	Elasticity estimation	Country
R.Giordano, S. Momigliano, S. Neri and R. Perotti, (2005).		Using external estimates	Italy
Restrepo and Rincón, (2006).	net taxes, government spending on wages, goods and services and investment, and real GDP.	Using time-series regression for contemporaneous effects	Chile and Colombia
Štiková (2006)	real GDP, government spending, government revenue, change in net CPI and three month PRIBOR	Combine both time-series regression and external estimates	Czech Republic
Heppke-Falk, Tenhofen and Wolff, (2006)	real GDP, GDP-deflator, nominal short-term interest rate, real government direct expenditure and real government net revenue	Combine both time-series regression and external estimates	Germany
Shaheen and Turner (2006)	public expenditure, net taxes, GDP in real terms, consumer price index and interest rate of government bonds		Pakistan
Fernández and Hernández de Cos, (2006).	Public expenditure, net taxes, GDP in real terms, GDP deflator and three-year interest rate of government bonds	Combine both time-series regression and external estimates	Spain
Rarytska, O. (2003)	Government expenditures, government revenues, total output and price level	Using internal information for regression	Ukraine

Source: Author's summary.

In this paper, we apply a simple regression to derive these needed elasticities. In the future, these results need to be checked with other sources (which is, unfortunately very scarce) or different methods. Table 2 provides these estimates for different variables.

3. Source of data and variable construction

For the structural VAR model, the availability of quarter data of key variable, including fiscal is crucial. That explains a lot why most of studies on this area were mainly focused on developed countries (Perotti et al, 2004). Until recently, this area of research starts to penetrate to other countries, including some developing economics thank to emerging of new data. In some cases, interpolation of lower-frequencies data is used to obtain needed quarterly data for model use, but this approach may cause some problems. In the case of Viet Nam, when traditionally data availability is really a scarce resource for research and economic decision-making, new improvement has been shown in recent years including that in the government finance area. From 1997, the Government committed to release publicly government budget data as a part of its financial transparency commitments. Since then, quarterly government finance data have been available for wider public. The data reliability and consistency are still in question but their availability is a good improvement and makes it possible to apply some modeling techniques to evaluate policy. The length of data is far from desirable but with 42 observations, something can be done for policy analysis.

The structure and development of government budget in Viet Nam

While there are many difference remained in the definition and operational applications of various terms in the government budget between Viet Nam and other countries, I will use the same definition for government spending and taxes as in these reference studies. Therefore, in this paper the government expenditure is defined as total purchases of goods and services. In the Vietnamese budget specification that would include two items: government capital expenditure and government current expenditure. As in other cases interest payment is excluded from government spending.

On the revenue side, two items are excluded from ‘government taxes’. These are receipts from oils (both as transfers from state-owned companies and as taxes, including corporate income tax and natural resources taxes. The reason of excluding these receipts from the government revenues is that they are not responsive to any domestic economic conditions. Viet Nam has no refine facility so it has to export all crude oil. Oil revenues depend solely on the external environment so

including them into the government revenues would mislead some of impact on output and price that we are interested in. For a similar reasons, official development assistance (ODA) is also excluded from the revenues because it is considered as transfer. For the fiscal policy analysis purposes, it may be more complicated because, some of ODA are considered as ‘budget-support items’ so they have the same role as other items. For a similar reasons, official development assistance (ODA) is also excluded from the revenues because it is considered as transfer. For the fiscal policy analysis purposes, it may be more complicated because, some of ODA are considered as ‘budget-support items’

Table 1-3 show data of government budget from 2000 to 2009 with break-down for both revenues and expenditures. On the revenue side, taxes account for nearly 90 percent of total revenue, but income taxes, including both corporate income and personal income account for around 40 percent of total taxes. A sharp drop in the share of income tax in 2009 is due to tax-break initiated by the Government as a counter-measure to the economic slowdown as a result of the global recession. At the same time, personal income account for a negligible share in total tax collection. As Kojo Oduro (2007) rightly puts it ‘around 74 percent of Vietnamese pay no tax at all’. Import duties tax also lost its relevance in the total government revenues. This is partly because of tariff liberalization efforts, implemented intensively in recent years as Viet Nam engaged in many regional and bilateral trade and investment arrangements.

On the expenditure side, capital expenditure includes two key items: government spending on public investment on infrastructure and supporting state-owned enterprises. That explains why the share of capital expenditure still remains significant (almost one-third of total). It is also expected that the state sector can benefit a lot from the government spending. Concerning the current expenditure, most of it is in form of wage to the state employee, other targeted programs. It should be noted that under the current system of fiscal decentralization, part of central government budget is given to provinces for their own need of spending. Of total 64 provinces in Viet Nam, 48 provinces get net transfers from the central budget.

One of the prominent features of the Vietnamese fiscal system is that there is strong role of the government in providing budget resources for public investment and development finance and supporting state-owned enterprise.

Financing the budget deficit and macroeconomic stability issue

One of intensively debated issues in Viet Nam recently is the macroeconomic stability and related to this the issues of the effectiveness of government spending and its sustainability in particular. Using ICOR (Incremental Capital Output Ratio) as a measure of the effectiveness of investment and government spending, many argue that this ratio exhibits a continuing upward trend in the last two decades. Vuong Quan Hoang (2009) for example shows that the ICOR for the whole economy has increased from as low as 3.05 in the period of 1991-1995 to as high as 8.0 in 2009. More importantly, there is evidence that the state sector has much higher ICOR than the national average (Nguyen Phi Lan, 2010). Many relate this seemingly inefficient use of resources to ineffective government spending via public investment and other targeted programs. As a result, the government budget deficit tends to widen as shown in Table 3a. In the last five years, especially during the global financial crisis, the government budget deficit tends to widen further, exceeding a 5-percent limit set by the National Assembly. Widening the government budget deficit has a profound implication to the macroeconomic stability for the Viet Nam economy for many reasons. Firstly, it increases the burden of national debt which may become a real issue in the near term (Vu Thanh Tu Anh, 2010). Secondly, both ways of financing the deficit, e.g. via domestic or foreign borrowing will have serious consequences for the economy in the context of Viet Nam. Domestic financing often leads to monetizing the deficit even in the case of initially selling the government treasury bonds to the public or to commercial banks. On the other hand, foreign borrowing will expose the economy to increasing risk of exchange rate fluctuation as evidenced in recent years. Both exchange rate and inflation induced by deficit financing represent a significant risk for the economy's macroeconomic stability.

Industrial output

In this paper, we don't use GDP as a variable in the model because of the absence of the data before 2004. Today the Government publishes quarterly data on GDP, but before 2004, only annual data on GDP is available. Interpolation of annual data to get quarterly data may cause some problems as pointed out by Shaheen and Turner (2008). Instead, data on industrial gross output has been published regularly with monthly frequency and with quite detailed break-down to different sectors by ownership, for example. Therefore, in this model, we use industrial output not GDP data.

As previously mentioned, in Viet Nam, there is still strong presence of the state sector in the economy and with this a heavy budget support (directly or indirectly) to the sector. In this context, it is important to examine the effects of the government spending on each sector: the state and the private separately. Therefore, there is also a need to disaggregate the total industrial output into these components. Later on these disaggregated data will be used in different model options.

Data transformation and analysis

In this study we will use the following key variables

- *TOTAL*: total industrial output produced in a given quarter
- *SOE*: industrial output produced by the state sector
- *PRIVATE*: industrial output produced by the private sector as a whole
- *TOT_REV*: total budget revenues
- *TOTEXPEND*: total government spending
- *CAPITAL*: total government capital expenditures
- *CURRENT*: total government current expenditures, and
- *CPIINDEX*: price index

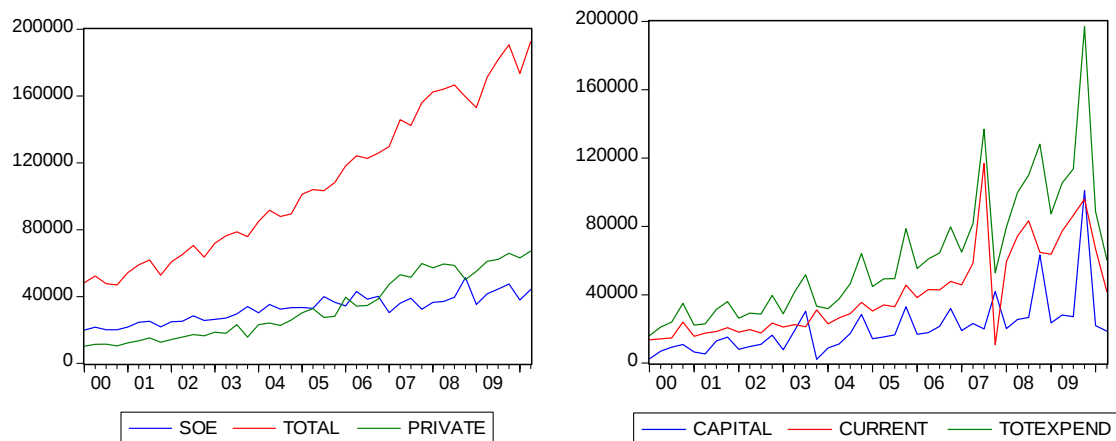
In total, there are seven variables divided into four groups of indicators in our model. These groups include output (includes *TOTAL*, *SOE* and *PRIVATE*); price (*CPIINDEX*); government revenues (*TOT_REV*) and government spending (*TOTEXPEND*, *CAPITAL* and *CURRENT*). Not all these variables will be used simultaneously in a model. Instead, in each option only four variables, one from each group will be included into the model. For example in the basic model, we use for variables *TOTAL*, *TOEXPEND*, *TO_REV* and *CPIINDEX* to analyze the effects of *total* government spending on *total* industrial output. In another case, only government *capital* spending *CAPITAL* is used to analyze the effects of this *particular kind* of government spending on the total output. Similarly, in another setting, when the effect on the state-sector output is in focus, variable *SOE* will be used instead of *TOTAL*.

Data transformation.

It is evident that data are heavily affected by seasonal fluctuations. These fluctuations are caused by both technical and institutional factors and applied to not only production and price data but to even greater extend to the government budget data. Under the current budget planning and implementation in Viet Nam, it is often the case that resources are quickly disbursed at the end of a financial year to fulfill target growth rate and become slowly channeled to designated

users at the beginning of a planning period. Figure 1 shows this pattern for all components of the government spending. On the production side, seasonality is also highly visible as shown the left panel of Figure 1.

Figure 1. Seasonality of key variables



Therefore it is needed to adjust the original data to capture this time-series features of the data. A standard TRAMO/SEATS procedure has been used to all variables in the model. Figures show the original and seasonally adjusted data for CAPITAL, CURRENT, TOTAL and TOTAL_REV as an example. In each panel, three data sets: the original, seasonally adjusted and the trend-cycle data are shown for each corresponding variable. In our study, seasonally adjusted data will be used instead of the original one.

Figure2. Seasonally adjusted data for CAPITAL and CURRENT

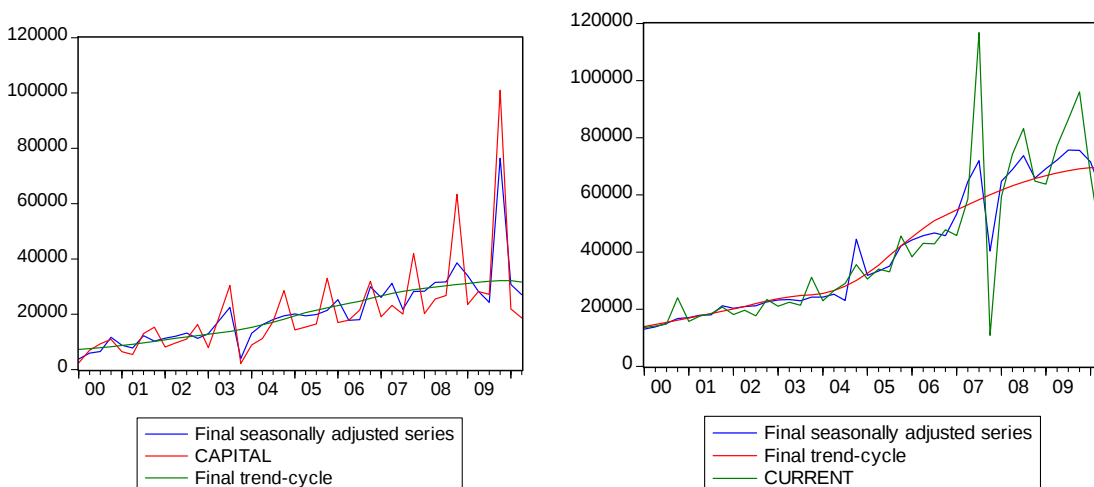
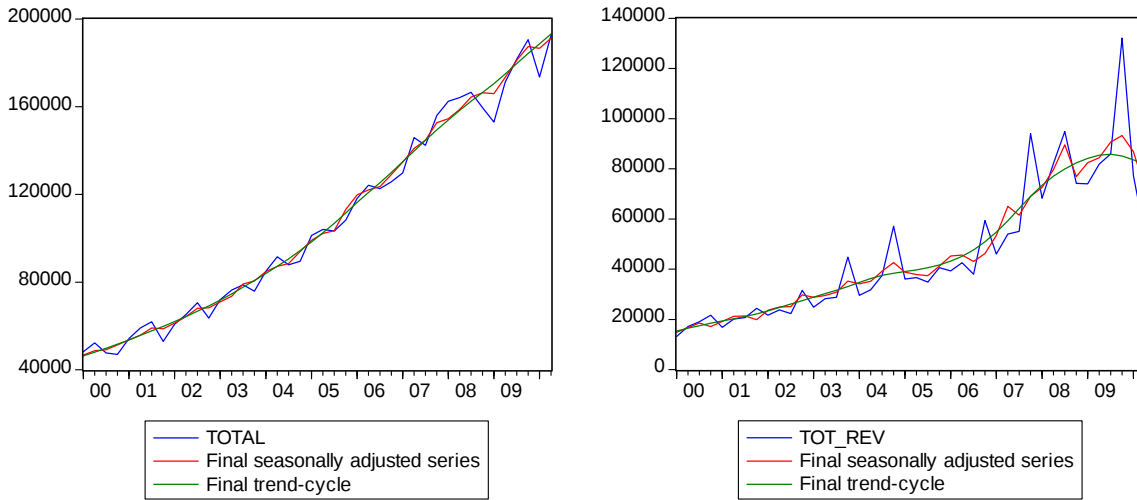


Figure 3. Seasonally adjusted data for TOTAL and TOTAL_REV



Unit Root and Stationarity Test.

We perform both unit root and Grange-causality test for all variables in the model. The results are given in Table xx and xx. We consider four options for unit root test for each variable. These options are: (i) level without trend; (ii) level with trend; (iii) 1-st difference without trend and (iv) 1-st difference trend. It is shown that all variables, except the price level become stationary after de-trending. Some are I(1) as Table 3 shows. The same pattern of stationarity is reserved after data transformation into seasonally adjusted data

Table 3: Unit root test for key variables: the original data

Variable	Level without trend		Level with trend		1-st difference without trend		1-st difference with trend	
	T-statistics	P-value	T-statistics	P-value	T-statistics	P-value	T-statistics	P-value
TOTAL	1.680	0.999	-6.742	0.000	-3.394	0.066	-7.291	0.000
SOE	-1.191	0.669	-7.867	0.000	-6.446	0.000	-7.785	0.000
PRIVATE	-0.091	0.944	-8.312	0.000	-3.013	0.141	-8.329	0.000
TOT_REV	-2.220	0.202	-5.774	0.000	-4.560	0.004	-5.668	0.000
TOTEXPEND	3.111	1.000	-7.711	0.000	-0.469	0.980	-5.129	0.001
CAPITAL	0.762	0.992	-15.736	0.000	-1.434	0.834	-15.856	0.000
CURRENT	0.307	0.976	-6.589	0.000	-4.992	0.001	-5.463	0.000
CPIINDEX	2.356	1.000	-1.963	0.301	1.102	1.000	-3.629	0.043

Source: Author's calculation

Table 4: Unit root test for key variables: seasonally adjusted data

Variable	Level without trend		Level with trend		1-st difference without trend		1-st difference with trend	
	T-statistics	P-value	T-statistics	P-value	T-statistics	P-value	T-statistics	P-value
TOTAL	2.093	1.000	-5.759	0.000	-2.158	0.500	-6.315	0.000
SOE	-0.988	0.748	-7.627	0.000	-4.531	0.004	-7.560	0.000
PRIVATE	0.109	0.963	-9.829	0.000	-3.290	0.082	-9.784	0.000
TOT_REV	-0.858	0.792	-5.317	0.000	-3.676	0.038	-5.191	0.001
TOTEXPEND	2.171	1.000	-6.263	0.000	-4.360	0.007	-4.355	0.008
CAPITAL	2.724	1.000	-8.527	0.000	-6.756	0.000	-4.913	0.002
CURRENT	0.002	0.953	-6.977	0.000	-4.352	0.007	-6.870	0.000
CPIINDEX	3.385	1.000	0.541	0.986	2.244	1.000	-4.940	0.002

Source: Author's calculation

Granger-Causality Test

So the tests show that the price level does Grange-cause the output but not the reserve. On the other hand, both government budget items (spending and revenues) *do* Grange-cause the price level. Finally, output and price do Grange cause the expenditure. Most of the tests which are given in Table 5 are statistically significant at least at the 5% level. For example, Table 5 shows that the price level CPIINDEX does statistically Grange cause the total industrial output at 4% level of significance (chi-square equals to 10.272). Similarly, in its turns the price level is Grange caused by two government budget variables, TOT_REV and TOTEXPEND at 2.1 percent of significance. Both total industrial output TOTAL and the price level CPIINDEX do Grange cause the total spending (Table 5). It can also be seen that spending does Grange cause revenues but not the opposite. These results remain robust with regards to number of lags included in the test.

Table 5. Grange Causality Test.

Variables	TOTAL		CPIINDEX		TOT_REV		TOTEXPEND	
	Chi-sq	P-value	Chi-sq	P-value	Chi-sq	P-value	Chi-sq	P-value
TOTAL			4.210	0.378	5.158	0.271	26.234	0.000
CPIINDEX	10.272	0.036			3.687	0.450	10.551	0.032
TOT_REV	3.831	0.429	48.509	0.000			1.297	0.862
TOTEXPEND	3.939	0.414	11.523	0.021	11.460	0.022		
All	21.908	0.039	90.288	0.000	25.288	0.014	38.043	0.000

Source: Author's calculation

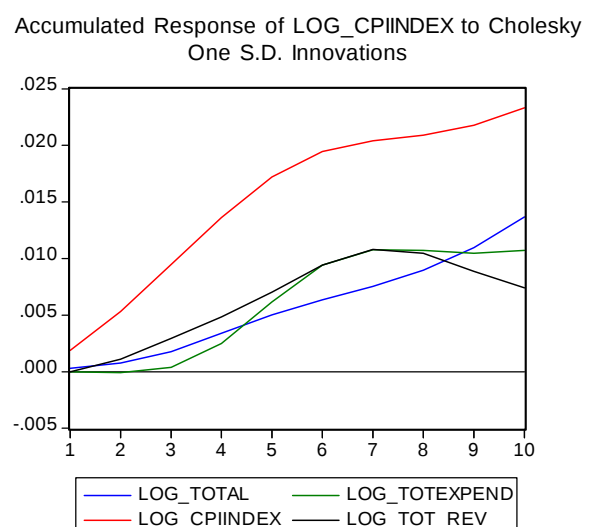
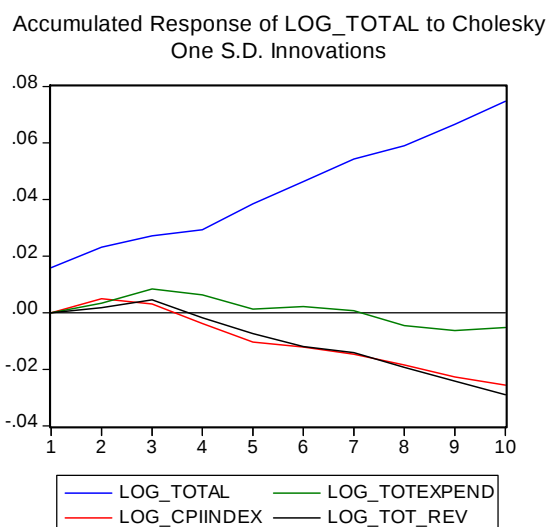
It should be noted that although this Grange causality test with respect to spending/taxation relationship seems to support our assumption on the these Grange causality results should not be mixed up with our assumptions made on contemporaneous effects of stochastic shocks on a given macroeconomic variable in the structural VAR model. The Grange causality tests involve the effects of past values of a variable on another, so they deal with *delayed* effects rather than the contemporaneous effects as in the SVAR set-up.

4. Preliminary findings and follow-up

The standard benchmark VAR model

Two panels in Figure 4 show the accumulated effects of the output (TOTAL) and price (CPIINDEX) to other government budget shocks. It can be seen that the total spending has a limited, short-lived long-term effects on the output. The accumulated effect reaches its peaks in 3 quarters and after that start to decline and eventually become negative. The same patterns are applied for the price and government revenues shocks albeit with shorter positive-accumulated reaches it peaks and eventually become negative in real terms in shorter time span.

Figure 4. The accumulated responses of output and price to the government spending and revenues



On the other hand, all other shocks, including output and government budget shocks have rather strong and permanent inflationary impact as shown in the right panel of Figure xx, although the impact of the government spending is diminishing over time.

Figure 5. The accumulated responses of output and price to the government capital spending and revenues

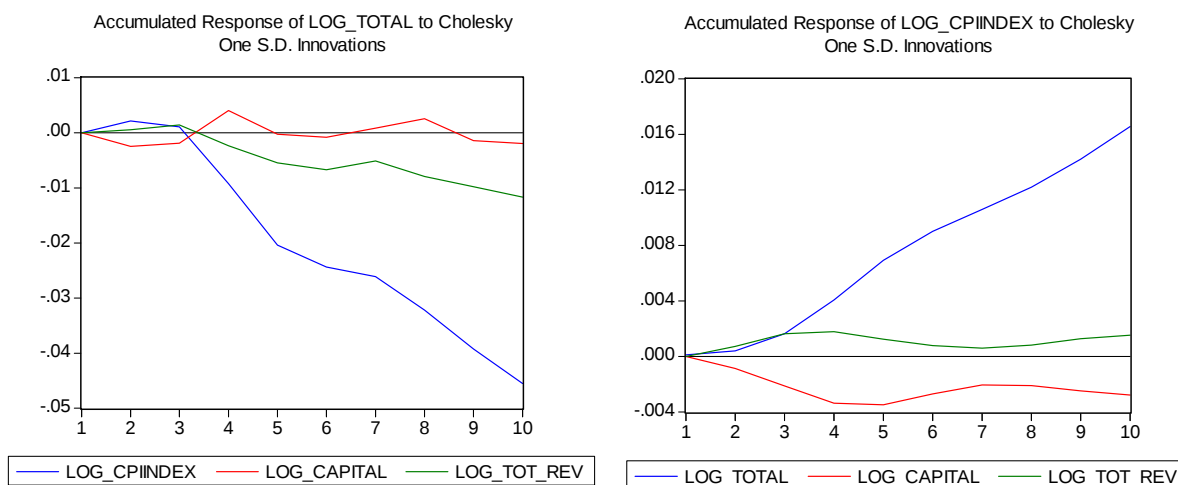
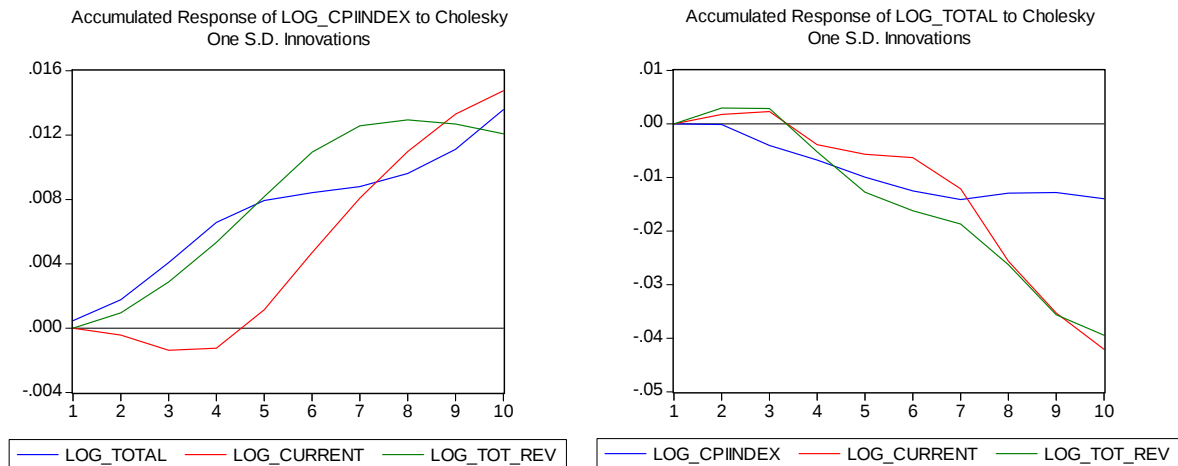


Figure 5 show similar results of the effects of government capital spending on output and price. It is surprising to know that the accumulated effects of capital spending on the output exhibits a cyclical pattern: It has a negative effects on the first 3 quarters and become positive in the subsequent quarter before going back to the negative interval, albeit with lower magnitude again. On the other hand, capital spending has a negative inflationary impact which is difficult to explain.

The effects of the government current spending on output and price are shown in Figure 6. The patterns of effects of government current spending mirror the effects of the overall spending. Again, the current expenditure has short-lived positive effects at the beginning but quickly turn into negative effects over time. Furthermore, although the current spending has initial disinflationary effect, over time it has accelerated inflationary effect. (Figure 6).

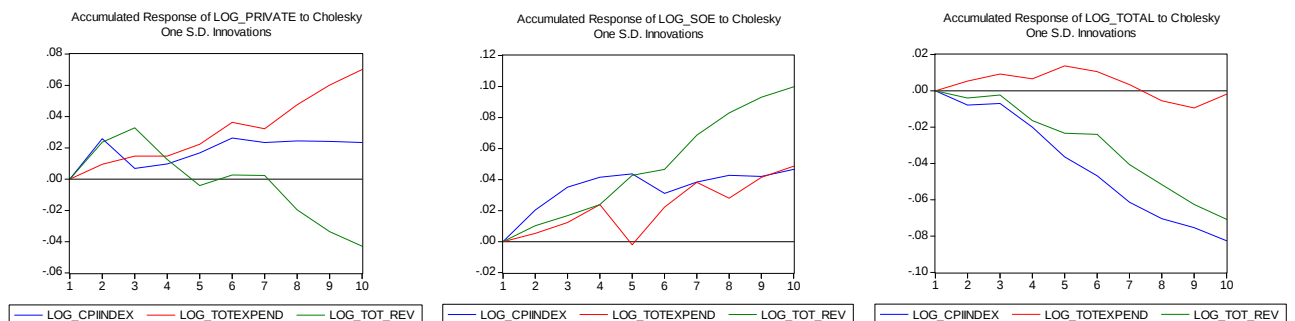
Figure 6. The accumulated responses of output and price to the government *current* spending and revenues



The effects of government spending on output in the private and state-owned sector.

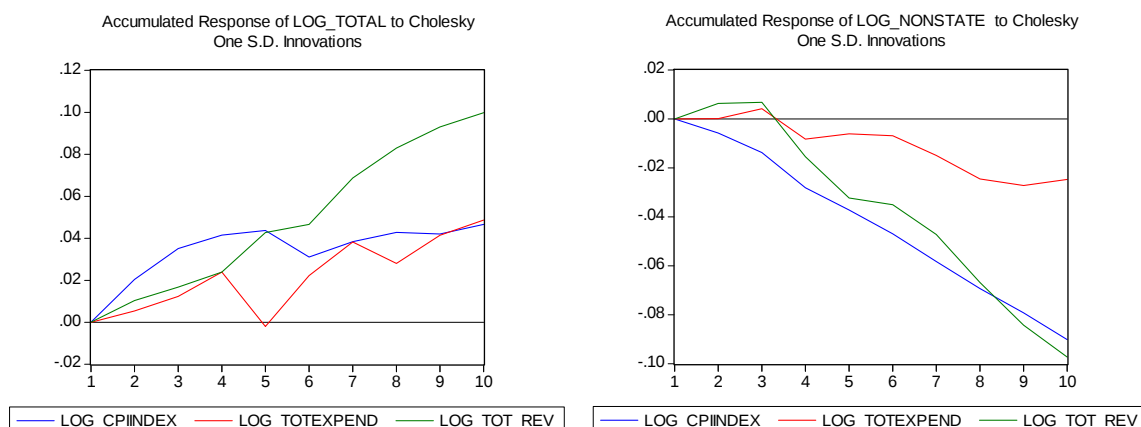
Although the private sector in Viet Nam has been experiencing an impressive growth in the last decade, the state sector still plays an important role in the economy. Support from the budget to the state sector no longer has its direct form as it was in the past. Nevertheless, the state sector still enjoys many forms of support from the government. Capital expenditure, for example often goes to the state-owned or –dominant companies and business groups. In this context, it is interesting to see how government budget has any distinguished effects on different ownership group, e.g. the state and the private sector. We undertake this test by replacing the total output by the state sector and the private sector output respectively in different options of the benchmark model. Figure 7 gives results of these model options

Figure 7. The accumulated responses of output by ownership to the government *total* spending and revenues



As can be seen from Figure 7 the effects on different sectors seem to be greatly different. The private sector seems to get positive effects of the government spending but bearing the cost of taxation, while the FDI sector tend to get all the burdens of the government spending

Figure 8. The accumulated responses of output by the state and non-state sectors to the government *total* spending and revenues



The effects of government spending on industrial output breakdown by ownership become more visible when outputs of the private and foreign direct investment (FDI) are combined together to form the non-state sector input and put into comparison with the state sector. Figure 8-10 give the effects of government spending to the output of these two sectors. There is a great contrast between the state and non-state sector output responses to price and government total spending shocks as shown in Figure 8. The SOE sector responds highly positive to the government spending and revenue shocks while the private sector has rather negative effects. Decomposition of total government spending into capital and current expenditures give a better picture to the non-state sector as shown in Figure 10.

So we observe an evidence crowding-out effects when government spending tends to expand the state sector output but contracts the non-state sector at the same time. A similar result was found by Hemming et al (200x) and they explained that this crowding-out may take place because either government provision substitutes for private provision or fiscal expansion leads to an interest rates rise which in turn negatively affect the private investment. This explanation can be used to the case of total government spending but can hardly be used to explain a overall negative effects of capital expenditure shocks as shown in Figure 9. The crowding-out effect result therefore needs to be taken with caution and its robustness should be checked.

Figure 9. The accumulated responses of output by the state and non-state sectors to the government's Capital Spending and *Total Revenues* Shocks

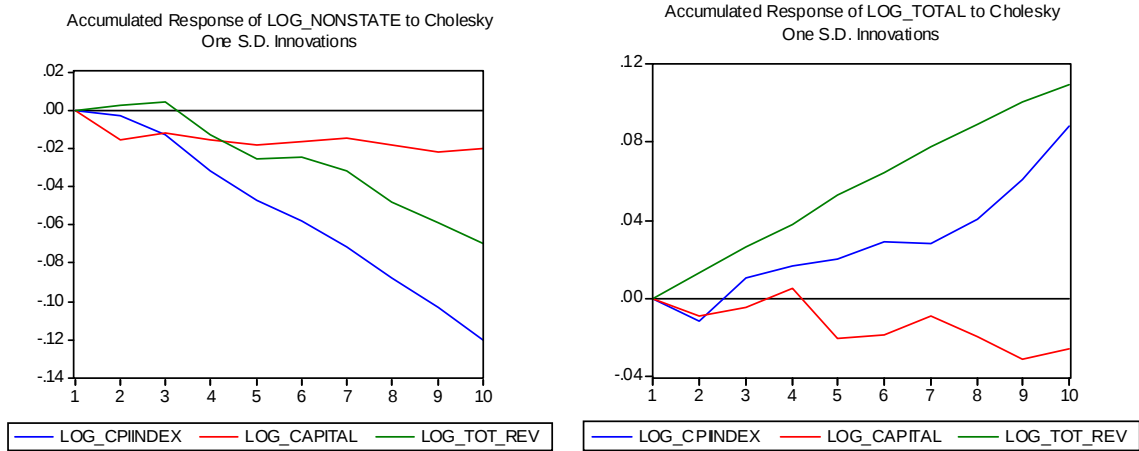
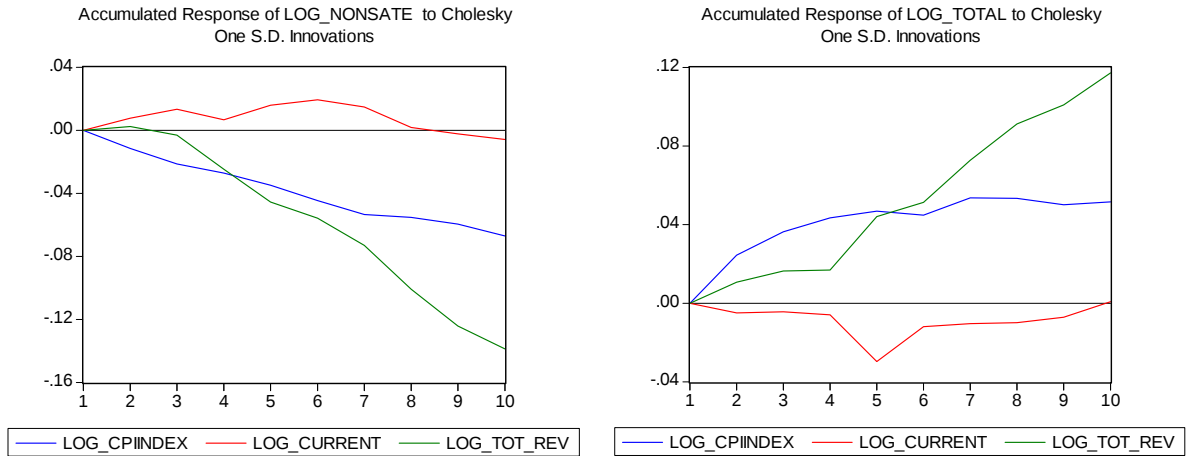


Figure 10. The accumulated responses of output by the state and non-state sectors to the government *current* spending and revenues



One possibility for the model robustness check is to use external data for exogenous elasticity estimation, for example. Including more variables, interest rate for instance into the model is another option but with this small sample it can hardly be a viable choice.

5. Conclusion

A structural VAR model has been used to explore the effects of government spending on output and price in Viet Nam. The model has provided some sensible result. It shows, for example, government spending has rather limited effect on output while its inflationary impact is prominent. The results provide evidence on possible crowding out and different patterns of effects by different components of the government spending. While these results need careful interpretation, the model nevertheless has shown that it could be a good tool to be used for assessing the effects of fiscal policy.

Table 1. Government spending structure, 2000-2009 (billion VND)

Year	Total spending	Capital expenditures	Current exp (incl. interest payment)	Current exp (excl. interest payment)	Interest payment	Share of capital exp in total (%)
2000	99751	29624	70127	66613	3514	29.7
2001	117285	40236	77049	72564	4485	34.3
2002	129434	45218	84216	78886	5330	34.9
2003	162150	59629	102521	96126	6395	36.8
2004	187353	66115	121238	114021	7217	35.3
2005	229092	79199	149893	143272	6621	34.6
2006	268409	88341	180068	172103	7965	32.9
2007	336312	104302	276483	232010	12666	31.0
2008	433222	135911	297311	281834	15477	31.4
2009	527342	179961	347381	323501	23880	34.1

Source: Ministry of Finance, 2010

Table 2. Government revenues, 2000-2009 (billion VND)

	Total revenue	Annual growth rate	ODA and other transfer	excl. ODA	Permanent source of revenues	Taxes	Share of taxes in total (%)
2000	90749		2028	88721	87883	77779	85.7
2001	103888	14.8	2011	101877	100918	90498	87.1
2002	121717	17.3	2250	119467	118347	107896	88.6
2003	158057	29.8	2969	155088	153972	134280	85.0
2004	198614	26.2	2877	195737	194399	167174	84.2
2005	223899	12.5	3789	220110	218827	203102	90.7
2006	289169	27.8	7897	281272	279279	248383	85.9
2007	336273	17.4	6012	330261	327773	291635	86.7
2008	416783	24.0	7275	409508	408223	382484	91.8
2009	442340	6.4	6520	435820	434452	396650	89.7

Source: Ministry of Finance, 2010

Table 3. Government revenue from taxes, , 2000-2009 (billion VND)

	Income and assets taxes	Land and resource taxes	Income tax	CIT	PIT	Import duty	Share of income taxes in total	Share of import duty taxes
2000	41639	10858	30781	28950	1831	13437	39.6	17.3
2001	47084	11728	35356	33298	2058	17458	39.1	19.3
2002	52386	13222	39164	36826	2338	21915	36.3	20.3
2003	69147	18786	50361	47410	2951	22374	37.5	16.7
2004	93316	32808	60508	56987	3521	21614	36.2	12.9
2005	117124	37043	80081	75847	4234	23660	39.4	11.6
2006	148966	43991	104975	99796	5179	26280	42.3	10.6
2007	165256	53289	111967	104552	7415	38309	38.4	13.1
2008	209773	61472	148301	135361	12940	59927	38.8	15.7
2009	182848	56447	126401	112072	14329	77040	31.9	19.4

Source: Ministry of Finance, 2010

Table 3a. Financing the budget deficit, 2004-2010 (billion VND)

	2004	2005	2006	2007	2008	2009	2010
Total budget deficit (classified by GFS)	-7,881	-7,140	-8,964	-20,094	-26,746	-75,780	-59,110
Deficit/GDP (%) (byGFS)	1.10	0.90	0.90	1.76	1.81	4.51	-\3.03
Total financing	7,881	7,140	8,964	20,094	26,746	75,780	59,110
Domestic financing	4,671	4,525	3,160	13,315	11,710	58,518	39,060
<i>Issued</i>	27,450	32,420	35,864	51,572	48,009	88,520	82,100
<i>Repayed</i>	22,779	27,895	32,704	38,257	36,299	30,002	43,040
Financing abroad	3,210	2,615	5,804	6,779	15,037	17,262	20,050
<i>Issued</i>	7,253	8,326	12,749	12,995	19,668	27,380	31,000
<i>Repayed</i>	4,043	5,711	6,945	6,216	4,631	10,118	10,950
Total budget deficit (classified by VN)	-34,703	-40,746	-48,613	-64,567	-67,676	-115,900	-113,100
Deficit/GDP (%) (by VN)	4.90	4.86	4.99	5.65	4.58	6.90	5.80
Share of foreign borrowing in total financing	92.0	116.6	142.2	64.7	73.5	36.1	52.4

Source: Ministry of Finance, 2010

Table 4. Industrial output by ownership, 2000-2010 (billion VND)

Year	Total	State-owned	Private	Foreign	Foreign (excl. oil	Share of SOE in total (%)
2000	195,320	82,101	43,809	69,410	47,535	42.03
2001	228,182	93,608	53,899	80,675	57,010	41.02
2002	260,202	104,348	63,948	91,906	65,258	40.10
2003	302,990	117,289	75,906	109,795	84,968	38.71
2004	354,030	131,570	96,150	126,310	96,562	37.16
2005	416,863	143,074	118,858	154,931	127,859	34.32
2006	490,819	156,107	147,276	187,436	157,106	31.81
2007	574,046	137,889	211,871	224,286	195,521	24.02
2008	652,766	164,796	225,471	262,499	241,332	25.25
2009	696,577	169,102	244,376	283,099	251,070	24.28
2010 (*)	366,116	82,348	130,321	153,447	137,925	22.49

Source: General Statistical Office, <http://www.gso.gov.vn>

(*) for the first two quarters

REFERENCE

- Andrew Mountford and Harald Uhlig (2005). What are the Effects of Fiscal Policy Shocks ?. SFB 649 Discussion Paper 2005-039. July 2005
- António Afonso and Ricardo M. Sousa (2009). The Macroeconomic Effects of Fiscal Policy in Portugal: a Bayesian SVAR Analysis, January 2009
- Dang Van Thanh (2007). Vietnam's Budget Revenue Structure: Status and Trend. Paper presented at the International Workshop on the Vietnam Budget Structure, 18 September 2007. Ha Noi, Viet Nam
- Ernesto Rezk, Maria Cecilia Avramovich and Martín Basso (2006). Dynamic Effects of Fiscal Shocks upon Diverse Macroeconomic Variables: A Structural VAR Analysis for Argentina). Paper presented to the XLI Annual Reunion of the Argentine Association of Political Economy, National University of Salta, 15 – 17 November 2006
- Francisco de Castro Fernández and Pablo Hernández de Cos, (2006). The Economic Effects of Exogenous Fiscal Shocks in Spain: A SVAR Approach. *European Central Bank Working Paper Series*, No 647 / June 2006
- General Statistical Offices. <http://www.gso.gov.vn>
- Hemmning R., Kell M. and Mahfouz S. (2008). The Effectiveness of Fiscal Policy in Stimulating Economic Activity – A Review of the Literature. *IMF Working Paper*. December 2002
- Jorge E. Restrepo and Hernán Rincón, (2006). Identifying Fiscal Policy Shocks in Chile and Colombia
- Kenneth N. Kuttner and Adam S. Posen (2002). Fiscal Policy Effectiveness in Japan. *Journal of the Japanese and International Economies* 16, 536–558 (2002)
- Kirsten H. Heppke-Falk, Jörn Tenhofen Guntram B. Wolff, (2006). The macroeconomic effects of exogenous fiscal policy shocks in Germany: a disaggregated SVAR analysis. *Deutsche Bundesbank Discussion Paper*, Series 1: Economic Studies, No 41/2006
- Kojo Oduro. (2007). Structure of Vietnam's Budget: An Assessment Evaluation from an International expert; Experience in England Budget structure reform. Paper presented at the International Workshop on the Vietnam Budget Structure, 18 September 2007. Ha Noi, Viet Nam

- Mardi Dungey and Renée A. Fry (2007). Identifying Fiscal and Monetary Policy in a Small Open Economy VAR. The University of Cambridge and The Australian National University, August 2007
- Ministry of Finance, Viet Nam <http://www.mofi.gov.vn>
- Mohammed Nur Hussain¹, Albert Wijeweera, and Nam Hoang, (2008). Impacts of Monetary Policy and Fiscal Policy on Output: A Structural Cointegrating VAR Approach for selected ASEAN Economies
- Nguyễn Phú Lâm (2010). Endogenous Growth Strategy in Restructuring the Vietnamese Economy. Paper presented to Conference “*Economic Theory and implications for Viet Nam*”, Quang Ninh, 2010.
- Radka Štiková (2006). Effects of Fiscal Policy in the Czech Republic: a SVAR analysis. Alternative Approaches to Economic Modelling
- Raffaella Giordano, Sandro Momigliano, Stefano Neri and Roberto Perotti, (200x). The effects of fiscal policy in Italy.
- Rarytska, O. (2003). The dynamic effects of fiscal policy in Ukraine: A Structural VAR Approach. A MA's Thesis. National University of 'Kyiv-Mohyla Academy'. 2003
- Roberto Perotti (2004). Estimating the effects of fiscal policy in OECD countries. IGER– Università Bocconi. *Working Paper No. 276*, December 2004
- Roberto Perotti (2004). Public Investment: Another (Different) Look. IGER– Università Bocconi. *Working Paper No. 277*, December 2004
- Rozina Shaheen and Paul Turner (2008). Measuring the dynamic Effects of Fiscal Policy shocks in Pakistan. Economics Department, Loughborough University, UK
- Vũ Thành Tự Anh (2010). Sustainability of Public Debts in Viet Nam. <http://tuoitre.vn/tuoi-tre-cuoi-tuan/378593/>.
- Vương Quân Hoàng (2010) Viet Nam Economy 2009 and the need for change. *Communist Journal online* No 3 (195) , 2010.

“The Effectiveness of Macroeconomic Policies in Cambodia: An Empirical Investigation”

by
Chea Ravin & Ung Luyna¹

May 10, 2011

ABSTRACT

The remarkable achievements of stable macroeconomic environment in Cambodia for last decade have inspired a lot of debates over the role of the macroeconomic policies implemented. To verify this up, the study examines the influential of fiscal and monetary policies in Cambodia by a battery of time series econometrics approaches. More specifically, the study looks at the impact of policy shock on economic growth and inflation. The empirical results suggest that fiscal policy is more influential than monetary policy in stimulating the country economic growth in medium term and stabilizing prices. Interestingly, inflation does not virtually respond to monetary policy shock. On the other hand, the real effective exchange rate affirmatively reacts to fiscal and monetary shocks though the effects of government spending take longer than broad money. These empirical observations highlight policy markers the appropriate tools which could be employed to achieve macroeconomic objectives and cope with external shocks.

¹ *Authors would like to express our deep thanks to Thai Research Fund (TRF) that kindly provides financial supports for the CLTV project. Secondly, our special gratitude would be dedicated to Prof. Bhanupong Niddiprabha who gives us a golden opportunity to participate in the project, sharing the views and experience on Cambodian macroeconomic policies.*

I. INTRODUCTION

The influence of fiscal and monetary policies remains a researchable issue being debated by many policymakers and economists - some of whom have advocated Keynesian view in favor of fiscal policy influencing economic growth, while others have believed in monetary policy raised by monetarists. Despite the different channels over the two policies, the consensus is that sound macroeconomic policies are vital for stabilizing the inflation and stimulating growth. However, their implicit contributions to economic activities differ across countries based on the nature of their economic structures and political complexity. For a small open economy-like Cambodia that has undergone a transitional period of economic transformation from centrally-planned to free market economy couple with an experience of high “dollarization”², designing an appropriate macroeconomic policy to sustain economic growth is a difficult task to accomplish. Surprisingly, since Cambodia obtained full peace in 1998, implemented huge reform programs and integrated itself into regional and international groupings, the economy has enjoyed high growth with an annual average of more than 9% and reaching double digit in some years from 1999 to 2007 before declining to nearly zero growth in 2009 due to global economic downturn (NBC bulletin, 2009). Then, the economy was estimated and predicted to bounce back in 2010 and 2011. Inflation had been broadly stable around 1% from 2000 to 2005 before rising to double digit in 2007 due to dramatic surge in oil and food prices. In addition, unemployment rate has hovered around 3 percent (ADB, 2009).

The remarkable above-mentioned results of economic resilience have been so impressive that a lot of questions have been posed about its determinants, in particular the successful implementation of macroeconomic policies. Some argued that the conduct of monetary policy in a very highly-dollarized economy like Cambodia is very complicated in the sense that since the central bank is only able to control domestic money supply, the scope for effectiveness of monetary and exchange rate policies is minimal (Kem, 2002). The same conclusion was drawn by Zamaroczy et al. (2001) who carried out his research on “*The macroeconomic adjustment in highly dollarized economy: Cambodia case*” and Hoffmaister and Vegh(1995) who conducted an empirical analysis of “*Disinflation and Recession Now vs. Later Hypothesis: Evidence from Uruguay*”. This may leave some rooms for fiscal policy to play more crucial role in accelerating economic growth and

² Dollarization refers to a situation where foreign currencies serve the same function as domestic currency-medium of exchange, unit of account and store of value.

controlling inflation. Hence, it is important for the Royal Government of Cambodia (RGC) to understand how fiscal and monetary policies affect the highly dollarized economy under international integration in order to draw up comprehensive and suitable macroeconomic policies for stabilizing the economy.

This paper attempts to examine the roles of fiscal and monetary policies in Cambodia in stimulating economic growth and maintaining a low rate of inflation. In addition, the research is conducted with an expectation that the empirical findings will provide some policy makers and other researchers with an insight into the Cambodia's macroeconomic stances and appropriate tools which should be used to stabilize the economy. The study is organized as follows. Following an introduction in Section I, Section II provides an overview of Cambodian economy by highlighting the stylized facts of its monetary and fiscal development. Section III sheds a light on literature review of macroeconomic policies by examining the effectiveness of both fiscal and monetary policies in diverse countries. Section IV places an emphasis on the empirical studies by using Vector Auto Regression (VAR) to explore the relationship between output and inflation, and macroeconomic variables such as government expenditure, monetary aggregate, and real effective exchange rate. Section V draws policy implication and recommendations in order to improve the current economic performance so as to achieve macroeconomic stability which is not prone to external shocks.

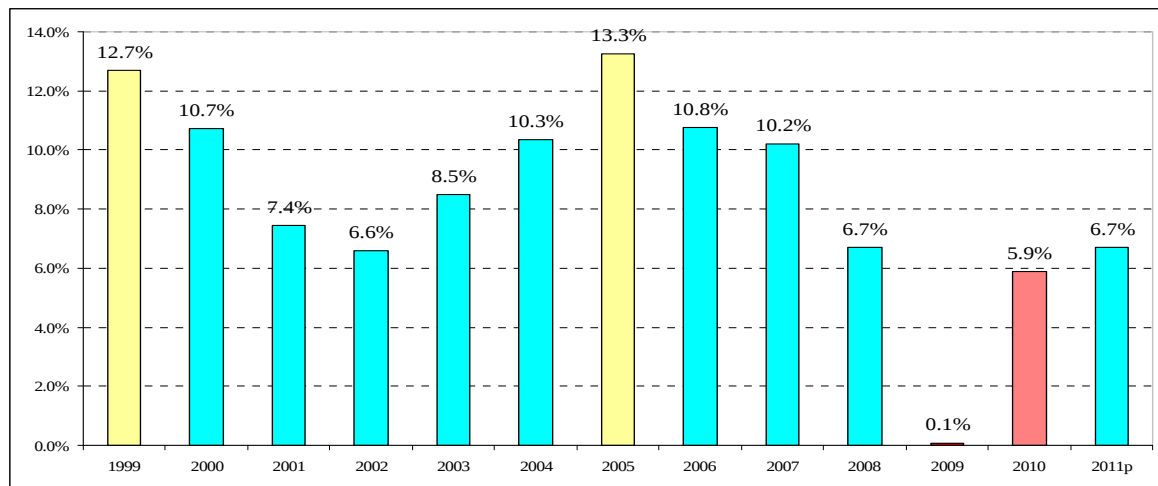
II. OVERVIEW OF CAMBODIAN ECONOMY

1. THE PERIOD OF RAPID GROWTH

In the wake of cloudy period of Pol Pot regime from 1975-1979, Cambodia undertook centrally-planned economy, which followed Soviet Union's style. The commencement of economic liberalization in 1985 accelerated the enhancement of private property rights and lift of price controls in 1989. Importantly, the national election sponsored by UNTAC in 1993, marked the beginning of free market economy orientation into Cambodia. Since then Cambodia has changed its face both politically and economically. The Royal Government of Cambodia (RGC) with international community supports began a huge stabilization and rehabilitation reform programs aimed at economic development and growth. To achieve this, priority was given to the restoration of legal and institutional frameworks as well as development plan. Then, the government embarked on dramatic reform evidenced by large-scale privatization of state-owned enterprises and the banking system, deregulation of the financial system and trade liberalization. In addition, National Development Plan (2001-2016) which has been propped up by Triangular and Rectangular Strategies was developed and served as a roadmap for the Royal Government to achieve Millennium Development Goals (MDGs) and its objective of a sustainable development.

As a result, as shown in figure 1, Cambodia broke the record of highest annual economic growth averaging 9%, in particular in period of 1999-2008 followed by Laos and Vietnam whose economies had grown about 7% and 8%, respectively. In aftermath of financial crisis and internal conflict in 1997, GDP growth rate dropped significantly to 3%. After the political situation returned to normal, Cambodian real GDP recovered by growing on average around 9% from 2000 to 2004 and then reaching its peak of 13.3 % in 2005 before declining to around 0.1 % in 2009 due to surge in oil price and global economic downturn. Real GDP was positively projected to grow an average of 5.9 % in 2010 and 6.7% in 2011 (IMF, 2011). The main driving forces for such robust economic outcome include rapid expansion of textile and garment industries, tourism and construction.

Figure 1: Real GDP Growth



Data source: NBC

Manufacturing sector, which is dominated by garment industry, has plays a crucial role in contributing to recent economic growth, accounted for an average of 25% as percentage of GDP from period 1999-2008. The number of garment factories had increased substantially from 7 in 1994 to 292 in 2008 and employed 35,2000 workers in September, 2008 (Jalilian et. al., 2009). In the aftermath of the global crisis, about 50 textile and apparel factories were closed in early 2009 resulting in 51,000 job losses or an approximately wage loss of \$5 million due to slow demand from USA and European markets. In 2010, the industry has been recovered by growing an average of around 20% (IMF, 2011). On the other hand, the construction sector also contributes to speeding up the industrial sector in Cambodia, accounted for 7% of GDP in 2007 with annual growth rate of 20% and about 300,000 workers were employed in this sector. The real estate boom with huge jump in its price and input costs was burst due to sharp slump in incomes and credits resulting from global turmoil. As a consequence, the sales volumes have substantially dropped by 50-80% and property prices have declined by 30%-40% and about 15,000 jobs were lost. In 2010 and 2011, the sector has slightly bounced back by growing by 10%.

Service sector which has the largest share of GDP has been considered as one of the main drivers of growth in the study period. The growth of service sector has been spurred by tourism which has grown by 22 percent annually from the period of 2002-2007. During the global downturn and the chaos in Thailand, its growth rate considerably decreased to 5.48 percent in 2008 and 1.7 percent in 2009. Most of tourists are Vietnamese, increased by 50.92 percent followed by Americans and Britain, while number of Korean and Japan visitors dropped by 25.8 % and 10.7 % in 2009, respectively. In 2010, the tourism has

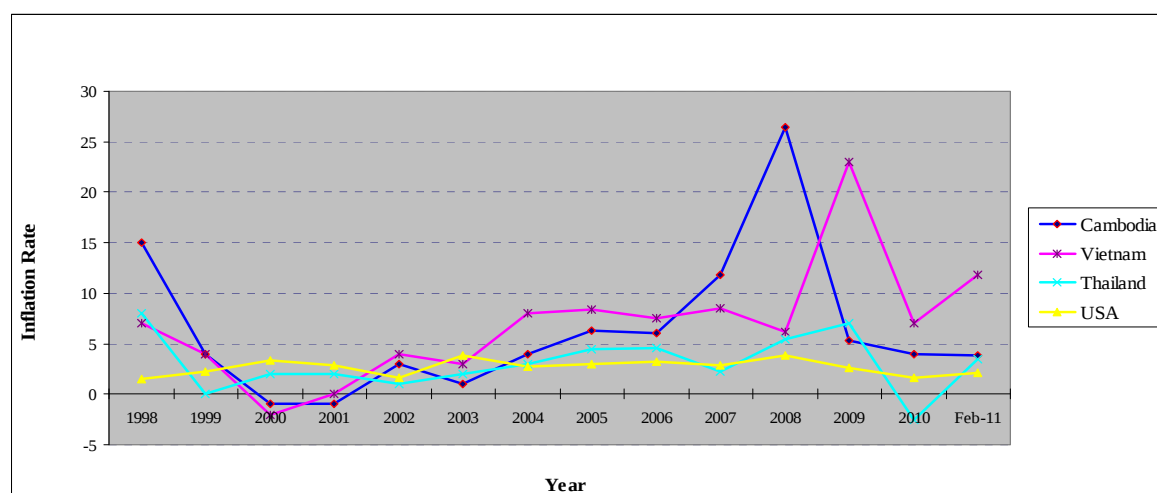
bounced back, growing between 10 to 20 % (IMF, 2011). On the other hand, banking sector has recently made a big stride both in operations and size. This was because the sector had received a huge flow of FDI into service sector inclusive of banking sector, accounted for \$133.1 million in 1998 in which a big chunk was invested in hotel industry and then dropped significantly to \$14.6 million in 2004. Since 2005 onward, the investment in this sector had increased steadily, reaching its peak of \$562.3 million in 2008 in which a lot of investment was poured into banking industry.

It should be noticed that a majority of Cambodian people rely heavily on agriculture and livestock which have low productivity due to poor infrastructure: irrigation system and roads in rural areas, use of rudimentary techniques for farming, low level of mechanization and limited access to credits. It was compounded by the fact that this sector is not attractive to foreign investors because the amount of foreign investment was an average of \$8.3 million (3% of total FDI) from 1998 to 2005, though it reached \$130 million in 2006 and \$118 million in 2007. Of agricultural crops, rice is the main agricultural production which is accounted for 84% of the cultivation land. In 2008, total land for rice production was 2.6 million hectares, which yielded 7.15 million tons, of which around 2.5 million tons were formally and informally exported. Other crops are also planted including cassava, cashew nuts, maize, rubber, tobacco etc. The agricultural sector had employed 63% of labor forces followed by service sector creating jobs of average 24.65% (IMF, 2008).

Inflation Rate

The rapid monetary expansion during fiscal deficit induced inflation to rocket above 200% in 1991 and 176.8% in 1992. After the commencement of economic reform, inflation had been brought down to a single digit during the period of 1994-2000. For instance, the inflation rate has reduced substantially from 31 % in 1993 to about 1% in 1995, then rose slightly to about 10% during the period of 1996-1998. From 1999 until 2006, the inflation rate stayed at less than 5% on average and then hiked to double digit in 2007 and 2008 due to surge in oil and commodity prices (NBC, 2009). In aftermath of global economic slump which has slowed down domestic demand, the inflation begun declining to 5.3 % in 2009 and down further to 3.79% in February 2011 (Figure 2).

Figure 2 : Inflation rate of some main trading countries with Cambodia



Source: IMF & their respective authorities

As observed, inflation rate in Cambodia had moved parallel with that of Vietnam from 1999 to 2006 and then diverged due to external shocks. Ginting et al., (2009) conducted an empirical study of the root cause of inflation in Cambodia by using Error Correction Model, suggesting that inflation in Cambodia has positive link to that of main trading partners, in particular Thailand and Vietnam. Moreover, the growth of narrow money (M1) resulting in increase in domestic demand fuels the price of non-traded goods. Surprisingly, exchange rate movement is not statistically significant in explaining inflation in Cambodia. They also maintained that in an economy adopting the currency board or common currency arrangement, the impact of exchange rate pass-through on inflation appeared to be deteriorated. On the other hand, Plate et. al, (2008) conducted Granger causality test for Cambodia and Bolivia to investigate into the relationship between dollarization and inflation. The result did not support the hypothesis. In addition, they used VAR model to explore the impact of exchange rate fluctuation on domestic inflation in dollarized countries including Cambodia. The result was statistically significant, implying that the depreciation of exchange rate led to increase in CPI though its impact was found to be smaller in Cambodia, Bolivia and Uruguay than in Argentina, Peru and Laos.

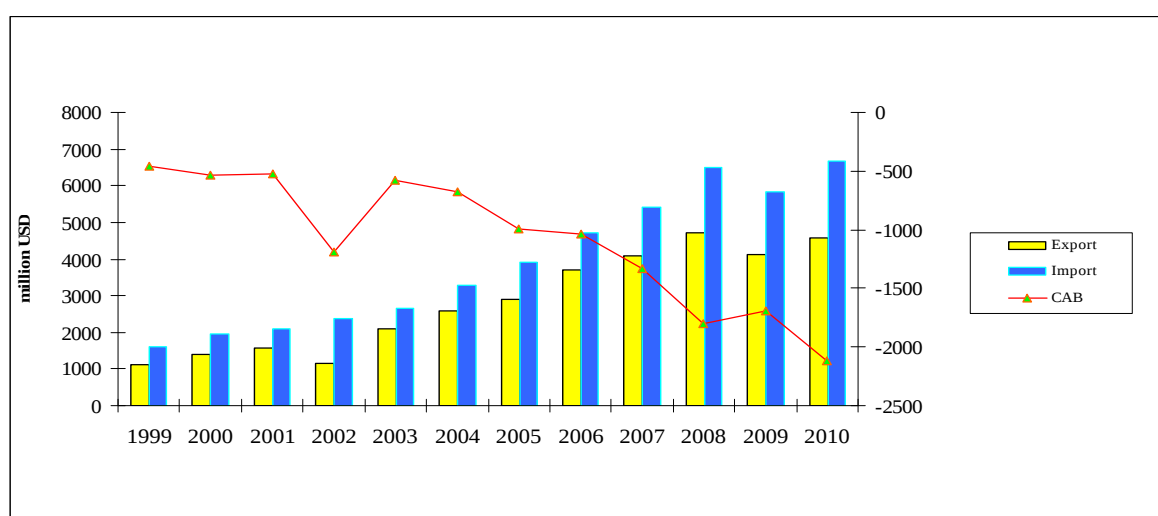
External Sector

Following the trade liberalization and economic openness in early 1990s, the exports as percentage of GDP increased substantially from 19.6% in 1994 to 29.1% in 1995 and had grown remarkably from 28.7% in 1997 to 65.3% in 2007. In nominal term, the exports increased from \$1,129 million in 1999 to \$4,708 in 2008. The major merchandise exports consist of textile which contributed to 70-80% of total exports, and agriculture products

including logs, rubber, woods, sawn timber and tobacco. In 2009, the exports dropped by 12% to \$4,137 million due to slowdown in external demand for garments imports from USA market which occupied 65% in 2008. However, agricultural exports, in particular rice, have escaped unscathed from the crisis with surplus of around 2.5 million tons for export according to Ministry of Agriculture, Forestry and Fisheries. After the global economy recovered, the exports started to increase by 10% to \$4,563 in 2010.

At the same time, imports had grown from \$1,591 million in 1999 to \$6,509 million in 2008 prior to declining to \$5,831 million in 2009 resulting from shrinking domestic demand for luxury goods including cars, motobikes, buses etc. (Jalilian et al., 2009).

Figure 3: Current Account Balance



Source: IMF (2011)

As the imports have exceeded exports, the country has experienced current account, increasing from \$462 million or about 5.2% of GDP in 1999 to \$2,116 million or about 7% of GDP in 2010 due to slowdown in demand for textile goods caused by global financial turbulence (IMF, 2011). The current account deficits have been financed by financial and capital account resulting from increase in foreign direct investment and borrowings from abroad. The surplus of BOP's overall balance has brought about increase in gross official reserve from \$548 million in 2001 to \$2,550 million in 2010, which was equivalent to 3.6 months of imports (IMF, 2011).

2. FISCAL POLICY

Fiscal policy refers to the use of government spending, taxation and borrowing to manipulate the economic activity through the effect on aggregate demand and aggregate supply. It means that changes in taxes alter the firms' and households' decision on investment and consumption demands, while changes in government spending have directly impact on aggregate demand.

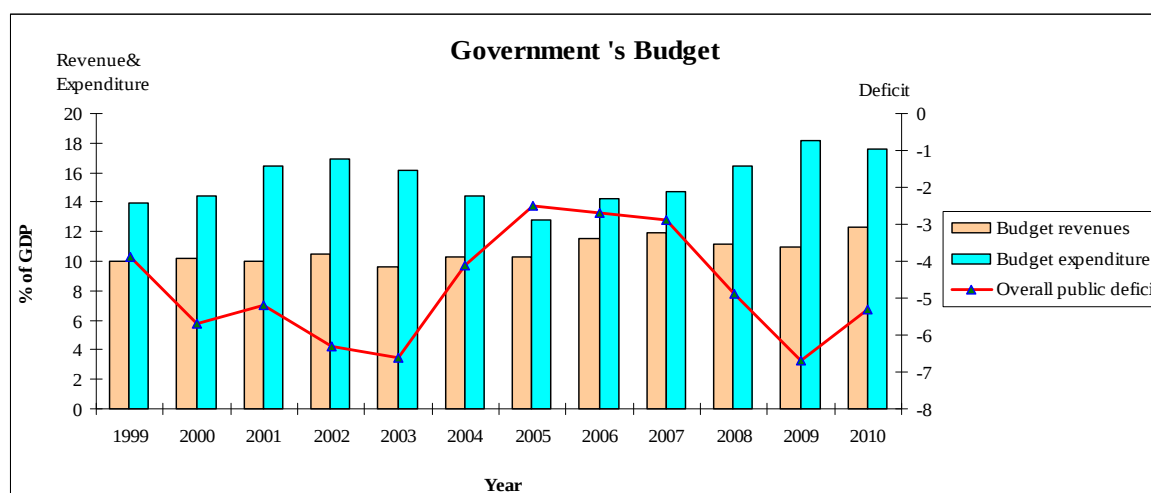
2.1 Government Revenue and Taxation

Since the new government was formed in 1993, the taxes have been considered as the main source of government revenue, accounted for more than 70% of total revenues. In fact, tax system in Cambodia has undergone through dramatic changes since 1990s after huge reforms of tax structure have been carried out to keep pace with economic growth and cope with new challenges when Cambodia embarked on openness of its economy to the world. In 2002, the government had made efforts to improve the collection of tax revenue through enhancement of personnel integrity, strengthening of enforcement measure and handling of smuggling issue. The aim of this action was to reduce the reliance on international trade taxes by enhancing the tax base. In addition, in 2003 in 2004 tax and customs departments had adopted a lot of administrative measures to improve tax collection by imposing heavier penalty, re-designing organizational structure, introducing computerized system for tax collection, audit and reconciliation, and providing training on audit and tax avoidance to tax department officials. Importantly, Law on Customs and other regulations were promulgated and anti-smuggling activities had been beefed up. Moreover, customs fraud investigation unit was established and steps of inspecting traded goods was trimmed down to boost international trade flows. After all, Law on Anti-corruption was already passed and Anti-corruption Unit was recently set up to oversee all bribe-taking activities and penalize those who are engaged in the actions. On the other hand, some actions had been undertaken to administer non-tax revenue including commencement of collecting non-tax revenue outstanding, and auditing contracts and leases to check their compliances.

As a result, the revenues as percentage of GDP have increased considerably from about 5.4% in 1994 to about 10% in 2000 and hovered around 11% annually till 2007 and returned to 10% for the following years due to sharp decline in international trade customs revenue. Considering the components of revenues, indirect taxes and trade revenues have

significantly contributed to government revenues, accounted for 50% and 22% respectively, while share of non-tax revenues was 21%. In fact, Cambodia tax revenue is affected by narrow base which is exposed to international trade revenue, of which 60 % is collected from fuel and vehicle imports. As committed by the government, the revenue relative to GDP is targeted to increase by 0.5 percentage point per annum (IMF, 2011). In 2011, the Ministry of Economy and Finance plans to strengthen tax collection by achieving total revenues of 18.88% of GDP, in which domestic taxes will increase by 14.5% to reach 13.9% of GDP (MEF, 2011).

Figure 4: Government's Budget Operations

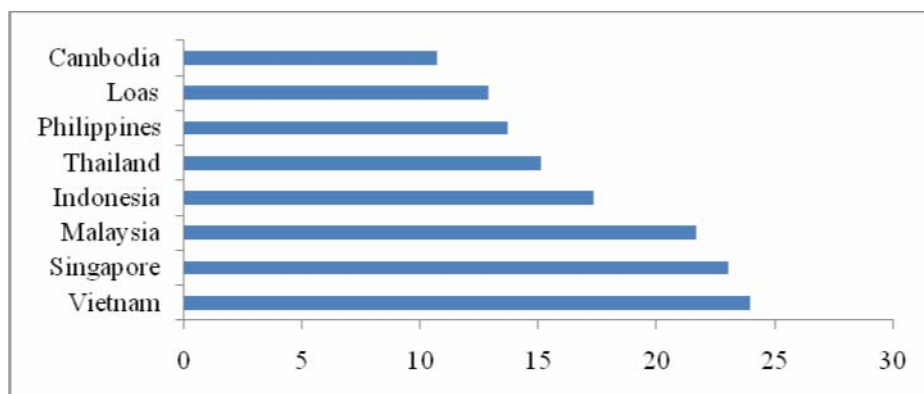


Source: IMF, 2010

It should be noticed that the average of total revenue as percentage of GDP in Cambodia is considered to be the lowest as compared to that of some ASEAN countries, while Vietnam and Singapore achieved the highest ratio, averaging more than 20 percent (figure 5). This clearly indicates that Cambodia's ability to collect and generate revenues is minimal, affecting the budget for expenditure. In the future, Cambodia like other new ASEAN members would be facing a great deal of challenges in terms of reduction of intra-regional tariffs and non-tariff barriers in compliance with Common Effective Preferential Tariff (CEPT) scheme. Cambodia is expected to fulfill its obligations to reduce tariffs to 0-5% for goods in inclusion list and temporary exclusion list in 2010 and for goods in sensitive list in 2017 (Lao-Araya, 2002). Of new ASEAN members, Cambodia is predicted to be strongly affected by the scheme because tax on international trade has been considered to be one of the main sources of government revenues, and average tax rate on good in Inclusion List (IL) was 10.4% in 2001 and 7.96% in 2003. Moreover, Cambodia included more goods in Temporary Exclusion List (TEL) than Lao PDR, Myanmar or Vietnam.

Nevertheless, it was believed that the AFTA would boost trade volumes among member countries, and economic activities as a result of trade liberalization as well as decline in cross-border smugglings.

Figure 5: Government revenue as percentage of GDP for ASEAN members



Source: IMF

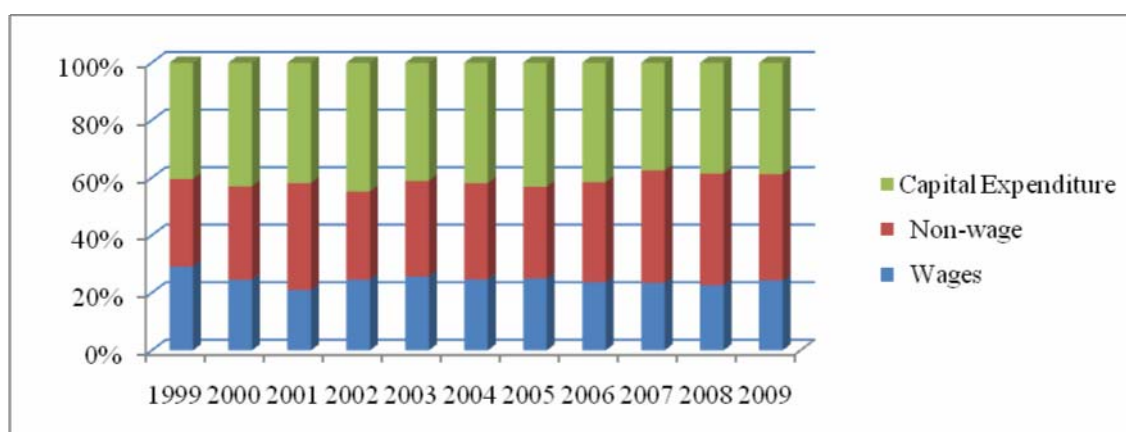
Even though a lot of benefits would expect to be reaped by ASEAN members, it is important for Cambodia like other new ASEAN members to strengthen its current tax system by increasing more tax bases so as to provide a solid cushion against unanticipated shocks following tax reduction. In order to cope with the future challenges of declining tax revenue on international trades, the government would revise some investment incentives in form of “tax holiday” and exemption of import duties and VAT. The cost associated with tax holiday incentives which were likely to be misleading was estimated to be 6 percent of GDP (IMF, 2006).

2.2 Government Expenditures

The budget would be in good position (manageable deficit or surplus) if it is used in prudent manner that will not impair the government’s ability to service the debt. The government expenditure is divided into two: *current and capital expenditures*. It should be noticed that current government revenues could cover the current expenditure which has been accounted for 60% relative to total budget from 2005, while capital expenditures are mainly financed by external funds in form of grants or loans. As revenue has gradually increased, the expenditure also follows the same path. For instance, the expenditure as percentage of GDP increased from 11.2% in 1994 to around 15% in 2000, reaching its peak of 16.9% in 2002 and then hovered around 13% till 2007. A large share of the budget has

been devoted to current expenditures which have merely doubled relative to capital expenditure. As proposed in the I-PRSP, SEDii, and MTEF³, the budget was allocated in favor of social administration and general administration which were accounted for 30% and 31% respectively, while respective 18% and 13% of total budget were earmarked toward defense and security and economic administration in 2007 (Phalla, 2007). For general administration, most amount of budget was allocated to priority ministries including Ministry of Education, Ministry of Health, Ministry of Agriculture, Fishery and Forestry, Ministry of Women Affair, Ministry of Rural Development, Ministry of Justice and Ministry of Land Management, Urbanization and Construction. Non-wage spending in which a big chunk was earmarked toward operating expenditures was on upward trend from 2007, while expenditure on wages and capital slightly increased. Interestingly, the expenditures on defense and security which were previously trimmed down began to increase from \$75 in 2008 million to \$204 million in 2010 due mainly to the border dispute with Thailand.

Figure 6 : Components of Expenditure



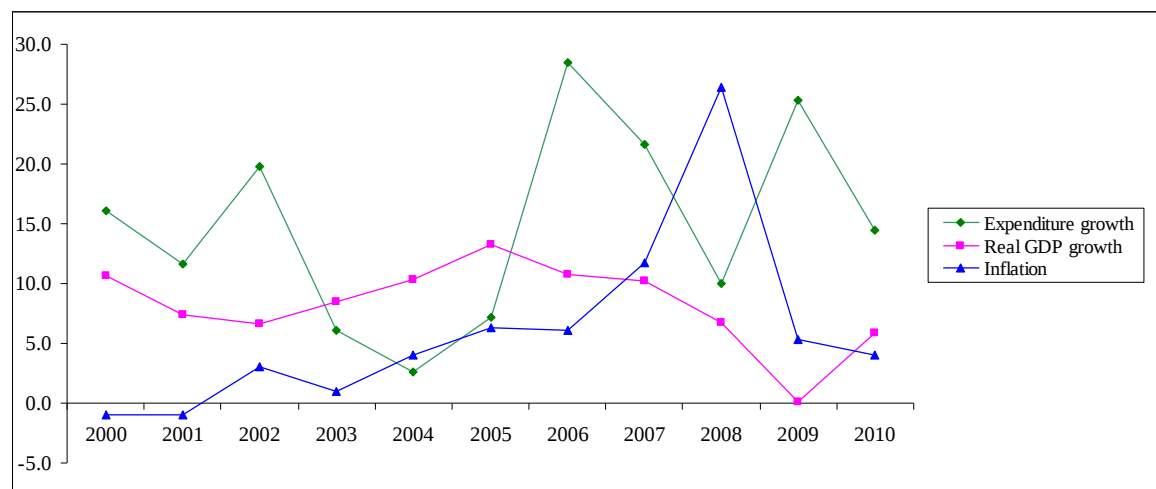
Source: IMF & MEF

Even though fiscal measures have been managed in prudent manner, since 1999, the budget deficit as percentage of GDP had increased from 3% to a record high of 7% in 2003 as a result of dramatic surge in government outlays and then improved remarkably to less than 3% in 2007 after a lot of efforts made by Ministry of Economy and Finance to improve revenue collection including the implementation of public financial sector reform. The deficit jumped back to 7% in 2009 due to the implementation of fiscal stimulus measures in response to 2008 economic turbulence. The budget deficits have been financed mainly by

³ SEDP-ii: Socio-Economic Development Plan II; MTEF: Medium Term Expenditure Framework; I-PRSP: Poverty Reduction Strategy Paper

external funds which were accounted for around 5% of GDP, while domestic financing contributed about half compared to external financing (IMF, 2010).

Figure 7: Relationship among expenditure, real GDP growth and inflation



Source: NBC & MEF

The spending pattern in Cambodia has appeared to be procyclical in some years and counter-cyclical in other years (figure 7). For instance, from year 2001 to 2006 and from 2009 to 2010, the government spending had been counter-cyclical, i.e, the expenditure had increased, when the economic activity had been contracted and when the economy had expanded, the government expenditure had decreased. This behavior turned to be procyclical from 2007 to 2008 because the expenditure declined in line with shrinking economic growth. Giving a glance at relationship between inflation and government expenditure, it seems that from 2003 up to 2009, inflation had moved in opposite direction with expenditure, indicating that counter-measure of fiscal policy had been implemented. In other words, once fiscal expansionary is conducted in certain year, the inflation would follow suit in following year. For instance, when the government spending had grown from 7% in 2005 to 28.5% in 2006 and 21.7% in 2007, the inflation had moved up from 6.1% in 2006 to 11.7% in 2007 and reached 26.4% in 2008. Then as contractionary measure was undertaken in 2008 by reducing expenditure growth to 10%, the inflation cooled down to 5.32% in 2009 (figure 7).

Fiscal Measures against Global Economic Downturn and Debts Sustainability

Against the back drop of global financial turmoil in 2008, the government undertook fiscal stimulus as part of fiscal expansion by increasing the expenditure from 16.1% which was

allocated in the budget to about 17.6% of GDP (Sidgwick, 2010). In addition, the government spent \$10 million on vocational training for some workers laid off by closed factories caused by slow demand for imports by foreign buyers. At the same time, additional measures had been taken including the reduction of tax for tourism and garment industries, and tariff free on fertilizers and machines imported for agricultural production. Due to the decline in revenues caused by decrease in imports and increase in government outlays including 20% increase in public servant wages along with provision of some allowances, overall budget deficits were estimated to be 5.3% of GDP in 2010.

The heavy reliance on external financing for capital investment has brought about great concerns over accumulation of debts despite the fact that RGC has entered the agreement with IMF on the limits to borrowing from abroad. Fortunately, most funds have taken forms of grants and concessional loans from either bilateral or multilateral donors. Since early 1990s, multilateral debts have become the main source of budget financing, while a huge amount of bilateral debts were owed to Russia Federation and United States of America resulting from the earlier period of internal conflicts. However, the current changes from grants to loans would give rise to debt obligation in the future. In 1999, the external debts outstanding was \$2.3 billion, in which bilateral debts possessed the largest share, amounted for 82% while the share of multilateral debts were only 17%. The debt had significantly dropped to \$1.55 billion in 2002 and then gradually increased up to \$3.17 billion in 2009. Interestingly, the share of multilateral debt had been on upward trend, reaching 54% in 2007, while share of bilateral debt had declined to 45% for the same period. At the end of 2008, the debt stock as percentage of GDP was 25% in nominal term and is predicted to increase to 29% in 2009 and 31% at the end of 2010. Following favorable economic conditions, the total debt including public and external debt as percentage of GDP is projected to return to pre-crisis level of 26% in 2016 (IMF, 2011).

3. MONETARY DEVELOPMENT

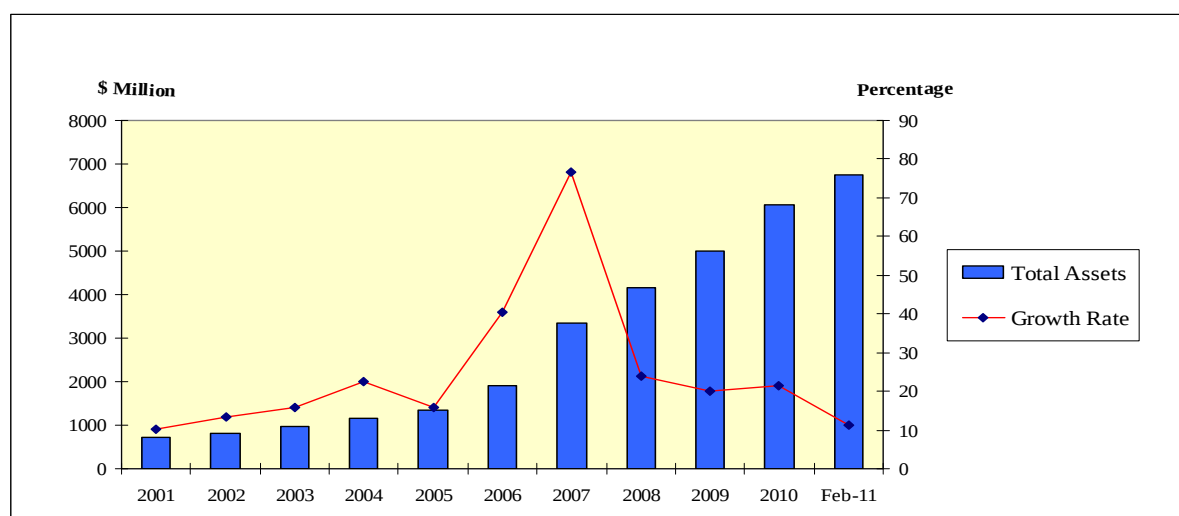
3.1 Banking Sector Development

Currency and banking system were abolished for the period of 1975-1979 and resumed its operation in the form of mono-banking system in early 1980. In addition, new banknotes were printed and circulated in March 20, 1980. Under this system, the monetary authority functioned both as central and commercial banks through a network of provincial branches and agencies. In the aftermath of political and economic reform in 1993, a two-tier banking

system was introduced in line with the Law on the conduct and organization of National Bank of Cambodia which was promulgated in 1996. As a result, the number of banks rose considerably to 24 at the end of 1994. This number further increased to 31 by the end of 1998. Those banks comprised 2 state-owned banks, 7 foreign bank affiliations and 22 commercial banks owned by foreigners and local bankers.

After the commencement of bank restructuring which required higher minimum capital and higher reserves depositing in the NBC under IMF's support in 1999, this number was trimmed to 18 banks (IMF, 2002). Moreover, recognizing the vital role of financial sector in economic development, the Royal Government of Cambodia under auspices of Asian Development Bank developed "Financial Sector Blueprint for 2001-2010" which has served as roadmap for financial and banking sector development in 10 years. The blueprint lays a solid foundation for more competitive and sounder banking system which effectively mobilizes financial resources from surplus units to deficit units with a view to supporting growth of private sector which is one of the main engines for sustainable growth. Besides, the plan also highlights the importance of improvement of inter-bank market, other non-bank financial institutions such as insurance, transparency and development of capital market and national payment system. After six year performance, a new "Financial Development Strategy 2006-2015" was launched to assess the progress within the time frame and what was left behind to be addressed in coming year in order to build public confidence in banking and financial sectors in Cambodia. Up to 2010, because of favorable economic conditions, the number of commercial banks and microfinance institutions rose to 44, of which 28 are commercial banks (NBC's bulletin, 2010).

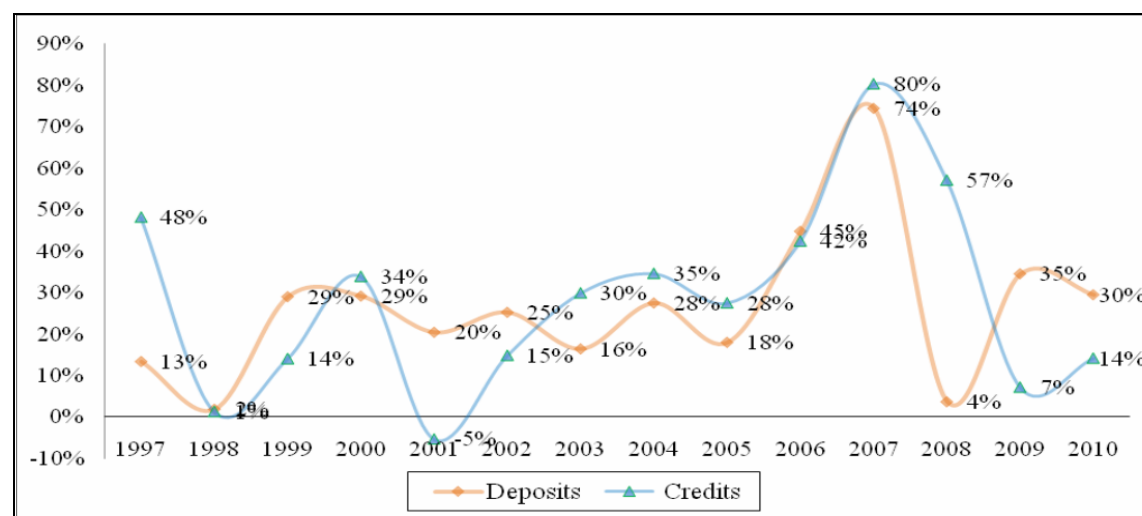
Figure 8: Total Assets of Commercial Banks



Data source: NBC

In addition, total assets of private banks including microfinance institutions had increased substantially from \$729 million in 2001 to \$4,996 million in 2009 with annual growth rate of 10.26% in 2001 and registered a high record of 76.6% in 2007 before declining to 21% in 2010. This reflects the rapid increase in banking activities. For instance, deposits in banking sector have increased considerably from 13% in 1997 to about 74% in 2007 and then dropped significantly to 4% in 2008 due to little panic in banking sector arising from sub-prime mortgage crisis in USA. After confidence in banking sector was regained, the deposits started rising by 31% in 2009 and 30% in 2010.

Figure 9: Growth of Deposits and Credit in Banking System



Data source: NBC

Meanwhile, the credits have been remarkably expanded by 48% in 1997, but dropped dramatically to 1% in 1998 resulting from Asian financial crisis and internal conflict and then became negative growth of -5% in 2001. Since 2002, credits to private sectors including wholesale and retail trading activities, and service sector have grown steadily and reached its peak of 80% in 2007 in line with high economic growth. However, 2008 global financial crisis caused the credit growth to decline substantially to around 7% in 2009 and 14.2% in 2010 due to the fact that most investments in banking and financial sectors were obtained from crisis-hit countries such as Korea, Malaysia, China and Thailand. By and large, the private banks are very cautious to provide more loans to the vulnerable sectors, especially both commercial and residential real estates due to fear of unforeseeable risks which may hinder the borrowers' abilities to repay the loans.

Table 1: Monetary Survey

<i>In billion riels</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Net Foreign Assets	2,589	3081	3737	4027	4797	5475	7224	10,735	10346	14655	16698
Foreign Assets	3047	3587	4279	4741	5482	6142	7650	11890	12886	16514	18918
Foreign Liabilities	-458	-507	-542	-714	-685	-667	-426	-1156	-2540	-1858	-2220
Net Domestic Assets	-759	-877	-849	-698	-467	-450	-282	576	1513	1573	2779
Domestic Credits	904	868	942	1209	1608	1972	2676	4570	6907	8280	11206
Other	1663	-1744	1791	-1907	-2075	-2423	-2959	-3994	-5394	-6707	-8428
Liquidity	1,831	2204	2888	3329	4329	5025	6942	11311	11859	16228	19477
Money	540	610	813	937	1153	1323	1658	2052	2400	3120	3221
Currency Outside Banks	495	578	766	908	1115	1282	1600	1990	2295	3002	3099
Demand Deposit	45	32	47	29	38	41	58	62	105	119	122
Quasi - Money	1291	1594	2075	2391	3176	3702	5285	9259	9459	13108	16256
Time and Saving Deposits	46	56	74	82	97	113	89	121	185	359	408
Foreign Currency Deposits	1245	1539	2001	2310	3079	3589	5196	9138	9274	12749	15848

Source: NBC

The rapid growth of banking activities has contributed to gradual expansion of monetary aggregate (M2) with an annual average of 17% in 1999 and registered the highest record of 63% in 2007 prior to dramatic decline to 5% in 2008 and slightly increased to 37% in 2009. Quasi-money which is mainly consisted of foreign currency deposits was the main components of M2, accounted for about 76%. At the same time, net foreign assets (NFA) has increased from 2,589 billion riel in 2000 to 16,698 billion riel in early 2010, while net domestic assets (NDA) has turned from negative value in the period of 2000-2006 to positive from 2007 onward because of increase in private sector activities (Table 1).

3.2 Monetary and Exchange Rate Policies

Monetary Policy Goal and Targets

Even though goals of monetary policy vary across countries depending upon macroeconomic situations, a common goal set by many central banks including NBC is price stability⁴. The policy goal can be achieved through targets and its instruments. It appears that monetary aggregate and exchange rate have been viewed as intermediate targets for monetary policies in Cambodia. In other words, exchange rate is likely to play a

⁴ See Article 3 of “Law on the Conduct and Organization of the National Bank of Cambodia”

role as nominal anchor of monetary policy because NBC always intervenes in exchange market to stabilize exchange rate fluctuation in a bid to maintain price stability. However, there is no clear policy framework for operating targets, and intermediate targets in monetary policy implementation.

Monetary Policy Instruments

A gloomy aspect of monetary system of Cambodia is that there have not been seen any effective monetary instruments issued to hit the predetermined targets, thereby attaining the ultimate goal of price stability. Against the backdrop of bank reform from mono to two-tier banking system, the National Bank of Cambodia has tried to introduce direct and indirect monetary policy instruments. Nevertheless, direct policy tools have rarely used as part of monetary policy operations since it is believed to discourage intermediation of banking system. On the outset of free market orientation and huge banking reform in Cambodia, a lot of efforts have been made to set up the following indirect instruments:

1-Reserve Requirement: In December 1993, a statutory reserve requirement was introduced by demanding all commercial banks to maintain 5% of all deposit liabilities at NBC in a bid to control the commercial banks' abilities to create money supply. Following 1997 Asian financial crisis and bank restructuring in 1999, NBC increased the rate to 8 % of total deposits. In response to global crisis in 2008, NBC conducted the monetary policy tightening by imposing higher required reserve up to 16% of total foreign currency deposits aimed at slowing down the dramatic surge in credits before the crisis. Then the rate was reduced to 12%, while the rate applied to riel deposits was retained at 8%. Though change in reserve ratio would have impact on dollar deposits, the riel liquidity in the market might not change. In this essence, this instrument may only play a role as prudential measure to reduce credit extension to private sectors and maintain liquidity in the banking system in time of crisis. Nevertheless, under-developed inter-bank market poses an obstacle to reallocate the excess reserves to the problem banks if happened.

2- Standing Facilities

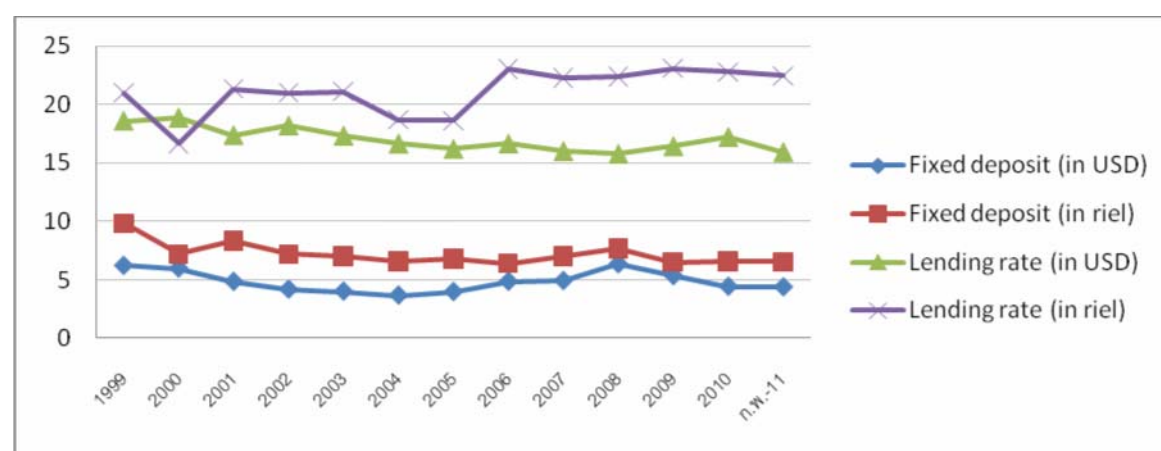
Fixed deposits: the deposits are offered for both riels and USD with maturity date of three, six and twelve months. This facility may help cope with the tendency toward placement of funds with offshore correspondent banks and manage liquidity.

Overdraft facility: was launched in January, 2009 in order to handle the lack of short-term

liquidity. The interest rate for the overdraft is 8% per annum. So far, only few banks have been engaged in this operation.

Refinancing window: the facility was introduced in 1994 in order to satisfy the commercial bank's need of short-term liquidity. The most favorable asset for this facility is trade bill denominated in riel since the government securities have not yet been issued. The lender is able to repurchase the facility before maturity date at 70% of face value (IMF, 1997). Nevertheless, it has not been used by commercial banks since most banks receive deposits and provide loan in foreign currencies which hinder the function of NBC as a lender of last resort. So far only a few microfinance institutions that mostly conduct its operation in riel have used this tool. The discount rate of 6% per annum is applied to this facility. In the absence of bank refinancing, NBC is unable to direct interest rates, thereby limiting the scope for effective use of interest rate policy as a monetary instrument. It is expected that the tool will be viable and more active when the financial market is formally established in mid-2011 as proclaimed by the Cambodian Stock Exchange Commission. Currently, individual banks freely set the deposit and lending rates both in riel and USD. However, the interest rates for deposits or lending in riel do not play a crucial role in monetary policy direction largely due to fewer holdings and deposits of local currency. Interestingly, interest rates spread of 12% between fixed deposit and lending rates are colossal, reflecting a high risk premia and high transaction costs. For example, the annual rates of fixed deposits in USD had moved around 4 to 6% from 1999 to February, 2011, while lending rates had fluctuated within a range of 16% to 18% per annum for the same period (figure 10).

Figure10 : Bank deposit and lending rates



Data source: NBC

3- Open market operation

This instrument is commonly used by many countries where, in particular, financial system is well-developed. Open market purchase or sales of securities have been conducted in order to pump or absorb money from circulation aimed at controlling inflation and fostering output growth. Since financial market in Cambodia has not come into existence and so has its instruments, the tool has not been employed so far, even though the government had tried to issue T-bill to finance its budget deficit which can be bought by central bank to alter money supply in the economy.

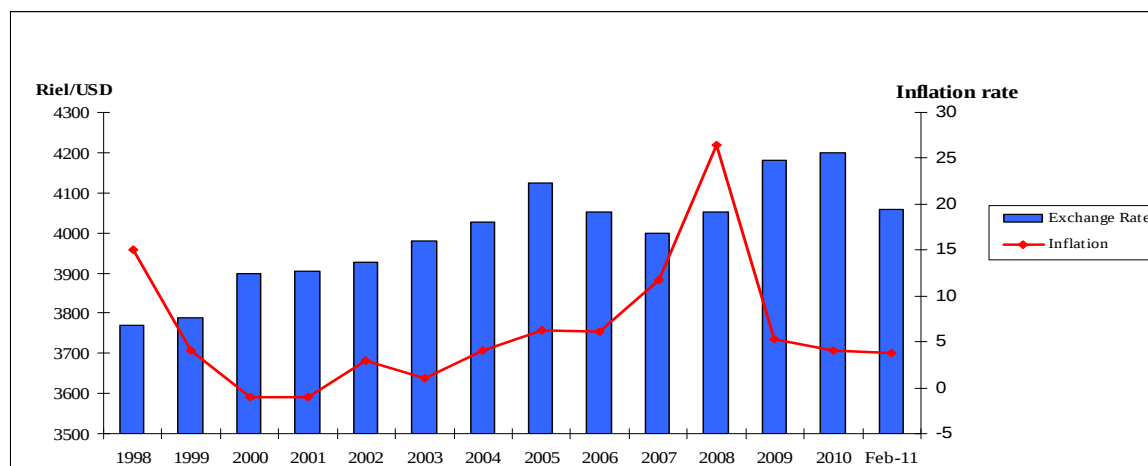
Exchange Rate Policies

Cambodia has adopted managed floating exchange rate regime since 1992, which implies that the National Bank of Cambodia occasionally intervenes in the foreign exchange market so as to stabilize the exchange rates which consist of market exchange rate and official exchange rate. While the economic agents undertake market rate, NBC also determines the official rate for any transaction between NBC, government and the public sector. The gap between parallel market rate and official rate is maintained by less than 1%. In the absence of market-based securities, foreign exchange intervention plays a crucial role in effectively liquidating Riel circulation and maintaining exchange rate variability. In September, 1993, periodic foreign exchange auctions were introduced. Since most bank transactions were conducted in US dollars, commercial banks and microfinance institutions have not actively joined the auction. That is only money changers in the parallel foreign exchange market engaged in the auction.

In 2009, for instance, NBC had intervened in the exchange rate market by making the purchase auction of US dollar for 34 times worth of \$88.92 million equivalent to 367.3 million riel. Then, recognising the downward swing of the riel, NBC began conducting subsequent sales auction of \$54 million. The intervention in foreign exchange market was cited as a success of smoothing exchange rate fluctuation in Cambodia. Some economists maintained that the exchange rate policy in dollarized economy is tantamount to monetary policy. It might be true for Cambodia where the central bank regularly intervenes in exchange market with a view to smoothing the exchange rate fluctuation, thereby maintaining price stability and restore the confidence in local currency. However, De Zamoczy argued that the exchange rate flexibility might not survive the high dollarization environment since it hinders the effective adjustment of exchange rate in the presence of any unanticipated shock. According to the figure 10, the nominal effective exchange rate

has appeared to be broadly stable from 1998 to 2006, depreciating by 7% from 3770 to 4052 riel per USD, while inflation rate was around 2.8 % on average, dropping from 15% in 1998 to 11.77% in 2007 and then rocketed to 26.44 % in September, 2008 due to dramatic surge in oil and commodity prices.

Figure 11: Nominal exchange rate and inflation



Source: NBC

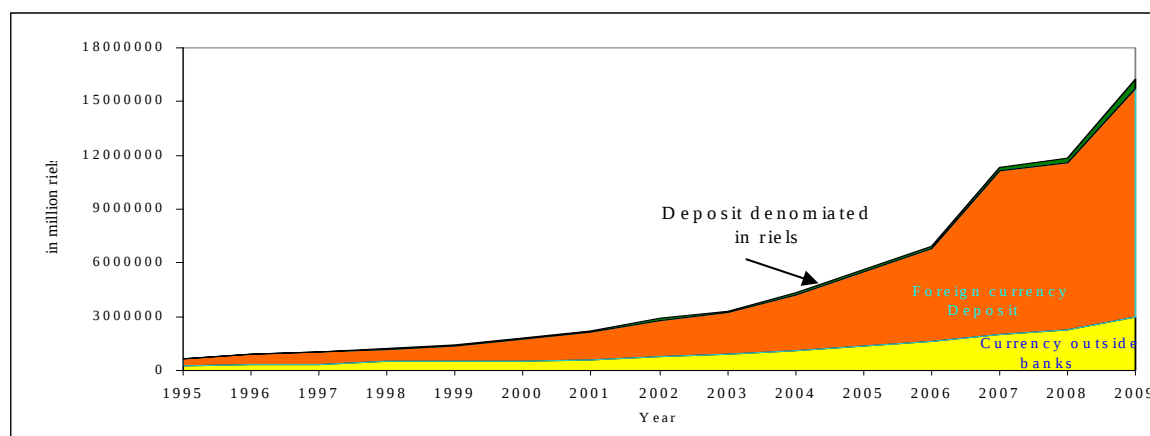
To sum up, the achievement of low inflation rate in Cambodia has not completely been attributable to stable exchange rate since most goods have been traded in foreign currencies, in particular USD. Up to June 2010, the exchange rate of riel against USD was 4,229 riel/USD and then appreciated to 4,056 riel/USD by December, 2011. The downward movement of exchange rate was influenced by both external and internal factors. With regard to internal factor, the demand for domestic currency seasonally increases, in particular during period of the tax payment and the purchase of agricultural products for export as well as celebration of Buddhism religion, western and Khmer new years. Regarding external factor, the current measures taken by Federal Reserves to inject excessive money into circulation have led to decline in value of US dollar against major currencies including riel.

The Effects of Dollarization

A striking feature of the Cambodian monetary system is that it is characterized by a high degree of dollarization and cash transactions. For instance, ratio of foreign currency deposit by residents to M2 has increased from 56% in 1995 to around 78% at the end of 2009 (NBC Bulletin, 2009). Not surprisingly, most commercial banks' operations such deposits-

taking and lending are conducted in US dollars, and other currencies beside riel. Only microfinance institutions mostly provide loans in riel to the poor. According to figure 12 the foreign currency deposit has been in increasing trend even though NBC has adopted de-dollarization policy as a long term goal.

Figure 12: *Composition of money supply 1995-2009*



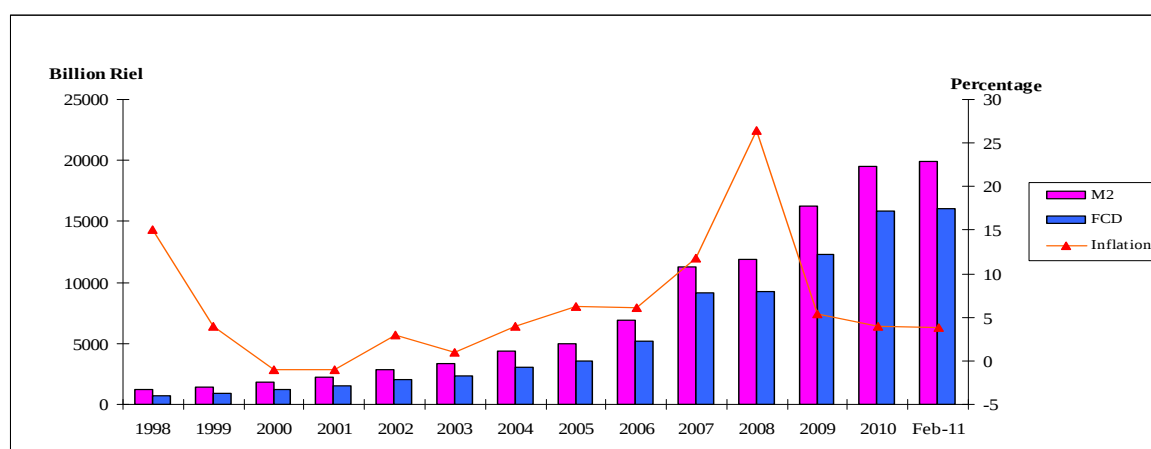
Source: NBC

It should be noticed that dollarization, as many claimed, has brought about several benefits including reduction of exchange rate and currency risk, promotion of financial deepening, facilitation of economic and financial integration, strengthening of fiscal discipline and low inflation. In contrast, some drawbacks of dollarization have been raised including the loss of seigniorage, low level of international reserve, and limited central bank roles as lender of last resort. Importantly, the conduct of monetary policy within highly-dollarized economy is claimed to be ineffective since the central bank is only able to control the small proportion of total money supply, of which the foreign currency in circulation was estimated by de Zamaroczy (2002) to be as large as Cambodia's GDP. In addition, currency substitution may theoretically bring about exchange rate fluctuation. In other words, the higher the degree of dollarization, the more volatile the exchange rate is due to expected exchange rate depreciation (Kem, 2002).

Theoretically, currency substitution has had impact on inflation via what is so-called 'monetary-growth induced inflation' and 'speculative bubble induced inflation' (Kem, 2002). Regarding monetary-induced inflation, inflation is expected to rise when money growth increases. The Cambodian government has so far used inflation tax to partly finance its budget deficit. Since residents have been holding both foreign and domestic currencies, some amounts of inflation tax have been lost. Hence, a certain amount of inflation tax

creation has to be followed by a rapid increase in domestic money supply, as a result of which domestic inflation also follows suit. As far as speculative bubble-induced inflation is concerned, an increase in inflationary pressure inspired by the rational expectation of a rise in money supply, threatens those who are holding domestic currency, thereby forcing them to substitute for foreign currency to avoid inflation tax. In this context, this tends to put pressure on the domestic currency to depreciate against the foreign currency (US dollar). The depreciation of the domestic currency, in fact, implies higher prices of goods quoted in the domestic currency (Riel).

Figure 13: Money supply, foreign currency deposit and inflation



Source: Data provided by NBC

Castillo, S. (2006) used Generalized Least Square (GLS) to estimate the impact of dollarization and macroeconomic variables on GDP growth and inflation for 21 Latin American countries. The results suggested that dollarization had positive impact on growth and helped reduce inflation. In addition, growth of monetary aggregate led to a surge in inflation. Similarly, Edwards, S., et al., (2001) explored the relationship between dollarization and growth, and inflation. The study indicated that dollarized economies have experienced with lower inflation than non-dollarized economies which were claimed to have achieved higher economic growth because dollarized economies have found themselves difficult in response to external shocks.

It seems to be the case for Cambodia where inflation and broad money (M2) had moved the same direction from period of 2000 to 2007. However, from 2008 to 2010, the inflation had dropped from the peak of 26.44% to 4% in 2010, while M2 had still increased from 11,858 billion riels to 19,476 billion riels during the same period. Surprisingly, what had been argued by many researchers that dollarization contributes to low inflation rate might not be

true for Cambodia since foreign currency deposits to M2 (which is a measure of degree of dollarization) have been on upward trend from 54% in 1998 to 79% in 2009, while the inflation rate had slightly increased within acceptable and manageable level.

III. LITERATURE REVIEW

There was a contradiction view between Keynesian and monetarists over the effectiveness of fiscal and monetary policies in terms of stimulating economic growth. Keynesian believed that fiscal policy played more important roles in boosting economy, while monetarists stressed the influential role of monetary policy in stimulating economic growth. For IS-LM framework developed by Roy Harrod, John R. Hicks and James Meade in 1936, the effectiveness of fiscal and monetary policies depends upon the choice of exchange rate regime. It is argued that fiscal policy under floating exchange rate with capital mobility is less effective than monetary policy in relation to spurring economic growth in the sense that increase in interest rate resulting from fiscal policy expansion leads to appreciation of domestic currency which affects net export and aggregate demand. Under fixed exchange regime, however, with perfect capital mobility, monetary policy seems less powerful in boosting the output than fiscal policy. In general, monetary and fiscal policies are interconnected by government's budget constraint. Any action taken by central bank to change money supply causes the interest rate fluctuation which in turn affects the interest-bearing debts. Higher interest rate will squeeze government budget in terms of interest payments.

According to **Eskesen L.** (2008), the effectiveness of fiscal policy may be attributable to sound macroeconomic fundamentals, nominal wage and price stickiness. In addition, it may depend on the size of government debts and fiscal stimulus. He argued that tax has less effect than expenditure because the government investment has the largest impact on economic activity and inflation. He also concluded that some factors which contribute to the success of implementation of fiscal policy include timing of fiscal response, the macroeconomic conditions and appropriate actions taken to affect aggregate demand. Based on new Keynesian, monetary policy has real effects on the economy in the short to medium term because of nominal and real rigidities.

Arestis (2010) argued that for traditional view with fixed price, fiscal policy has significant impact on aggregate demand which in turn fosters production, income and employment. With inflexible price, the fiscal multiplier size may be affected by some factors such as

productivity, higher interest rates, currency depreciation, and fiscal measure in which spending is more effective than tax. For new consensus framework, empirical evidence suggested that the mentioned factors weakened fiscal policy effectiveness as the main tool of macroeconomic stabilization. However, Wren-Lewis concluded that in short-run, aggregate demand would be affected by changes in government spending and taxes. For new consensus macroeconomics, fiscal policy will affect the aggregate demand and supply through the change in future income and wealth and employment status. The role of expectation and wealth effects is likely to dominate the multiplier effects raised by Keynesian. In fact, the economic agents would reduce their current consumptions in response to an increase in government's budget deficit resulting from increase in its spending which is believed to be financed by increasing taxes, lowering the agents' future income and wealth. For supply side, on the other hand, the fiscal policy expansion would induce higher demand for labors, putting upward pressure on wages which have adverse impact on investment due to deterioration of the company profits. Most economists agreed that when the market is internationally integrated, fiscal policy become less effective in the sense that fiscal measure would induce some demands for imports (Ostrup, 2006).

Blanchard et.al. (2010) expressed their views, in the wake of 2008 global financial crisis, on macroeconomic policy that when calculating the inflation both core inflation and oil or housing prices should be included because when the crisis broke out, the core inflation was broadly stable. They argued that monetary policy with low inflation seemed to be less effective than fiscal policy because the economy has not yet been recovered though some central bank has reduced its policy rate to nearly zero. In this situation, fiscal stimulus measure is inevitable as the recession was expected to long live. The crisis gave a lesson that many targets of macroeconomic policy should be turned from monetary policy to "fiscal and regulatory instruments". Nevertheless, the consensus is that output and inflation stability remains the goal of macroeconomic policy. To cope with future shocks, fiscal space should be beefed up by avoiding pro-cyclical measure during the boom periods and debt burden should be reduced rather than financing expenditures or taking tax measures.

In recent decades, hundreds of empirical studies, using vector autoregression (VAR) have been conducted to investigate the response of output and inflation to policy tools, i.e, fiscal and monetary policies. However, the results have been mixed for one country to another, depending on their economic situations. For instance, Boivin, et al. (2003) employed identified VAR to examine the effect of monetary policy shocks on output, inflation and

fed fund rate for United State in the period of prior to 1980 and after 1980. The result showed that monetary policy was more effective in stabilizing the economy in terms of response to its own shocks and other shocks such as real demand and supply disturbances. The same results was found by Arjisafe, et al., (2002) who carried out an empirical study by employing VAR to investigate into the effectiveness of monetary and fiscal policy in Nigeria, and Batten, et al., (1983), who conducted study in advanced economies. In addition, Ali, S. et. al. (2008) explored the effectiveness of fiscal and monetary policies on growth in short-run and long run for South Asian countries, using the Autoregressive Distributed Lag Model (ARDL) and Error Correction Model (ECM). The results indicated that monetary policy is more effective than fiscal policy in spurring economic growth in short-run and long run. The same results were advocated by Rahman H. (2005) who conducted a study about “The Relative Effectiveness of Monetary and Fiscal Policies on Output Growth in Bangladesh: A VAR approach”, using unrestricted VAR framework which contains main variables such as real government expenditure (G), real money, real interest rate and real GDP. Owing to a study conducted by Girardin et. al. (2006) by using VAR to explore the effect of monetary policy shock in China from 1997 to 2005, output and price level were significantly explained by M1, but not M2.

In contrast, some findings in favor of fiscal policy had been raised by a research conducted by Andersen and Jorden (1986), Chowdhury who examined the two policy effectiveness in Bangladesh in 1986. In addition, the results of empirical analysis of fiscal and monetary policies in China conducted by Hsin, Y. et.al (2010) using VAR model indicated that in the short run, fiscal policy is more powerful than monetary policy, while it works in opposite way in the long run. Nasir M., et.al (2010) used VAR model to examine mix of fiscal and monetary policies in Pakistan, suggesting that there is evidence of weak or very little coordination among the two policies.

According to empirical evidence studied by Walsh E. C. (2003), it is clear that there exist a high positive correlation between money supply growth and inflation, but a sign of causality among the two variables is not seen in the studies. McCandless (1984), Weber, Boschen and Mills (1995) concluded that the money growth and output growth were positively correlated, but no correlation between output growth and inflation. In contrast, Kormendi and Meguire, and Monnet and Weber (2001), and Mishikin (1992) found that money supply growth would not affect output growth in long run. Fisher equation emphasizes the relationship between nominal interest rate and expected rate of inflation

which is strongly correlated with money growth; hence the nominal interest rate has a positive link to money growth. Friedman and Schwartz (1963) concluded from empirical study that higher or lower output growth happened in light of higher or lower money growth.

IV. EMPIRICAL STUDY

1. The Model and Data Description

Fiscal policy, traditionally, could be used as an effective tool in demand management, thereby stimulating GDP growth, and controlling inflation. In addition, fiscal measure may influence exchange rate in the sense that fiscal expansion, for instance, will leads to higher demand for foreign currency-dollar to import more foreign goods, which eventually puts pressure on exchange rate to depreciate. The effectiveness of fiscal policy could be viewed as how price level, exchange rate and GDP respond to the shock of government spending. Similarly, monetary policy is effective if the effects of monetary aggregate on price level, and outputs can be detected. In addition, fiscal policy is considered to have more impact on price level and output than monetary policy. Hence, the model takes form with respect to following order: government spending, monetary aggregates, price level, exchange rate and real GDP:

$$\begin{aligned}
 G_t &= \sum_{i=1}^t \alpha_{1i} G_{t-i} + \sum_{i=1}^t \beta_{1i} M_{t-i} + \sum_{i=1}^t \gamma_{1i} P_{t-i} + \sum_{i=1}^t \mu_{1i} E_{t-i} + \sum_{i=1}^t \delta_{1i} Y_{t-i} + \epsilon_{1t} \\
 M_t &= \sum_{i=1}^t \alpha_{2i} G_{t-i} + \sum_{i=1}^t \beta_{2i} M_{t-i} + \sum_{i=1}^t \gamma_{2i} P_{t-i} + \sum_{i=1}^t \mu_{2i} E_{t-i} + \sum_{i=1}^t \delta_{2i} Y_{t-i} + \epsilon_{2t} \\
 P_t &= \sum_{i=1}^t \alpha_{3i} G_{t-i} + \sum_{i=1}^t \beta_{3i} M_{t-i} + \sum_{i=1}^t \gamma_{3i} P_{t-i} + \sum_{i=1}^t \mu_{3i} E_{t-i} + \sum_{i=1}^t \delta_{3i} Y_{t-i} + \epsilon_{3t} \\
 E_t &= \sum_{i=1}^t \alpha_{4i} G_{t-i} + \sum_{i=1}^t \beta_{4i} M_{t-i} + \sum_{i=1}^t \gamma_{4i} P_{t-i} + \sum_{i=1}^t \mu_{4i} E_{t-i} + \sum_{i=1}^t \delta_{4i} Y_{t-i} + \epsilon_{4t} \\
 Y_t &= \sum_{i=1}^t \alpha_{5i} G_{t-i} + \sum_{i=1}^t \beta_{5i} M_{t-i} + \sum_{i=1}^t \gamma_{5i} P_{t-i} + \sum_{i=1}^t \mu_{5i} E_{t-i} + \sum_{i=1}^t \delta_{5i} Y_{t-i} + \epsilon_{5t}
 \end{aligned}$$

Y_t is real GDP measured in billion riels; G_t is government spending in million riels, which includes both government purchases and capital expenditure; P_t is consumer price index; E_t is Real Effective Exchange Rate (REER) index, which was calculated by averaging

trading partners' exchange rate, weighting relative trade balances of main trading partners and adjusting with price index; M_t is broad money (M2) in million riels which include money in circulation, deposits in riels and US dollars; and ε_t is error terms.

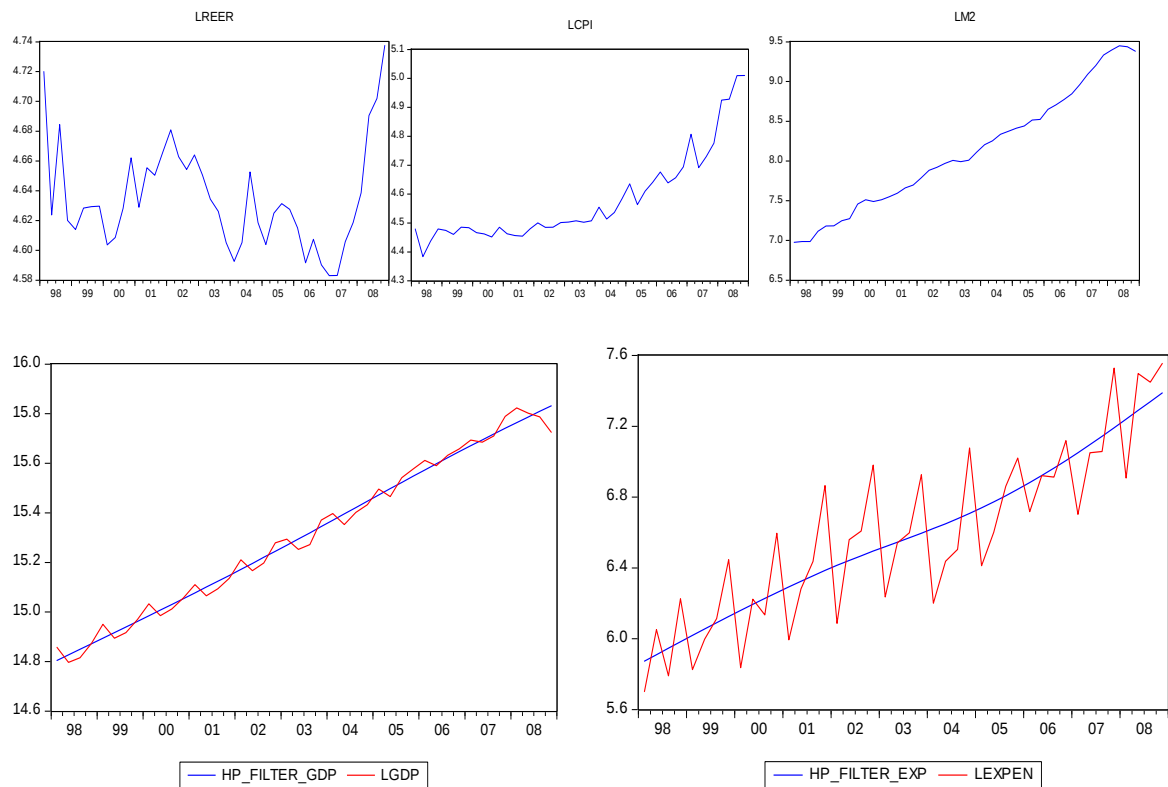
2. Data Description

Quarterly data ranging from 1998 to 2008 has been collected from various sources including Ministry of Economy and Finance (MEF), National Institute of Statistics (NIS), and National Bank of Cambodia (NBC). The summary of variables is described in Table 1 in Appendix. The data of GDP was extrapolated for 1998 to 2001 since its quarterly data was available only from 2002 to 2009. Moreover, the empirical testing makes use of quarterly data of broad money (M2), CPI and REER. In addition, G represents the total spending of each quarter including both current and investment spending.

Plotting all series in log form as shown in figure 14, from 1998 to 2004, CPI had fluctuated following its seasonal pattern which is contrary to its level which had been broadly stable. From 2004, CPI had been in upward trend and reached its peak in Q4, 2008 due to dramatic surge in food and fuel prices. REER behavior had been mixed during the period of review, except high appreciation in 2008. Broad money (M2), on the other hand, had been in increasing trend, resulting from the successful reform of banking system in early 2000 and had slowed at the end of 2008 due in part to increase in reserved requirement from 8% to 16% of deposits liabilities to tackle inflation and curtail credit expansion and slowdown of economic activities. Since 1998, GDP at level had grown steadily and then achieve high growth rate from 2003 to 2007, prior to declining in 2008. Similarly, government spending had steadily increased, but at the slower rate than GDP. In this context, the empirical study analyses the data in which the economy had undergone through boom and gloomy periods, and structural changes, in particular banking sector reform.

Figure 15 shows the scatter plot of key variables, namely CPI, GDP and REER against total expenditure and broad money in order to examine their relationships. CPI, M2 and government spending tend to have a positive impact on CPI, but only when CPI stays at high level.

Figure 14 : Summary of variables in use



Interestingly, the relationship is stronger for broad money relative to government spending. However, their effects on CPI lessen when CPI is at lower level. On the other hand, M2 is likely to have a strong and positive relationship as compared to government spending. In other words, monetary policy was more effective than fiscal policy in stimulating economic growth during the observed period. Interestingly, REER was neither influenced by M2 nor government spending.

Figure 15: Relationship among key macro-economic variables

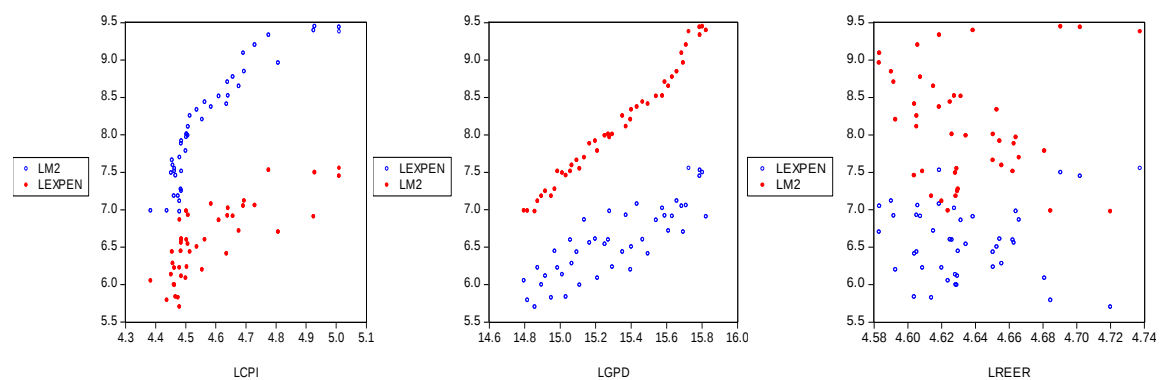


Table 2 in Appendix summarizes the results of unit root test by using ADF, suggesting that all variables in log forms are none-stationary at level, but trend stationary at first difference.

Since all ADF statistics are less than critical value at 5% significant level, the null hypothesis of a having a unit root process is rejected. Hence, the series are integrated at first difference, i.e., I(1). All variables are random walk with drift. Since all variables are stationary at first differences, the reduced form of VAR model turns out to be as follows:

$$\begin{aligned}
\Delta G_t &= c_G + \sum_{i=1}^t \alpha_{1i} \Delta G_{t-i} + \sum_{i=1}^t \beta_{1i} \Delta M_{t-i} + \sum_{i=1}^t \gamma_{1i} \Delta P_{t-i} + \sum_{i=1}^t \mu_{1i} \Delta E_{t-i} + \sum_{i=1}^t \delta_{1i} \Delta Y_{t-i} + \epsilon_{1t} \\
\Delta M_t &= c_M + \sum_{i=1}^t \alpha_{2i} \Delta G_{t-i} + \sum_{i=1}^t \beta_{2i} \Delta M_{t-i} + \sum_{i=1}^t \gamma_{2i} \Delta P_{t-i} + \sum_{i=1}^t \mu_{2i} \Delta E_{t-i} + \sum_{i=1}^t \delta_{2i} \Delta Y_{t-i} + \epsilon_{2t} \\
\Delta P_t &= c_P + \sum_{i=1}^t \alpha_{3i} \Delta G_{t-i} + \sum_{i=1}^t \beta_{3i} \Delta M_{t-i} + \sum_{i=1}^t \gamma_{3i} \Delta P_{t-i} + \sum_{i=1}^t \mu_{3i} \Delta E_{t-i} + \sum_{i=1}^t \delta_{3i} \Delta Y_{t-i} + \epsilon_{3t} \\
\Delta E_t &= c_E + \sum_{i=1}^t \alpha_{4i} \Delta G_{t-i} + \sum_{i=1}^t \beta_{4i} \Delta M_{t-i} + \sum_{i=1}^t \gamma_{4i} \Delta P_{t-i} + \sum_{i=1}^t \mu_{4i} \Delta E_{t-i} + \sum_{i=1}^t \delta_{4i} \Delta Y_{t-i} + \epsilon_{4t} \\
\Delta Y_t &= c_Y + \sum_{i=1}^t \alpha_{5i} \Delta G_{t-i} + \sum_{i=1}^t \beta_{5i} \Delta M_{t-i} + \sum_{i=1}^t \gamma_{5i} \Delta P_{t-i} + \sum_{i=1}^t \mu_{5i} \Delta E_{t-i} + \sum_{i=1}^t \delta_{5i} \Delta Y_{t-i} + \epsilon_{5t}
\end{aligned}$$

After conducting ADF test to check the stationary variables, lag of all variables is selected. A Schwarz information criterion (SIC) indicates one lag because it has the lowest value, while an Akaike information criterion (IC) indicates 4 lags. The rest of indicators suggests three lags. Moreover, at each lag level, the system satisfied with stability condition (Table 3 in Appendix).

Table 4 (Appendix) shows the results of Johansen's (1995) multivariate co-integration test. The results (of both trace statistics and maximum eigenvalue statistics) indicates at least one co-integrating vector between real GDP, broad money, real effective exchange rate, consumer's price index and government spending with 3 lags. However, co-integration does not exist for lag 4. For a model with 1 lag, more than one co-integration vector exists. Hence, all variables have long-run relationship based on trace test result for 1 and 3 lags.

The result of the Granger Causality test for Lag 3 Model indicates that the equation of money growth, real effective exchange rate and price level is not jointly explained by the system model. However, GDP growth is significantly explained by the system model, while price equality is explained by the model at 10% of significant level. The model with one lag shows that with regard to the equation of change in government spending, GDP growth and inflation equation are jointly explained by the system model and the two others are not. For one lag model, more equations tend to be well-explained by the system model. Because the

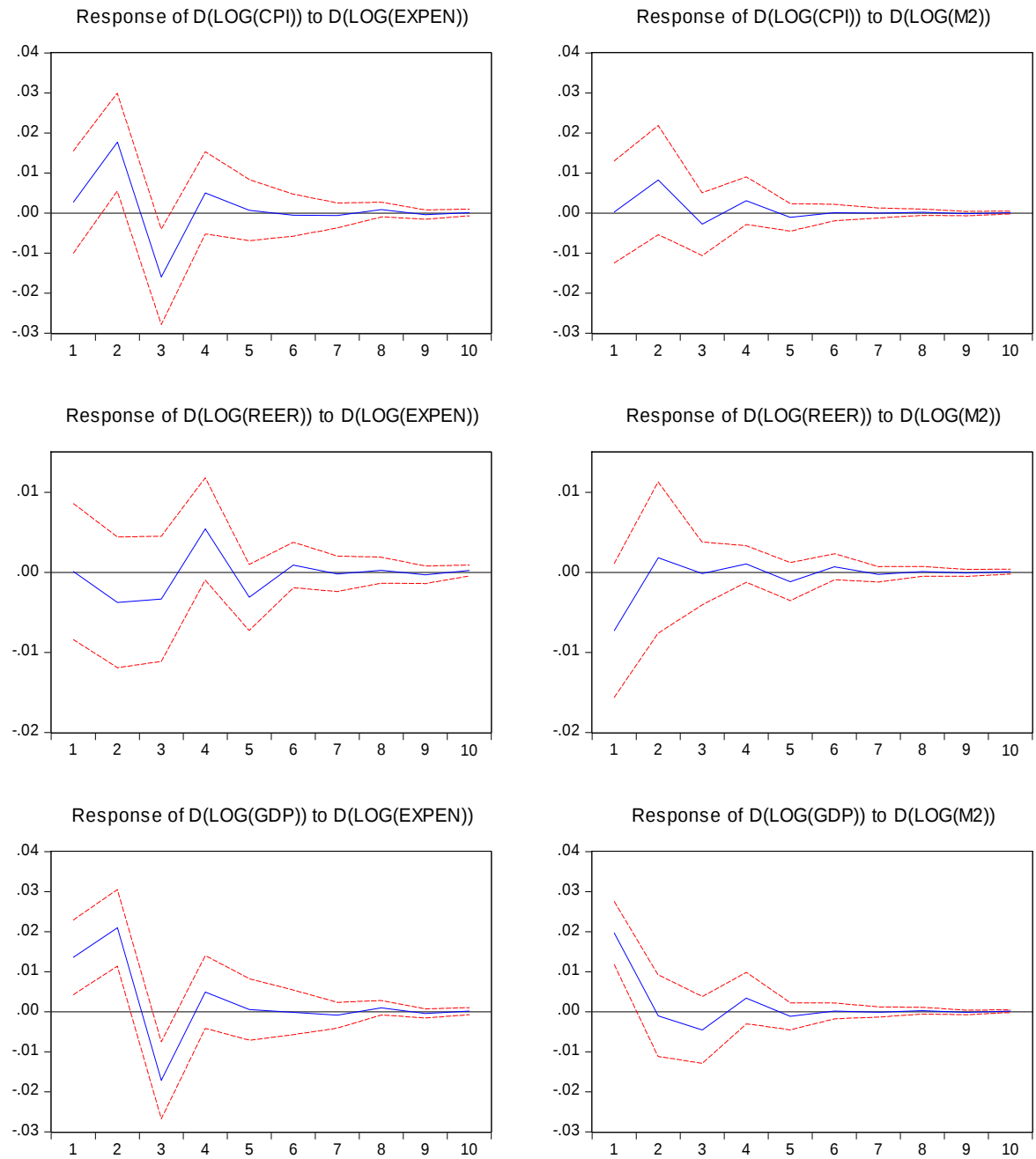
observation is small, it is advisable to use the model with one lag to save degree of freedom.

3. RESULTS OF IMPULSE RESPONSE

The estimated impulse response function is derived from 95 % confidence interval in order to examine the response of price level, real effective exchange rate and real GDP to the shocks of fiscal and monetary policies. The graph shows that inflation rate responds positively to the shock of government spending, implying that fiscal policy expansion by increase in government spending causes inflation in next two quarters and fluctuates before converging toward zero in the fifth quarter. In other words, the fiscal expansion brings about increase in inflation in next two quarter and causes deflation in third quarter, but has no long-term effect. Similarly, a shock of monetary aggregate (M2) results in a slight increase in inflation rate in the next two quarters and fades away in the sixth quarter. However, the future inflation rate is not statistically explained by broad money. Though the inflation does not statically respond to change in M2, it is believed that monetary policy might play a complementary role which is not embedded in the study.

Similarly, the real effective exchange rate responds to both macroeconomic policy shocks. Increase in spending or broad money could bring down REER or improve competitiveness and its effect would end in sixth quarter. Statistical testing showed that only monetary policy has a significant impact on REER in the next first quarter. In other words, a monetary expansion would improve competitiveness in very short term. Interestingly, real GDP growth strongly responds to the growth of government spending and money supply (M2). However, the positive responses to fiscal shock are significant for the first two quarter and oscillate from three quarter before moving up toward zero in the fifth quarter. That is, the increase in government spending leads to positive growth in the next two quarters and negative growth in third quarter. Similarly, real GDP responds positively to shock of money supply only for first quarter and then phases out. In other words, the positive shock of broad money will lead to positive growth in the next quarter, but the effects are not significant in the following quarters. Based on these findings, a conclusion can be drawn that fiscal policy is an effective policy tool to simulate the economy within a year time frame, while monetary policy affects the economic growth for short and medium term.

Response to Cholesky One S.D. Innovations ± 2 S.E.



4. FORECAST ERROR VARIANCE DECOMPOSITION

Variance decomposition of GDP growth is reported in Table 2.1. Almost 50 percent of forecast error variance of GDP growth is explained by government expenditure, around 20% by monetary aggregate and 30% by its own forecast. The explanatory power has continuously extended throughout the time path. Precisely, for the first quarter the explanatory power is 15% and then moves up to 50% in second quarter and onward. On the contrary, explanatory power of monetary policy is 37% in the first quarter, and then drops significantly to around 20% for the next quarter forecast. Similarly, self-explanation is high for the first period, but become lower for the future forecast. Overall, output growth is explained around 70% by fiscal and monetary policies even though the longer the forecast, the more explanatory the fiscal policy is and the less powerful is the monetary policy.

Table 2.1 : Variance Decomposition of Output Growth

Period	S.E.	ΔG	ΔM	ΔP	ΔE	ΔY
1	0.043389	15.34297*	33.16187**	0.007231	2.102202	49.38573**
		(9.566392)	(10.4973)	(1.561806)	(3.133897)	(9.931046)
4	0.052978	48.9275**	20.01524**	0.345211	1.365968	29.34608**
		(10.0919)	(7.887236)	(2.712097)	(2.759859)	(6.580543)
8	0.053044	48.89459**	20.06411**	0.344983	1.381992	29.31433**
		(10.14027)	(7.892063)	(2.845796)	(3.121622)	(6.601148)
12	0.053044	48.89472**	20.06405**	0.345004	1.382012	29.31421**
		(10.1889)	(7.909671)	(2.873255)	(3.268376)	(6.642047)

Note: -Number in () are standard errors from Monte Carlo simulation (1000)

- ** 5% significant level

As shown in Table 2.2, the forecast error variance of inflation rate is mostly explained by its own forecast, accounted for 97 percent for the first quarter and 66 percent for next periods. It means that inflation rate is exogenously explained by external factors. In addition, fiscal policy explains about 25% of forecast error of variance decomposition of inflation from the second quarter. Surprisingly, monetary policies do not have any statistical explanation power on the forecast error variance of inflation rate, which implies that monetary policy tool is an ineffective in controlling inflation rate. However, fiscal policy involves spending in domestic currency to the economy. Therefore, it has role to play in explaining inflation through simulating aggregate demand.

Table 2. 2: Variance Decomposition of inflation rate (CPI)

Period	S.E.	ΔG	ΔM	ΔP	ΔE	ΔY
1	0.277802	2.34615**	0.230854	97.423**	0.0000	0.0000
		(5.180909)	(3.369472)	(5.98907)	(0.0000)	(0.0000)
4	0.418056	24.69571**	4.243317	66.85341**	1.921608	2.285955
		(10.90804)	(5.351292)	(11.87974)	(4.370473)	(2.250392)
8	0.418526	24.6699**	4.347146	66.69713**	1.978496	2.307323
		(11.19003)	(5.567431)	(12.6799)	(5.193434)	(2.395702)
12	0.418528	24.67001**	4.347213	66.69677**	1.978668	2.307336
		(11.30883)	(5.616819)	(12.89503)	(5.422642)	(2.416195)

Note: -Number in () are standard errors from Monte Carlo simulation;

- ** 5% significant level

Variance decomposition of real effective exchange rate (REER) is reported in Table 2.3, indicating that the forecast error variance of REER is virtually explained by its own forecast with explanatory power of over 88% in the first quarter and around 78% for the rest period. On the other hand, REER is not statistically explained by both fiscal and or monetary policies and inflation. Since Cambodia has been overwhelmed by dollarization, the exchange rate plays very limited role in either deflecting change of external inflation or improving the country's competitiveness.

Table 2.3: Variance Decomposition of REER

Period	S.E.	ΔG	ΔM	ΔP	ΔE	ΔY
1	0.051923	1.572502	8.730813	1.32549	88.37119**	0.0000
		(-4.69389)	(-7.82778)	(-3.89392)	(-9.10191)	(0.0000)
4	0.053837	2.302242	14.18276	5.24216	77.89876**	0.37408
		(-6.99136)	(-10.1122)	(-6.81104)	(-12.9031)	(-1.66961)
8	0.053859	2.402865	14.27014	5.273785	77.65784**	0.395376
		(-8.14034)	(-10.1243)	(-6.8863)	(-13.5545)	(-1.7055)
12	0.053859	2.402984	14.27046	5.273929	77.65721**	0.395413
		(-8.47588)	(-10.1393)	(-6.90115)	(-13.745)	(-1.71551)

Note: -Number in () are standard errors from Monte Carlo simulation;

- ** 5% significant level

The forecast error of variance decomposition of expenditure is completely explained by its own forecast for the first quarter and then the explanatory power diminishes to around 88%

for the following periods. The growth of M2, CPI, REER and real GDP does not explain the variance decomposition of expenditure growth (Table 2.4). On the other hand, Variance decomposition of money growth is significantly explained by its own forecast error, accounted for almost 100% in the first quarter and around 95% in the subsequent quarter. All other variables did not significantly explain the variance decomposition of the money growth (Table 2.5). The results indicate that the fiscal and monetary policies are independent in stabilizing the macro-economy in Cambodia. Both policies have joint role in simulating growth. However, fiscal policy has significant role in controlling inflation. Both policies did not have significant role in raising competitiveness.

Table 2.4: Variance Decomposition of Expenditure Growth

Period	S.E.	ΔG	ΔM	ΔP	ΔE	ΔY
1	0.022353	100.00**	0.00	0.00	0.00	0.00
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
4	0.026277	88.76199**	4.193738	0.029262	0.06404	6.950965
		(-9.19717)	(-5.90267)	(-3.28359)	(-4.49907)	(-4.3867)
8	0.026357	88.75454**	4.19421	0.02931	0.069246	6.952691
		(-10.1165)	(-6.10143)	(-3.57651)	(-5.28906)	(-4.444)
12	0.026358	88.75449**	4.194231	0.029315	0.069249	6.952714
		(-10.3498)	(-6.16051)	(-3.67275)	(-5.43764)	(-4.4528)

Note: -Number in () are standard errors from Monte Carlo simulation;

- ** 5% significant level

Table 2.5: Variance Decomposition of M2 Growth

Period	S.E.	ΔG	ΔM	ΔP	ΔE	ΔY
1	0.032876	0.083176	99.91682**	0.00	0.00	0.00
		(-3.38455)	(-3.38455)	(0.0000)	(0.0000)	(0.0000)
4	0.045694	1.663322	95.17509**	0.402301	1.442622	1.316665
		(-5.67801)	(-8.7713)	(-3.32872)	(-4.22659)	(-2.39973)
8	0.045745	1.700735	95.1195**	0.404187	1.450069	1.325513
		(-5.90762)	(-9.29973)	(-3.40028)	(-4.53383)	(-2.43659)
12	0.045745	1.700745	95.11944**	0.404197	1.450104	1.325515
		(-5.9605)	(-9.43952)	(-3.43834)	(-4.62942)	(-2.43992)

Note: -Number in () are standard errors from Monte Carlo simulation;

- ** 5% significant level

However, the results should be carefully interpreted for policy implication. Actually, the methodology does not capture contemporaneous effects of policy variable to macroeconomic indicators. It means that model does not provide immediate effectiveness of macroeconomic policy, especially monetary policy within a quarter. Moreover, the result of study has several limitations. First, the conclusion is based on short observation, when economy was high growth and stable inflation then hit by global financial crisis. Second, the study takes growth as general without discussion on the distribution effect. Third, during observed period both public finance which tackle effectiveness of fiscal policy and market financial system target to improve responsiveness of monetary policy were under reform. The results might be due to the different in reform intensity and success. Fourth, during observed period, the impact of macroeconomic policies on poverty status which was reported to reduce from 47% in 1994 to 35% in 2004 and 30% in 2007 was ignored (WB 2009). Finally, during the course of high growth, the inequality has been widened and this study does not attempt to distinguish which policy might bring about more inclusive growth. So, the conclusion should not be generalized.

V. CONCLUSION AND RECOMMENDATIONS

Macroeconomic stabilization can be achieved through the successful implementation of fiscal and monetary policies despite sometimes the latter has more influence than the former or vice versa owing to a country's economic structure. For a highly-dollarized economy like Cambodia, many economists argued that fiscal policy is more powerful than monetary policy. Following testing by employing VAR model, the results support the hypothesis, suggesting that both monetary and fiscal policies play a crucial role in spurring economic growth, even though fiscal policy has greater influence in medium terms than monetary policy which has larger impacts in short run. As expected, fiscal policy has positive impact on inflation, implying that increase in government expenditure would induce higher inflation rate. On the contrary, price levels do not virtually respond to monetary policy shock, indicating that money supply may not be an effective tool in curbing volatility of inflation. In fact, it may be true for Cambodia that has experienced with currency substitution and relied heavily on imported goods whose prices are prone to external shocks because an increase in demand arising from fiscal expansion leads to higher demand for imported goods. Real effective exchange rate affirmatively reacts to change in government spending and broad money, but the effects appear modest.

Realizing that fiscal policy is more powerful than monetary policy, the Royal Government of Cambodia should improve fiscal discipline so that the budget spending should be prudently allocated in such a way that both macroeconomic and microeconomic objectives will eventually be achieved. To this end, Ministry of Economy and Finance should enhance its capacity in collecting more taxes by improving the tax and customs administration through enhancement of good governance practices, and enlarging the domestic tax base in order to increase tax revenues, and reduce the dependency on customs revenues which will be prone to CEPT scheme and aid which gives rise to debt burdens. Importantly, special attention should be paid to the way in which the budget is spent and allocated because it will have significant impacts on growth and inflation as well as poverty status. Nevertheless, it seems that goals of high economic growth and price stability are in conflict, i.e, both goals can not be accomplished simultaneously because once the economic growth is accelerated, the inflation will follow suit.

On the other hand, monetary policy should not be ignored in the sense that it can play a complementary role for fiscal policy in fostering economic growth and controlling inflation. Hence, the National Bank of Cambodia in its capacity as a monetary authority should improve overall aspects of monetary policy including the building of the public confidence in banking sector and national currency, establishment of inter-bank market and more indirect instruments, and effective transmission mechanism channel through creation of financial market. To make these instruments viable, de-dollarization policy should be pursued in long term in order for central bank to effectively control its money supply. However, since this objective will not be accomplished overnight, a comprehensive strategy should be put in place to regain the public confidence in riel as well as banking system. In effects, up to date, despite a great deal of NBC's efforts to de-dollarize economy, light has yet to be seen at the end of the tunnel. Therefore, care must be taken to alter the people's preference of holding US dollar and other foreign currencies to local currency.

REFERENCES

Arestic P., (2010). “New Consensus on Macroeconomics and Keynesian Critique”, University of Cambridge.

Ajisafe, R.A, and Folorunso, B.A., 2002 .“Relative Effectiveness of Fiscal and Monetary Policy in Macroeconomic Management in Nigeria”, *African Economic and Business Review*, Vol.3, No.1.

Ali, S., Irun Si., and Ali A., 2008. “Whether Fiscal Stance or Monetary Policy is Effective For Economic Growth in Case of South Asian Countries?”, *Pakistan Development Review*.

Blanchard O., Dell’s Ariccia G.,and Mauro, P., 2010. “Rethinking Macroeconomic Policy”, IMF.

Boivin J., and Gainnoni, M., 2003. “ Has Monetary Policy Become More Effective?”, *Working Paper No.9459*, NBER.

Castillo, S., 2006. “Dollarization and Macroeconomic Stability in Latin America”, University of Wisconsin Board of Regents.

Cedergren, M., 1995. “ Fiscal Reforms and Macroeconomic Stabilization in Cambodia”, Department of Economics at the University of Lund, *Minor Field Study Series No.62*.

Calderon C., and Hebbel, S.K., 2003. “ Macroeconomic Policies and Performance in Latin America”, *Working Paper No. 217*, Central Bank of Chile.

De Zamaroczy, M. and Sa, S., 2002. “Macroeconomic adjustment in a highly dollarized economy: The case of Cambodia”, *IMF Working Paper, wp/02/97*, Washington, D.C.

Ekesen L.L., (2009). “Countering Cyclical-The Effectiveness of Fiscal Policy in Korea, w/09/249, IMF.

Guimbert, S., 2010. “Cambodia 1998-2008: An Episode of Rapid Growth”, Policy Research Working Paper 5271, The World Bank.

Ginting, E., and Bird, K., 2009. “Explaining Inflation in Cambodia”, Third Cambodian Economic Forum, ADB.

Hsing, Y., and Hseih, J.W., 2010. “ Impacts of Monetary, Fiscal and Exchange Rate Policies on Output in China: A VAR approach.”

Hang, Ch. N., 2009. “ **Cambodian Economy: Charting the Course of a Bright Future**”, Supreme National Economic Council, Phnom Penh.

IMF Country Report No.11/45, 2011. “ Camdodia: 2010 Article IV Consultation-Staff Report”, Washington, D.C, USA.

IMF Country Report No.06/290, 2009. “Cambodia: 2008 Article IV Consultation-Staff Report”, Washington, D.C, USA.

IMF Country Report No.06/290, 2007. “Cambodia: 2007 Article IV Consultation-Staff Report”, Washington, D.C, USA.

IMF Country Report No.06/290, 2006. “Cambodia: 2006 Article IV Consultation-Staff Report”, Washington, D.C, USA.

Jalilian H., Sophal C., Reyes G., Hang C.S., Dalis P., Dorina P., 2009. “Global Financial Crisis Discussion Series Paper 4: Cambodia, Overseas Development Institute, London.

Kildegaard, C.A., and Fernandez, O.R., 1999. “Dollarization in Cuba and implication for the future transition”, lanic.utexas.edu/la/cb/cuba/asce/cuba9/kil_orro.pdf.

Kem, R. V., 2002. “Currency substitution and exchange rate volatility in Cambodia”, part of the thesis submitted for degree of Doctor of Philosophy at National Center for Development Studies, the Australian National University, Canberra.

Lao-Araya, K., 2002: “How can Cambodia, Lao PDR, Myanmar and Vietnam Cope With Revenue Lost Due to AFTA Tariff Reductions?”, *ERD Working Paper No.29*, ADB, Manila.

MEF, 2011. “The Directive on Implementation of the Law on Finance for 2011”, No.02, Phnom Penh, Cambodia.

Nasir, M., Ahmad, A. and Ali, A., and Rehman, U.F, 2010. “Fiscal and Monetary Policy Coordination: Evidence from Pakistan”, International Research Journal of Finance and Economics, Euro Journals Publishing, Inc., 2010.

NBC Bulletin, 3rd Quarter, 2009.

Ostrup, F. and L. Oxelheim (2006), "The Impact of International Integration on Macroeconomic Policy Effectiveness", *Conference Paper*, International Conference on European Financial Integration and China, May 12-13, Fudan/Durham University, Shanghai.

Phalla, P., 2009. “Fiscal Analysis in 2007”, Supreme National Economic Council, Phnom Penh.

Plate V.P. and Herrero, G.A., 2008. “*To Dollarize or De-dollarizes: Consequences for Monetary Policy*”, Paper prepared for the Asian Development Bank.

Rahman, H., 2005. “Relative Effectiveness of Monetary and Fiscal Policies on Output Growth in Bangladesh: A VAR Approach”, working paper: *wp0601*, Bangladesh Bank.

Sang Sinavith, 2006. “Cambodian Tax Revenue and Non-Tax Revenue”, kamome.lib.ynu.ac.jp/dspace/bitstream/10131/.../KJ00004473294.pdf

Stiglitz, E.J., 2002. “Alternative Approach to Stabilization Policy: An Overview”, Preliminary Draft of a Paper Prepared for IPD Task Force Meeting, Barcelona.

Sidgwick E., and Poullang D., 2010. “Asian Development Outlook 2010”, ADB.

Verbeek, M., 2000. “Modern Econometrics”, John Wiley and Sons Ltd, England.

Walsh E. C, 2003. “ ***Monetary Theory and Policy***”, (2nd ed.), Massachusetts Institute of Technology, USA.

World Bank (WB), 2009. “Poverty profile and trends in Cambodia, 2007: Findings from the Cambodia Socio-Economic Survey (CSES)”, Report No. 48618-KH

Appendix: A

Table 1: Descriptive Statistics

	CPI	EXPEN	M2	REER	GDP
Mean	104.2494	770.9339	4156.895	4.63349	4518177
Median	101.7200	680.5855	2920.866	4.628264	4246152
Maximum	149.9800	1909.055	12697.86	4.737578	7445189
Minimum	78.82000	229.6969	902.0743	4.55898	2532241
Std. Dev.	14.34613	423.8427	3478.701	0.036299	1513734
Skewness	1.703988	1.138511	1.266585	0.698148	0.438991
Kurtosis	6.314448	3.805720	3.475416	3.534442	1.905717
Jarque-Bera	45.19973	11.66804	13.28594	4.470542	3.936612
Probability	0.000000	0.002926	0.001303	0.106963	0.139693
Sum	5003.970	37004.83	199531.0	222.4075	2.17E+08
Sum Sq. Dev.	9673.136	8443203.	5.69E+08	0.061928	1.08E+14
Observations	48	48	48	48	48

Table 2: Result of Unit Root Test

Variables in log form		ADF Statistics	Probability*	Order of Integration
LCPI	Level, Intercept	5.9447507	1.0000	I(1)
	Level, Intercept and trend	3.356503	1.0000	I(1)
	First different, intercept	-1.7067799	0.4208	I(1)
	First different, Intercept and trend	-3.769195	0.00281	I(0)
LEXPEN	Level, Intercept	-0.134022	0.9395	I(1)
	Level, Intercept and trend	-2.860433	0.1846	I(1)
	First different, intercept	-18.30358	0.0000	I(0)
	First different, Intercept and trend	-18.08463	0.0000	I(0)
LM2	Level, Intercept	1.170123	0.9976	I(1)
	Level, Intercept and trend	-2.226016	0.4652	I(1)
	First different, intercept	-6.492221	0.0000	I(0)

	First different, Intercept and trend	-6.474532	0.0000	I(0)
LREER	Level, Intercept	-2.985280	0.0436	I(0)
	Level, Intercept and trend	-2.941293	0.1595	I(1)
	First different, Intercept and trend	-9.500455	0.0000	I(0)
LGDP	Level, Intercept	0.406743	0.9811	I(1)
	Level, Intercept and trend	-2.521797	0.3167	I(1)
	First different, intercept	-9.333437	0.0000	I(0)
	First different, Intercept and trend	-9.211227	0.0000	I(0)

* MacKinnon (1996) one-sided *p*-values.

Table 3: Lag Selection Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	308.4222	NA	5.11e-13	-14.11266	-13.90787	-14.03714
1	362.6825	93.37825	1.32e-13	-15.47361	-14.24486*	-15.02048
2	400.8019	56.73584	7.55e-14	-16.08381	-13.83111	-15.25308
3	436.5428	44.88390*	5.21e-14*	-16.58339	-13.30673	-15.37506*
4	463.9860	28.08140	6.08e-14	-16.69702*	-12.39642	-15.11109

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 4: Co-integration at Lag 4, Lag 3 and Lag 1

Lag 4

Null	Eigenvalues	Trace Test		Max Eigenvalue Test	
		$\lambda - trace$	$p - value$	$\lambda - max$	$p - value$
$r \leq 0$	0.468996	65.77556	0.0152**	26.58537	0.1403
$r \leq 1$	0.329388	39.19019	0.0626*	16.78173	0.3589
$r \leq 2$	0.297007	22.40846	0.0844*	14.80115	0.1335
$r \leq 3$	0.150615	7.607312	0.2687	6.856178	0.2622

$r \leq 4$	0.017725	0.751134	0.4439	0.751134	0.4439
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Lag 3

Null	Eigenvalues	Trace Test		Max Eigenvalue Test	
		$\lambda - trace$	$p - value$	$\lambda - max$	$p - value$
$r \leq 0$	0.653130	91.30851	0.0000**	45.52859	0.0003**
$r \leq 1$	0.451412	45.77992	0.0123**	25.81754	0.0296**
$r \leq 2$	0.240576	19.96237	0.1591	11.83341	0.3128
$r \leq 3$	0.145879	8.128965	0.2268	6.780345	0.2692
$r \leq 4$	0.030877	1.348620	0.2871	1.348620	0.2871

Lag 1

Null	Eigenvalues	Trace Test		Max Eigenvalue Test	
		$\lambda - trace$	$p - value$	$\lambda - max$	$p - value$
$r \leq 0$	0.816467	161.0283	0.0000**	76.29123	0.0000**
$r \leq 1$	0.705092	84.73703	0.0000**	54.94908	0.0000**
$r \leq 2$	0.291535	29.78795	0.0091**	15.50946	0.1069
$r \leq 3$	0.209334	14.27848	0.0232**	10.56960	0.0650*
$r \leq 4$	0.097115	3.708889	0.0642*	3.708889	0.0642*

Table 5: Granger Causality Test Result (Lag 3 and 1)

Dependent Variable	Lag 3 Model		Lag 1 Model	
	Chi-Square	P-Value	Chi-Square	P-Value
ΔG	13.65320	0.2914	13.45571	0.0093**
ΔM	12.07053	0.4400	2.117893	0.7141
$\Delta REER$	7.805147	0.8002	2.249465	0.6900
ΔP	20.65811	0.0556*	16.16030	0.0028**
ΔY	28.12904	0.0503**	35.83752	0.0000**

Macroeconomic Policy Strategies for Growth and Stability in Cambodia, Lao PDR, Thailand, and Vietnam: A Panel Data Study

Phongthorn Wrasai*

Faculty of Economics, Thammasat University

May 18, 2011 (Work in progress)

Abstract

The aim of this paper is twofold: first to examine impacts of macroeconomic policies on real economic activities among CLTV economies; and second, to identify plausible sources of variation in real economic activities resulting from the use of macroeconomic policy tools. Major findings are as follows. First, not surprisingly, it is confirmed that export is the main engine for growth. Second, it is evident that over time horizon, among CLTV economies, expansionary fiscal policy has a positive impact on real output but size of the impact is demunitive. Third, monetary and exchange rate policy play an insignificant role of enhancing growth. A policy implication is that to achieve long term growth, export promotion policy focusing on capacity building and productivity enhancing is vital.

JEL classification: E02; E47; E61; E63

Keywords: Economic Growth, Stability, Macroeconomic policy strategy, Panel VAR

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1 Introduction

As trade and financial integration have become increasingly important among countries in Cambodia, Lao PDR, Thailand, and Vietnam, implementation of macroeconomic policies must take into account this new regional environment that may help or hinder social and economic development. Monetary and fiscal policies employed to curb inflation and stimulate growth must also take into account the impact of globalization.

Given institutional constraints and transitional economic structure, macroeconomic policy conducted in the CLTV economies faces challenging tasks. With current development state of money and capital markets, the transmission mechanisms from policy instruments to policy targets are inconsistent and unpredictable. As a result the monetary policy conducted would be different from those policies applied in advanced economies. On fiscal front, low tax base and increasing public debt due to economic slowdown make it more difficult to reallocate and mobilize financial resources for infrastructure development. Policy makers must acknowledge institutional rigidities and explore new macroeconomic strategies that can bring about growth and stability under these constraints

2 Background

Since the financial crisis in 1997, Thailand's economic growth has been lower than other three economies in the region. Factors that are responsible for such dismal performance are negative factors affecting private consumption, investment, and exports. The plunge in 2009 was due to global economic slowdown which in turn drags down Thai exports, the remaining engine for growth in 2008.

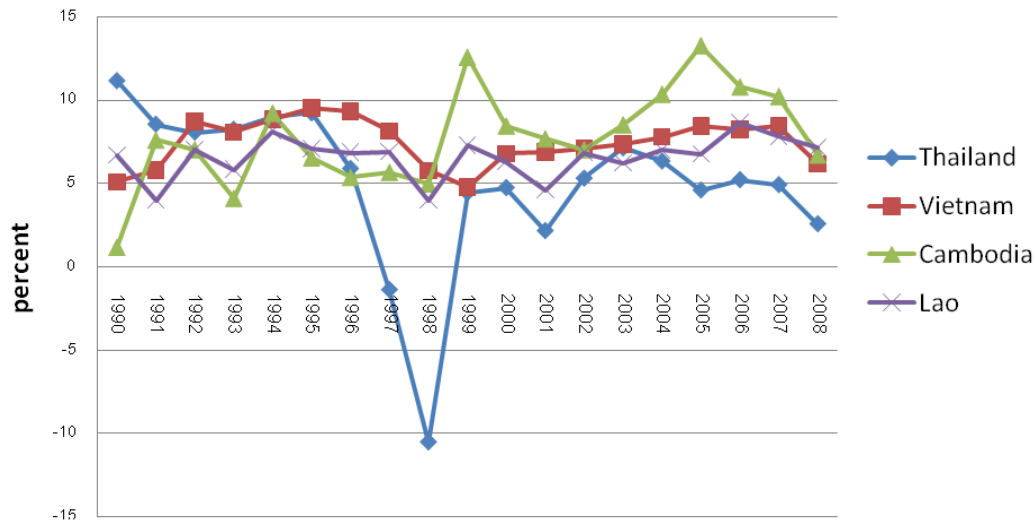


Figure 1: Comparative Output Growth

Source: Asian Development Bank (ADB)

Thailand is the only country among the four countries under the study that experienced contraction of income during the Asian financial crisis between 1997 and 1998. Although not as detrimental to output as the Asian financial crisis, Thailand was also affected by the global financial crisis in 2009, when output fell by 3.5 percent. Nidhiprabha (2009) argues that monetary and fiscal policy stimulus may not sustain the recovery unless business sentiment and consumer confidence are restored to the level before the military coup in 2006.

The study would shed light on the output fluctuation of the CLTV countries and examine whether differential institutional setups and macroeconomic policy responses to shocks attribute to differences in macroeconomic performance in the region.

While Thailand has the worst performance in term of output growth, it has accomplished price stability (Figure 2). There are various hypotheses concerning the sources of inflation. For a country with a fixed exchange rate regime, imported inflation could be a potential cause. The degree of trade openness implies the speed of transmission of world inflation into the local

economy. In addition, excessive monetary growth from capital inflows or money-financed budget deficit can lead to rising velocity of money and in turn inflation spiral. The comparative study will analyze conducted policy measures that brought down hyperinflation in the three countries. The relevant research question is that the extent to which these countries can tradeoff between growth and price stability.

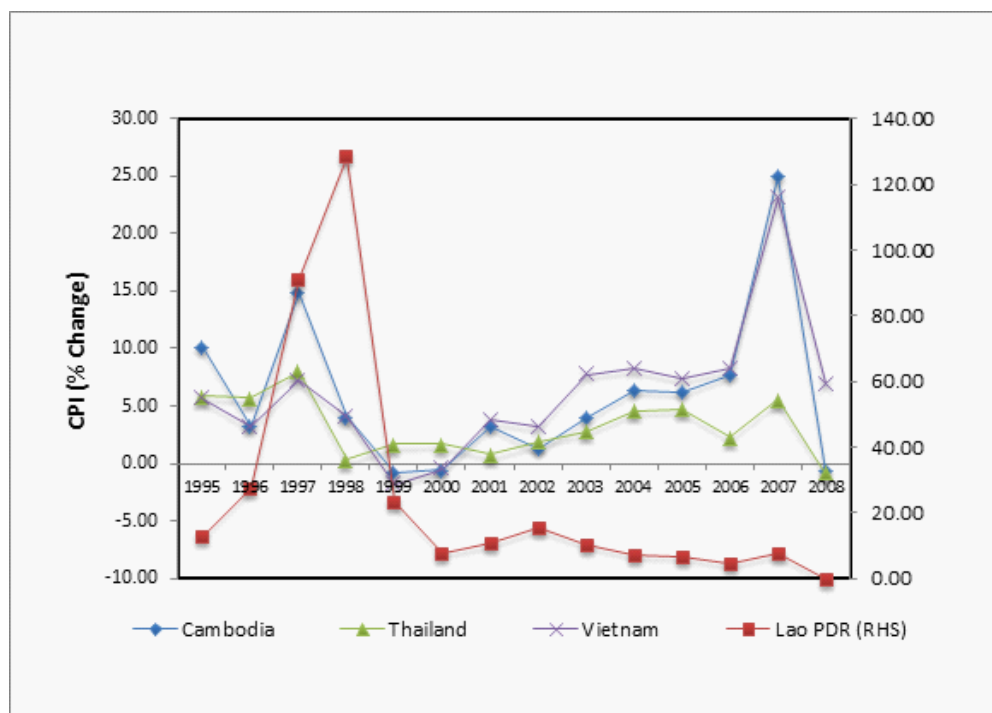


Figure 2: Price Stability
Source: Asian Development Bank (ADB)

According to Kyophilavong (2009), the Bank of Lao's ability to control inflation is hampered by dollarization. The cost of dollarization is greater than its benefit and de-dollarization must be a long-term objective which can be gradually achieve through building the confidence in the Kip. When the government can maintain price stability, the problem of dollarization can be minimized.

When inflation rate remains high, expectations on devaluation would increase and consumers would be willing to hold dollar rather than domestic currency for speculative purpose. Leung, Thanh, and Viseth (2005) found the long-run relationship between the expected rate of depreciation and the

holding of the dollar during 1993-2001. As a consequence the effectiveness of monetary policy is hampered by currency substitution in Cambodia.

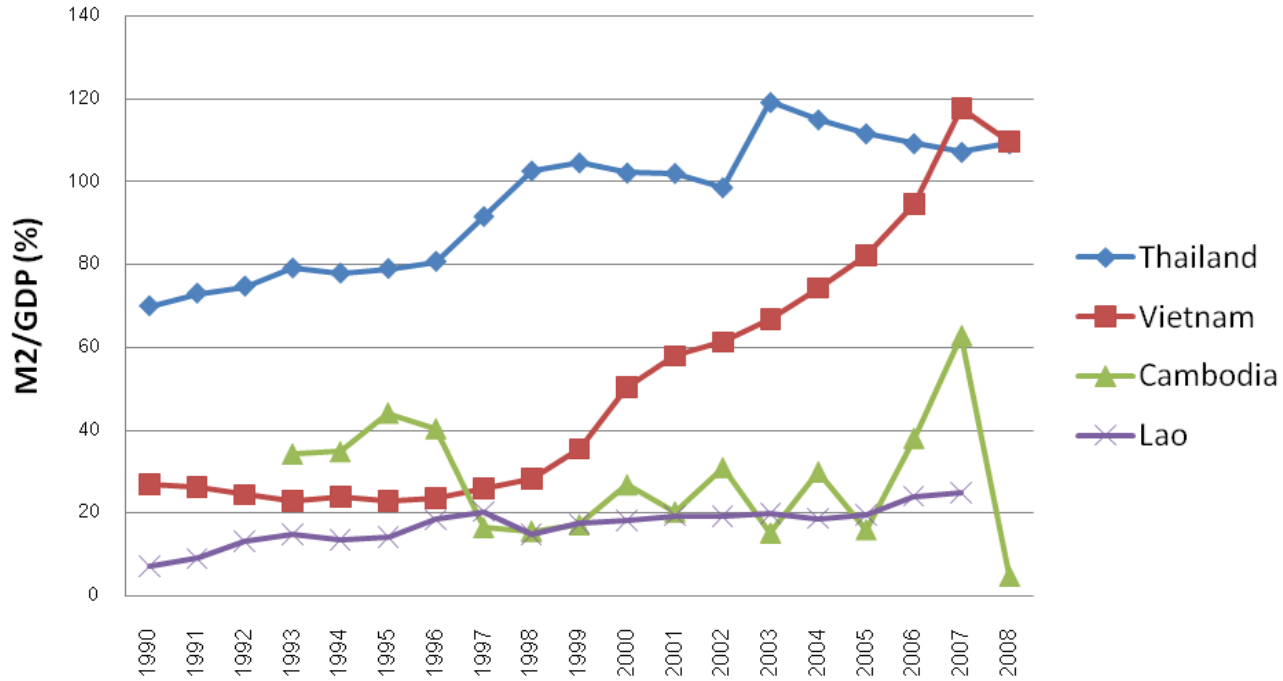


Figure 3: Financial Deepening in CLTV Economies
Source: Asian Development Bank (ADB)

Figure 3 reports financial development in CLTV economies as measured by the ratio of broad money supply to aggregate output, $M2/GDP$. Although financial development in Thailand has an increasing trend, it stumbled and stagnated from period to period as the ability to save and the incentives to save deteriorated during the downturn of economy. Lao's financial development has increased steadily since 1990, albeit at a slow growth rate. The fastest financial development is witnessed by Vietnam. Among the four economies, variation of financial development is highest in Cambodia. Heterogeneity of financial development has strong endurance on the effectiveness of monetary policy and ability of the banking sector to finance fiscal deficit. If domestic investors are constrained by credit availability from banks, capital inflows can mitigate the insufficient level of domestic savings. Whether

capital inflows can compensate insufficient domestic saving largely depends on the openness of capital account.

Klein and Olivei (2008) argued that developed countries were able to benefit from open capital accounts in terms of greater financial depth and higher economic growth. Nevertheless, there was no evidence that capital account liberalization provides desirable impact for developing countries. In this regard, there is an opportunity to use capital controls in order to achieve monetary policy independence and stable exchange rates for these countries. A critical issue is that under which conditions expected benefits from achieving the above goals outweigh their associated costs. Could the controls help managing volume and speed of capital inflows or could the measures prevent capital flight and help stabilizing the exchange rate?

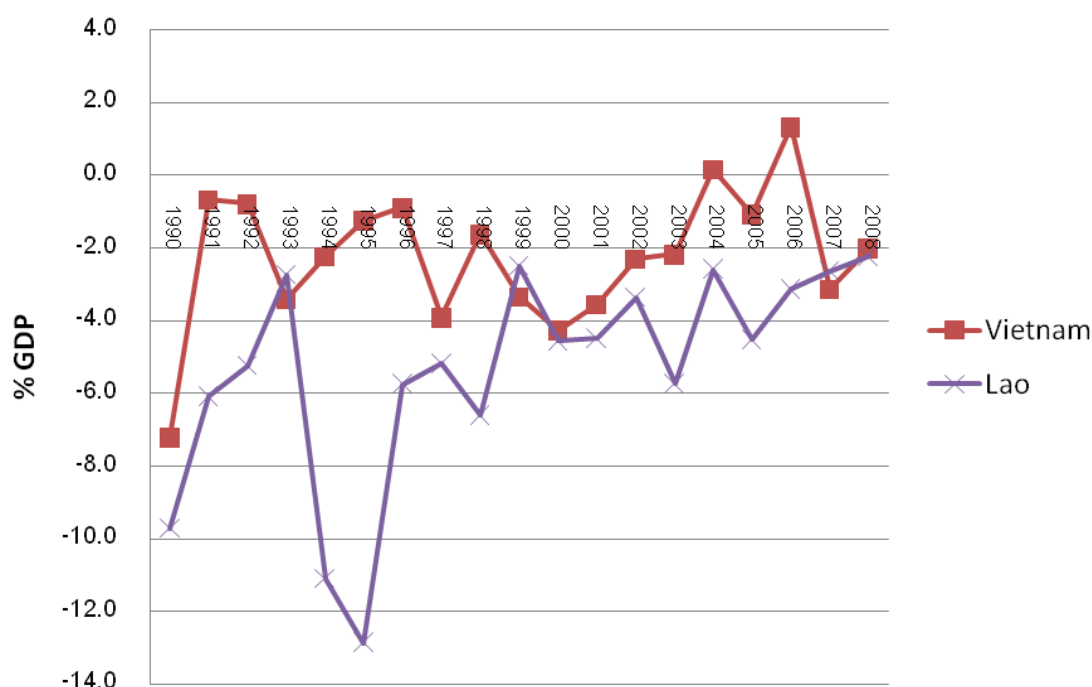


Figure 4: Fiscal Balances in Lao PDR and Vietnam
Source: Asian Development Bank (ADB)

On fiscal policy front, government spending and tax cut could be implemented so as to stimulate growth during period of economic recession with no

inflationary pressure provided that resources are underutilized. The methods of fiscal deficit financing really matter if price stability is also taken into account. According to Figure 4, Fiscal deficit in Lao is quite substantive and persistent for almost 20 years with the record low at 12% of GDP in 1995 while Vietnam encountered cyclical pattern of surpluses and deficits during the last two decades. It is important to note that one must carefully weigh short term and long term benefits when deficit is created as opportunity cost of doing so is forgone benefits of the resources that could be used in providing infrastructure investment for long-term development. Moreover public deficits imply public debt and burden to service the debt. An important question raised in this study is that under what economic institution an economy is not prone to money-financial budget deficit.

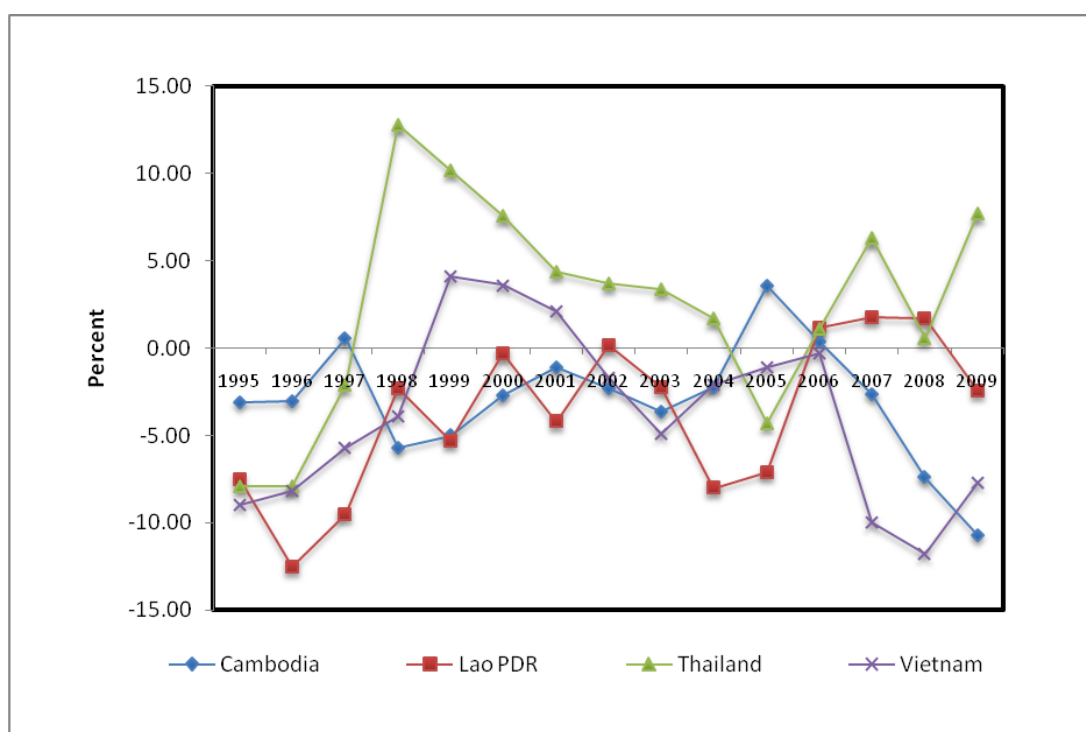


Figure 5: Current Account Deficits as Percentage of GDP
Source: Asian Development Bank (ADB)

Prior 1997 crisis Thailand had experienced unsustainable current account deficit due to real exchange rate appreciation and that significantly contribute

to the arrival of currency crisis later on. The massive currency depreciation after the baht devaluation resulted in output contraction and subsequent improvement in trade balance. Empirical evidence in Vietnam strengthens the hypothesis that devaluation can be employed to stimulate trade balance and in turn improvement in the balance of payments (Thanh and Kalirajan, 2006). Cambodia has been experiencing current account deficits while Lao, until recently, witnessed current account surplus.

In a nutshell, implementing macroeconomic policies to stimulate growth and stability with acknowledging institutional factors and initial conditions would greatly help understanding macroeconomic policy strategy in the context of increasing regional integration.

The study is aimed at identifying macroeconomic strategies for maintaining growth and stability in Cambodia, Lao, Thailand, and Vietnam. It will compare and contrast fiscal policy, monetary and exchange rate policy employed in Cambodia, Lao PDR, Thailand, and Vietnam.

The study will evaluate macroeconomic policy effectiveness and their limitations in maintaining sustainable growth and price stability. Even though there are institutional and social heterogeneity among country studies, policy lessons can still be drawn from various experiences in these CLTV countries. Furthermore, as capital markets among these economies have become increasingly important in the current stage of economic development, the study will touch upon the relationship between capital markets development and macroeconomic variables.

3 Empirical Methodology

Given the feature of the data sets which contains both time-series and cross-section data, panel data analysis will be employed. To capture the evolution and dynamic relationships among macroeconomic variables, Vector Autoregressions (VAR) will be used in the analysis. Time period of the study covers 1980-2009. Annual, quarterly, and monthly data will be employed in both qualitative and quantitative analysis. To achieve growth and stability, macroeconomic policy tools: fiscal policy, monetary and exchange rate policies employed in Cambodia, Lao PDR, Thailand, and Vietnam will be examined and evaluated. The paper focuses on dynamic impacts of the macroeconomic policy tools on two key macroeconomic variables: economic growth and price stability

Our data come from International Financial Statistics (IFS CD-September 2010) and DATASTREAM, UN databases, Asian Development Bank (ADB), etc. which contains standardized accounting information on large public macroeconomic data. The study uses annual data from 1990-2010 and quarterly data for 1990-2009 for the four countries that are Cambodia, Laos PDR, Thailand, and Vietnam. Some are not available. Thus, cubic spline and log-linear interpolation are used for capture all quarterly data to run in PVAR.

Table 1 Variable Definitions

Variables	Description
RGDP	Real GDP measured in million US Dollars
GOVEXP	Government expenditure measure in million US Dollars
IR	Short term interest rate or policy rate
X	Exports in million US Dollars
REER	Real effective exchange rate

Our analysis employs Panel Vector Auto-Regression (PVAR) methodology. This technique combines the traditional VAR approach, which treats all the variables in the system as endogenous, with a panel data approach, which allows for unobserved individual heterogeneity. The advantage of the VAR approach is that it does not require any a priori assumptions on the direction of the feedback between variables in the model. is based on the following model incorporating fixed effects:

$$y_{it} = \beta_0 + \sum_{s=1}^n \beta_s y_{i,t-s} + f_i + e_t; \quad y_t = \begin{bmatrix} GDP_{it}^j \\ IR \\ GOVEXP \\ X \\ REER \end{bmatrix}, i = 1, 2, 3, 4$$

where Y_{it} is a vector of the five endogenous variables $\{GDP, IR, GOVEXP, X, REER\}$ for country i and year t . The variable GDP is the real GDP (millions of US dollars) which represents output or economic growth, IR is the policy rate or discount rate of central bank of each country (%) represented as the monetary policy, $GOVEXP$ is the government expenditure (millions of US dollars) represented as the fiscal policy, X is the export trade volume (millions of US dollars) represent contribution of export towards output expansion,

and also *REER* is real effective exchange rate (index) which is a proxy of trade competitiveness.

This framework, which allows producing impulse response functions (hereafter, IRFs), will be useful to trace the direct effects and identify the indirect effects that may work through the monetary policy, fiscal policy, and exchange rate policy. More specifically, IRFs describe the reaction of one variable to the innovations in another variable in the system, while holding all other shocks to zero (Love and Zicchino, 2006). In applying the VAR procedure to panel data, we need to impose the restriction that the underlying structure is the same for each cross-sectional unit. Since this constraint is likely to be violated in practice, one way to overcome the restriction on parameters is to allow for individual heterogeneity. The countries' specifics are captured in this framework in the fixed effect variable, denoted in the model of f_i to overcome the restriction.

The dynamic behavior of the model is assessed using orthogonalized impulse response functions, which describe the reaction of one variable in the system to innovations in another variable in the system while holding all other shocks at zero. The shocks in the VARs were orthogonalized using Cholesky decomposition, which implies that variables appearing earlier in the ordering are considered more exogenous, while those appearing later in the ordering are considered more endogenous.

The PVAR has clear practical advantages as an explicit dynamic system that is the most appropriate way for studying macroeconomic dynamics. First, PVAR imposes a statistical model on the contemporary movements of the variables rather than being driven by a particular macroeconomic concept can be distorting. Second, PVAR does not distinguish between exogenous and endogenous variables, but rather treats all variables as jointly endogenous. Each variable in PVAR depends on its past rationalization and treat on equal footing. Third, PVAR permits modeling both endogenous and exogenous shocks. Forth, PVAR is easy to estimate both in single country case and panel case. And Finally, PVAR has clear practical value as a handy tool for a comparative analysis of the macroeconomic performance of CLTV countries.

However, PVAR has some limitations. VARs is not and cannot be viewed as a growth accounting or findings determinants of growth exercise. Second, VARs inevitably suffer from overparametarisation, the interpretation of the restrictions is not obvious if an innovation to one variable does not affect any other variable, while the system is still simultaneous. And finally, the con-

clusions are sensitive to the choice of lag length and the number of included variables.

The second methodology used in this paper is panel data analysis. After completing panel data set and take into account unobserved heterogeneities (country specific factors) into the panel model, there are two common assumptions made about the individual specific effect, the random effects assumption and the fixed effects assumption. The random effects assumption (made in a random effects model) is that the individual specific effects are uncorrelated with the independent variables.

The fixed effect assumption is that the individual specific effect is correlated with the independent variables. If the random effects assumption holds, the random effects model is more efficient than the fixed effects model. However, if this assumption does not hold, the random effects model is not consistent. In the result subsection, we find that the CLTV panel data is more appropriate for fixed effect model than random effect model tested by Hausman-Taylor test.

3.1 Fixed Effect Model

The model identification for Panel Data analysis of Fixed Effects Model can be illustrated as follows; Model, Hausman-Taylor method

Formally the model is

$$y_{it} = \beta_0 + X_{it}\beta + Z_i\gamma + \alpha_i + u_{it},$$

where y_{it} is the dependent variable observed for individual i at time t ,

X_{it} is the time-variant regressor,

Z_i is the time-invariant regressor,

α_i is the unobserved individual effect (Country specific factor)

u_{it} is the error term.

The two main methods of dealing with α_i are to make the random effects or fixed effects assumption:

1. Random effects (RE): Assume α_i is independent of X_{it}, Z_i or $E(\alpha_i|X_{it}, Z_i) = 0$.
2. Fixed effects (FE): Assume α_i is not independent of X_{it}, Z_i .

To get rid of individual effect α_i , a differencing or within transformation (time arranging) is applied to the data and then β is estimated via Ordinary Least Squares (OLS). The most common differencing methods are: 1. Fixed

effects (FE) model, 2. First difference (FD) model: and 3. Long difference (LD) model

Another common approach to removing the individual effect is to add a dummy variable for each individual i . This is numerically, but not computationally, equivalent to the fixed effect model and only works if T , the number of time observations per individual, is much larger than the number of individuals in the panel.

We could not use OLS to estimate γ from this equation because Z_i is correlated with α_i (i.e. there is a problem with endogeneity from our FE assumption). If there are available instruments one can use IV estimation to estimate γ or use the Hausman–Taylor method.

3.2 Hausman–Taylor method

Need to have more than one time-variant regressor (X) and time-invariant regressor (Z) and at least one X and one Z that are uncorrelated with α_i .

$$X = \begin{bmatrix} X_{1it} & \vdots & X_{K1it} \end{bmatrix}_{TN \times K1 \quad TN \times K2}$$

$$Z = \begin{bmatrix} Z_{1it} & \vdots & Z_{G2it} \end{bmatrix}_{TN \times G1 \quad TN \times G2}$$

Partition the X and Z variables such that where X_1 and Z_1 are uncorrelated with α_i . Need $K1 > G2$.

Estimating γ via OLS on using X_1 and Z_1 as instruments yields a consistent estimate.

Testing FE vs. RE

We can test whether a fixed or random effects model is appropriate using a Hausman test.

$$H_0 : \alpha_i \perp X_{it}, Z_i$$

$$H_a : \alpha_i \perp X_{it}, Z_i$$

If H_0 is true, both $\hat{\beta}_{RE}$ and $\hat{\beta}_{FE}$ are consistent, but only $\hat{\beta}_{RE}$ is efficient. If H_a is true, $\hat{\beta}_{FE}$ is consistent $\hat{\beta}_{RE}$ and is not. The Hausman test is a specification test so a large test statistic might be indication that there might be Errors in Variables (EIV) or our model is misspecified. If the FE assumption is true, we should find that $\hat{\beta}_{FE} \approx \hat{\beta}_{FE} \approx \hat{\beta}_{FE}$.

A simple heuristic is that if $\hat{\beta}_{LD} > \hat{\beta}_{FE} > \hat{\beta}_{FD}$ there could be EIV.

4 Results

We first consider the panel model with four economies and the estimated results are as follows. First it is evident that over time government spending has a positive impact on output growth. Nonetheless, manitude of the impact is diminutive. Second, export is the main engine for growth for CLTV countries. Third, monetary policy and exchange rate policy plays insignificant role on growth enhancing aspect.

As the group of four economies exhibits different stages of economic development and institutional constraints, effectiveness of macroeconomic policies should be examined by taking into account above heterogeneities. We next separate the data set into two main groups, i.e., group A: cambodia and Lao PDR (Highly dollarized economies) , group B: Thailand and Vietnam. Panel models of group A and group B are reported in Table 3 and 4, respectively. The result from Table 3 indicates that government spending has a positive impact on output even though magnitude of the impact is in a limited scope. The estimated results on the effect of interest rate and real effective exchange rate on output show unexpected sign; however they are statistically insignificant. Concerning group B of Thailand and Vietnam, an estimated result runs against what should be conventionally expected. Over time an appreciation in REER has a positive impact on output expansion. As argued by Nidhiprabha (2010), it is possible that a country with strong currency may retain its position on trade competitiveness as degree of competitiveness depends not only on price factor but also non-price factors such as rate of country saving and productivity growth. Traditionally it has always been suggested that an economy needs to make it currency relatively cheaper so as to promote export. However, economic consequences of currency depreciation strategy on the whole economy require a comprehensive analysis on its distributional concern: who gains and who loses. Another important result is that similar to group A, export is statistically reveals that export has a favorable impact on output over time horizon. This is not a surprising result. As for small open developing economies, export-led growth is typically one of the most important policy ingredients for enhancing output growth.

To answer the questions of what are the potential factors among variables of our interest that cause variation in output. we empoly Variance Decomposition and Impulse Responses as reported in Table 5 and in Figure 6, respectively. Variance decomposition indicates the proportion of variance in a variable that is explained by different shocks acroos countries. Typically

variation in a variable is well-explained by its own fluctuation in the first period and then subside. For instance nearly 97% of the variation in real output (rgdp) is explained by its own shock in the first period and the remainder explained by export shock. Over time the variance decomposition indicates that monetary policy shock, as represented by short term interest rate (ir), has a negligible impact on growth enhancing for CLTV economies. As for transitional economies with less-developed banking and finance system and instruments, transmission mechanism of employing short term interest rate to boost private consumption and investment and in turn aggregate demand is far from being effective. Monetary policy would keep its major role on price stabilization. Another question of interest is: could real depreciation of exchange rate influence growth? The result in Table 4 reveals that variation in real output is not significantly explained by variation in real effective exchange rate. The result is likely to run against a conventional belief that it is necessary to employ cheap currency strategy if a country were to pursue for real output expansion from international trade. Finally, considering all possible shocks (innovations), namely monetary shocks, fiscal expansionary shocks, exchange rate shocks, and export shocks towards real output, it is documented that export shocks (x) generate the greatest impact on real output. Therefore what need to be addressed further is about how monetary and fiscal policy shocks affects exports. Interestingly, exports are quite responsive to output expansion. So if a country pay more attention on enhancing capital utilization and increasing in productivity, exports would grow up. This finding sheds light on a policy implication. To promote long term growth policy makers should pay more attention towards capital adequacy and capital utilization in the country's productive sectors. For small open economies with limited capitals, attracting well-qualified inflows of foreign direct investments is essential and so necessary conditions to achieve the above mentioned issue must be carefully draw.

Fixed-effects (within) regression				Number of obs	=	304
				Number of groups	=	4
-----+-----						
rgdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
govexp	.0406217	.0111077	3.66	0.000	.0187615	.0624818
ir	12.08944	25.86285	0.47	0.641	-38.80893	62.9878
reer	1.342286	1.718438	0.78	0.435	-2.039619	4.724191
x	1.019356	.0288172	35.37	0.000	.9626432	1.076068
_cons	5520.108	495.1123	11.15	0.000	4545.722	6494.495
-----+-----						

Table 2: Panel Estimation on Cambodia, Lao PDR, Thailand, and Vietnam

Fixed-effects (within) regression				Number of obs	=	152
				Number of groups	=	2
-----+-----						
rgdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
govexp	.2719395	.0213877	12.71	0.000	.22967	.3142091
ir	-3.054298	1.690745	-1.81	0.073	-6.395796	.2871994
reer	-.1100858	.0590152	-1.87	0.064	-.2267202	.0065487
x	1.173151	.0325801	36.01	0.000	1.108761	1.23754
_cons	407.4039	40.7837	9.99	0.000	326.8012	488.0066
-----+-----						

Table3: Panel Estimation on Group A: Cambodia and Lao PDR

Fixed-effects (within) regression				Number of obs	=	152
				Number of groups	=	2

rgdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
govexp	.017958	.0151413	1.19	0.238	-.0119664	.0478825
ir	18.45963	51.63821	0.36	0.721	-83.59531	120.5146
reer	117.7123	17.8184	6.61	0.000	82.49699	152.9276
x	1.039995	.0369442	28.15	0.000	.9669809	1.11301
_cons	-1126.835	1929.508	-0.58	0.560	-4940.21	2686.54

Table 4: Panel Estimation on Group B: Thailand and Vietnam

	s	rgdp	govexp	ir	reer	x
rgdp	1	.96620291	.00192785	.00804815	.00002941	.02379167
govexp	1	.08327162	.58559296	.04171883	.00075928	.28865731
ir	1	.0105067	.06155797	.90992968	.00218583	.01581983
reer	1	.02125232	.00061496	.00209362	.95961329	.01642581
x	1	.52589685	.00372248	.00274242	.0000808	.46755745
rgdp	2	.90170646	.00113844	.00663963	.00005047	.090465
govexp	2	.15507696	.50936748	.0525396	.00105153	.28196443
ir	2	.01641991	.07989192	.88639942	.0023579	.01493085
reer	2	.02640523	.0017996	.00601342	.94421573	.02156602
x	2	.72318076	.00302656	.00321868	.00003758	.27053642
rgdp	3	.85670918	.00073367	.00431632	.00004698	.13819383
govexp	3	.21677995	.48720566	.05502132	.00114168	.23985139
ir	3	.02382632	.09609618	.86383841	.0025133	.01372579
reer	3	.02635085	.00309736	.00736407	.94150134	.02168638
x	3	.75011368	.00343661	.00223573	.00002529	.24418869
rgdp	4	.83059182	.00130641	.00294491	.00003848	.16511838
govexp	4	.27644562	.45675892	.06123817	.00118204	.20437525
ir	4	.03624181	.11529408	.83307515	.00264086	.0127481
reer	4	.02627898	.00451723	.00849837	.93872186	.02198356
x	4	.74868675	.00605417	.00156059	.00001763	.24368085

Table 5: Variance Decomposition

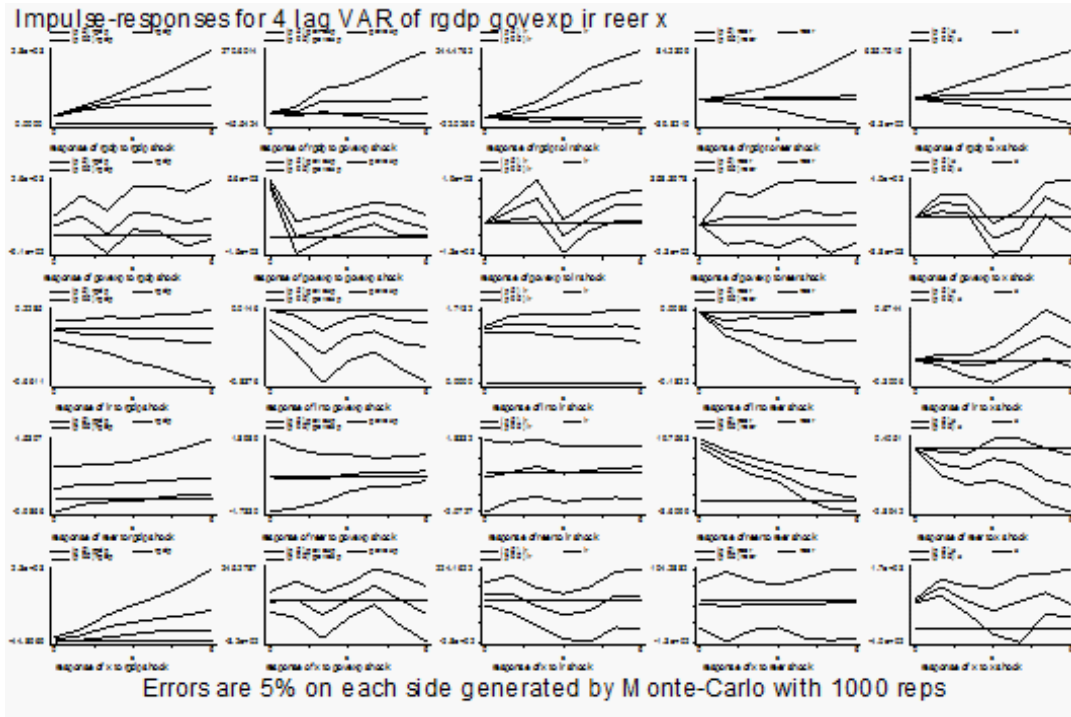


Figure 6: Impulse Responses: CLTV economies

Source: Author's calculation

5 Concluding Remarks

In the realm of globalization, small open economies confront not only with their internal shocks but external shocks. Taking into account the context of globalization, country's institutional constraints, and its stage of economic and social development, macroeconomic policy strategies need to be appropriately designed so as to ensure long term growth path and price stability. Prior to policy design and implementation, policy makers and advisors must have a comprehensive knowledge and understanding on nature of economic growth and its determinants associated with sources of its variation. The paper attempts to shed light on above body of knowledge and the findings are as follows. First it is documented that over the time period of our study (1990-2009) exports were found to be the main engine for growth. Second it is shown that fiscal stimulus has a positive impact on real output but size of the impact is rather small. As the paper employs fiscal spending as a

proxy of expansionary fiscal policy, it might be interesting to examine and compare between effectiveness of fiscal spending and tax cut on real output. Thire result is that monetary and exchange rate policy were found to have a negligible impact on enchaning growth and on explaining variation in economic growth. It is plausible that to have well-functioning and effectiveness of monetary and exchange rate policies, necessary conditions would require better-developed banking and financial architecture, more flexible exchange rate regime, and less degree of dollarization. These plausible conjetures need to be verified at the next stage of this paper which will be focusing on qualitative analysis. Given our findings, a policy implication is that if export promotion policy will be employed as the main engine for long term growth, by not competing with price factors, attention must be put towards how to ensure adequacy of capital flows into productive sectors and how to improve labor and output productivity.

References

- [1] Bhattacharya R., Ila Patnaik, and Ajay Shah. (2010) "Monetary policy transmission in an emerging market setting," IMF Working Paper, WP/11/5, International Monetary Fund.
- [2] Holtz Eakin, D., W. Newey, and H. Rosen (1988). "Estimating Vector Autoregression with panel data," *Econometrica*, 56, 1371-1395.
- [3] Giovanni C. and J. Menon (2010) "Dealing with multiple currencies in transitional economies: the scope for regional cooperation in Cambodia, the Lao People's Democratic Republic, and Vietnam" Asian Development Bank.
- [4] Jha, S., S. Mallick, and D. Park. Effectiveness of Countercyclical Fiscal Policy: Time-series evidence from developing Asia," ADB Economics Working Paper Series No. 211, Asian Developement Bank.
- [5] Klein, M.W. and Olivei, G.P. (2008) "Capital account liberalization, financial depth, and economic growth," *Journal of International Money and Finance*. 861-873.
- [6] Kyophilavong P., and Toyoda T. (2005). "An Econometric Analysis of the Lao Economy: Simulations Using a Macroeconomic Model", in eds.,

- Amakawa, N. and N. Yamada, Towards a Market Economy under One Party System in the LaoPDR, pp. 115-153.
- [7] Leung, S, Thanh, V.T., Viset, K. (2005) Integration and transition-Vietnam, Cambodia, and Lao PDR, International Development Economics, APSEQ, Australian National University.
 - [8] Love, I., and L. Zicchino. (2006) Financial Development and Dynamic Investment Behavior: Evidence from Panel VAR, *The Quarterly Review of Economics and Finance*, 46 , 190-210.
 - [9] Nidhiprabha, B. (2009) "The hard road ahead for Thailand's economic recovery" *Asian Economic Papers*, 8(3).
 - [10] Ravin, C., and U. Luyna. (2011) The Effectiveness of Macroeconomic Policies in Cambodia: VAR Approach (Draft)
 - [11] Sims C.A. (1980) "Macroeconomics and Reality", *Econometrica*, 48, 1-48.
 - [12] Thanh, Nguyen Ngoc & Kalirajan, Kaliappa, (2006) "Can devaluation be effective in improving the balance of payments in Vietnam?," *Journal of Policy Modeling*, Elsevier, vol. 28(4), 467-476, May.