THE REFORMS OF MONETARY AND EXCHANGE RATE POLICIES IN VIETNAM DURING THE 1990s

By

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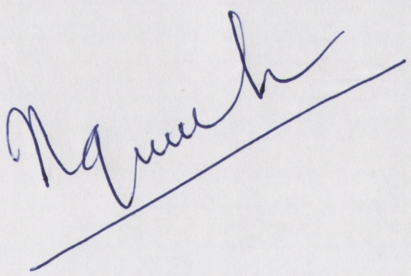
A thesis submitted for the degree of Doctor of Philosophy of
The Australian National University

Canberra, April 2001

DECLARATION

Except where otherwise indicated, this thesis is my own work.



Nguyen Ngoc Thanh

April 2001

Acknowledgments

I would like to express my gratitude to my supervisory panel. First, I am deeply indebted to my supervisor Dr Kali Kalirajan. His academic guidance, support and encouragement have been vital to the development and completion of my thesis. No expression of my respect and thanks would be adequate. I am also grateful to my advisers, Dr Trevor Breusch and Dr Ross McLeod for their useful advice and assistance, particularly the "sharp advice" from Dr Trevor Breusch on the econometric issues improved my work significantly.

I would also like to thank the staff of the National Centre for Development Studies (ANU) for all their help and assistance to me through the whole period of my studies. My special thanks go to Professor Ron Duncan, for his support and valuable comments and suggestions on core chapters of my thesis. My appreciation also goes to Dr Suiwah Leung, for her assistance in the early stages of my research. Special thanks go to Mr Patrick De Fontenay who has provided me with valuable feedback and helpful suggestions on my thesis. I am indebted to Mrs Billie Headon, for her assistance in English language and for other special support and encouragement. I am also highly appreciative of Mr Harry Samios for his substantial help in editing the English on my thesis from the first to the final draft, particularly in the last period, when the time was limited.

The Australian Agency for International Development (AusAID) and The Asian Development Bank (ADB) provided financial support for my Master of Economics of Development and then for my PhD studies, for which I wish to express my deepest

thanks. I would also like to thank my Faculty and University (the Faculty of Economics, Vietnam National University - Hanoi), which gave me a chance to study in Australia.

I also thank my friends and colleagues for their advice and encouragement, in particular, Dr Vo Tri Thanh, Dr Doan Hong Quang, Dr Vu Quoc Huy, and Dr Ngo Huy Duc.

I am grateful to my wife and son, for their invaluable encouragement and for the sacrifices they have had to make living far away from me during my years of study in Canberra. Finally, I am also grateful to my parents and my mother-in-law, for their endless support and encouragement to me during these years.

Abstract

This study analyses the reforms of monetary and exchange rate policies in Vietnam during the 1990s. It focuses on the reform of monetary instruments, particularly transition from direct to indirect monetary policy instruments, the effects of exchange rates and prices on trade flows, the possibilities and policy options of using devaluation as a tool to encourage exports, improve the trade balance and balance of payments (BOP).

Investigating the reform of monetary instruments and the transition from direct to indirect instruments shows that the State bank of Vietnam (SBV) relied more on direct instruments, which were used as effective tools to control inflation and maintain macroeconomic stability and have been liberalised step by step. However, the use of direct instruments led to inefficiency in financial intermediation and misallocation of financial resources. Indirect instruments have been increasingly introduced but their role in the financial sector is still limited due to the underdevelopment of the financial market. The results from empirical analysis indicate that the use of indirect instruments contributed to increase the degree of monetary control, but there is not enough evidence to conclude that it improved financial sector efficiency. Therefore, indirect instruments should be increasingly implemented and should start to replace the direct ones in the near future. In addition, the restructuring of the banking system and state-owned enterprise (SOE) reform are important for the success of transition to indirect instruments and to maintaining macroeconomic stability.

Exchange rate policy in Vietnam, as a part of monetary policy, has been implemented in a flexible and market oriented way. During the period 1992-1998, nominal effective

exchange rates depreciated around 20 per cent, but real ones appreciated around 20-30 per cent. The results from Error Correction Models (ECMs) indicate that prices affect trade flows more than exchange rates do in the short run for export demand and in both short and long runs for import demand. In contrast, exchange rates have larger effects on trade flows in the long run for export demand and the Marshall-Lerner condition holds. Moreover, joining bilateral and multilateral trade agreements requires Vietnam to reduce tariffs and other trade restrictions. This suggests that devaluation may need to be used to encourage exports in the near future.

This possibility of using devaluation can be considered more carefully when the dynamic links between inflation, exchange rate and money supply are examined. The results from Vector Error Correction Models (VECMs) show that exchange rates and money supply indeed lead to higher inflation in the long run. In the short run, both money growth and exchange rate depreciation are major sources to increase inflation, but exchange rate depreciation alone increased inflation very little. So, the devaluation can be used to stimulate exports and reduce the appreciation of real exchange rates in the short run. However, the devaluation policy needs close coordination with monetary policy, in which money supply must be controlled effectively. With large capital inflows, indirect monetary policy instruments such as open market operations (OMO), foreign exchange forwards and variable deposit requirements, are considered as tools to sterilise capital inflows, and to avoid inflation and real exchange rate appreciation.

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GLOSSARY

Currency Equivalents

Currency Unit		Vietnamese Dong
US$1.00	=	VND14,501 (December 30, 2000)

Fiscal Year

January 1- December 31

Abbreviations

ADB	Asian Development Bank
ADF	Augmented Dickey-Fuller (test)
ANU	The Australian National University
ASEAN	Association of South- East Asian Nations
AusAID	Australian Agency for International Development
BIDV	Bank for Investment and Development of Vietnam (Vietindebank)
BFTV	Bank for Foreign Trade of Vietnam (Vietcombank)
BOP	Balance of Payments
CMEA	Council of Mutual Economic Assistance
CPE	Centrally Planned Economy
CPI	Consumer Price Index
DF	Dickey-Fuller (test)
ECM	Error Correction Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product

GSO	General Statistics Office of Vietnam
IMF	International Monetary Fund
ICBV	Industrial and Commercial Bank of Vietnam (Vietincombank)
NPLs	Non-Performing Loans
OLS	Ordinary Least Square (estimation)
OMO	Open Market Operations
PPP	Purchasing Power Parity
SBV	State Bank of Vietnam
SOCB	State-Owned Commercial Bank
SOE	State-Owned Enterprise
VAR	Vector Autoregression (model)
VBA	Vietnam Bank for Agriculture and Rural Development (Agribank)
VECM	Vector Error Correction Model
VND	Vietnamese Dong

For Tables

..	Not available
n.a	Not applicable
-	Zero
pa	Per annum
pm	Per month

Chapter 1

INTRODUCTION

Monetary policy plays a vital role in shaping the destiny of a nation, for money and credit significantly influence the direction, nature and volume of economic activities (Desai and Ghonasgi 1969). The term monetary policy refers to actions taken by central banks to influence monetary and other financial conditions in pursuit of the ultimate targets of price stability, high level of employment, external equilibrium and sustainable economic growth. Through monetary transmission, central banks use monetary instruments to influence operational and intermediate targets in order to achieve the above ultimate targets.

Exchange rate policy is considered as a macroeconomic tool to achieve and maintain international competitiveness and so ensure a viable balance of payments (BOP), and to anchor domestic prices. Exchange rate policy also has been conducted by the central banks and is considered as an instrument of monetary policy.

However, in general, the role of monetary policy in developing countries is limited compared with developed countries because of some features of the developing economies such as, a low degree of monetisation, their underdeveloped banking systems and the narrow size of securities markets. These will hinder the effectiveness of monetary policy (see Addison and Demery 1993, Ghatak 1981). The implementation of exchange rate policy in developing countries also has some differences with developed countries since most developing countries still maintain fixed or crawling peg exchange

rate regimes after the collapse of the Bretton Woods system. Their currencies are non-convertible, foreign exchange is controlled and capital markets are repressed (Edwards 1989).

Since the late 1980s, most centrally planned economies (CPEs) have transited their economies into market oriented ones, and the reform of monetary and exchange rate policies in these countries are essential, because of their historical legacy. Most CPEs had typical features such as state ownership of means of production, government set up physical input and output plans, as well as fixed prices. Foreign trade mainly relied on the countries within the Council of Mutual Economic Assistance (CMEA[1]), this was in the form of barter trade among these countries. A passive financial system and mono-banking system included state bank and state specialised financial institutions[2]. State banks had significant monopoly power over banking and credit, specialised financial institutions usually provided banking services to particular sectors (for example State-Owned Enterprises (SOEs)) that were specified by the state bank authorities (Sundararajan 1992). Banking system activities and monetary policy (monetary management) in these countries played a passive role that provided the financial assets required to finance the real sector transactions prescribed by the central plan (Wagner 1998: 6). Exchange rates were considered as an accounting device to convert the domestic and foreign prices during the barter trade between CMEA countries, since physical input and output plans also contained foreign exchange, external borrowing and import plans (Sundararajan 1992).

The transition from centrally planned economies into market oriented ones has changed

[1] CMEA countries included Bulgaria, Hungary, Poland, Romania, Former Czechoslovakia, Former Soviet Union, Former German Democratic Republic, Mongolia, Cuba and Vietnam (see IWE 1985).
[2] They included specialised banks and saving funds.

the nature of those economies. Therefore, their financial systems must be reformed and the fundamental reforms of monetary and exchange rate policies in both their institutions and functions are crucial for the success of financial sector and economic reforms.

1.1-Vietnam economic reform since the unification in 1975

Vietnam's economy before the 1980s followed the Soviet economic model as well as traditional CPEs. The major characteristics of the Vietnamese economy in that period can be described as follows: means of production belonged to the state, the government determined all economic activities through physical input and output plans, and controlled prices. SOEs in industries (with emphasis on heavy industry) and cooperatives in agriculture were the foundation of the economy. These sectors received subsidies from the government in investment, credit loans, etc. Foreign trade was underdeveloped, was mainly with CMEA countries and monopolised by the government. The service sector was peripheral. The financial system was passive and there was a mono banking system. The financial and banking system only accommodated the production plans set by the central government.

This economic model was appropriate to the government to develop certain sectors (state sector) or pursue the purpose of industrialisation. Besides that, it also provided social benefits for people such as education and health. However, this did not create incentives for economic units and individuals. In addition, the military involvement of Vietnam in Cambodia, the US embargo and a cut in foreign aid from the former Soviet Union and Eastern European Countries in 1979-1980, worsened the economic situation and put the Vietnamese economy in serious recession. This revealed more clearly the

failure of a central planned system and created the critical demand for economic reform (see Vu 1994, Vo 1997).

In the early 1980s, some partial reforms in the economy were undertaken. The first reform was initiated in agriculture in 1980 with the "output contract" movement, which brought incentives and flexible, effective possibilities for households in the collective farms. The following reform was the reform of SOEs in the industrial areas in 1981, with the "three point plan"[3] under Decision 25/CP of the State Council. This reform in the industrial area also increased the autonomy and improved the incentives of SOEs in production. However, the reforms in both agriculture and industry still performed in the frameworks of the CPEs and these did not make a fundamental change (Vo 1997).

In 1985, the first financial reform, named "price-wage-money", was launched. In this reform, the one price system was introduced and state subsidies on consumption goods prices were abolished. A higher wage system was set up to compensate the reduction in the real wage due to abandoning of subsidies and high rates of inflation. Money reform was also implemented, the old Dong was converted into the new one at a rate of ten to one. However, this reform failed and caused a severe crisis for the economy. In the period 1986-88, "Annual inflation accelerated to several hundred per cent, output growth slowed, and external arrears rose to high levels" (Leung and Vo 1996: 188, and see Table 1.1). Total investment declined to very low rates (around 8 per cent of GDP) and the "current account deficit is estimated to be larger than total investment, implying that the saving rate was negative. For those three years, external finance was used not

[3] Plan A consisted of the output plan for the state, using state-supplied inputs; Plan B was the plan for state above plan A, which resulted from inputs procured by the enterprises themselves; and Plan C was the "minor" output plan, under which enterprises could sell these outputs in the "free" market.

only to fund all investment, but also to cover some consumption and/ or government current expenditure" (World Bank 1990:17).

The failure of this reform was due to the absence of appropriate fiscal and real sector reforms (Ngo 1997). Moreover, the sequencing of reform was poor: "restructuring of the state sector was not in phase with the financial reform, which was still of a mono-bank type" (Roman 1995: 117). Therefore, a comprehensive reform package was needed.

Table 1.1. Economic Growth and Inflation Rates, 1981-88 (per cent pa)

	81	82	83	84	85	86	87	88
Real national income growth 1/	2.3	8.8	7.2	8.3	5.7	6.5	3.4	4.6
Real GDP growth 1/	..	..	..	..	5.7	3.4	2.5	5.9
Investment (% of GDP)	..	..	..	..	12.9	8.6	8.0	8.5
National saving (% of GDP)	..	..	..	..	5.6	-1.7	-1.1	-2.0
Inflation rate 2/	69.6	95.1	49.5	64.9	91.6	487.2	301.3	308.2

Note: 1/ 1982 Prices
2/ General Price Index (weighted to the official and free market indices).
Source: GSO (1991: 15). McCarty *et al* (1992: 87). World Bank (1990:16,118). Author's

In March 1989, a comprehensive economic reform in Vietnam was implemented. The purposes of this reform were to stabilise the economy, to create a basic change in economic management and set up prerequisites for the transition to a market oriented economy. The reform included a stabilisation program that used measures of restraining government expenditures and the growth of credit, eliminating most domestic price controls, raising interest rates and devaluing the exchange rate (Riedel 1993) and was combined with the abolition of bureaucratic management based on state subsidies, decentralisation of SOEs, decollectivisation in rural areas, allowing the development of

the private sector, reforms of the financial sector and changes in external economic relations (foreign trade, FDI).

As a result, from 1989 to 1997, macroeconomic stability was achieved and maintained. Inflation was brought down from 308.2 per cent pa in 1988 to 34.7 per cent pa in 1989, and although it rose to more than 60 per cent pa during 1990-1991, it was brought down again and maintained at around 10 per cent pa or single digit level during the period 1992-1997 (Tables 1.1 and 1.2). During that time, the economy achieved a high growth rate. Real GDP grew at an average rate of 7.9 per cent pa, of which 10 per cent pa was for industry, 4.3 per cent pa for agriculture, and 9.9 per cent pa for services.

Average annual growth rates of exports and imports were around 27 per cent to 28 per cent pa. FDI had been increased substantially from US$100 million in 1989 to around US$2 billion in 1997. Balance of payments (BOP) improved and budget deficit also was restrained from 7.7 per cent to 8.8 per cent of GDP in 1989-1990 to just above 1 per cent of GDP in 1997. Total investment and domestic saving increased from around 11 per cent and 5 per cent of GDP in 1989 to around 27 per cent and 20 per cent of GDP in 1997, respectively (Table 1.2). Moreover, the reform was effective in galvanising the development of the private sector[4] and contributing to poverty reduction (World Bank 1999). The achievements of the comprehensive economic reform were praised by international communities.

The financial crisis in the region occurred in mid-1997 and most countries in the region were affected by it. In contrast, "Vietnam has avoided the serious balance of payments,

[4] Share of private sector in the total GDP of economy increased from around 27 per cent in 1991 to around 39 per cent in 1995, and it declined to around 37 per cent and 36 per cent in 1997 and 1999 due to the development of state and foreign investment sectors (see Appendix: 8.9).

fiscal or banking crises that have been common in the region" (World Bank 1999: 5). In the two years 1998-1999, inflation was still controlled at 9.2 per cent pa in 1998 and only 0.1 per cent in 1999. BOP and budget deficits were maintained at the pre-financial crisis level (Table 1.2).

However, Vietnam has been facing many challenges and difficulties after the financial crisis and severe floods in the central area of Vietnam in 1999. The real GDP growth rate declined to 5.8 per cent and 4.8 per cent pa (the lowest rate since 1989). FDI also reduced to US$800 million in 1998 and US$700 million in 1999 (private foreign investment returned to Korea, Thailand, and Malaysia, but not as yet to Vietnam). Urban unemployment rose to 7.4 per cent from 6 per cent in 1997 (World Bank 1999). The total amount of foreign debt (both convertible and non-convertible areas) accounted for 76.8 per cent and 74.0 per cent of GDP in 1998 and 1999[5] (IMF 2000: 3) and may cause problems for the current account and BOP.

[5] This data was estimated by the IMF (2000) until August 2000, and the amount of foreign debt in the convertible area was US$10,577 million (of which 94.7 per cent was medium and long term debt) and for the Nonconvertible area it was TR10,515 million (TR is transferable roubles). However, according to Nguyen (2001), the total amount of Vietnam's foreign debt (government and business debt) was estimated at US$11,800 million by December 31, 1999. Government debt was US$7,600 million, accounting for 64.5 per cent of total foreign debt. The government's debt before 1993 is called the old debt; it was equivalent to only US$3,700 million since this debt was written off from 50 per cent to 85 per cent. The government's debt after 1993 is called the new debt, which was estimated at US$3,900 million. All the government's old debt after restructuring and new debt have times for maturity from 10 to 40 years with concessionary interest rates (low interest rates). Data of business foreign debt are not available.

Table 1.2. Vietnam: Selected Macroeconomic Indicators, 1989-99											
	89	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**
GDP (VND trill)											
At current price	28.1	42.0	76.7	110.5	136.6	170.3	228.9	272.0	313.6	361.5	399.9
At 1989 price	28.1	29.5	31.3	34.0	36.7	40.0	45.9	50.2	54.3	57.5	..
Annual changes (%)											
Real GDP	8.0	5.0	6.0	8.6	8.1	8.8	9.5	9.3	8.2	5.8	4.8
Inflation - CPI	34.7	67.1	67.5	17.5	5.2	14.4	12.7	4.5	3.6	9.2	0.1
External Balance (US$ mill)											
Exports	1,320	1,731	2,042	2,475	2,985	4,054	5,198	7,330	9,145	9,365	11,540
(% change)		31.1	18	21.2	20.6	35.8	28.2	41	24.8	2.4	23.2
Imports	1,670	1,775	2,107	2,535	3,532	5,250	7,543	10,483	10,460	10,350	10,460
(% change)		6.3	18.7	20.3	39.3	48.6	43.7	39	-0.2	-0.1	1.1
Trade Balance	-350	-44	-65	-60	-547	-1,196	-2,345	-3,153	-1,358	-986	1,080
Private Remittances	9	50	36	59	70	170	474	1,046	712	951	1,050
Current Account Balance	-584	-262	-134	-10	-767	-1,185	-1,928	-2,449	-1,642	-1,073	1,252
(% GDP)	-8.3	-4.2	-1.9	-0.7	-8.3	-7.6	-12.8	-9.9	-6.2	-3.9	4.4
FDI	100	120	165	333	832	1,048	2,236	1,838	2,003	800	700
Balance of Payments	-222	-142	50	268	-1,056	-409	-199	-278	-4	-527	768
Ratios to GDP (%)											
Gross Investment	11.6	11.7	15.1	17.0	19.4	25.5	27.3	27.9	26.7	21.6/e	20.5/e
Gross National Saving	5.1	7.4	13.1	16.3	11.2	16.9	17.0	16.7	19.8	17.1/e	24.4/e
Overal Fiscal Balance 1/	-7.7	-5.8	-1.5	-1.7	-4.6	-1.1	-0.5	-0.2	-1.7	-0.5	-0.9

Note: all data are at the end of period. e is estimated. 1/ including grants, excluding on lending

Source: World Bank (1995: 4), World Bank (1998: Annex 2, 7), World Bank (1999: 58-72). IMF (1995b: 30), IMF (1998), IMF (2000: 3, 27). SBV (1995-99).

During the period of comprehensive reform, SOEs have been reformed to improve their autonomy and efficiency, but until late 1997, more than half of them (total SOEs are 5800) have lost money, their total debt was VND63 trillions (US$4.4 billions)[6]. The equitisation process has been slowed. After the financial crisis, their situation has worsened due to fall in domestic demand and greater import competition (World Bank 1999).

The banking system has also been reformed from a mono to a two-tier system and it has been in the process of restructuring and improving in soundness and effectiveness. However, there are still problems in the banking system such as the degree of monetisation being low, a high level of non-performing loans (NPLs), poor management, and ineffective intermediation.

The reform of foreign trade has seen significant achievements in liberalising the entry to foreign trade, supporting exports and diversifying the direction of trade. However, the level of protection in Vietnam is still higher than its neighbours, import tariffs are high and dispersed, export taxes are still imposed on some goods, the degree of transparency is low.

Understanding these challenges and difficulties, the Vietnamese government has continued to reform and a number of important measures have been taken such as creating a sound banking system, reforming SOEs, opening up international trade, and creating a more supportive environment for the private sector. The aims of further reform are to stimulate the growth of the economy, but "the implementation of these

[6] (see World Bank 1999: 22)

measures is only now beginning, and it is not yet clear whether action will be firm or rapid enough to help turn around the economy" (World Bank 1999: 5). At present, while neighbouring countries in the region have recovered rapidly, Vietnam may become one of the slower performers in the region.

1.2-Objectives, approaches and structure of this thesis

The objectives of this thesis are to examine the reforms of monetary and exchange rate policies. These focus on the reform, particularly the transition from direct to indirect monetary instruments and also concentrate on the effects of exchange rate and prices on the trade flow and whether devaluation can be used as a effective tool to encourage exports and improve trade balance and BOP. Moreover, the links between inflation, exchange rate and money supply needs to be examined in order to provide the scientific evidence for policy makers to coordinate monetary and exchange rate policies in the case of devaluation that stimulates exports and economic growth while macroeconomic stability is still maintained.

These issues are important in transitional economies such as Vietnam, where financial sector reform was undertaken and the reform of monetary policy, particularly the transition from direct to indirect monetary instruments is in progress. This transition is indispensable and the evolution of indirect monetary instruments is a key factor to evaluate the success of financial sector reform. In addition, the tendency of VND/US$ real exchange rate appreciation since March 1992 (Dodsworth *et al.* 1996a) and the heavy devaluations from neighbouring countries after financial crisis in the region in mid 1997, may erode the competitiveness of Vietnam's exported goods, discouraging exports, stimulating imports and increasing the pressure to devaluate the Dong. These issues have attracted more attention.

However, these issues have not been analysed comprehensively. Monetary instruments were looked at by Vo (1997) to analyse the stabilisation program in the 1980s-1990s, and exchange rate policy was mentioned in the aspects of dollarisation in Ngo (1997). The debate of whether or not to use devaluation to improve exports and trade balance has been substantial among Vietnamese economists and policy makers, but their analyses were mainly based on institutional and policy change and used very simple econometric models (see Le and Tran 1995, Le 1996, Vu 1997 etc).

This thesis tries to answer the questions: How have monetary instruments, particularly transition from direct to indirect monetary instruments been implemented in Vietnam during the 1990s? Has the transition from direct to indirect monetary instruments improved financial sector efficiency and monetary control? How has exchange rate policy been reformed during that period? Do exchange rates and prices affect the trade flow? Can devaluation be used to improve exports and trade balance? What are the links between inflation, exchange rates, and money supply? Did exchange rate depreciation and money supply growth lead to a higher rate of inflation during the 1990s? This thesis has used economic theories and econometric models such as the Error Correction Models (ECMs), and Vector Error Correction Models (VECMs) in order to solve these questions.

The structure of the thesis is as follows:

Chapter 2 reviews the theoretical issues, which relate to the uses, advantages and disadvantages of direct and indirect monetary instruments. The experiences in the transition from direct to indirect monetary instruments in developing and transitional

economies, which include the pace of implementation and the use of indirect monetary instruments are summarised in this chapter. Chapter 2 will provide the theoretical framework for analyses in subsequent chapters.

Chapter 3 summarises the characteristics of the banking system, its monetary and exchange rate managements prior to 1988 and reviews the reform of the banking system from early 1989 up to present. In this chapter, institutional reform of the banking system since 1989 and some important issues which may affect monetary and exchange rate policies during the 1990s are discussed.

Chapter 4 analyses the reform of monetary policy, particularly the transition from direct to indirect instruments in Vietnam during the 1990s. The impact of using indirect monetary instruments on financial sector efficiency and monetary control is examined. After that, policy implications for further reform of monetary instruments are also suggested.

Chapter 5 reviews the exchange rate policy in developing countries since the mid 1970s and discusses the effect of devaluation on the trade flows and the alternative of using import tariffs cum export subsidy policies. The Error Correction Model (ECMs) that can be used to analyse the short and long run relationship between variables in the following chapters are briefly introduced.

Chapter 6 analyses the reform of exchange rate in Vietnam during that time, including examination of nominal and real exchange rate movements. The reform of foreign trade policy is not a focus of this thesis, but this is also reviewed to set a stage for analysing the effects of prices and exchange rates on trade flows in the next chapter.

Chapter 7 uses ECMs to examine both the short and long run effects of prices and exchange rates on exports and imports, in order to answer the question of whether or not devaluation can be used as a good tool to encourage exports and improve trade balance. Based on the empirical studies in this chapter, policy implications for the exchange rate policy, particular devaluation policy, are also discussed.

Chapter 8 reviews the theoretical issues that relate to the links between inflation, exchange rates and money supply. After that, Vector Error Correction Models (VECMs) are used to examine the dynamic links between these variables in both short and long runs. The main purposes of this chapter are to find the effects of exchange rate depreciation and money supply growth on inflation. This provides the basic information to closely coordinate monetary and exchange rate policies in the case of devaluing the domestic currency.

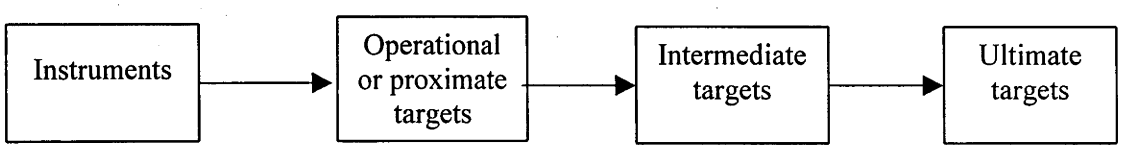
Chapter 9 summarises the main contents and findings of the thesis.

Chapter 2

REFORMING MONETARY INSTRUMENTS: THE TRANSITION FROM DIRECT TO INDIRECT INSTRUMENTS IN TRANSITIONAL ECONOMIES AND DEVELOPING COUNTRIES

2.1. Introduction

Monetary instruments play an important role in implementing monetary policy and their changes have a crucial influence on the economy in most countries. Through the monetary transmission mechanism, the central banks use monetary instruments to influence the operational or proximate targets and the intermediate targets as well as to achieve the ultimate targets. The general framework for the implementation of monetary policy as outlined in the diagram below, has been widely accepted (Freedman 1990):



The instruments of monetary policy include interest rate controls, credit ceilings, reserve requirements, discount, rediscount and refinancing facilities, and open market operations. The operational or proximate targets may be short-term interest rates, bank reserves, and the monetary base. The intermediate targets include money aggregates

(M1, M2, and M3), market interest rates, and exchange rates. The ultimate targets include price stability, a high level of employment, external equilibrium and adequate economic growth (Bockelmann 1990)[7].

There are two kinds of monetary instruments: direct instruments such as interest rate controls and credit controls, and indirect instruments such as reserve requirements, discount, rediscount and refinancing facilities, and open market operations. The use of each instrument depends on the central bank which implements monetary policy based on its macroeconomic conditions and the level of financial development (Alexander *et al.* 1995). In recent years, developed, developing and transitional economies have increasingly adopted indirect monetary instruments. This is because when a country's market expands, direct instruments tend to become less effective, resulting in inefficiencies and dis-intermediation. Also, advantages of the use of indirect instruments are: "The greater use of indirect monetary instruments can be seen as the counterpart in the monetary area to the widespread movement toward enhancing the role of price signals in the economy more generally. Both have the same objective of improving market efficiency" (Alexander *et al.* 1995: 1).

The transition from direct to indirect instruments of monetary policy in developed countries has been stimulated by innovation and deregulation in the financial sector, while transition in developing countries has occurred since financial liberalization removed rigid controls and encouraged competition. However, for CPEs, now transitional economies, this transition has occurred since the nature of the financial sector has changed, so its instruments must also be changed (Hilbers 1993).

[7] "Although all countries have instruments and ultimate goals, they may not use proximate or intermediate targets depending on whether the authorities find them helpful in carrying out policy". See Bockelmann (1990: 27) for more details.

Therefore, the transition for transitional economies is a vital process in financial sector reform and the transition from CPEs into market oriented economies. In that sense, analysing the transition to the indirect instruments of monetary policy is important in order to evaluate the achievements of banking and financial sector reform, particularly the process of moving to a market economy in the transitional economies.

The issue of monetary instruments and transition to indirect instruments of monetary policy has been analysed by some economists such as Lindgren (1991), Caprio and Honohan (1991), Sundararajan (1992), Hilbers (1993), Alexander *et al* (1995), Menkhoff (1997), Axilrod (1997). Their studies focussed on advantages and disadvantages of direct and indirect monetary instruments, the transition to indirect instruments in transitional economies and developing countries, which includes the institutional and initial conditions, the implementation and use of indirect instruments. At present, many developing countries and transitional economies including Vietnam are still in transition to indirect monetary instruments. Therefore, analysis of the theoretical aspect and experiences in reforming monetary instruments, in particular the transition to indirect monetary instruments from the previous studies is necessary.

The purpose of this chapter is to provide the necessary theoretical framework and the lessons learned from experience, in order to set the stage for the analysis of the reform of monetary instruments, particularly transition to indirect instruments in Vietnam in the next chapters. The structure of this chapter is as follows: Part 2 reviews research on monetary policy instruments. Part 3 discusses experiences in the reform of monetary instruments and the transition from direct to indirect monetary instruments in transitional economies and developing countries.

2.2. Monetary policy instruments

As many economists have pointed out, a central bank can implement monetary policy in two ways: "directly through its regulatory powers, or indirectly through its influence on money market conditions as the issuer of central bank money" (Alexander *et al.*1995: 2).

The differences between direct and indirect monetary instruments in their operation have been distinguished as follows: 1-direct instruments set or limit either prices (interest rates) or quantities (credit) through regulations, while indirect instruments operate through the market by influencing demand and supply conditions; 2-direct instruments are mainly aimed at the balance sheets of commercial banks, while most indirect instruments are aimed at the balance sheet of the central bank (see Hilbers 1993 and Alexander *et al.* 1995).

These differences are relative and not very clear. Since a central bank uses indirect monetary instruments to influence market conditions, it can target certain key interest rates or quantities of credit through the market mechanism. On the other hand, even though indirect instruments are market-based, they still need regulation through the government or central bank to set up the framework for their operations (Alexander *et al.*1995).

2.2.1. Direct monetary instruments

Three main direct monetary instruments have been used in transitional economies and developing countries. They are interest rate controls, bank-by-bank credit ceilings, and directed credits[8].

[8] "The typical direct instruments are credit ceilings and administratively determined deposit or lending rates"(Hilbers 1993: 309). These three instruments have been the main direct instruments used in

Interest rate controls

Interest rate controls are a popular direct instrument for developing countries and CPEs. Industrial countries still used such controls until the late 1980s. Usually, interest rate controls are in the form of fixed interest rates or fixed spreads between lending and deposit rates.

An advantage of interest rate controls is that it is easier for monetary authorities to set fixed interest rates or spreads than to use using indirect instruments of monetary policy to influence money demand or supply conditions to reach a certain level of interest rates. If long-term interest rates are considered as an objective of monetary policy, or when monetary authorities cannot achieve a target interest rate through market means, then interest rate controls are resorted to (Alexander *et al.* 1995).

Interest rate ceilings are also regarded as a second best response to financial collapse, although "preventing the concentration of loans to one borrower, limiting foreign exchange risk, requiring adequate reserve against default, and so on are the first line of defense against financial break down" (McKinnon 1991: 91). Interest rate ceilings have the advantage of limiting the adverse selection problem. Since high-risk borrowers normally want to bid higher lending rates to get bank loans, they may not want to pay back these loans or cannot do so because of their defaults from high-risk projects (Mishkin 1996). With regulated interest rates, risky borrowers will find it difficult to get bank loans through bidding higher lending rates, particularly when the banks have not enough information on borrowers or bank supervision is weak (Alexander *et al.* 1995).

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developing countries and transitional economies before and during the transition to indirect instruments. See case studies in seven countries: Chile, Egypt, Ghana, Indonesia, Mexico, New Zealand, and Poland

However, interest rates controls inhibit financial development mainly by depressing real interest rates. Low or negative real interest rates can impede economic growth by reducing volume of investment and the productivity of capital (see McKinnon 1973, Shaw 1973, Mathieson 1980, and World Bank 1989). Fixing interest rates or the spreads in terms of the ceiling on lending rates and the floor on deposit rates may lead to misallocation of resources and bank dis-intermediation. Ceilings are usually lower than market rates, so borrowers can get cheap credit, which encourages them to overuse capital (a scarce good in developing countries and transitional economies). This also leads to administrative rationing of credit. Ceilings or floors discourage intermediation between banks and banks easily circumvent them, because this rigid regulation may reduce bank profits in the case of low ceilings and high floors. To ensure profits, the banks may impose additional fees for the borrowers or shift bank's deposits into assets yielding market rates (such as foreign exchange or into goods) (Alexander *et al.* 1995). Interest rate controls also hinder price competition and development of a money market (Lindgren 1991). So interest rate liberalisation is a prerequisite for banking system reform and the transition to indirect instruments as well.

Bank-by-bank credit ceilings (or credit ceilings)

Credit ceilings were used in Western Europe until the 1980s and are still used in some developing and transitional economies. Credit ceilings set by the central bank determine the maximum credit growth rates over a given period. They are in the form of quotas that depend on capital, existing credit and deposits.

Credit ceilings are an effective way of controlling bank credit expansion. Particularly when the monetary transmission mechanism is uncertain, the central bank can use credit ceilings to minimise the loss of monetary control during transition to indirect

(Alexander *et al.* 1995).

instruments (Alexander *et al.*1995). Credit ceilings also help to control inflation and the balance of payments more quickly and precisely than other conventional methods of monetary policy. They are more advantageous and to be preferred in small open economies when external deficits can become very large in relation to GDP, and financing problems may arise in a very short time (Cottarelli *et al.* 1986). In urgent occasions such as a financial crisis, or when no other instruments are adequate, credit ceilings may be used effectively for relatively short periods.

However, credit ceilings discourage competition between banks since all the banks in the banking sector have the same credit growth rates as determined by the central bank. The more effective banks cannot expand their credit at a higher rate than the less effective banks. This leads to ineffectiveness and dis-intermediation in the banking sector. Moreover, credit growth rates are not market-determined, so credit ceilings distort the allocation of bank resources and they also distort freely determined interest rates (Lindgren 1991). In addition, the implementing of credit ceilings is difficult if there are many banks and if there are capital inflows (Alexander *et al.* 1995). If credit ceilings do not cover all credit institutions there may be a discriminatory element which could lead to an uneven playing field between them.

Directed credits

Directed credit has been used in transitional economies for a long time. Usually, central banks make credit plans to fit in with the production plans of the government, and credits flow directly to particular sectors or enterprises such as SOEs and cooperatives in the transitional economies before economic reform. Usually, such credits do not require collateral.

Directed credits have advantages in concentrating financial resources to finance specific sectors or priority programs such as heavy industries and export promotion. They are often allocated in areas, with low rates of return (as in the case of former socialist countries). However, directed credits result in the misallocation of financial resources, since these credits are a discretionary provision of the central banks and misallocation is magnified where discretionary behaviour and corruption are endemic.

In summary, direct instruments have some advantages such as being relatively easy to perceive, to use (than indirect instruments) and to explain to politicians and the public. The governments or central banks can easily finance specific objectives[9].

Direct instruments are effective in controlling interest rates and credits in the case of a rudimentary and noncompetitive financial system. In particular, direct instruments are still used in the transition to indirect monetary instruments in the case of undeveloped financial systems:

> During the transitional period to indirect monetary control, financial markets may be too thin, resulting in strong interest rate effects and volatility, which many governments fear will discourage investment. Central banks may therefore maintain some direct instruments for an interim period until financial markets are sufficiently developed (Alexander *et al.*1995: 9).

In addition, direct instruments can be considered as a second best or supplementary solution in the case of market failure (for example, a financial crisis).

Direct instruments also have some disadvantages. These disadvantages may increase over time, especially when the financial sector becomes more developed. First, direct instruments are not market-based instruments, leading to misallocation of financial resources and inefficiencies, since credit is often provided to projects that are inefficient

[9] See details in Lindgren (1991) and Alexander et al (1995).

or given for non-monetary objectives. Second, direct instruments may hamper competition and lead to disintermediation between banks. With banks being constrained to the same growth rate of credit due to the credit ceiling, inefficient banks can be protected from competition by limiting the growth of efficient banks. This is particularly so in the transitional economies where state-owned banks dominate the banking sector, which tends to limit the entrance of the private actors to the banking sector.

Third, direct control may lead to monetary overhang of liquidity and financial repression.

> Excess liquidity tends to build up because of limits on bank lending, while deposit growth is fuelled by an expansion of reserve money caused, for instance, by monetary financing of the deficit. The excess liquidity, in turn, entails an inflationary potential, for the time when the credit limits are eased (Alexander *et al.*1995: 9).

In particular, if interest rates are kept below the equilibrium level by regulation, that may lead to financial repression. This discourages saving and leads to unproductive uses of saving; and financial resources may shift from bank saving to other forms such as securities or real assets. If the structures of interest rate and credit controls are complicated, it may distort bank management and cause inefficiencies.

Fourth, direct instruments require more micro-management of the banking system by central banks and the monitoring of bank performance is increasingly difficult (Lindgren 1991). When direct controls are in place for long periods, evasion and circumvention tend to increase (Hilbers 1993), since these controls force credit institutions into portfolio positions that they would not voluntarily accept. If the compliance is not uniform, financial intermediaries that comply with the controls may

be placed at a disadvantage, further compromising the position of the formal financial sector and encouraging the growth of the informal financial sector (Alexander *et al.*1995).

The next section examines indirect instruments and compares them with direct instruments.

2.2.2. Indirect monetary instruments

There are various types of indirect instruments. However, here the focussing on three instruments those have been popular in developing and transitional economies. They are reserve requirements; discount, rediscount and refinancing facilities; and open market operations.

Reserve requirements (RRs)

RRs refer to the proportion of deposit liabilities at a financial institutions held in the form of deposits with the central bank or in the form of other eligible assets, such as cash in vault. RRs are classified as an indirect instrument since although "they are applied through regulation ... their monetary effect is realised through the impact on a bank's demand for reserve money, and reserve money creation is most directly monitored and controlled via the central bank's balance sheet" (Alexander *et al.* 1995: 2).

RRs were first introduced through statute law in the United States in 1913 (Menkhoff 1997). They were considered originally as an instrument for countering crises of confidence arising when liquidity shortages occurred. Banks may face extreme demands for liquidity; if this demand is not satisfied, it could trigger additional demand. This can

happen when depositors fear that they will lose their deposited money and try to convert their money deposits into cash before other depositors can do so and before a general confidence crisis arises. Such a crisis could threaten the banking system. Minimum RRs can be used to meet unexpected demand and avoid shortages of liquidity. However, the counter crises of confidence role of RRs has declined because of the development of other methods such as bank supervision, credible deposit protection, and the central bank function as the lender of last resort to prevent solvency problems (Menkhoff 1997).

Besides the advantage of RRs in countering the liquidity shortages, the main advantage of RRs is to allow the central bank to control the money supply. Central bank control of the money supply through changing required reserve ratios (or reserve ratios), can be briefly explained as follows:

From the conventional money multiplier equation:

$$mm \equiv \frac{M}{H} \equiv \frac{C+D}{C+R} \equiv \frac{1+cd}{rd+cd} \qquad (2.1)$$

Where:

M is money stock; mm is money multiplier; H is base money or high-powered money; C is currency held by the public; D is money deposits; R is bank reserves; *cd* is the currency-deposit ratio; *rd* is reserve-deposit ratio (it is a ratio of bank reserves to deposits; bank reserves consist of notes and coin held by banks and banks' deposits at the central bank).

(*mm* is larger the smaller the *rd*; *mm* is also larger the smaller the *cd*).

And the reserve-deposit ratio function:

$$rd = r\ (i,\ i_D,\ rr_R,\ \lambda); \qquad (2.2)$$

where, rd is a function of the market interest rate i, the discount rate i_D, the required reserve ratio rr_R, the variability of deposit flows λ. An increase in i will reduce excess reserves: rd will be reduced. In contrast, increases in i_D, rr_R, and λ will increase rd.

The money supply function (2.3) is a function of the market interest rate i, the discount rate i_D, the required reserve ratio rr_R, the currency-deposit ratio cd, and the variability of deposit flows λ.

$$M = mmH = mm(i, i_D, rr_R, cd, \lambda)H \qquad (2.3)$$

At given H, money supply M is increased when money multiplier mm rises. The money multiplier mm increases with the level of the market interest rate i, and it decreases with the discount rate i_D, the required reserve ratio rr_R, and the currency-deposit ratio cd. If the central bank raises the required reserve ratio, bank deposits at the central bank will increase and bank lending will fall, the money supply will decline (excess liquidity will be sterilised if this occurred[10]), the market interest rates will rise, and the level of economic activity will decrease (Livingston 1990). If the central bank reduces the required reserve ratio, the reverse will happen.

There are some disadvantages of RRs that have been pointed out by Hilbers (1993) and Alexander *et al* (1995). First, unremunerated RRs are like a tax on the banking system. If RRs are at high levels, it may result in a widening of the spread between bank lending and deposit rates, and this can lead to disintermediation. However, if remunerated RRs are imposed, it may cost the central banks. Second, RRs are not convenient for managing short-term liquidity, since if RRs are adjusted frequently, this may lead to fluctuating interest rates and disruption to bank portfolio management. Third, RRs may

[10] RRs also can be used to sterilize excessive liquidity by increased RR ratios; particularly when the open market operation policy does not absorb excessive liquidity at the desired level, then RRs are considered to be a useful supplementary tool. However, this advantage is meaningless when "the volume and flexibility of open market operation policy is sufficient" (Menkhoff 1997: 49).

lead to a movement of funds to financial centres, which have lower RRs (Menkhoff 1997).

RRs have been used in many countries for a long time and they are still an effective tool for controlling money supply in countries in the early stage of undertaking the transition from direct to indirect monetary instruments. However, their role is reduced when open market operations are sufficiently developed. The use of RRs has been dropped in industrial countries in recent years.

Discount, rediscount and refinance facilities.

Discount, rediscount and refinance facilities are an important tool of central banks for relieving liquidity shortages of banks (lender of last resort function), for controlling money and credit conditions, and for allocating credit selectively (Alexander *et al.*1995).

In the last resort function of a central bank, these facilities allow individual banks or the banking system as a whole to borrow funds from the central bank at times when there is a shortage of funds and when other sources of funds are closed off. This function is very important in securing individual banks and the banking system as a whole from a financial crisis, since a relatively small liquidity problem in one bank (if it is not resolved) might become a large problem for the whole banking and financial system. An advantage of these facilities is in providing liquidity more quickly to banks, when it is needed, than open market operations. In particular, they also may be useful in the case where open market operations are limited due to lack of paper (Alexander *et al.*1995). Moreover, these facilities do not require collateral; usually they are involved with eligible papers and access criteria.

Discount, rediscount and refinance facilities can be used as an effective means of controlling money and credit conditions. In Equation 2.3, at a given money base H, when the central bank increases the discount rate i_D, the money multiplier *mm* will be reduced, since with a higher discount rate, banks will hold a higher reserve rather than borrowing more expensive funds from the central bank to cover any reserve shortage that may occur. Therefore, an increase in discount rates (it is similar to an increase of rediscount and refinance rates) will induce the market interest rate to rise, demand for money to fall, money supply to contract, and economic activities may fall. Changes in the discount rates are also used as a signal from the central bank to inform the market that it will discourage or encourage borrowing from central banks. In supporting the discount, rediscount and refinance facilities, some economists agree that the initial impact of these facilities on financial markets is wider than is the case with open market operations, which are limited to one or a few financial centres (Alexander *et al.*1995).

These facilities are also used to allocate credits selectively to banks or credit institutions which provide funds to support particular sectors such as SOEs, agriculture, or the poor in the remote areas as is the case in some transitional economies. The aim of this policy is to increase the social return from these sectors, but there are inefficiencies in some cases.

Discount, rediscount and refinance facilities have been shown to have some disadvantages. First, the efficiency of these facilities in terms of flexible quantitative implementation is substantially poorer than in the case of open market operations (Menkhoff 1997). Second, the rediscount window is "not very convenient for precise base money targeting, since access to the window is usually at the initiative of banks.

Criteria for rediscount paper and for access to the window have often been utilised to implement selective credit policy" (Alexander *et al.*1995: 4). Third, if these facility rates are set up below market rates (as in the USA, Japan and Germany), it would most likely lead to non-price rationing of credit. So in the financial sectors where open market operations are developed these facilities are contractionary.

Open market operations (OMO)

Open market operations involve the purchase or sale of bonds, bills and other financial instruments from central banks in the open market. By purchasing or selling these securities, a central bank can affect the money supply and related financial measures through their impact on the monetary base[11]. Through purchasing securities, central banks can inject money into the financial system, and through selling them, they can absorb money from the system (Axilrod 1997).

The mechanism whereby OMO purchases increase the monetary base, and thus increase the money supply can be briefly explained as follows: assume the state bank of Vietnam (SBV- central bank) purchases VND1billion of government bonds from a private individual, government securities on the assets side in the balance sheet will rise by VND1billion (Table 2.1). The seller of this bond receives a cheque (its value is VND1billion) from the SBV, and deposits it in a bank account. The bank will deposit it with the SBV and its bank deposits at the SBV will rise by VND1billion on the liabilities side in the balance sheet. Therefore, the monetary base rises by VND1billion as do bank reserves.

[11] The monetary base includes currencies held by the public and bank reserves. For the purpose of controlling the money stock in the long run, it makes little difference if the central bank controls the monetary base or bank reserves, but in the short run, tighter control of money stock can be exerted through the monetary base than through bank reserves. See details in Rasche and Johannes (1987).

This story is continuous with the subsequent behaviour of the seller and the seller's bank. The seller may want to hold more currency, in which case a part of his or her deposit is converted into currency. The currency deposit ratio *cd* will rise (both bank reserves R and deposits D fall).

Table 2.1: An Open Market Purchase and the Central Bank Balance Sheet (VND bill)

Assets		**Liabilities**	
Government securities	+1	Currency	0
All other assets	0	Bank deposits at central bank	+1
Monetary base (source)	+1	Monetary base (uses)	+1

The bank which has a cheque for VND1billion deposited in the SBV now has a reserve deposit ratio *rd* which is too high (since both R and D in this bank increase by the same amount, *rd* must be increased), which will reduce the bank's profitability. So the bank has to reduce *rd* through lending activities. When the bank makes a loan, the borrower will have a new bank deposit (in this way, the money supply is raised more than the amount of OMO). By making loans from deposits of loan customers in the banking system, this process will create a multiplied expansion of the money stock.

Therefore, open market purchases from the central bank will increase the monetary base, which generates a multiple expansion of the money stock, and *ceteris paribus*, the interest rate will be reduced (Livingston 1990). It is inversely the case for open market sales.

A central bank can conduct OMO in one of two ways: aiming for a given quantity of reserves and allowing the interest rate to fluctuate freely (the active way) or by aiming

at a particular interest rate and allowing the amount of reserves to fluctuate (the passive way). The passive way is usually employed by industrial countries, where the market is sensitive and well developed. The active way is more advantageous in developing countries; the reason for that perhaps being the absence of effective secondary and inter-bank markets in these countries (Axilrod 1997).

Open market operations have advantages in that they allow "central banks great flexibility in the timing and volume of monetary operations at their own initiative, encourage an impersonal, businesslike relationship with participants in the market place, and provide a means of avoiding the inefficiencies of direct controls" (Axilrod 1997: 2). They also provide a transparent and efficient means of controlling money that enhances market development.

However, to conduct OMO, interest rates must be fully liberalised, a deep liquid and secondary market is required, and the central bank must have an adequate stock of marketable assets. Moreover, advanced monetary programming skills and reliable economic information are necessary (Hilbers 1993 and Alexander *et al.* 1995).

There is another kind of open market operations which has similar effects, called open market type operations (Lindgren 1991). This activity concerns the selling of bills in the primary market. These bills may be issued by the central bank or the government and, usually, they are short-term bills. Open market type operations have been used in economies where there is no financial depth and the secondary market is insufficiently developed to conduct open market operations.

This type of open market operation has an advantage as a:

> Flexible instrument for short-term liquidity management because issuance is at the discretion of the central bank, and various auction/tender formats

> can be used to steer the interest rate. If treasury is not willing to accept sufficient interest rate flexibility, central bank papers preserve the operational autonomy of the central bank (Alexander *et al.*1995: 5).

Moreover, the issuance of government bills is a convenient way to finance excess government expenditure. It also increases financial discipline when central bank finances directly to the government are stopped.

However, the open market type operations exhibit some difficulties in their use as Alexander *et al* (1995) and other economists have pointed out: "the central bank may incur losses if large primary issuance is need to sterilise liquidity. If central bank bills are used in parallel with treasury bills, a problem may occur in the absence of strong coordination between the issuing agents" (Alexander *et al.*1995: 5). In addition, debt management may conflict with money management, since the treasury in most cases makes final decisions on debt management and the central bank serves as its agent. The central bank may be pressured to facilitate primary market issues at a predetermined rate (Axilrod 1997).

Recently, OMO have been the main instrument of monetary control in industrial countries and are becoming important for developing countries and transitional economies. Open market type operations are a rudimentary type of open market operations that is preferred in economies where liquidity and secondary markets are thin and particularly in countries making the transition from direct to indirect monetary instruments.

In short, we can sum up the advantages of indirect instruments of monetary policy as follows:

First, indirect instruments are more effective than direct ones, since they do not encourage disintermediation and growth of an informal financial sector like direct instruments, while direct instruments become increasingly ineffective over time (Alexander *et al.*1995). Second, indirect instruments allow monetary authorities greater flexibility in implementing monetary policy. Through small, frequent changes in indirect instruments, monetary authorities are able to respond quickly to shocks and to correct errors of policy in a short time. In contrast, it is difficult to adjust direct instruments rapidly without disturbing bank portfolios. Indirect instruments also ensure consistency between monetary, fiscal and exchange rate policies (Lindgren 1991). Third, indirect instruments are market-based instruments, which means greater efficiency in the allocation of financial resources, and reduction of non-money objectives of financial resources. The use of indirect instruments also increases economic signals to central banks in conducting and implementing monetary policy. These contribute to the development of the financial market. Fourth, by using indirect instruments, central banks can encourage intermediation, competition, transparency and financial deepening, and reduce evasion and circumvention from banks and financial institutions.

However, the implementation of indirect instruments is more complicated than use of direct instruments and requires a deep financial market, financial instruments and infrastructure. The effects of indirect instruments on the ultimate targets cannot be observed immediately; they can only be observed indirectly through intermediate targets or indicators. This is due to the lag in the transmission process. In addition, conducting monetary policy is complicated when the central banks introduce indirect instruments in the process of financial liberalisation. Moreover, interest rates and exchange rates may become more interdependent; opening the capital account does not

always accompany the transition to indirect instruments[12].

In general, we can say that direct instruments become less effective than indirect instruments when the financial sector is developed. Therefore, the transition to indirect monetary instruments is indispensable for most countries including Vietnam, and the important question to economists and policy-makers is: how can the shift from direct to indirect instruments be accomplished smoothly and effectively in the conditions of developing countries and transitional economies? The next section answers this question.

2.3. Experiences in reforming monetary instruments: the transition from direct to indirect monetary instruments in transitional economies and developing countries

Transitional economies and developing countries have embarked on reform of monetary instruments and transition to indirect instruments since the late 1980s. Some of the countries have been successful, but a few have failed in this reform process, and have had to reintroduce direct instruments. So, drawing lessons from the experience of these countries is necessary.

The experience from the transitional economies and developing countries in the transition to indirect instruments has shown that they have faced more problems than industrial countries, mainly because they lacked the necessary institutional and economic conditions (Alexander *et al.* 1995). These necessary conditions are discussed below.

[12] A more detailed discussion, see Alexander *et al.* (1995: 15).

2.3.1. The initial institutional and macroeconomic conditions

The characteristics of centrally planned economies (CPEs) and the features of their banking and financial systems in the period before the reform of monetary instruments and the transition to indirect instruments in the transitional economies have been investigated by Sundararajan (1992) and Hilbers (1993). These authors described the characteristics that were typical of CPEs such as controlled wages and prices, large inter-enterprise arrears (which strongly influenced the effectiveness of monetary policy), soft budget constraints, excess liquidity and macroeconomic instability. There was a single tier banking system in the CPEs with the central bank's role to execute the financial plan (a cash and a credit plan) to meet the production plan set by the government. There was little autonomy in conducting monetary policy. Credit and interest rates were controlled strictly by the central bank; interest rates were set administratively, with loans to priority sectors often provided at preferred rates. Besides the central bank (or state bank), there were specialised banks, which served in particular areas (industry, agriculture, and foreign trade), but they were segmented, lacked competition and commercial banks skills, and had weak or nonexistent prudential regulations and supervision.

The initial institutional and macroeconomic conditions in non-industrialized countries (developing countries mainly) that adopted indirect instruments of monetary policy were analysed by Alexander and other economists from the IMF[13]. They found initial conditions were common to most of these countries. First, the introduction of indirect

[13] A sample included 19 countries (17 developing and 2 transitional economies) which were well-advanced in transition from direct to indirect instruments in each region was chosen for the analysis. The initial point of transition to indirect instruments started when the central banks began to auction treasury bills or central bank bills. The transition ended at the point where the market was reliant fully on indirect instruments (at that time, interest controls had been eliminated, and the share of direct credits from central banks amounted to no more than 25 per cent of total credits), see Alexander *et al* (1995).

instruments was part of a broader set of reforms, which included liberalisation of the financial sector, macroeconomic stabilization and liberalization of the economy in general. Second, most of them had an IMF-supported program at that time. Third, they all had policies to allow new banks to enter the financial sector and give them more freedom. Fourth, the banking sector was mainly owned by the public sector (60 per cent of the sample), and the common features were weak and segmented money and inter-bank markets, lack of effective supervision, a low level of competition between banks, and autonomy of central banks. Fifth, half of the countries in the sample had large economic imbalances at the beginning of the reform process that were indicated by some factors such as high inflation rates (above 20 per cent pa), negative real interest rates, and high fiscal deficits (exceeding 5 per cent of GDP). Sixth, at the beginning of the reform process, about 80 per cent of the sample countries had excess liquidity in the financial system.

So, the main conditions of transitional economies and developing countries before transition to indirect instruments were excess liquidity and macroeconomic imbalance; the banking system being segmented and inefficient, lacking competition and supervision; a low level of central bank autonomy; and credits and interest rates controlled. These conditions suggest that it is difficult to transit to indirect instruments without a stabilisation plan and comprehensive reform of the economy, a reorganised banking system and liberalised interest rates. The introduction of indirect instruments may not be completed in a short period, depending, among other things, on the development of liquidity and secondary markets.

These conditions may affect the pace and the use of indirect monetary instruments, and the sequencing of the transition to indirect instruments as well. Moreover, the transition

to indirect instruments may need the concomitant reforms.

2.3.2. Implementation and the use of indirect instruments

Alexander *et al* (1995)[14] also pointed out that the implementation of indirect instruments in non-industrialised countries has some similar features. Firstly, as mentioned in the previous section, reform of monetary instruments was part of a broader financial reform package. This included reorganizing the banking system, improving bank supervision, and revising the legal framework. Moreover, two-thirds of countries in the sample spent considerable effort in coping with excessive fiscal imbalances. Secondly, central banks improved control of credit expansion and in many cases absorbed the excess reserves. Most countries had to abolish or limit access to facilities that allowed banks to borrow automatically from the central banks, and central bank financing to governments was also reduced. Thirdly, interest rates were liberalised early in the transition in most or all countries, but bank-by-bank credit ceilings were abolished only in 35 per cent of the sample countries, and the rest abandoned them later in the transition process.

In addition, the implementation of indirect instruments often required other measures and reforms to support the transition process, depending on each country's circumstances[15]. In some cases, the reform of monetary instruments often included temporary reversals or the reintroduction of direct instruments. Experiences from Argentina, Burundi, Chile, Jamaica, the Philippines, and Venezuela were examples[16].

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[14] Sample from Alexander *et al* (1995) included 19 countries, but there were only two CPEs (Poland and Hungary).

[15] For instance, Poland had to take into account modernisation of the payment system during the transition to indirect monetary instruments. Egypt, Ghana, Israel, Mexico, and Thailand began to restructure their commercial banks. Most sample countries had to strengthen bank supervision and regulation and increase banking competition in the transition process. See Alexander *et al* (1995).

[16] "All countries except Burundi and Jamaica faced a serious financial crisis, which prompted the temporary reintroduction of controls on interest rates to alleviate the burden of high real interest rates on borrowers and banks. Reversals in Burundi and Jamaica were a direct response to excessively high fiscal imbalances, which the authorities were reluctant to finance at market interest rates. Thus, inadequate

These experiences from sample countries also indicate that a successful transition to indirect instruments does not depend on the choice of exchange rate regime, but it could be influenced by this choice[17]. In this transition, it is also not require to remove capital controls, which will be phased out gradually when the monetary authorities had necessary instruments to manage capital flows. A capital account liberalisation can stimulate large capital inflows, making it difficult for the monetary authorities to manage the funds. However, this does not deny that the inflows also contribute to the development of money and capital markets, which may facilitate the transition to indirect instruments.

The survey by Alexander *et al* (1995) shows that all countries in this sample at the end of the transition started open market type operations mainly in the primary market, due to the absence of well-developed secondary markets for treasury and central bank bills. Only 20 per cent of the sample countries relied fully on open market operations through secondary markets. In these open market operations, treasury bills were preferred to central bank bills and maturities of no more than three months were used more than longer-term ones. Weekly auctions were adopted by most countries. Reserve requirements were commonly used in all countries, except Mexico, and half of them imposed RR rates above 15 per cent. However, only one-third of the central banks remunerated reserve requirements. Rediscount facilities were used as well as open market type operations, but most countries restricted access to these facilities.

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banking supervision and failure to sustain adequate macroeconomic policy were key factors in the reversal of financial reform" (Alexander *et al.* 1995: 21).

[17] The choice of exchange rate regime could influence the desirable speed of transition to indirect instruments, because fixed exchange rate regimes typically require greater interest rate flexibility. See Alexander *et al* (1995).

Besides analysing the implementation experiences and the use of indirect instruments, the authors also examined the financial efficiency and monetary controls in these countries when the transition was complete. Their results indicate that the efficiency of financial sector intermediation improved and the volatility of the money multiplier and key monetary aggregates declined to a manageable level in most countries.

The analysis of the adoption of indirect instruments in non-industrialised countries from Alexander *et al* (1995) shows that the pace of transition from direct to indirect instruments has varied across sample countries. Some countries such as Argentina, Chile and Israel adopted indirect instruments within one year; 58 per cent of the sample countries took a more gradual approach; 47 per cent of the selected sample countries reversed monetary reforms. In the latter cases, they continued to use direct instruments; Mexico, for example, even reversed its policy on the debt crisis during the transition to indirect instrument.

The sequencing in the reform of monetary instruments and the transition to indirect instruments in transitional economies and developing countries is not identical. However, the typical sequencing can be divided into three stages.[18] In the first stage, the main characteristics of transitional economies and developing countries before the transition to indirect instruments were excess liquidity and macroeconomic instability; the banking system was underdeveloped and inefficient, with a lack of competition and supervision. As well, there was a low level of central bank autonomy. Therefore, reform of monetary instruments and transition to indirect instruments was carried out in the

[18] See Sundararajan (1992), Hilbers (1993), and Alexander *et al* (1995). Sundararajan and Alexander *et al* divided the sequencing into three stages. Hilber identified four stages in the transition from a command economy to a market economy with the choice of monetary instruments appropriate to each stage. However, the second and third states of Hilber's division are similar to the second stage of both Sundararajan and Alexander *et al*. So we will summarise the attitudes of these authors about the sequencing into three stages.

context of a comprehensive economic reform, which includes a macroeconomic stability program and financial sector liberalisation. In the financial sector, besides improving bank supervision and reforming the legal framework, reorganising the banking system was a very important task in these countries. In particular, the transformation from a mono-banking system to a two-tier banking system was essential in transitional economies, since the two-tier banking system created an appropriate framework for the use of indirect instruments (Hilbers 1993). At this stage, although a two-tier banking system had been established, it was very segmented and the central bank had limited independence, and financial transactions were still based on the financial plan. Therefore, direct instruments dominated, and indirect instruments such as RRs could be used but played only a supporting role in transitional economies (Sundararajan 1992). RRs were used to absorb excess liquidity in many countries at the first step of this stage, and they could also be used to inject funds into the market through reduction in RRs.

When the money market is underdeveloped, the central bank can use some instruments such as overdrafts, Lombard facility, credit auctions and refinancing (in the transitional economies) to perform the lender of the last resort function and provide funds to the market (Alexander *et al.* 1995). During this stage, some countries maintain interest rate controls (not only transitional economies), but depending on the degree of macroeconomic stability and development of financial sector, they can begin to liberalise interest rates to foster the money market, increase competition between banks and create room for operation of indirect instruments in the next stage.

The second stage has been reached by most transitional economies. During this stage, macroeconomic imbalance may persist and excess liquidity is possible. The two-tier

banking system is more developed but it is still segmented and competition between banks is low. A secondary market is not established yet in some countries, and central bank independence is being confirmed. Therefore, direct instruments begin to be phased out and indirect instruments begin to be used (Sundararajan 1992). Interest rates are largely liberalised, but not fully; credit ceilings are allowed to trade unused margins in some countries; and direct credits have been reduced in transitional economies. RRs are beginning to be reduced at this stage since the development of other instruments (discount windows and auctions of government and central bank bills) and macroeconomic stability may be improved. Discount windows are the main financial sources from the central bank to banks and credit institutions. However, it is impossible to introduce open market operations with the absence of a secondary market, so most countries adopting indirect instruments in this stage have used open market type operations in the form of auctions of short-term government or central bank securities. These auctions need to be combined with credit auctions or discount windows to facilitate monetary control and development of the money market (Alexander *et al.* 1995).

In the third stage, when the macroeconomic imbalance has been sufficiently reduced, the banking system is developed, a secondary market is established, the central bank becomes independent and interest rates are fully liberalised. Then the central bank can rely entirely on indirect instruments and direct instruments can be eliminated, but they should be kept at hand for emergencies (Hilbers 1993). If the elimination of direct instruments lacks the above conditions and direct instruments are still effective, then full reliance on indirect instruments could be premature and the central bank may have to reintroduce direct instruments (Alexander *et al.* 1995).

In general, experience in the reform of monetary instruments and the transition to indirect instruments from developing and transitional economies has proceeded along similar lines, except in the first stage of the transition. In Stage 1, due to some differences in initial and macroeconomic conditions in the transitional economies and developing countries, the process was a bit different: the CPEs had to establish a two-tier banking system and the central bank first conducted monetary policy toward a market economy. With an undeveloped financial market, there was lack of prudential regulation and supervision, macroeconomic imbalance, and the banking staff still lacked experience in the new environment. Therefore, the level of maintaining direct instruments in Stage 1 and early in Stage 2 in the transitional economies may be higher than that in the developing countries, in order to perform smoothly and efficiently the transition to indirect instruments. From late Stage 2 and Stage 3, the pace, implementation and the use of indirect instruments should be similar to developing countries, since the conditions between the two kinds of countries are similar.

2.4- Conclusion

In the expansion in both domestic and international financial markets, indirect instruments of monetary policy have been revealed to be more advantageous than direct ones in encouraging efficient financial intermediation, reallocating financial resources efficiently, and minimizing the circumvention from banks and credit institutions. Indirect instruments also allow the money authorities more flexibility in implementing monetary policy. Therefore, the transition from direct instruments to indirect ones is indispensable for most countries; particularly for transitional economies where the nature of the financial system has changed and its instruments must be changed.

The experience in the reform of monetary instruments and transition to indirect instruments of the transitional economies and developing countries can be summarised as follows:

- First, initial and macroeconomic conditions in these countries have influenced the pace of implementation, the use of indirect instruments and sequencing as well.
- Second, reform and transition have been performed in the context of broader financial sector reform. However, to minimise the difficulties and smooth the transition, concomitant reforms that relate to the restructure of the banking and financial systems, insulation of fiscal deficits and improving bank supervision, legal and payment systems are necessary.
- Third, a gradual pace in the transition to indirect instruments is preferred in these countries. The typical sequencing of the transition can be divided into three stages. In the first stage, besides other reforms in the financial sector (particularly, the establishment of a two-tier banking system in transitional economies) and the liberalisation of interest rates, RRs and credit facilities should begin to be introduced. However, direct instruments still dominate compared with indirect ones. In the second stage, direct instruments are being phased out and indirect ones begin to be implemented widely. Open market type operations in the form of auction of short-term government and central bank securities, and other indirect instruments such as rediscount and refinancing facilities and credit auctions, should be used to develop monetary control and foster money market development. In the third stage, the monetary authorities should stimulate the development of institutions and infrastructure of the financial market and begin to rely entirely on open market operations. At this stage, direct instruments should be abolished gradually. However, the monetary authorities should be able to access direct instruments in case of emergency.

These experiences from transitional economies and developing countries are useful and valuable to countries in transition, particularly to Vietnam. These will be considered in the examination of the reform of monetary instruments and transition to indirect instruments in Vietnam in the next chapter.

Chapter 3

THE BANKING SYSTEM IN VIETNAM

3.1-Introduction

The exploration of the banking system and the State Bank of Vietnam (SBV), which has conducted monetary and exchange rate policies, is necessary before analysing the reforms of monetary and exchange rate policies. This chapter summarises the characteristics of the banking system and the management of money, credit and foreign exchange prior to 1988. The reform of the banking system that focuses on the institutional reform since 1988 is reviewed (policy reforms that include monetary and exchange rate policy reforms are the task of subsequent chapters). Moreover, some issues such as the degree of monetisation, soundness of the banking system, the money and securities markets, and reform of SOEs that may affect the reform of monetary and exchange rate policies are also mentioned.

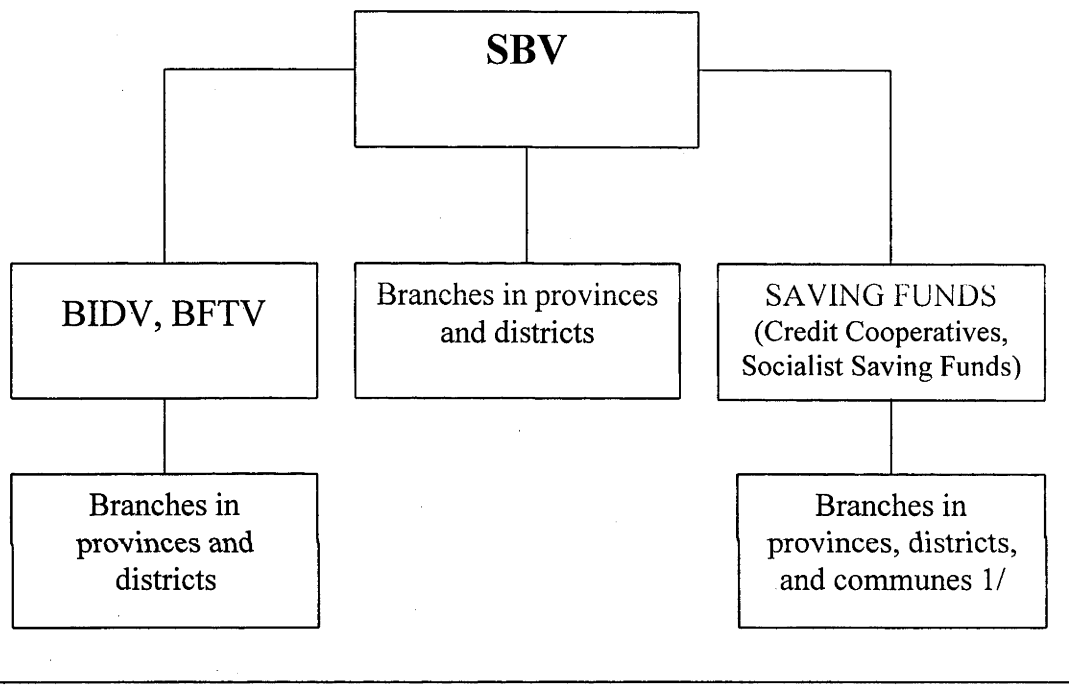
3.2-The banking system before 1988

Similar to a typical CPE, Vietnam had a passive financial system and a mono-banking system in the period prior to 1988. The financial sector consisted mainly of the banking sector, and non-bank financial intermediaries were not significant. The structural and operational features of the banking system in this period are considered in order to understand this system more clearly.

3.2.1- Structure of the banking system

The banking system prior to 1988 included the SBV, two specialised banks and a system of saving funds (see Chart 3.1).

Chart 3.1. Structure of the Vietnamese banking system before 1988



Note: 1/ Socialist saving funds operated in the urban areas, Credit Cooperatives which had branches to communes operated in the rural areas.

The National Bank of Vietnam was established on May 6th, 1951 according to Order 15/SL and was renamed the State Bank of Vietnam (SBV) in 1960. It was a mono-bank and was also a state-owned organisation, which had a complete structure from central to local level with the headquarters in Hanoi and their branches in most cities, provinces and districts. The main functions of the SBV included monetary management and financial intermediation. So, it functioned as both a central bank and a commercial bank. The main tasks of the SBV were to manage the state funds, serve the state sector and finance the state budget.

There were two other specialised banks belonging to the SBV. The Construction and Investment Bank of Vietnam, established in 1957 (now the bank for Investment and Development of Vietnam-BIDV), was in charge of supplying funds for long-term public projects. The Bank for Foreign Trade of Vietnam (BFTV) was established in 1959, and had the duty of financing all international economic activities, and managing foreign exchange.

The Credit Cooperatives (saving funds) were established in 1957. They operated mainly in rural areas. In the 1960s, the Socialist Saving Fund was founded in urban areas. Both saving funds mobilised funds from the public under the supervision and regulation of the SBV. During this period, the non-state sector was very small and not allowed to establish banks, and the SBV and its specialised banks monopolised the whole banking system.

3.2.2 - Operation of the banking system

As was typical of CPEs, the operation of the banking system in Vietnam prior to 1988 was mainly to provide money (cash) and credit to meet the money (cash) and credit plans that were required from the planned output targets, which were determined from the central government. The operation focussed on financing the state sector and state budgets and managing state funds. In this chapter, the operation that relates to our purposes, such as managing money and credit, and regulating foreign exchange, are mentioned.

Management of money and credit

Deposits mobilised from the saving funds and banks were under the control of the SBV, and the mobilised funds were distributed by the SBV to its branches and specialised banks in order to finance the SOEs, cooperatives and the private sector according to the plan targets from the State Planning Commission (on behalf of the government). Normally SOEs had priority and received huge credit at low interest rates. Cooperatives received a small portion of total credit at interest rates higher than SOEs. The private sector received very little credit from the state owned banks (SOBs)[19]. Table 3.1 shows the bank credit structure during the 1980-85 period. The figures reflect the fact that credit policy from SOBs was very much in favour of SOEs, but not for the cooperatives and the private sector.

Table 3.1. Bank credit structure, period 1980-85
(% of loans, end of period)

	Short term loans	Long term loans
SOEs	94.6	86.3
Cooperatives	4.6	11.1
Private Sector	0.8	2.6

Source: SBV (1996a: 224-25).

The SOEs were required to open accounts at (SOBs) and all their financial activities were controlled strictly by the SOBs. However, under the soft budget constraints (easy access to cheap credits and financial bailouts), the SOEs usually drew cheap credits from the SOBs to fulfill the production plans, which were a very important task (sometimes more than economic efficiency) in the command economy. They tried to accumulate raw materials or store those to ensure fulfillment of the production plans, and then credits often-exceeded credit quotas (Ngo 1997). The negative interest rate

[19] These included SBV branches and specialised banks

policy and ineffective ways to enforce the allocated quota of credits from the SBV encouraged such activities by the SOEs. To finance the excess credits over planned quotas to SOEs, the SBV normally had to print money, and therefore, according to Tu (1991), money supply was always higher than the planned level (up to 2.5 times), and M2 in 1985 was about 35 times higher than in 1980 (SBV 1996a).

Table 3.2. Sources of financing for State Budget Deficits, 1976-92 (VND billion)

	76-80 a/	81-85 a/	86	87	88	89	90	91	92
Total Deficits	15	218	36	128	1,044	2,727	2,818	1,468	3,845
Domestic borrowings	0	3	0	3	17	0	0	131	1,000
Foreign borrowings	13	109	13	39	331	1,026	1,641	0.5b/	2,845c/
Issuing Money	2	106	23	86	696	1,701	1,177	262	0
(% of total deficits)	13.3	48.6	63.9	67.2	66.7	62.4	41.8	17.9	0

Note: a/ average figure for the period, b/ mobilised from imported goods remained prior to 1990, c/ contained VND600 bill of imported goods remaining from previous years + VND720 bill of foreign aid for development + VND1, 525 bill of Foreign Borrowings.
Source: Cao (1995: 63). Author estimates

According to its task, the SBV also financed the state budget, which was always deficient during that time. Besides domestic and foreign borrowings[20], the proportion of money printed to finance the state budget deficits in total deficits increased and reached its highest level of 64 per cent to 67 per cent of total deficits in the period 1986-1988 (Table 3.2). This event was most likely related to the highest level of inflation in the 1980s-90s, including 487.2 per cent, 301.3 per cent and 308.2 per cent pa in 1986, 1987,

[20] See World Bank (1990:10): "Vietnam's external economic relations during the 1980s have primarily been with Comecon economies, especially the Soviet Union. Western nations and several neighbouring countries have maintained an economic boycott that has limited Vietnam's transactions with convertible currency area. The trade with Comecon economies is carried out through barter arrangements negotiated government-to-government. As part of these arrangements, Vietnam has received large amounts of credit at low interest rates as well as grant financing. Hence, external borrowing and aid from the Comecon has financed some part of the government's budget deficit; nevertheless, too large a share has been financed domestically by printing money". (Note: Comecon is Council of Mutual Economic Assistance (CMEA)).

and 1988, respectively (see Table 1.1, Chapter1). After that, the SBV slowed down with respect to printing money and stopped during the period 1989 to1992. Inflation also was brought down to 67.5 per cent pa in 1991 and 17.5 per cent pa in 1992 (Table 1.2). Therefore, printing money to finance the SOEs and state budget deficits is considered as a major cause for inflation during the 1980s.

Table 3.3. Nominal and Real Interest Rates, 1986-88 (per cent pa)

Interest rates	1986 real	1987 nominal	1987 real	1988 nominal	1988 real
Lending rates on working capital					
SOEs (under plan)	-79	14.4 - 18.72	-69	21.6 - 24.84	-69
Private sector	-62	100.80 - 122.4	-45	100.80 - 122.4	-45
Lending rates for capital construction					
SOEs	-80	12.96 - 15.84	-69	18.00 - 24.12	-70
Deposit rates					
SOEs	-81	8.88	-72	10.8	-73
Saving deposits	-71	72	-58	72	-58
Time deposits	-67	96	-51	96	-52
Credit cooperatives					
Lending rates	-64	112.91	-46	122.71	-46
Deposit rates	-64	112.91	-44	115.32	-47

Source: World Bank 1990, Table 4.2, p133

At this time, the SBV imposed low nominal interest rates for both deposits and loans. However, with a high inflation rate, the real interest rates were negative. In addition, interest rates were varied, depending on economic sectors. The state sector, with heavy industry, received the lowest lending rates. Cooperatives and the private sector paid higher interest rates (Table 3.3). Negative real interest rates had discouraged saving (Table 1.1, Chapter 1), which had the potential to restrict available funds for investment, but these stimulated SOEs to borrow and overuse the cheap credits from the SBV.

Management of foreign exchange

Before 1988, foreign exchange transactions in Vietnam were controlled strictly by the government through three state organs: the State Planning Commission (now called the Ministry of Planning and Investment-MPI), the Ministry of Finance (MOF) and the SBV. They have coordinated closely in formulating policies concerning the nation's foreign exchange reserves, credit and controls over foreign exchange transactions. SOEs, cooperatives, private firms and individuals did not have rights to deal in foreign exchange. All activities that involved foreign exchange (buying or selling foreign currencies, gold, precious metals or stones) were under the sole control of the SBV and Vietcombank (BFTV) managements.

Table 3.4. Official and Parallel Exchange Rates, 1981 – 89.

Year	Vietcombank Rate VND/US$	Parallel Rate VND/US$	Premium (per cent)
Feb 1981	2.445	36.0	1,372.4
Apr 1982	9.358	75.0	701.5
Jan 1983	9.806	105.0	970.8
1984	..	..	..
Dec 1985	14.250	167.0	1,071.9
Oct 1986	15.00	465.0	3,000.0
Apr 1987	80.50	700.0	769.6
Dec 1987	368.20	1150.0	212.3
Dec 1988	3,000.0	4,350.0	45.0
Mar 1989	3,800.0	4,850.0	27.6
Apr 1989	4,900.0	4,950.0	1.0

Note: Exchange rates were at selling prices. Premium = (Parallel-Official Rates)*100/Official Rate. Author estimates.
Source: Phan (1992: 100).

During this period, a fixed exchange rate regime with a multiple exchange rate system was in place and exchange rates were set daily by the SBV. Between 1985 and 1988, there were three kinds of official exchange rates for the VND and US$: the official exchange rate for external trade (which ranged from VND18: US$1 to VND900: US$1);

the inward remittances rates for Vietnamese living abroad (ranging from VND18: US$1 to VND3000: US$1); and the non-commercial transaction rate (eg. tourism, services of foreign experts, and remittances for foreigners - ranging from VND15: US$1 to VND3000: US$1)[21]. Besides these rates, two Rouble exchange rates also existed. The transfer Rouble rate was used for trade with the CMEA countries, and the clearing Rouble rate was used for non-commercial transactions[22].

Vietnam's foreign trade was largely undeveloped during the period 1976 to 1988. The majority of foreign trade was with countries in the CMEA[23], among which exchange rates were used as a converting tool to clear barter trade. So, the role of exchange rates was neglected. On the other hand, due to the fixed exchange rate regime, the official exchange rates were kept below the parallel market rates, and the premium was very high. The highest level of premium was 3,000 per cent in October 1986 (Table 3.4). This caused difficulties for the SBV in managing and reserving foreign exchange, stimulated rent seeking, smuggling activities, and encouraging people to store their wealth in the form of US$ and gold outside the formal banking system.

In general, management of money and credits in the period before 1988 from the SBV was accommodated to the production plans set by the central government. The financing SOEs and state budget deficits, and inefficient controls of money supply by the SBV were major sources for high level of inflation and macroeconomic instability. The role of exchange rate was neglected and considered as a conversion tool between VND and other currencies.

[21] See Brahm (1992).
[22] See Vu (1994).

Moreover, credit policy was favouring the state sector and neglected the private one that made investment inefficiently. The negative interest rate policy and lack of public confidence in the banking sector made saving discouraged. Therefore, these necessitated major changes in the banking and financial sectors and as well as the whole economy.

3.3-Banking system reform since 1988

As mentioned in Chapter 1, Vietnam adopted a comprehensive reform package in March 1989 and this package included financial sector reform, besides the reform of state economic management, SOE reform and reform of external economic relations.

The banking system is an essential part of the financial sector and it was reformed a little earlier than the comprehensive economic reform. From March 1988, the Vietnamese banking system started to reorganise and change under Decision No 53/HDBT, which determined the main orientation of the new structural organisation and operation of the banking system. In May 1990, under two decrees of law from the State Council, a two-tiered banking system was established. The institutional reform of the banking system and some related issues in the banking system and the economy, which may have affected the monetary and exchange rate policies during that time, are discussed below.

3.3.1. Institutional reform

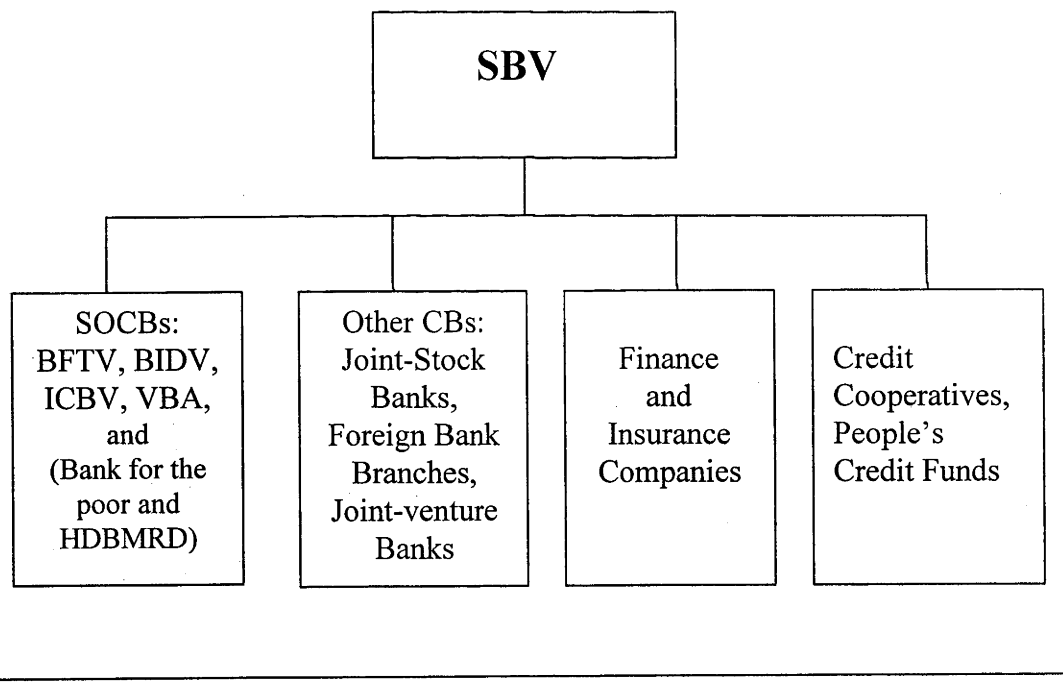
The two-tier banking system was established in 1990 and it has consisted of the SBV in the first tier and state owned commercial banks (SOCBs), other commercial banks,

[23] More than 60 per cent of foreign trade volume was traded with CMEA countries (non-convertible Area) (Tran 1992: 184-85).

finance and insurance companies, credit cooperatives and people's credit funds in the second tier (Chart 3.2).

On the first tier of the banking system, the SBV became the central bank of Vietnam (commercial banks were separated from the SBV), the "bank of banks". The main functions of the SBV since 1990 have been in macro-management and they can be described as follows (Brahm 1992: 30):

Chart 3.2. Vietnamese Banking System, 1990-99.



Note: HDBMRD is Housing Development Bank of Mekong River Delta

- economic planning and monetary policy;
- settlements;
- foreign exchange controls;
- supervision of commercial banks and credit institutions;

- issuing regulations and directives concerning foreign exchange, settlements, credit and banking activities;
- supervising the implementation of these regulations and directives;
- functioning as banker for credit institutions;
- printing and issuing currency;
- maintaining and monitoring reserves;
- a managing money circulation;
- managing gold and foreign currency;
- and establishing a national balance of payments.

So, the SBV has been in charge of conducting monetary policy that includes printing and issuing money, managing money circulation and foreign exchange, and implementing exchange rate policy. It has also been responsible for formulating the operations of commercial banks, finance companies, and credit cooperatives, and supervising and regulating all their activities.

The second tier of the banking system has comprised of four different groups of credit institutions. The first group contained four state owned commercial banks (SOCBs): The Bank for Foreign Trade of Vietnam (BFTV-Vietcombank) and the bank for Investment and Development of Vietnam (BIDV-Vietindebank) existed before 1988. The BFTV has dominated trading in foreign exchange and offering services in international trade such as processing international payments, letters of credit operations, and also making loans and accepting deposits. The BIDV is responsible for mobilising and providing funds for development projects in both local and foreign currencies. It provides medium and long term lending.

The Industrial and Commercial Bank of Vietnam (ICBV-Vietincombank) and Vietnam Bank for Agriculture and Rural Development (VBA-Agribank) were established in 1990 based on the separation of two departments from the SBV. The ICBV has operated in mobilising funds and making local and foreign loans, trading foreign exchange, gold and silver, processing local and international payments, consulting, etc. The VBA-Agribank's operations include mobilising funds and making loans mainly in the agriculture sector. The VBA also operates the Bank for the Poor, which was established in 1995. This is a government funded low-income credit scheme (see IMF 1998).

Table 3.5. Structure of Banking System, 1990-98

	90	91	92	93	94	95	96	97	98
The SBV									
Assets (VND trill)		12.7	24.82	32	48.7	..	77.4	..	..
Total bank Assets									
(TBA), (VND trill)	14.9	28.0	34.5	38.8	48.4	74.3	86.2	119.2e	137.4e
TBA Ratio to GDP (%)	35.5	36.5	31.2	28.4	28.4	32.5	31.7	38	38
Total Loans to GDP (%)	14.1	13.2	13.8	17.5	19.6	18.5	18.7	19.8	22.0
Total Deposits to GDP (%)	17.4	17.7	14.8	13.2	13.3	14.4	15.3	18.0	20.0
SOCBs									
Assets (VND trill)	14.7	26.6	31.6	35.2	43.3	58.0	66.0	97.7e	112.7e
% of TBA	99.0	94.8	91.8	90.5	89.5	78.1	76.6	82	82
% of total credit extended	..	..	..	..	82.8	79.6	75.5	77.2	81.4
Other CBs									
Assets (VND trill)	0.15	1.46	2.84	3.67	5.1	16.3	20.2	21.5e	24.7e
% of TBA	1.0	5.2	8.2	9.5	10.5	21.9	23.4	18	18
of which: JSB (%)								10	10
FBB+JVB (%)								8	8
% of total credit extended					17.2	20.4	24.5	22.8	18.6

Note: e is estimated figure, JSB is Joint Stock Bank, FBB is Foreign bank branch, JVB is Joint Venture Bank. TBA is total bank Assets (excluding assets of the SBV).
Source: World Bank (1995: 9,15), IMF (1997b), IMF (1999a: 27), IMF (2000:23), Saito (1997: 3).

In 1997, the Housing Development Bank of the Mekong River Delta was established to provide low interest rate loans for housing development of inhabitants in the Mekong River Delta. This is a development bank and also has other functions as a commercial

bank, but its capital is small (VND500 billion from the government)[24] compared with the four big SOCBs (average capital of each bank was around VND1.3 trillion in 1997[25]) and as it has just operated for a few years, its role in the banking sector is limited.

Since 1990, the four SOCBs have always played a dominant role in the banking system. The 3000 branches of SOCBs are in most provinces, districts and economic centers in Vietnam, and their total assets accounted for 82 per cent of total bank assets in 1997-98. Credit extended to the economy by SOCBs accounted for three/fourths to four/fifths of total credit, while non-SOCBs have from one/fourth to one/fifth of total credit (Table 3.5).

The second group contains joint stock banks, foreign bank branches and joint-venture banks. Most joint-stock banks were established during 1991-93 and their shareholders are SOCBs, SOEs and private entities. Foreign bank branches operate mainly in the area of trade finance and deal with foreign currencies. They are allowed to accept a limited amount of domestic currency deposits (which equal 25 per cent of their branch capital). Joint-venture banks are partnerships between an SOCB and a foreign bank, and they also are subject to the same restrictions as foreign banks in taking domestic currency deposits.There were 51 joint stock banks, 23 foreign bank branches and 4 joint venture banks in 1998 and their total assets increased quickly from 1 per cent in 1990 to 18 per cent of total bank assets in 1998 (Table 3.5 and World Bank 1999).

[24] See VIR (1997)
[25] The figure estimated from Table 3.5 and 3.7 (in 1997, capital/Total asset is 5.5 per cent for SOCBs).

The third group includes finance companies, which may be established as either shareholding or state-owned companies. The main operation of a finance company is to provide funds for the purchase of goods and services. Finance companies may also engage in many of the same activities as a commercial bank provided that approval has first been obtained from the SBV (Brahm 1992: 34). There were 4 finance companies, one insurance company and 8 leasing companies operating in 1998 and 1999, but their assets are small compared to other commercial banks (in 1996, 2 financial companies had capital and reserves equal to VND20 billion (Saito 1998)).

The fourth group contains credit cooperatives, which are collectively owned institutions. The funds of credit cooperatives have been collected from their members and only contributors are eligible to borrow funds. Credit cooperatives' operations have been supervised and regulated by the SBV. In the period 1988-1990, the number of credit cooperatives grew rapidly. In late 1990, there were 7,660 credit cooperatives in rural and urban areas. However, due to lack of adequate rules related to licensing, limits to volume of credit and interest rates, collateral and inspections, the credit system was in severe crisis, and until June 1993, 6,000 unqualified cooperatives were closed and only 62 credit cooperatives remained (VIR 1993). In 1994, savings and loan institutions such as people's credit funds were permitted and there were around 1000 credit cooperatives and people's credit funds, operating in 1998 and 1999.

After 10 years of reform since the mono-banking system was transformed into two tiers, the banking system has been developed in the numbers of commercial banks, credit institutions and assets. There are many domestic and foreign bank branches in Hanoi, HoChiMinh City and other big cities. Residents and foreigners can easily open accounts in term of VND and foreign currencies, and easily deposit and withdraw their money.

Some big banks such as Vietcombank and ANZ have also provided ATMs (Automatic Teller Machines) in some places. The use of bankcards, and credit cards is not unusual in Vietnam at present. Total bank assets increased from 28.4 per cent of GDP in 1994 to 38 per cent of GDP in 1997-98 (Table 3.5). This reflects an increase in the degree of monetisation in the banking system (even though this degree is still lower than some countries in ASEAN - see in the next section). Currency deposits in VND and in foreign currencies also grew in the range from 28.5 per cent to 51.3 per cent pa and from 16.1 per cent to 42 per cent pa, respectively in the period 1994-98 (Table 3.8); this indicates the increase in public confidence in the banking system.

The establishment of the two tier banking system in 1990 was crucial for banking reform in Vietnam, since it created an appropriate framework for monetary policy reform, particularly the use of indirect monetary instruments (see Hilbers 1993). The development of banking and financial systems facilitates the transition to indirect monetary instruments and implementation of exchange rate policy. However, the following issues are important when analysing the reform of monetary and exchange rate policies.

3.3.2. Important issues in the banking system and the economy

The degree of monetisation

The degree of monetisation is conventionally measured as a ratio of the broad money stock to GDP. There was a very low degree of monetisation in the Vietnamese banking system compared to other countries in the ASEAN from the period 1995-98. The ratio of M2/GDP was 26 per cent in 1997 and 28.4 per cent in 1998 for Vietnam, while it was from 55.6 per cent to 113.8 per cent for some countries in ASEAN in 1997-98 (Table

3.6). Moreover, the ratio of total commercial bank assets in Vietnam to GDP was 38 per cent, loan and deposit ratios to GDP were from 22 per cent to 20 per cent in 1998. These also reflect the low degree of monetisation in Vietnam (Table 3.5).

Table 3.6. Indicator of Financial Deepening in International Comparison (per cent), 1994-98

	1994	1995	1996	1997	1998
1-Broad Money (M2)/GDP					
Vietnam	**25.3**	**23.0**	**23.8**	**26.0**	**28.4**
Indonesia	44.9	48.0	52.2	55.6	57.5
Malaysia	82.0	86.2	93.9	99.9	..
Philippines	45.7	50.4	54.5	61.6	60.8
Singapore	86.8	84.5	85.6	86.7	113.8
Thailand	77.8	78.9	79.3	89.9	..
2- Currency/Deposit Ratio					
Vietnam	**76.4**	**57.2**	**53.9**	**44.5**	**35.7**
Indonesia	14.3	12.1	9.9	10.2	8.6
Malaysia	15.9	14.0	11.9	11.1	8.5
Philippines	15.6	14.5	13.0	11.7	11.0
Singapore	13.3	12.9	12.1	11.2	7.6
Thailand	9.7	9.7	9.2	8.5	7.4
3-Currency/Broad Money (M2)					
Vietnam	**43.3**	**36.4**	**34.9**	**30.8**	**26.4**
Indonesia	10.8	9.5	8.1	8.2	7.3
Malaysia	10.2	9.2	8.1	7.8	6.7
Philippines	12.4	11.6	10.4	9.6	9.0
Singapore	10.0	9.7	9.2	8.7	6.3
Thailand	8.5	8.6	8.2	7.7	6.7

Source: IMF (1999b), IMF (1999c), IMF (2000). Author estimates.

Currency/deposits and currency/M2 ratios in Vietnam have declined from 76.4 per cent and 43.3 per cent in 1994 to 35.7 per cent and 26.4 per cent in 1998, respectively. However, they were still higher than those (from 6.3 per cent to 11 per cent) in some countries in ASEAN (Table 3.6). This reflects a deficient payments system and low levels of confidence by the public in the SOCBs. A commonly felt shortage of currency induces the public to hold currency for a long period (World Bank 1995). However, even if public confidence existed, the inadequate financial instruments limit banking financial intermediation in the banking sector.

Money and securities markets

The money market in Vietnam has been underdeveloped during the 1990s. The inter-bank market for domestic currency was opened in July 1993, and the inter-bank market for foreign exchange also was established in 1994. These markets have provided a mechanism for transferring funds between banks, before the use of the last resort function from the SBV. However, they have been still underdeveloped and have not functioned well. The volume of transactions in the market for domestic currency was small, it was from more than VND80 trillion in 1994 to VND 26 trillion in 1996, and there were no transactions in this market in VND in 1997 (IMF 1997a).

The inter-bank market for foreign exchange in the period between 1994 and 1996 was also very poor, total volume of US$ transactions went from just over US$3million to US$24 million a year. This market has become more active from 1997 due to demand for US$ being high - total volume of US$ transactions increased from US$720 million to US$7200 million in 1998 (SBV 1997-98).

After some years of preparation, the securities market in Vietnam was first officially opened on July 26, 2000 in the securities trading centre in HoChiMinh City. However, the operations of this market have been very limited[26]. Since the scope of our thesis covers the period of the 1990s, so it will not be mentioned in this thesis.

[26] On the opening day, VND300 billion of T-Bills was auctioned. Also this centre had its first day of trading securities on July 28, 2000. However, the performance of the centre have not been active due to lack of securities and controlled prices of securities. There were only 6 kinds of securities in the market in August 2000: T-bills, shares of four companies which were listed in the securities market and shares of BIDV, while the number of broker companies is seven. Ceiling prices for securities were set, the prices for the next business day must not exceed the closing price of the last trading day by more than 5 per cent. As a result, there were only a few thousand shares traded in the first few weeks and some economists are

Bank Soundness

Non performing loans (NPL) in the Vietnamese banking system are indicated by the amount of overdue loans. Overdue loans, as a percentage of total loans were 12.5 per cent for deposit money banks in September 1998 compared to 8.9 per cent in 1994. The SOEs and joint stock companies contributed 35.5 per cent and 46.1 per cent of the total amount of overdue loans in 1998 (see Appendix 3.1). The large amount of overdue loans underlies the risk of loan losses and reduce the profitability of banking system. The profits/ total asset ratios for deposit money banks were only 0.77 per cent in 1997 and 1.12 per cent in September 1998 (Table 3.7).

Table 3.7. Vietnam: Bank Soundness Indicators (per cent), 1994-98 1/

	94	95	96	97	98/S	94	95	96	97	98/S
	Capital/Total Assets					**Capital/Total Loans 2/**				
Deposit money banks	6.0	7.7	7.2	7.9	7.6	9.4	12.5	12.3	13.2	12.9
SOCBs	5.5	4.8	5.0	5.5	5.0	9.2	8.4	8.6	9.3	8.6
Non-SOCBs	7.7	25.1	14.6	16.5	18.0	10.1	28.5	23.8	26.3	29.1
	Profits/Total Assets					**Profits/Loans**				
Deposit money banks	0.10	0.30	0.73	0.77	1.12	0.17	0.48	1.24	1.28	1.90
SOCBs	0.20	0.39	0.85	0.75	1.05	0.33	0.68	1.47	1.26	1.78
Non-SOCBs	-0.27	-0.25	0.32	0.83	1.43	-0.36	-0.29	0.52	1.32	2.30

Note: all figures are in percent

1/ Based on the monetary survey of four SOCBs and 24 non-SOCBs.

2/ Reflects recapitalization of SOCBs in October 1998 through conversion of frozen loans from the SBV

3/ Excluding loans to government. 4/ Excluding government deposits.

S/ Average figure from March, June and September figures.

Source: IMF (1999a: 31)

The capital base of Vietnamese banks was very weak. Before October 1998, the highest capitalised SOCB had a ratio of capital to total assets of 5.5 per cent, non-SOCBs had a

discussing about the possibility of crisis in the securities market in Vietnam (see Hoang 2000, Quang 2000).

stronger capital/asset ratio of 18 per cent and capital/loans of about 30 per cent (Table 3.7). By October 1998, the SBV recapitalised the four SOCBs by converting into capital VND2.4 trillion of SBV loans to banks, which were for the most part in the split of the mono-bank in 1990. As a result, the capital/asset ratio of SOCBs rose to 7.2 per cent (IMF 1999a), still a low ratio, containing a potential risk for banking operations.

Table 3.8. Vietnam: Monetary Survey, 1989-98

	89	90	91	92	93	94	95	96	97	98
	(VND trillion, end of period)									
Net foreign assets	0.5	1.7	6.7	10.6	6.6	6.9	10.9	14.3	21.0	31.2
Net domestic assets	7.0	9.7	13.6	16.6	26.6	36.1	41.9	50.4	60.6	71.2
* Domestic credit	7.3	9.9	14.3	17.1	27.8	38.0	47.1	55.3	66.8	81.0
- Net claims on Gov	3.1	4.0	4.1	1.9	3.9	4.6	4.7	4.4	4.4	8.4
-Credit to the economy	4.1	5.9	10.2	15.2	23.9	33.4	42.4	50.9	62.4	72.7
+ to SOEs	3.6	5.3	9.1	12.4	15.9	20.5	24.1	26.8	31.0	38.1
+ to non-SOEs	0.5	0.6	1.0	2.8	8.0	13.0	18.3	24.1	31.4	34.6
*Other iterms, net	-0.3	-0.2	-0.7	-0.6	-1.2	-1.9	-5.2	-4.9	-6.2	-9.8
Broad money (M2)	7.4	11.4	20.3	27.1	33.1	43.0	52.7	64.7	81.6	104.2
of which: total deposits	5.1	7.5	13.9	16.6	18.9	24.4	33.5	42.0	56.5	75.5
* Dong liquidity	5.3	7.7	12.0	18.9	25.1	33.5	41.6	51.5	62.9	78.3
- Currency out banks	2.4	3.7	6.4	10.6	14.2	18.6	19.2	22.6	25.1	27.0
- Deposits (dd+other	3.0	3.9	5.5	8.4	10.9	14.9	22.5	28.9	37.8	51.4
* Foreign Cu Deposits	2.1	3.6	8.4	8.2	8.0	9.5	11.1	13.2	18.7	24.1
- in US$ millions	..	..	..	..	..	862	1004	1180	1520	1733
	(Annual % change)									
Credit to the Economy	..	43.9	71.3	49.8	57.0	39.8	26.9	20.1	22.6	16.4
Broad money (M2)	..	53.1	78.7	33.7	22.0	29.9	22.6	22.7	26.1	25.6
Dong deposits	..	32.2	40.4	51.0	30.2	36.6	51.3	28.5	30.8	36.0
Foreign cu deposits	766	75.6	127	-1.7	-2.1	18.5	16.1	19.0	42.0	28.8

Note: Gov is government, dd is demand deposit, Cu is currency
Source: IMF (1995b), IMF(1999b), IMF (2000).

Besides these issues, the legal system has not yet caught up with banking and financial reform, there is a lack of skills and knowledge in the banking staff, a backward payment system, and supervision and prudential regulations are weak. These influence the effectiveness of the banking system, but they are beyond the scope of this paper.

SOEs Reform

During the reform process, the number of SOEs fell from 12,296 in 1989 to around 5,800 at the end of 1997 since some of those were merged and closed. The SOEs have played an important role in the economy. The SOEs share in total output increased from 24.8 per cent in 1989 to 29.6 per cent in 1994, while employment fell from 11.9 per cent of total employment in 1989 to 8 per cent in 1994 (IMF 1995a: 18). In the period 1997-98, the SOE sector accounted for about 37 per cent of GDP and 8.8 per cent of total employment and it has dominating shares in production of oil, cement, chemicals and steel (IMF 2000: 5,13). SOEs have also used about 50 per cent of outstanding domestic bank credit. The 200 largest SOEs accounted for 60 per cent of state capital and 40 per cent of total debt (IMF 1999a: 42). There are three outstanding issues of SOEs, which need to be considered:

First, SOEs' performance has been very weak. The classification of SOEs from 5,429 enterprises in 1997 showed that only 40 per cent of SOEs were profit makers, 44 per cent were temporary loss-makers and 16 per cent were permanent loss-makers[27] (IMF 1999a: 43). If this situation were to be maintained for long time, it would undermine the health of the economy and banking system since SOEs are the main customers of the banking system and credit is allocated to this inefficient sector.

Second, SOEs' debt has been a big problem. In 1997, SOEs' total debt was VND63 trillion (US$4.4 billion), of which 20VND trillion and VND43 trillion for worst performing and "poor" performing SOEs respectively (classified on the basis of

[27] The large SOEs which are managed by central government seemed to perform slightly better than local ones (that may result from monopolistic position, preferential treatment in business operation including financing and import protection –see IMF 1999a).

profitability and debt ratios) (World Bank 1999). The statistics of 1,044 large SOEs indicated their average debt-asset ratio[28] equal to 0.61 and for two/thirds of the sample (5,429 SOEs), it was higher than 0.5 in 1997 also. These figures reflect the fact that on average, SOEs have larger debt than equity (IMF 1999a). The large debt affects profitability of SOEs since they have to pay more interest and also increase NPLs in the banking system, weakening both SOEs' performance and the banking system.

Third, the process of equitisation of SOEs has been slow. This process was launched in mid-1992, but only 186 SOEs were equitised by August 1999[29]. The reasons for the slow equitisation have been related to "workers and managers about their jobs, concerned to local governments on losing revenue sources and the lack of a well articulated framework for equitisation and valuation" (IMF 1999a: 45). The slow equitisation reduces the pace of SOE reform and development of money and securities markets.

3.4. Conclusion

The banking system in Vietnam before 1988 was a mono one and its role was passive and accommodating to production plans set by the central government. This system had to be reformed in the transition to a market oriented economy. After 1988, and especially since reform of the banking system in 1990, the two tier banking system has been established. The SBV became the state bank, its main functions being to conduct monetary and exchange rate policies, supervising and regulating the operation of the banking system as a whole.

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[28] Debt-asset ratio =(debt/(debt+equity)

[29] See 'Electronic Nhandan's Newspaper' on August 14, 1999. Http://www.nhandan.org.vn

After 10 years of reform, the two-tier banking system has been developed in both number of financial institutions and their assets, these created a framework and facilitated the reforms of monetary and exchange rate policies. However, there are still issues of low degree of monetisation, the underdeveloped money market, bank soundness, and outstanding issues of SOEs, which limit the scope and effectiveness of monetary and the safety of the banking system. These issues have to be taken into account when analysing monetary and exchange rate policies in Vietnam.

Chapter 4

REFORM OF MONETARY INSTRUMENTS: THE TRANSITION FROM DIRECT TO INDIRECT INSTRUMENTS IN VIETNAM

4.1. Introduction

As in many transitional economies, reform of monetary instruments, particularly the transition from direct to indirect instruments of monetary policy, is indispensable in Vietnam (see Chapter 2). After the establishment of the two-tier banking system in 1990 which created the appropriate framework for the implementation and use of indirect instruments (see Chapter 3), the indirect instruments such as RRs and refining facilities were introduced in the early 1990s, and the T-Bill auctions in the primary market officially opened in June 1995.

There were not many studies related to the reform of monetary instruments in Vietnam, except for the few reports from the IMF Mission in 1995-96 and World Bank studies on Vietnam's financial sector in 1995. Their studies are also reviewed in this chapter.

This chapter analyses the reform of monetary instruments, particularly the transition from direct to indirect instruments in Vietnam during the 1990s. The impact of the use of indirect monetary instruments on the financial sector efficiency and on the degree of monetary control are also examined. The chapter is organised as follows: Section 2 examines the reform of monetary instruments and the transition from direct to indirect

instruments. Section 3 evaluates the impact of the use of indirect monetary instruments on the financial sector efficiency and on the degree of monetary control. Section 4 includes the conclusion and policy implications.

4.2. Reform of Monetary Instruments: the transition from direct to indirect instruments

In 1990, the two-tier banking system was established and for the first time, monetary policy was implemented by the SBV in the environment of a market-oriented economy. The ultimate targets of monetary policy as exercised by the SBV are to stabilise the value of the VND, restrain inflation and contribute to economic growth. The intermediate targets of monetary policy are the growth rate of money supply (M2), credit growth, and foreign currency reserves. Based on the macroeconomic conditions and the development of banking and financial sectors, the SBV has to use both direct and indirect instruments of monetary policy to achieve these targets, but it has relied more on direct instruments than indirect ones. During the 1990s, direct instruments have been liberalised and indirect ones have been increasingly introduced.

4.2.1. Direct instruments

The direct instruments of monetary policy which have been used by the SBV include interest rate controls, credit ceilings and directed credit. The main features of those instruments are discussed in the section below.

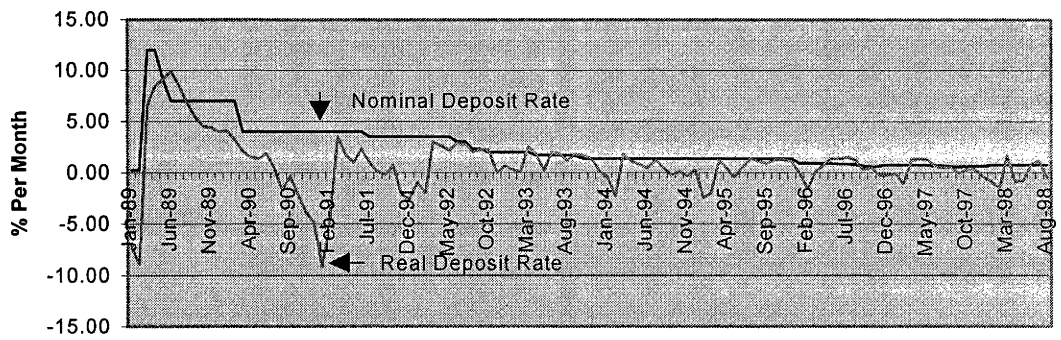
Interest rate controls

From the beginning of financial sector reform in 1989 up to the present, interest rates have been controlled by the SBV. However, reform of interest rate policy has made

some progress: first, real interest rates have become positive. Second, interest rate setting has been liberalised step by step.

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 very low levels, about 0.25 per cent per month (pm) or 3 per cent per annum (pa), but they were pushed up suddenly to a very high level in March and April 1989 (12 per cent pm or 144 per cent pa) and after that they were reduced step by step to 3.5 per cent pm (42 per cent pa) in March 1992 (Figure 4.1). Increasing the nominal DR was a method used the SBV to absorb the cash in circulation; it helped to bring down inflation from about 300 per cent pa in the late 1980s to more than 10 per cent in 1992. Real DRs before March 1989 were highly negative, from more than -5 per cent to -10 per cent pm (Figure 4.1), due to the high inflation rate at that time. With success in curbing inflation, the real DRs became a positive first in March 1989, they maintained in a positive range for more than one year, then went down below zero until February 1992. The real DRs in 1989, 1990, and 1991 were 47.8 per cent, –13.1 per cent, and –22.5 per cent pa, respectively (Table 4.1).

Figure 4.1: Monthly Deposit Interest Rates (01/1989-08/1998)



Source: Mori (1997), SBV (1995-98), Bach and Nguyen (1999). Author estimates the real deposit rate.

The situation with the DRs was similar to the short-term lending rates (SLRs), and

medium and long-term lending rates (MLRs) in that period (Table 4.1, Appendix 4.1 and 4.2). Before March 1992, the nominal SLRs and MLRs were around 40-48 per cent pa. The real SLRs and MLRs were strongly negative (from about -20 per cent pa). Due to anti-inflation policies, the nominal DR was higher than both nominal SLR and MLR from around 5 per cent to 40 per cent pa in the 3-year period from 1989 to 1991, except for nominal SLR in 1991. The interest spreads were highly negative from –34.5 per cent and –6 per cent pa in 1989 and 1990 (Table 4.1).

Table 4.1: Interest Rates in Vietnam, 1989-99 (per cent pa)

Year	Deposit rates		Short-term Lending rates		M & L term Lending rates		CPI	Spreads
	N	R	N	R	N	R		
1989	82.5	47.8	48.00	13.3	42.00	7.3	34.70	-34.50
1990	54.0	-13.10	48.00	-19.10	42.00	-25.50	67.10	-6.00
1991	45.0	-22.50	46.00	-21.50	40.60	-26.90	67.50	1.00
1992	34.1	16.60	41.80	24.30	31.20	13.70	17.50	7.70
1993	20.4	15.20	28.20	23.00	18.00	12.80	5.20	7.80
1994	16.8	2.40	25.20	10.80	16.90	2.50	14.40	8.40
1995	16.8	4.10	25.20	12.50	20.40	7.70	12.70	8.40
1996	9.6	5.10	18.85	14.35	19.00	14.50	4.50	9.25
1997	8.0	4.40	13.50	9.90	14.70	11.10	3.60	5.50
1998	9.7	0.50	14.40	5.20	15.00	5.80	9.20	4.70
1999	6.9	6.80	13.0	12.9	13.28	13.18	0.1	6.10

Note: N is nominal rates, R is real rates, CPI is Consumer Price Index. Nominal annual rates are a sum of 12 monthly rates. The real rates equal nominal rates minus CPI rates. Spreads equal nominal short-term lending rates minus deposit rates. Deposit Rates (DRs) are interest rates for saving deposits (three-months, household), Short-term Lending Rates (SLRs) are interest rates for loans with maturity less than 1 year, Medium and Long-term lending Rates (MLRs) are interest rates for loans with maturity more than 1 year.
Source: Mori (1997), Bach and Nguyen (1999). SBV (1995-99), IMF (2000).
Author estimates the real DR, SLR, and MLR.

This policy used interest rates as an instrument of monetary policy to curb inflation, but with lending rates set below deposit rates, banks could not make profits and, "Consequently, the state commmercial banks require the subsidies from the SBV, and they have no incentive to mobilise dong deposits or, alternatively, have incentives to

introduce non-interest rate barriers to discourage new deposits, such as minimum balance requirements" (McCarty 1997: 61).

From March 1992 to December 1995, positive interest rates were maintained and the SBV moved from setting particular lending and deposit rates to imposing maximum lending rates and minimum deposit rates for each period. All subsidies on interest rate have been abolished from the beginning of this period. In particular, there were no special lending interest rates for SOEs. However, there were special (bargained) interest rates for borrowers in the remote areas or for specific objectives. Nominal DRs were reduced slowly from 34.1 per cent to 16.8 per cent pa through three time adjustments during more than 3 years. The real DRs were high, but they declined over the 1992-94 period from 16.6 per cent to 2.4 per cent pa (Table 4.1).

Nominal SLRs were also adjusted from 41.8 per cent to 25.2 per cent pa through five discrete changes. With low inflation in that period, the real SLRs were very high and also declined from 24.3 per cent to 10.8 per cent pa (Table 4.1). Then the commercial banks achieved the high rates of return at that time.

Nominal MLRs were lower than Nominal SLRs until 1995 and they were also lower than nominal DRs until 1993 (Table 4.1). This implies that there was still a form of subsidy through interest rates to medium and long-term borrowers (most of them were SOEs). The real MLR fell in a range from 13.7 per cent to 2.5 per cent pa over the 1992-94 period. So, real interest rates at that time were maintained at positive levels.

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 organisations). 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 per cent pm (4.2 per cent pa). The special interest rates were replaced by different ceilings for lending rates for urban and rural areas. According to Decision 381/QDNH1 on December 28, 1995, the lending rate for urban areas was 1.75 per cent pm, and for the rural areas 2 per cent. It is argued that this differential is justified since the demand for credit in the rural areas is greater than supply, the loan value is small, and risks and transaction costs are higher in rural areas than in urban areas. The maximum lending rates to mountainous, coastal or Khmer-minority regions were significantly lower than the market rate, from 15 to 30 per cent (Nguyen, 1997).

The nominal DRs (determined by the commercial banks) in the 1996-97 period declined from 9.6 per cent to 8.0 per cent pa. The real DRs also moved to a very low level from 5.1 per cent to 4.4 per cent pa (there were few negative real DRs in several months during this period).

Through five periods of adjustments, the nominal SLRs and nominal MLRs decreased from 18.85 per cent and 19.0 per cent pa to 13.5 per cent and 14.7 per cent pa, respectively. These interest rates were lowest over the last 10 years. However, with very low inflation (from 4.5 per cent to 3.6 per cent pa), commercial banks and credit institutions still had real SLRs and MLRs that were around 10-14 per cent pa. The important point in this period is for the first time since 1989, the nominal MLRs were set higher than SLRs in 1996, and SLRs were higher than DRs from 1991 (Table 4.1). This is a move in the right direction, which can lead to reduction in the borrowing of medium and long-term loans (most borrowers of these loans were SOEs) and direct borrowers to efficiently use bank funds. Interest rate policy in this period was liberalised step by step and interest rates were gradually reduced. The lower interest

rates should have created a more favourable climate for investment and economic growth.

During 1998, the SBV abolished the interest rate differential between urban and rural areas, and the fixed spread of 0.35 per cent pm or 4.2 per cent pa as well, in order to promote competition between the areas. The ceiling of lending rates now applied to all areas, except mountainous, coastal and Khmer-minority regions that still received concessionary interest rates as in previous periods. Nominal DRs were at 9.7 per cent pa in this year, but the real DRs were 0.5 per cent pa due to higher inflation, 9.2 per cent pa in this year compared to 3.6 per cent in the previous year. Nominal SLRs and MLRs have been set to 14.4 per cent and 15 per cent pa, respectively. Their real rates were still positive (5.2 per cent and 5.8 per cent pa), despite higher inflation. The nominal DRs, SLRs and MLRs were slightly higher than in 1997 because the SBV had to maintain the real positive interest rates and they also wanted to absorb the cash in circulation and undertake a tighter monetary policy to reduce the impact of the financial crisis in the region.

In 1999, the ceiling on nominal SLRs and MLRs were reduced to around 13 per cent pa, nominal DRs were 6.9 per cent pa, (Table 4.1). These nominal rates were a bit lower than 1998, but the inflation rate was only 0.1 per cent pa, then the real interest rates were still higher than the previous year. The lower lending rates may stimulate the growth of economy, GDP grew at only 4.8 per cent in 1999 due to falling in both domestic and foreign demand as well as FDI (Table 1.2), after the financial crisis in the region in mid-1997.

In short, throughout the banking and financial sector reforms, interest rates have been

controlled by the SBV. This control is appropriate in conditions of Vietnam where supervision and prudential regulation in the banking system is weak, the legal system is not developed yet and the degree of monetisation is low. The interest rate controls have the advantage in limiting adverse selection problems (see Chapter 2). As a high cost lesson from the past, losing interest rate controls from the SBV was one reason for the collapse of the credit cooperative system in Vietnam in the early 1990s (see Chapter 3). So, full interest rate liberalisation in Vietnam in that period would not be appropriate or too soon. The contribution of interest rate policy in curbing inflation and its gradual liberalisation toward market rates are successes of the SBV in the transition to a market economy and reform of monetary instruments.

However, interest rate controls normally impose deadweight losses on the economy, limit competition and provide incentives for arbitrage and evasion of controls from credit institutions, and hamper the effectiveness of indirect instruments (IMF 1997b). This has been the case in Vietnam and is detailed in sub-sections below.

The spread between the deposit rate and the lending rate

A spread of 4.2 per cent pa between deposit rates and lending rates[30] was applied from January 1996 to January 20th, 1998[31]. Through this regulation, the SBV intended to protect depositors and encourage banks to pay more attention to management and supervision of their business so that they could make profits by reducing costs. In practice, this fixed spread has had harmful effects on the SBV and the banks. First, the spread is harmful to competition (when the spread is regulated, deposit rates are managed too). Banks differ in terms of assets, kinds of business and areas, facilities and management skills. So banks with favourable conditions and low running costs will be

[30] Deposit rates for foreign currency deposits are determined individually by each bank (IMF 1997b).
[31] According to decision 39/1998/QD NHNN1 and the SBV Annual Report 1998.

able take advantage of others. Second, it is highly complicated to calculate the spread and cost for the SBV to ensure compliance by banks, because there are many kinds of deposits and loans with different terms (Nguyen and Nguyen, 1997). In Table 4.1, the spread between short-term lending rates and deposit rates in 1996 and 1997 was 9.25 per cent and 5.50 per cent pa, not 0.35 per cent pm or 4.2 per cent pa; this reflects the fact that banks did not obey this regulation even though non-compliance incurred penalties from the SBV. This outcome also indicates the SBV's enforcement was weak. However, non-compliance means that the market is operating, although the transaction costs are higher than if there were no such regulation. Third, the spread can be circumvented by banks through increasing other fees, or requiring borrowers to hold compensating deposit balances, leading to inefficiencies. Fourth, the spread of 4.2 per cent pa may not ensure the profitability of banks or cover operating costs, since the average bank spreads in countries that have similar per capita income and levels of financial sector development have been around 6-7 per cent pa (IMF 1997b). The fixed spread had been removed since January 1998.

The difference between lending rates of VND and foreign currencies

In Table 4.1 and 4.2, the lending rates for domestic currency (VND) in nominal and real terms are always higher than those for US$, except the real MLRs in 1994 and 1995, and real SLRs and MLRs in 1998 were lower than those for US$, since inflation rates in these years were higher than other years during 1993-1999.

Lower interest rates in terms of other foreign currencies (particularly US$) could encourage domestic borrowers to borrow in foreign exchanges and neglect the foreign exchange risks. During the 1990s, many domestic companies have borrowed US$ from

both domestic banks and foreign bank branches, or opened deferred letters of credit[32] (LC) with guarantees or non-guarantees from the banks to import goods. When imported goods arrive in Vietnam, they are sold (at prices even lower than imported prices) for VND which is deposited to receive interest or used for other businesses. On the due date, these companies would buy back US$ to repay the loans.

Table 4.2: Lending Interest Rates in US$, 1993-99 (per cent pa)

1993	1994	1995	1996	1997	1998	1999
7.5	9.0	9.5	9.5	8.5	7.5	6.5

Note: Data for December each year.
Source: IMF (1997b), SBV (1998), IMF (2000).

Under conditions of lower interest rates for US$ borrowings compared with those for VND, and stable exchange rates, these companies can obtain high rates of return. However, when there is a depreciation of the VND/US$ exchange rate, borrowers who borrow in US$ will lose when they are still holding VND. This was the case of some companies that have faced difficulties due to exchange rate depreciation from the financial crisis in the region. The banks that have guaranteed those companies have also suffered.

Interest rate controls and the effectiveness of indirect monetary instruments

The IMF (1997b) has argued that the interest rate regime imposed by the SBV hampers the effectiveness of indirect monetary instruments. The experience from developing and transitional economies shows that the use of indirect monetary instruments depends on the development of money markets, while interest rate controls could affect the fluctuation in the inter-bank market rates, so that these rates do not reflect the true

[32] This is also one way of circumventing credit ceilings. This will be detailed in the next section.

marginal costs of bank funds or other interest rates, including lending rates (IMF 1997b). Therefore, these controls hamper the development of the money market and limit the effectiveness of indirect monetary instruments. These problems are major limitations to the development of the financial sector and economic growth.

Credit ceilings

Credit ceilings are understood as the maximum volume of credit that is allowed to commercial banks by the central bank over a given period. In financial and banking sectors that are undeveloped and where indirect instruments are not fully introduced, credit ceilings remain the principal instruments of money control in credit expansion.

In Vietnam, a system of credit ceilings has been implemented by the SBV since April 15, 1994. This direct instrument has been used to control credit expansion and constrain inflation, but this control was circumvented by banks until it was monitored.

The SBV decided the total increase in credit for each quarter, and then allotted credit ceilings for each commercial bank, also on a quarterly basis. Theoretically, the allotment of the banks' credit ceilings has been calculated according to criteria such as their equity capital, the amount of credit outstanding, and deposit mobilisations of the previous quarter (MAE 1995). In practice, from 1993 to 1995, the allotment to each commercial bank was just like a share of the total amount of credit increase. The justification for this statement can be found in Appendix 4.3 which denotes the credit shares of the big six commercial banks (four SOCBs plus EXIM and Maritime banks). The credit share of Agribank increased, presumably due to the high priority given to the agriculture sector and rural development. In contrast, IDBV's credit share was reduced; other banks' credit shares were relatively fixed. So, the SBV seems to have direct

control over the credit ceilings of each bank, rather than using the above criteria (Amano 1997).

The penalties for banks that increase their credit more than their allotments have been applied in several ways; for example, the SBV can recall the excess amount of their allotments from the banks, or they may increase the minimum reserves to absorb this credit excess. In 1995, the SBV considered a charge of 0.1 per cent per day of violation. In 1996, the charge for exceeding the ceilings was 0.3 per cent per month over the maximum lending rates (MAE 1996).

According to Decision 43/QD-NH41, the SBV also allowed banks to sell or trade their excess credit ceilings for specific maturities in February 1996 (SBV 1996). In fact, most banks had not reached their ceilings, so the prospects for trading were limited. Also, the SBV has the right to reallocate unused credit ceilings to banks that have used their allocation (MAE 1996).

The number of banks covered by the credit ceilings in 1996 was 24, and 26 in 1997. Joint venture banks and foreign bank branches are not subject to credit ceilings yet (SBV 1997). The credit of banks that were not subject to ceilings grew at a faster rate (7.1 per cent for the quarter) than credit of banks covered (5.0 per cent for the quarter) in the third quarter 1996. Therefore, the credit ceilings should cover all banks, to level the playing field and to make the credit ceilings more consistent with the financial program targets (MAE 1996).

As with other direct controls, credit ceilings create incentives to banks to avoid or circumvent them (IMF 1997b). This was the case of many Vietnamese banks that used

deferred letters of credit (LC) to circumvent credit ceilings until these were included in the credit ceilings from 1995 to 1997. In early 1997, the total LC amounted to around US$2 billion, of which around US$1.2 billion was guaranteed by the SOCBs (60 per cent of total LC was guaranteed) (Ngoc 1997). However, the SBV's data on bank guarantee activities was poor. In 1996, only five banks reported their LC guarantees to the SBV and only US$350 million in guarantees was reported (MAE 1996). Several joint stock commercial banks did not fulfil their LC payment obligations to foreign parties in late 1996-early 1997. This eroded international confidence in the Vietnamese banking system and also reflected the weakness of bank supervision by the SBV. In 1997-98, the SBV implemented a number of measures such as requiring banks to strictly perform their LC commitments, strengthening regulations on LC transactions (Bach and Nguyen 1999). As a result, the backlog of LC payments was reduced to US$200 million at the end of 1998 (IMF 1999a).

Nevertheless, credit ceilings have been a useful tool for controlling credit expansion and constraining inflation in the period before 1998, particularly when the financial market is not deep and other indirect instruments have not been introduced widely. Since the second quarter of 1998, the use of this instrument began to be phased out, because the credit expansion was necessary to promote the economy that was showing the signs of slowdown at this time (SBV 1998). However, the SBV still keeps credit ceilings on hand in case they are needed.

Directed credits

Direct credits were the main instrument of credit policy from the mono-banking system before banking reform in 1990. Credits were provided directly to SOEs or to priority projects in accordance to production plans set by the government (see Chapter 3). In

principle, after banking and financial sector reforms in 1990, direct credit was phased out and SOEs have had to compete with private enterprises to get bank loans; in the second half of 1992, all implicit interest rate subsidies for SOEs were removed (IMF 1995a). As a result, credit to non-SOEs has increased from more than 12 per cent in 1989 to nearly 48 per cent of total credit in 1998, while credit to SOEs gradually declined from around 88 per cent in 1989 to around 52 per cent in 1998 (Table 4.3).

Table 4.3: Share of Credits by Economic Sectors, 1989-98 (per cent)

	89	90	91	92	93	94	95	96	97	98
Credit to SOEs	87.6	89.5	89.9	81.8	66.5	61.3	56.8	52.7	49.7	52.4
Credit to non-SOEs	12.4	10.5	10.1	18.2	33.5	38.7	43.2	47.3	50.3	47.6

Source: IMF (1995b), IMF (1999b), IMF (2000).

However, the SOEs still have found it easier than non-SOEs to access bank credits and receive credit privileges. In 1995, the national investment fund was created by the government to provide preferential credits for selected sectors and disadvantaged regions. Both SOEs and non-SOEs are eligible to access this fund, but 90 per cent of total loans has gone to SOEs. Since 1997, SOEs have been able to borrow from the SOCBs without collateral. SOCBs have been permitted to lend to loss-making SOEs if a sound business plan is presented. Some SOEs, which are facing difficulties in payments, have been allowed the rollover of outstanding credit[33] (IMF 1998). These policies discourage the efficient allocation of financial resources, still favour SOEs, and do not create a level playing field between SOEs and non-SOEs. These could also impair banking system soundness.

[33]The SOEs are typically allowed to rollover loans for half the length of the original maturity. IMF (1999a).

In general, during the 1990s direct controls were used effectively as tools to curb inflation and control the credit expansion, so that they have contributed to the maintenance of macroeconomic stability. However, their use has induced inefficiencies and circumvention, and hampered competition between financial institutions. These direct instruments need to be replaced gradually by indirect instruments when the conditions are sufficient.

4.2.2- Indirect instruments

Indirect instruments have been used by the SBV since the establishment of the two-tier banking system. The instruments used include reserve requirements, rediscount and refinancing facilities, and T-bill auctions in the primary market.

Reserve Requirements (RRs)

RRs have been used as an instrument of monetary policy by the SBV since 1991, after the two-tier banking system was established. This was similar to other transitional economies in transition to the use of indirect instruments. The use of RRs during the 1990s mainly performed the function of countering crises of confidence in meeting unexpected demand and avoiding shortages of liquidity. However, they were not used in an active fashion to influence liquidity (IMF 1997b).

According to the Decree of Banking Law (1990), the RRs ratio could vary from 10 per cent to 35 per cent of total deposits in the commercial banks[34]. But in practice, due to the fact that the assets of commercial banks were small and the inflation rate was low, the SBV imposed an RR ratio of 10 per cent of total deposits (in terms of both dong and

[34]The ratio of RRs from 0 per cent to 20 per cent of total deposits in the commercial banks, according to the Banking Law (1997), that was passed by the National Assembly on 12/12/97, was effective from 1/10/98.

foreign currencies, excluding maturities of over 12 months) in the period before March 1, 1994 (Table 4.4). These RRs were in the form of deposits with the SBV. The deposit base of each bank was estimated by the SBV as the average of deposits outstanding at the beginning and the end of the previous month. However, most banks did not maintain RRs of 10 per cent of total deposits. Actual RRs held in the banking system were 0.7 per cent, 5.6 per cent, and 6.9 per cent in 1991, 1992, and 1993, respectively (World Bank 1995: 102). Penalties for a bank's non-compliance with RRs were rarely enforced, so the RR policy at that time was generally ineffective.[35]

In March 1994, the policy of a uniform RR of 10 per cent of total deposits was changed to the use of differentiated rates by the SBV. The RRs for demand and saving deposits were increased to 13 per cent. In contrast, RRs for time saving deposits (including 3 and 6 month saving deposits) were lowered to 7 per cent (this was raised to 8 per cent from late 1994 to the third quarter 1995). These RRs were applied to all deposits equal to or less than one year of maturity, including foreign currency deposits (deposits over one year of maturity were exempted). The SBV also allowed banks more latitude in choosing the deposit base. Depending on the availability of reported information, banks could calculate the deposit based on a daily average of outstanding deposits during the month or the average outstanding deposit as on the 5th, 10th, 15th, 20th, 25th, and the last day of the month (World Bank 1995).

The components of RRs were also modified. In the previous period, RRs had to be deposited totally with the SBV; the reserve rule was 55 per cent of RRs had to be deposited at the SBV, with no more than 15 per cent of RRs to be T-bills, and 30 per

[35] Besides RRs, the SBV also imposed other ratios (non-statutory) on large cash holdings of banks that vary depending upon the liquidity situation in the financial system. For instance, the SBV can raise the ceiling on cash holdings by banks and ask them to hold any excess with it in a separate transaction

cent to be vault cash (in both domestic and foreign currencies). The coverage of RRs was also extended to finance companies (before, it covered only banks, mainly SOCBs). The change in RR policy gave greater latitude to banks in calculating the deposit base, and partially relieved the burden of banks in maintaining non-interest deposits at the SBV.

However, the new policy had an adverse impact on the financial system. First, the difference in RRs for demand and time deposits left scope for banks to evade their impact. Banks can collude with customers to camouflage demand deposits as time and saving deposits if RRs for demand deposits are higher than time and saving deposits (World Bank 1995). Several countries have abandoned separate RR ratios because of this problem. As the World Bank (1995:31) commented:

> Where the procedures in respect of banking transactions are not well understood or well defined, where staff expertise is limited, observance of the new policy is likely to cause problems, and monitoring and enforcement of the policy by the SBV are likely to be troublesome. From this point of view, the new system is a regressive step.

Second, the inclusion of T-bills in the RRs weakened the monetary policy impact, since the holding of T-bills only changes the composition of RRs and not the volume of credit. Moreover, the RR ratio was considered to be very high compared with neighbouring countries where RRs of about 7-8 per cent are considered as the break-even level. As mentioned above, the SBV has still used excess cash reserves in the transaction account as monetary instruments, even if they are remunerated, but obviously these two ratios imposed a heavy burden on financial intermediaries (World Bank 1995).

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account that earns interest at 0.15 per month to prevent excess liquidity. These ratios have been used

In October 1995, RR regulations were changed again. Separate RR ratios were again unified at 10 per cent. This RR ratio was applied to all domestic currency deposits of less than one year and foreign currency deposits of any maturities; all credit institutions were subjected to the RRs (in 1997, a uniform RR of 10 per cent was imposed on all deposits with maturity of 12 months or less and to all credit institutions, except rural joint stock banks, people's credit funds and credit cooperatives). The deposit base of RRs was calculated on a monthly basis as average deposits per month.

Table 4.4. The SBV's Reserve Requirements, 1991-99 (per cent pa)

	Demand deposit	Saving deposit	3 and 6-month saving deposits	Securities (a)
1991	10	10	10	10
1 March 1994	13	13	7	7
1 November 1994	13	13	8	8
1 October 1995	10	10	10	10
1 January 1998	10	10	10	10
1 March 1999(b)	7	7	7	7
1 June 1999 (c)	6	6	6	6
1 July 1999(d)	5	5	5	5

Note: RRs are calculated on total outstanding deposits on dong and foreign currency with maturities less than 12 months of the credit institutions (the state-run, urban joint-stock banks, foreign banks, joint venture-banks and finance companies).
(a) Securities issued by the banks.
(b) 5 per cent RRs imposed on rural joint-stock banks, central and regional people credit funds and cooperative banks).
(c) 4 per cent RRs imposed on rural joint-stock banks, central and regional people credit funds and cooperative banks). 0 per cent RRs for credit institutions that mobilize and lend funds in gold.
(d) 1 per cent RRs imposed on rural joint-stock banks, central and regional people's credit funds and cooperative banks.
Source: SBV (1995-99).

more as a monetary instrument than RRs (World Bank 1995: 102).

T-bills were removed as a component of RRs, and vault cash was raised to 30 per cent of RRs. Reserve and settlement accounts were merged into single accounts for demand deposits at the SBV. The excess reserve was remunerated at an interest rate of 0.1 per cent pm, and shortfalls in RRs were penalised at the maximum lending rates by the SBV (1995-97).

The new regulation on RRs was extended by the SBV under Decision No 396/QD NHNN1 (signed on December 1st, 1997), effective from January 1, 1998. This new regulation still imposed 10 per cent RRs on all deposits with maturity of 12 months or less and on all credit institutions, except people's credit funds and rural joint stock banks. Under this decision, the structure of RRs is as follows: a minimum of 70 per cent of RRs is to be placed on demand deposit accounts at the SBV, a maximum of 30 per cent of RRs are to be vault cash and valid payment notes that are placed in the credit institutions. The excess RRs are remunerated at an interest rate of 0.2 per cent pm for deposits in terms of VND and 4.86 per cent pa for deposits in terms of foreign currency. Any RR non-compliance is to be penalised (equal to 200 per cent of refinancing interest rates for deposits in terms of VND and 200 per cent of ceiling lending rates for deposits in terms of US$) (SBV 1998).

In the new banking law that was effective from October 1st, 1998, people's credit funds and credit cooperatives are subject to RRs. However, the capital mobilised in these institutions is small (Appendix 4.4), the SBV still considered applying RRs on them until March 1999.

So during the period of three and half years from October 1995 to February 1999, the RRs were maintained at 10 per cent of deposits with maturity of 12 months or less. It is

difficult to argue that RRs were used as an anti-inflation monetary instrument during the period since the annual inflation rate in 1995 rose to 12.7 per cent, declined to 4.5 per cent in 1996, and to 3.6 per cent in 1997. During this time RRs were fixed at 10 per cent pa. In addition, these RRs were very high, which imposed a heavy burden on credit institutions. From 1995 to 1998, the nominal SLR fell from around 25 per cent to 14 per cent pa, and the nominal MLR declined from 20 per cent to 15 per cent pa, while the RRs remained at 10 per cent pa. Thus the RR policy was rigid and financial intermediation in the banking and financial sector may be discouraged.

Since March 1, 1999, the RRs have been reduced to 7 per cent for all deposits of less than 12 months maturity. The regulation applied to state-run, urban joint-stock banks, foreign banks, joint venture-banks and finance companies. RRs of 5 per cent are imposed on rural joint-stock banks; regional people's credit funds and cooperative banks. By June 1, and July 1, 1999 the RRs were reduced continuously to 6 per cent and 5 per cent for all deposits of less than 12 month maturities, for all credit institutions except rural joint-stock banks, regional people's credit funds and cooperative banks which have RRs imposed of only 4 per cent and 1 per cent in June 1 and July1, 1999, respectively (Table 4.4). The reduction of RRs in 1999 may create favourable conditions for credit institutions to extend credits and improve their profitability.

Rediscount and Refinance Facilities.

Refinancing and refinance rates are also indirect instruments used by the SBV to regulate the volume of credit since the early 1990s. The refinance facilities have been introduced in simple form, due to lack of securities and other payment instruments in Vietnam.

There are two types of refinance facilities that have been used. The first type relates to short term lending to banks when there is any shortfall in payments clearing and settlement arrangements. All banks can access this facility. The refinancing interest rate rises with the length of the period of refinancing; 0.06 per cent per day for credit for one to five days, 0.09 per cent per day for six to ten days and 0.12 per cent per day for more than ten days. The rates for less than ten days were lower than the maximum lending rates (SLR and MLR) in 1990-92. So, this facility provided little incentive for banks to manage their own short-term liquidity, and encouraged them to access the SBV's credits (World Bank 1995).

Table 4.5: Refinancing Interest Rates, 1993-99

	Agribank	Incombank	IDBV	Vietcombank	
April 1993	60	70	75	85	(% of their loan
October 1993	60	80	80	80	contract rates)
April 1994	85	95	95	95	.....
October 1994	95	100	100	100	.....
April 1995	100	100	100	100	.....
March 1997	1.10 % per month - for all credit institutions				
August 1997	0.90 % per month -				
January 1998	1.10 % per month -				
January 1999	1.10 % per month -				
December 1999	0.50 % per month -				

Note: Agribank is the Bank for Agriculture and Rural Development, Incombank is the Industrial and Commercial Bank, IDBV is the Investment and Development Bank, and Vietcombank is the Bank for Foreign Trade of Vietnam
Source: SBV (1995-99).

The second type has been concerned with the longer-term facility and deals with refinancing of specific loan contracts involving documents. At the beginning, only SOCBs could use this type of refinancing; later on it was made available to all

commercial banks. Before 1995, specific loans were financed for periods of 45 to 180 days, and the financing interest rates were set individually for particular banks (World Bank 1995). The penalty rate for failure to repay on time was 150 per cent of the original refinancing rate.

According to Table 4.5, the Bank for Agriculture and Rural Development was charged the lowest discount rates (from 60-85 per cent of their loan contract rates) in the 1993-94 period, which reflected the priority given to the agricultural sector by the government. Other banks were offered higher rates, from 70-100 per cent of their loan contract rates.

From April 1995 to February 1997, all banks were charged the same refinancing rate, which was equal to 100 per cent of corresponding lending interest rates of commercial banks. This policy limited the borrowings from the central bank. From March 1997 to January 1999, the refinancing rates were set in a range from 1.1 to 0.9 per cent per month (or 13.2-10.8 per cent pa) for all other credit institutions. These rates were lower than the nominal short, medium and long-term lending rates in the period 1997-98 (Table 4.1).

During 1999, the new financing rates were reduced four times from 1.1 per cent pm to 0.5 per cent pm (13.2 per cent to 6 per cent pa). 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.

In general, the refinance facilities in place during the 1990s have been used as indirect monetary instruments to control the volume of credit in the financial sector. The SBV

has adjusted refinancing interest rates to encourage or discourage credit institutions from borrowing from the central bank in response to inflation trends. In 1994-95, inflation increased to over 10 per cent pa, the highest rate in the period 1992-99. The refinancing rate also reached its highest point (100 per cent of their loan contract rates) during this period. It was lowered when inflation fell to single digit levels in the period 1996-99.

However, there are some shortcomings of this policy as follows:

First, the rediscount and discount windows of the SBV are still limited in their effectiveness since discount window activities of the commercial banks and credit institutions are very limited. The commercial banks mainly repurchase T-bills and T-bonds in the market. This is due to the lack of other securities such as bills of exchange and promissory notes that were mentioned in the commercial law (effectively from 1/1/1998), and warrants as well. Moreover, company shares are very rare, because SOEs equitisation is still in its infancy. As of August 1999, only 186 SOEs had been equitised (see Chapter 3). They are mainly small enterprises so the volume of their shares limited. Moreover, legal arrangements that involve regulating securities transactions are very poor. These make discount window activities improve very slowly[36].

Second, the role of the SBV as lender of last resort is distorted since the government has used the SBV to refinance the SOCBs to enable them to channel funds to SOEs and to the rural sector (World Bank 1995). Moreover, the refinancing rates have been lower than interest rates in the period since February 1997, which could provide more credit to banks. But it may discourage them from managing their own liquidity, seeking to

[36] See, Ha Cuc, Banking Review-The SBV, No 14, July 1998.

borrow from the inter-bank market, and encourage them to borrow from the SBV with cheap credits which may affect the last resort function of the central bank.

Open Market Operations (OMO)

Vietnam does not have open market operations, since the securities market was not established until 1999, the inter-bank markets for domestic and foreign currencies have not developed, and generally there is a low degree of monetisation (Chapter 3). However, since 1996, the SBV has been putting in place the basic requirements for OMO such as the legal framework, determination of OMO, working rules of a steering committee for OMO, and the establishment of State Securities Committee (SSC).

Although OMO have not been introduced due to the necessary condition not being in place, T-Bills and Bonds have been issued to the public by the Ministry of Finance (MOF) since the early 1990s (25/03/1991). The volume of T-bills was estimated at VND 13,193.5 billion up to 1994 (Bach and Nguyen 1999), with the highest interest rates around 27 per cent pa at the end of 1993 (Nguyen 1998b). These T-bills and bonds are effective instruments of the government to borrow from the public and financial sector, in order to finance the budget deficit and important projects such as infrastructure and strategic industry.

On June 10th, 1995, open market type operations in the form of T-Bill auctions were began in Hanoi (SBV 1995). The amount of winning T-Bill auctions was around VND 240 billion during four bids in 1995, and the average weighted cut-off rate was 17.6 per cent pa (Table 4.6 and Figure 4.3). The MOF has coordinated with the SBV to regulate this market.

The T-Bills market increased modestly in 1996. After 19 bids, nearly VND 980 billion T-Bills were sold at an average weighted rate of around 9.0 per cent pa. However, the volume of T-Bills sold accounted for around 27 per cent of the amount planned, equal to around 12 per cent of total T-Bills issued. The auction was opened only irregularly, and the number of eligible participants was limited.

Table 4.6: T-Bill Auctions, 1995-99 (VND Billion)

	1995	1996	1997	1998	1999
Total T-Bills Issued	7649	8347	6186	..	..
Maturity					
3-month	-	-	-	..	..
6-month	3207	94	-	..	..
9-month	4442	46	-	..	..
1-year	-	4400	2200	5130	4400
2-year	-	3807	3986	..	..
Total amount of planned bids	..	3598	4090	5130	4400
Amount of successful bids	243	976	2913.9	4020	3011.6
(% of planned bids)	..	27.1 %	71.2 %	78.4 %	68.4 %
Highest-lowest cut-off rates (% pa)	18.0-17.2	13.8-7.89	12.0-9.0	12.0-11.0	11.5 - 4.5
Average weighted cut-off rates (% pa)	17.6	8.96	10.2	11.64	..
Number of auctions	4	19	37	46	46
Frequently	irregularly	irregularly	Weekly after May	Weekly	Weekly

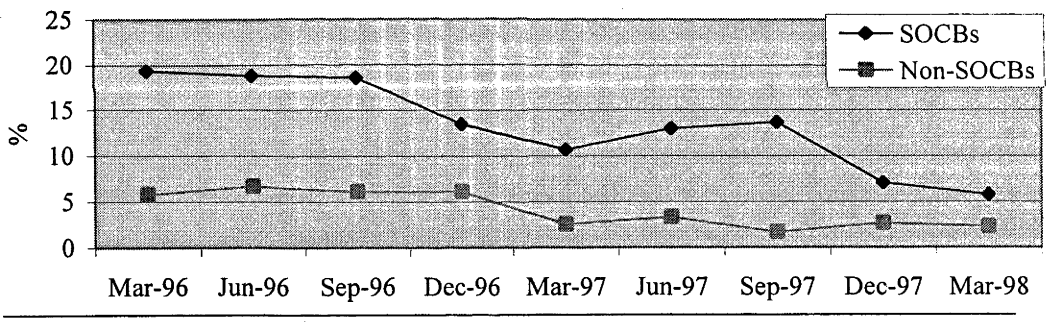
Source: SBV (1995-99), IMF (1997a), Nguyen (1998a), Bach and Nguyen (1999).

The T-Bills market was extended in 1997-98. There were 37 bids in 1997 and 46 bids in 1998, with the amount of successful bids rising from around VND2900 billion in 1997 to VND4020 billion in 1998. The cut-off rates rose from 10.2 per cent pa to 11.64 per cent pa. More than 60 per cent of credit institutions participated in the T-Bills market, and from May 1997 T-Bill auctions have operated weekly. In 1999, the number of T-Bill auctions was the same as 1998, but the amount of successful bids declined to

around VND3000 million. The reduction in the amount of successful bids in 1999 was due mainly to low cut-off yields which were in a range from 11.5 per cent to 4.5 per cent pa, and the issuance of the national construction bonds at that time (SBV 1999).

During five years of operations, T-Bill auctions were not only used as a tool of saving mobilisation for government, but also considered as an indirect instrument to absorb excess reserves for credit institutions, particularly to SOCBs. Since 1995, SOCBs have been the biggest successful bidder in the number of bids and volume of T-Bill auctions which accounted for more than 80 per cent of total T-Bills auctioned (SBV 1995-99). This may have contributed to reduce excess reserves of SOCBs from around 20 per cent in March 1996 to 5 per cent of total deposits in March 1998 (see Figure 4.2).

Figure 4.2: Excess Reserve (per cent of total deposits)



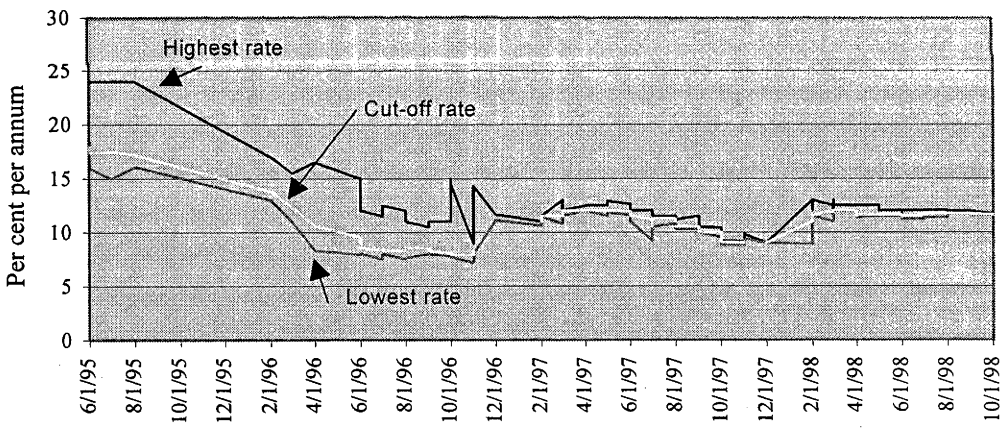
Source: IMF representative office-Hanoi, in Bach and Nguyen (1999).

However, the T-Bills market has experienced some shortcomings during these years of operations. These are detailed below:

First, the cut-off rate in the auctions has usually been steered by the Ministry of Finance (MOF) (or the cut-off rate was predetermined). This rate depends on the demand for funds to finance budget deficits and may not reflect the true demand and supply of capital markets. This may affect bank deposit rates if the cut-off rate was steered too high and make T-bill auctions slow if it was steered too low.

Second, the maturity of T-Bills is too long. In Table 4.6, except for 1995, there were small amounts of T-Bills that had maturities of less than one year in 1996, and there were no T-Bills with such maturity in 1997-99. With a secondary market not yet established, the long maturity T-Bills have limited the participation and purchases of banks in the T-Bill market in 1998 since most of their mobilised funds were short-term ones (SBV 1998), then banks need to buy short-term T-Bills in the case of excess reserve. This is different from the experience in other transitional economies and developing countries in transition to indirect instruments where short-term government bills were preferred. Therefore, the lack of short-term T-Bills hampers the effectiveness of this instrument as an indirect instrument of monetary policy.

Figure 4.3: Interest Rates of T-Bill Auctions, 1995-98



Source: SBV (1995), IMF Representative Office in Hanoi, in Bach and Nguyen (1999).

Third, the liquidity of the T-Bill market is low. This feature is related to the long-term T-Bills and the lack of a secondary market. Moreover, it also concerns the fact that the SBV discount window is weak. Some commercial banks that have T-Bills wanted to discount in the SBV to get funds back but they were refused (Nguyen 1998b). This was one factor discouraging the development of the T-Bills market in Vietnam at that time.

Fourth, the SBV may not need to issue its own bills at the present time, since the T-Bill market is not fully developed. If the SBV issues its bills, there will be overcrowding of T-bills and SBV bills. This will result in a depressed yield on bills, discourage the holding of bills by the financial institutions and may involve the SBV in heavy losses (IMF 1997a).

In brief, indirect instruments have been introduced increasingly in Vietnam and they are starting to replace direct instruments. Indirect instruments have contributed to the control of credit expansion, mobilising funds and reducing excess reserves. However, due to the thinness of the financial market, and with a securities market not yet established, the role of these instruments in the banking and financial sector is limited. The impact of the use of indirect instruments in the financial sector is analysed more clearly in the next section.

4.3. Assessing the impact of using indirect monetary instruments on financial sector efficiency and on the degree of monetary control

As mentioned in previous sections, Vietnam has used RRs and refinancing facilities since the early 1990s, while T-Bill auctions have only been in operation since June 10, 1995. From this date, the SBV has officially used T-Bill auctions as an indirect instrument of monetary policy to influence the demand and supply conditions of the money market. This date, therefore, is the official start for the use of indirect instruments and transition to indirect instruments of monetary policy in Vietnam. The sample period to do the analysis in this section should cover from the early 1990s to the end of 1999, but due to lack of data, the sample period is limited from 1992Q4 to 1998Q3. So, from 1992Q4 to 1995Q1 is called the pre-transition period from direct to

indirect monetary instruments, and from 1995Q2 to 1998Q3 is called the transition period (since Vietnam has not yet completed the transition to indirect monetary instruments).

The impact of the use of indirect instruments on financial sector efficiency and the degree of monetary control can be assessed through examining the change in the level and volatility of financial variables between the pre-transition and transition period (Alexander *et al.*1995).

4.3.1. Variables

Changes in interest rate spreads (SPR) can be used as measures of the efficiency of financial intermediation and the level of competition in the banking and financial sector within a country (however, they are not comparable across countries since transaction costs and other factors vary across countries). A narrowing of interest rate spreads suggests an increase in the efficiency of service in the banking sector (for example, it indicates lower transaction costs), and vice versa.

The share of credit going to the private sector in total domestic credit (SHARE)[37] can be used as a measure for the reallocation of financial resources to the efficient sector. An increase in the share of credit to the private sector indicates increased efficiency in the reallocation of financial resources.

The level and volatility of three financial variables such as money multiplier (M2/M0), the ratio of narrow money to broad money (M1/M2), and short-term interest rates

[37] Other variables such as the deposit market share of banks and the loan market share of banks can be used as measures of the banking sector in other countries, but such information is not available in Vietnam.

(SINT) are used to measure changes in the level of monetary control. Volatility is measured through the coefficient of variation in the period before and during transition. For the case of the money multiplier (mm), see Equation 2.3 (Chapter 2). At a given monetary base (H), if the money multiplier increases, money stock (M) will rise. The volatility of the money multiplier reflects the degree of monetary control by the central bank; when the volatility of the money multiplier increases, it underlines the potential for a loss of monetary control (Alexander *et al.* 1995).

The conventional formula for M1/M2 is:

$$M1/M2 = \frac{C+D}{M1+SD+STD}$$

Where:

C is currency; D is demand deposits; SD is saving deposits; and STD is small time deposit.

A decline in the level and volatility of M1/M2 denotes that the shift from short- term deposits to long-term deposits and the increase of confidence in the banking sector or may be the result of positive and higher real interest rates (Alexander *et al* 1995).

An increase in the volatility of the short-term interest rate (SINT) indicates that interest rate management has become more active or interest rates have become more market determined during the transition period. In contrast, the lower volatility of short-term interest rates may reflect the fact that the central bank and the market have gained experience in operating in the liberalised environment (Alexander *et al* 1995), and the level of monetary control is improved.

4.3.2. Model specification and data

Model specification

The F-test is a test of the stability of regression coefficients over two or more

subsamples of the data. The Chow-test is a special form of the F-test to examine the significance of the shift of the mean of financial variables between two periods, and the Goldfeld-Quandt test is another form of F-test to test the volatility of the variables between two periods.

The Chow-test and the Goldfeld-Quandt test were carried out on autoregressive regressions of order one in the level of financial variables in the form (4.1):

$$X_t = \beta X_t(-1) + \varepsilon_t \qquad (4.1)$$

Where X_t is a financial variable at time t; and ε_t is a disturbance term.

Form (4.1) is used to examine the whole sample period. Form (4.2) for the pre-transition and (4.3) for transition periods:

$$X_t = \beta_0 X_t(-1) + \varepsilon_t \qquad (4.2)$$

$$X_t = \beta_1 X_t(-1) + \varepsilon_t \qquad (4.3)$$

The hypothesis for the Chow test is: H_0: $\beta_0 = \beta_1$

The F statistic is calculated as follows:

$$F \text{ (Chow test)} = \frac{(RRSS - URSS)/k}{URSS/(n_0 + n_1 - 2k)}$$

Where: RRSS is the restricted residual sum of squares for the whole period (4.1); URSS is the unrestricted residual sum of squares, URSS = RSS_0 + RSS_1; RSS_0 is the residual sum of squares in the pre-transition period; and RSS_1 is the residual sum of squares in the transition period. k is the number of regressors; n_0 and n_1 are the number of observations in the pre-transition and transition periods (Maddala 1992).

If the F statistic is significant, then the null hypothesis of $\beta_0 = \beta_1$ is rejected, that is we reject the hypothesis of stability between the pre-transition and transition periods.

* The hypothesis for the Goldfeld-Quandt test is homoskedasticity between two periods, H_0: $\sigma_0^2 = \sigma_1^2$ and the F ratio for the test is calculated as follows:

$$F = \frac{\sigma_1^2}{\sigma_0^2} = \frac{RSS_1/n_1}{RSS_0/n_0}$$

Where σ_0^2, σ_1^2 is the variance of the financial variables in the pre-transition and transition periods (Maddala 1992).

If the F ratio statistic is significant, the null hypothesis of $\sigma_0^2 = \sigma_1^2$ is rejected, that is, we reject the hypothesis of homoskedasticity between the two periods[38].

Data

All data are quarterly data series from 1992Q4 to 1998Q3. From 1992Q4 to 1995Q1 is called period 0; from 1995Q2 to 1998Q3 is period 1. SHARE (share of private sector credit in total credit), M1/M2 and M2/M0 were collected from the SBV. SPR and SINT were taken from Mori (1997) and IMF (2000). All variables are analysed in their levels.

4.3.3. Financial Sector Efficiency - Results of Regressions

In Table 4.7, we can see that the mean of the interest rate spreads declined from 0.68 per cent to 0.59 per cent per month (pm) between the pre-transition and transition periods. However, the result of the F test is insignificant at the 5 per cent level, so we cannot reject the hypothesis of the stability of regression coefficients between periods. This suggests that the efficiency of service in the banking and financial sector was not

[38]The above tests proposed and carried out here assume that the changes, if any, in the parameters are entirely (or only) due to the reform of monetary instruments. In a fair assumption, there may be some other factors that can influence the evolution of the parameters such as the development of infrastructure in the economy and the development of technology in the banking system (computers, payment system, etc). The development of infrastructure such as transport and telecommunications, the use of computing systems can improve productivity of banking staff, reduce transaction costs in the banking activities, then interest rate spreads (SPR) may be narrowed, short term interest rates may be reduced. With the development of such technology, the central bank can have sufficient information on the best time to adjust reserve requirements (RRs) to control money base or M2, which means that it influences the money multiplier. However, the development of technology in the Vietnamese banking system is slow (see the SBV annual report 1996-99), banking staff skills are limited. Then we assume that during the period 1992-98, the development of technology and other factors are unchanged, to analyse how the changes of the above variables are due to the use of indirect monetary instruments.

improved or improved very little. The experience of most countries which have undertaken transition to indirect instruments show that interest rate spreads initially widened during the transition period and then narrowed significantly in the post transition period (Alexander *et al.* 1995). In only some cases, Egypt, Ghana, Kenya, Mexico, The Philippines, and Sri Lanka, interest rate spreads declined during transition.

The share of credit to the private sector in total credit increased in the pre-transition to transition periods, with its mean increasing from 32.85 per cent to 46.66 per cent. This is similar to most countries in the transition to indirect monetary instruments. However, the F test result is insignificant at the 5 per cent level. These results suggest that although share of credit to the private sector was increased, statistical evidence was not strong enough to reject the hypothesis that the use of indirect instruments of monetary policy from pre-transition to transition periods did not greatly increase the efficiency of the financial sector.

Table 4.7: Trends in Financial Variables between Pre and Transition Periods

	Interest rate spreads (SPR)	Share of credit to private sector in total credit (SHARE)
$Mean_0$	0.68	32.85
$Mean_1$	0.59	46.66
F (Chow test) $[F_{1,21,\ 5\ per\ cent} = 4.32]$	0.52	2.55

Note: $Mean_0$, and $mean_1$ are sample means for the pre-transition and transition periods, respectively.
Source: Author's estimates

4.3.4. Monetary control - Results of regressions

In Table 4.8, the mean values of the money multiplier increased between the pre-transition and transition periods as well as their standard deviations, this is the same as

in other countries undergoing the transition. The results of the F tests from both Chow and Goldfeld-Quandt tests show that the hypothesis of stability of regression coefficients and the homoskedasticity hypothesis cannot be rejected at the 5 per cent level. These results indicate the potential for maintaining monetary control by the SBV in the transition to indirect instruments of monetary policy.

While the M1/M2 ratio declined between the two periods, the Chow test result indicates there was no structural break between the two periods. The Goldfeld-Quandt test also denotes the variability of the M1/M2 was unchanged. These results imply that there was no significant shift toward long-term deposits and improved confidence in the banking system. This is similar to the situations in countries such as Egypt and Malaysia in the Alexander *et al* (1995).

Table 4.8: Trends in Monetary Indicators between Pre-transition and Transition Periods

	Money multiplier (M2/M0)	M1/M2 Ratio	Short-term interest rates (SINT)
$Mean_0$	1.79	0.55	2.21
$Mean_1$	2.12	0.48	1.47
F (Chow test) $[F_{1,21,\,5\%} = 4.32]$	2.03	0.21	0.21
$Sdev_0$	0.064	0.023	0.202
$Sdev_1$	0.217	0.019	0.407
F ratio (Goldfeld-Quandt test) $[F_{14,9,\,5\%} = 3.01]$	0.78	0.38	1.25

Note: $Mean_0$, and $mean_1$ are sample means; $Sdev_0$, $Sdev_1$ are the sample standard deviations for the pre-transition and transition periods, respectively.
Source: Author's estimates

Finally, short-term interest rate level declined, while volatility increased between the pre-transition and transition periods. This can be explained by the fact that interest rates

in Vietnam were still controlled by the SBV but were liberalised step by step during the 1990s (see direct instruments section). This is the same as most countries in the transition to indirect instruments, where the volatility of short-term interest rates increased during the transition period. This may be a sign of more active interest rate management or that those interest rates were more market-determined. In the post-transition period, the volatility of short-term interest rates decreased as the central banks and markets gained experience in operating in a liberalised environment (Alexander *et al.* 1995). However, the F-test results do not indicate that the stability of the regression coefficients and variability declined between the periods

The above results show that the statistical evidence is too weak to state that the use of indirect monetary instruments have increased the efficiency in the financial sector in Vietnam, but that during the transition to indirect instruments, the SBV still managed to maintain monetary control. This conclusion is supported by the high level of NPLs and low profitability in the banking sector (Chapter 3), but inflation was controlled at single digit level and macroeconomic stability was maintained during that period.

4.4. Conclusion and policy implications

The reform of monetary instruments, particularly the transition to indirect instruments in Vietnam has been performed in the context of financial sector reform and comprehensive economic reform. The transition is still underway as it is in other transitional economies and developing countries.

In the reform of monetary instruments during the 1990s, the SBV still relied on direct instruments and the use of direct instruments contributed to control inflation and maintain macroeconomic stability. However, it induced the inefficiency in financial

intermediation and misallocation of financial resources. Interest rate controls were used as an effective tool to curb inflation, but financial intermediation produced losses for banks. Fixed interest spreads hamper competition between banks and inefficiency. Credit ceilings were a good tool to control credit expansion, but it was circumvented by banks until monitored. Directed credits to SOEs were stopped in 1992, but SOEs still have found it easier than non-SOEs to access bank loans and receive credit privileges. During that time, interest rates controls were liberalised step by step and credit ceilings were phased out after mid-1998.

Indirect instruments have been increasingly introduced and become more market-determined; however, due to low level of monetisation, underdevelopment of money market and securities market was not established yet at that time, then the role of indirect instruments were limited. RRs have been introduced since 1991, but it was not used flexibly to influence liquidity. In contrast, refinancing facilities were used flexibly to direct the banking system to borrow from the SBV, which in accordance to the inflation trend, despite the fact of rediscount activities were limited. T-Bill auctions have been used to mobilise funds and also contribute to reduce excess reserves in the banking system, nonetheless the effectiveness of these instruments were restricted due to T-Bill maturity being too long and its liquidity being low.

The results from empirical analysis in this chapter show that the use of indirect instruments contributed to an increased degree of monetary control. However, the evidence is too weak to conclude that the use of indirect instruments increased efficiency in the financial sector. This is an important shortcoming of the reform and transition to indirect monetary instruments.

Based on the experience of the transitional economies and developing countries in transition to indirect monetary instruments, and based on the macroeconomic conditions and level of development of banking and financial sector, and the results of the present study, further policy reform on this issue may be suggested as follows:

At this state of transition to indirect instruments, where macroeconomic stability is still maintained and financial markets have been developed moderately (Chapter 3), direct instruments should be gradually phased out, but the SBV still keeps them in hand when needed. Ceilings on lending rates are still set by the SBV; this should be more market determined to reflect the true demand and supply of money market. Credit ceilings no longer exist, but strengthened regulations on LC are necessary to reduce the foreign exchange risks for borrowers and the banking system. Credit to the heavy loss making SOEs should be restricted as well as the credit privilege to improve financial discipline, reduce NPLs and increase the efficiency in reallocation of financial resources.

As experience is gained in the transition to indirect instruments and the development in the financial market, the SBV should increasingly implement indirect instruments and begin to replace the direct ones. RRs should be implemented more flexibly as anti-inflation monetary instruments. The enforcement of compliance should be raised to a level playing field to increase the effectiveness of this instrument. Rediscount and refinancing facilities should be developed and widened to all credit institutions, and refinancing rates should be considered as the key rates to drive market rates. The maturity of T-Bills should be shorter (less than one year: 3-9 months) to increase the effectiveness of this instrument. The role of the MOF in predetermination of T-Bill cut-off rates at auctions should be reduced, and the market allowed to determine those rates. The operation of the securities market should be promoted and after that OMO would

soon be able to be implemented.

In the transition to indirect instruments in Vietnam, further reforms of the banking system and SOEs are crucial for not only reform of monetary instruments, but also for macroeconomic stability and economic growth. A safe and sound banking system that will help protect macroeconomic stability, is also a key factor in ensuring that the central bank controls of money supply and liquidity are freely and rapidly transmitted. Restructuring of the banking system should be implemented, which includes measures to merge or close weak Joint Stock Banks, remove a portion of NPLs from banks' balance sheets and transfer them to a separate loan recovery agency. The equitisation of SOCBs would be necessary to increase capital and gain management experience. Moreover, supervising and regulatory frameworks should be improved. Legal system should be used to strengthen the rules on bank licensing, bankruptcy, collateral valuation and transfer of land use rights etc (IMF 1999a).

SOEs should be further reformed, since their weak performance and high level of NPLs undermine the health of economy as well as banking system. Equitisation and other methods should be stimulated and introduced to improve SOEs' performance and foster the development of a securities market.

When the banking system is consolidated and SOEs performance is improved, interest rates should be fully liberalised to encourage competition between banks and financial intermediaries, and to create favourable conditions for the development of the money market and at this stage the SBV will have enough conditions to rely fully on indirect instruments.

Chapter 5

EXCHANGE RATE POLICY IN DEVELOPING COUNTRIES AND THE EFFECTS OF EXCHANGE RATES AND PRICES ON TRADE FLOWS

5.1-Introduction

The Bretton Woods system of exchange rates was established after World War II. Under this system, exchange rates were fixed but they could be adjusted in very narrow bands to correct "fundamental disequilibrium". These adjustments were subject to international agreement.

In the late 1960s, due to the integration of world capital markets, growing inflation differentials which produced speculation over parity changes caused the Bretton Woods system to break down. In early 1973, major industrial countries moved to floating exchange rate systems. Since the mid-1970s, many developing countries have also moved away from pegging to a single currency to pegging to a basket of currencies or adopting a more flexible exchange rate arrangement (Aghevli *et al.*1991). The shift from a single currency fix to fixing to a composite basket of currencies can reduce the adverse effects of fluctuations in the exchange rate of the major currencies[39]. More flexible exchange rate arrangements have been adopted increasingly since domestic inflation in many countries rose sharply during the 1980s. As a result these countries

[39] For examples: US$, Pound, D Mark, Francs.

had to depreciate their currencies to maintain international competitiveness. Moreover, under the circumstances of high capital mobility, an adjustable peg or a tightly managed float with occasional large adjustment is a very difficult regime to sustain[40].

Exchange rate policy in developing countries has been used generally as a macroeconomic policy tool to achieve and maintain international competitiveness, and so ensure a viable balance of payments (BOP) and anchor domestic prices. These objectives of exchange rate policy have been debated extensively, but both policymakers and economists have to consider the relative weight of each objective in formulating an exchange rate policy (Aghevli *et al.* 1991). To achieve the first objective of exchange rate policy, that is, maintaining international competitiveness, and to ensure sustainable BOP, devaluation and other policies such as import tariffs and export subsidies had to be considered. The policy that was chosen depended on conditions such as the response of trade flows to changes in exchange rates and prices, the Marshall-Lerner condition, the BOP position, and international agreements on exchange rates.

Deciding on the appropriate policy to follow is important, especially for countries that are opening to international trade in the context of the floating exchange rate regimes of industrial countries and the more flexible exchange rate arrangements of developing countries. As a result of being more open, they became more vulnerable to the fluctuation in prices and exchange rates. The size and response time of imports and exports to changes in export and import prices and exchange rates are important to policy makers. From this information, they can choose appropriate policies such as

[40] See IMF (1997c). "With the knowledge that the exchange rates will be changed if pressure becomes too intense, strong pressures tend to build up when the market perceptions shift (sometimes quite suddenly) to view that the rate is no-longer sustainable. In a situation of high capital mobility, the exchange regime needs to be either a very determined peg with consequent constraints on other economic policies, or it needs to be a managed float where the exchange rate moves regularly in response to market forces although quite possibly with some resistance from intervention and other policy adjustments"- p7.

import tariffs, export subsidies, or devaluation to improve trade balance and BOP (Chua and Sharma 1998).

This chapter reviews the exchange rate regime and exchange rate policy of developing countries and theoretical issues that related nominal and real effective exchange rates, the effects of exchange rates and prices on trade flows. The review provides the basis for analysis of exchange rate policy reform, and the effects of exchange rates and prices on trade flows in the subsequent chapters. The chapter is organised as follows: Section 2 summarises the definition of nominal and real effective exchange rates and their calculation methods in developing countries. Section 3 reviews theoretical aspects, which are concerned with the effects of exchange rates and prices on trade flows, and a literature review of this issue as well. Section 4 introduces the Error Correction Model (ECM).

5.2-Nominal and real effective exchange rates

5.2.1- Definitions of nominal and real effective exchange rates

The nominal bilateral exchange rate can be defined as the domestic currency price of a unit of foreign currency, for instance the number of Vietnamese dong per US dollar. The nominal effective exchange rates are also defined to capture the changes in other currency prices to domestic currency price. It can be determined through weighting the bilateral exchange rates according to each currency in total imports, exports or trade (imports plus exports). Given the diversification of foreign trade in the region and in the world as a whole, effective exchange rates provide more useful information on relationships among currencies and their weights in foreign trade than bilateral ones. That is a reason why effective exchange rates are usually used in the analyses of exchange rates and foreign trade.

The real exchange rate is a measure of the competitiveness of a country in international trade. There are two common definitions of the real exchange rates (see Edwards 1988, Nguyen and Martin 1987). First, the real exchange rate (RER) is measured as a ratio of the price of tradeable to non-tradeable goods ($RER = P_T/P_{NT}$). This definition emphasises the rate at which tradeable goods are exchanged for non-tradeables, or the costs of domestically producing tradeable goods. Second, the definition of RER is based on the concept of Purchasing Power Parity (PPP), $RER = ER*(P^f/P)$, where ER is nominal exchange rate (bilateral or effective), P^f and P are foreign and domestic price levels, respectively. This definition is popular because of the availability of data. The approach implies that all changes in the nominal exchange rate are attributable to differences in inflation. However, PPP does not hold exactly in an absolute (level) or relative (percentage change) sense, because of substantial differences in productivity levels and productivity growth across countries (Fallon *et al.* 1995: 20).

For developing countries, the RER measured by PPP can combine the price of tradeable and non-tradeable goods: RER = ER*(WPI/CPI), where ER is either the nominal bilateral or effective exchange rate. WPI is the wholesale price index (or producer price index) in foreign countries (industrial countries) and is a proxy for tradeable prices, because WPI contains mainly tradeable goods. CPI is the domestic consumer price index that is a proxy for non-tradeable prices. Even though the CPI contains some tradeables, it is heavily influenced by non-tradeable goods and non-traded activities, such as retail sales, so it is a reasonable proxy for non-tradeable prices (Harberger 1986). Therefore, the PPP measure of RER is used in the next chapter to calculate real effective exchange rates in Vietnam.

5.2.2- Procedure to calculate the nominal and real effective exchange rates

There are two common things in calculating the RER and estimating the RER misalignment. First, components of BOP including the trade balance and net capital inflows are considered to determine a base period in which the RER is judged to be in equilibrium. Second, it is necessary to determine the extent to which the equilibrium real rate has changed in its fundamental structural determinants (Dodsworth *et al.* 1996a). Based on this argument, the procedure to calculate nominal and real effective exchange rates suggested by Bahmani-Oskooee (1995) has been applied in many developing countries.

Nominal effective exchange rate

The nominal effective exchange rate is calculated through three steps. First, the nominal bilateral exchange rates, NER_{ij} between a country and its major trading partners are calculated. The formula for nominal bilateral exchange rates is as follows:

$$NER_{ij} = NER_{ius\$}/NER_{jus\$}$$

where NER_{ij} is the price of domestic currency of country i (for example, Vietnam) per unit of foreign currency j (j = 1...n); $NER_{ius\$}$ is the price of country i's currency per US dollar. $NER_{jus\$}$ is the price of country j's currency per US dollar.

The second step is converting the levels of nominal bilateral exchange rates into an index $INER_{ij}$ where

$$INER_{ij} = (NER^{t}_{ij}/ NER^{t_0}_{ij})*100$$

t_0 is base time period (month, quarter, year), which is chosen in accordance to the Dodsworth *et al* (1996a) argument at the top of this section.

The third step is calculating the nominal effective (import-weighted) exchange rate ($NEER_i$) index:

$$NEER_i = \sum_{j=1}^{n} \alpha_{ij} INER_{ij}$$

Where α_{ij} is the share of country i's imports from trading partner j in each quarter from the base time period, α_{ij} = 1, n. The import-weighted exchange rate is chosen in this study and many studies analysed exchange rates and foreign trade in developing countries because: first, an import-weighted exchange rate provides the closest approximation to effective exchange rates (based on trade balance effects) for developing countries (Crockett and Nsouli 1977). Black (1976) also pointed out that import-weighted exchange rates in small open economies approximate the multilateral exchange rate model weights and indicate the effects on the trade balance. Second, Vietnam's trade deficit (imports minus exports) was in the range from US$60 million to around US$3 billion in the period from 1992 to 1998 (Table 1.2). Thus an import-weighted exchange rate will be more appropriate than another weighted exchange rate (export or trade weighted) in calculating effective exchange rates in Vietnam at that time.

Real effective exchange rate

After calculating the nominal bilateral exchange rates, RER_{ij} between country i and its major trading partners, there are three further steps to get to the real effective exchange rate. First, real bilateral exchange rates, RER_{ij}, are determined by the following formula:

$$RER_{ij} = NER_{ij} \frac{WPI_j}{CPI_i}$$

where WPI_j is the wholesale price (or producer price) index from country i's trading partners. CPI_i is consumer price index in country i. This formulation combines two

approaches to determining the real exchange rate (tradeable and non-tradeable, PPP) as mentioned above.

Second, converting the levels of the real bilateral exchange rates into indexes ($IRER_{ij}$) according to the base time period.

$$IRER_{ij} = (RER^{t}_{ij} / RER^{t_0}_{ij}) * 100$$

(t_0 is base time period)

Third, calculating the import-weighted real effective exchange rates $REER_i$

$$REER_i = \sum_{j=1}^{n} \alpha_{ij} IRER_{ij}$$

where α_{ij} is the share of country i's imports from trading partner j in the base time period, $\alpha_{ij} = 1, n$.

Since the bilateral exchange rates are defined as the price of domestic currency per a unit of foreign currency, then an increase in NEER or REER reflects depreciation, and a decline implies an appreciation of the domestic currency.

5.3-Effects of exchange rates and prices on trade flows

This section reviews the theoretical issues, which related the effects of prices and exchange rates on trade flows. These issues concern the first objective of exchange rate policy, that is maintaining international competitiveness and a sustainable balance of payments (BOP).

Exchange rates and trade flows

Theories and empirical evidence strongly support the idea that exchange rate movements have an important role in external adjustment. Through devaluation, prices

of tradeables relative to non-tradeables are increased, shifting aggregate demand in favour of non-tradeables simultaneously with the shift of aggregate supply in favour of tradeables[41]. These changes should reduce demand for tradeables and improve the trade balance and current account (see Edwards 1989, Aghevli *et al.* 1991). A sufficient condition for successful devaluation is that the Marshall-Lerner condition holds. The well-known Marshall-Lerner condition states that to improve the trade balance, the sum of the absolute value of import and export demand price elasticities should be greater than unity (with the assumption that the initial trade balance is either zero or relatively small). However, devaluation will not improve the trade balance under conditions of large trade deficits and small export elasticities.

Devaluation will result in an increase of domestic currency price of imported intermediate inputs and thereby consumer goods, and domestic price level, this will reduce the value of financial assets, and also reduces aggregate demand through the wealth effect. Devaluation will lead to a rise in domestic cost of servicing external debts denominated in foreign currencies (see Cooper 1971, Edwards 1989, Aghevli *et al.* 1991). Therefore, some governments are reluctant to devalue their currencies to improve the trade balance and BOP.

Price effects on Trade flows

Besides devaluation, another way to improve the trade balance is through adjusting export and import prices. Dornbusch (1980: 62-68) showed that an X per cent import tariff combined with an X per cent export subsidy is equivalent to X per cent devaluation. If the effects of prices on trade flows are larger than that of devaluation, and other conditions for an effective devaluation are insufficient, policy makers may

[41] If a nominal devaluation succeeds in altering real exchange rate (Edwards 1989)

choose an export subsidy and tariff policy rather than devaluation, since devaluation has negative effects as mentioned above.

Edwards (1989) had a further analysis on this issue. He stated that a simultaneous imposition of import tariffs and export subsidies (of the same rate) will replicate only some of the effects of devaluation. Since, import tariffs will lead to an increase in the domestic price of importable goods; export subsidies will result in an increase in the domestic price of the exportable goods. With the same rates for the tariffs and subsidies, the relative price between importables and exportables will be unchanged, but their relative price with respect to non-tradeables will increase. Thus, the domestic relative price of tradeables as a group will increase and this is similar to the case of a successful devaluation. So, in this respect, both tariffs cum subsidies and devaluation policies are equivalent.

However, he also pointed out a number of differences between the two policies such as a devaluation affects both visible and invisible trade, while tariffs cum subsidies policy affects only visible trade; a devaluation affects the domestic currency of both tradeable goods and tradeable assets, a tariffs cum subsidies policy affects only the domestic price of tradeable goods and services; the most important difference between a devaluation and tariffs cum subsidies is concerned with the political economies of these two strategies, the chosen policy usually is in favour of a well known lobby group.

Based on the main purpose of this chapter and the next one is to examine the effects of exchange rates and prices on trade flows, then the equivalence between a devaluation and tariffs cum subsidies policies is focused only.

Literature review

There are some studies, which examine the effects of prices and exchange rates on trade flows. The first study to look at the question of whether changes in prices and exchange rates have different effects on trade flows was that of Orcutt (1950). He argued that during the interwar period, the effects on trade flows of small and temporary changes in prices differed from that for large and permanent changes such as caused by devaluation. Orcutt's argument was interpreted by Leamer and Stern (1970) that the trade flows adjust more quickly to large price or exchange rate changes than to small price changes.

By using a pooled sample of 13 industrial countries for the period 1953-1969, Junz and Rhomberg (1973) concluded that the response of trade flows to changes in prices and exchange rates is similar. Wilson and Takacs (1979) estimated the import and export demand functions for six industrial countries (Canada, France, Germany, Japan, the United Kingdom and the United States), and they concluded that for most countries in this sample in the fixed exchange rate period, the length of the full response lags on exchange rates seemed to be shorter than for changes in prices. The initial impact of exchange rate changes on trade flows tended to be greater than that of price changes. Their conclusion supports Orcutt's early conjecture that trade flows respond differently to changes in prices and exchange rates.

Bahmani–Oskooee (1986) also estimated the magnitude and the time path of the trade flows to changes in the exchange rates and prices for seven countries (namely Brazil, Greece, India, Israel, Korea, South Africa and Thailand) in the floating rate period (1973-1980). His export and import demand functions included relative prices and effective exchange rates, and the Almon lag procedure was imposed. Quarterly data

were used and 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). His results also support Orcutt's early hypothesis.

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. Quarterly data of Ethiopia from 1973Q1 to 1985Q4 were used in those models. The results from 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. In addition, variance decomposition analysis revealed that changes in prices account for a larger percentage change in inputs and exports than exchange rate changes. (Moreover, he concluded that devaluation might have an initial adverse effect on the trade balance). His results also support the results obtained by Wilson and Takacs (1979) and Bahmani-Oskooee (1986).

Deyak *et al* (1993) analysed 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 changes in these variables. In this model, domestic prices and foreign currency export prices were used separately instead of relative import prices (as a ratio of import price to domestic price: PM/PD is considered as being homogeneous in prices). 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 changes in both prices than to change in exchange rates.

Chua and Sharma (1998) investigated the dynamic response (magnitude and time path) of imports and exports to changes in domestic prices, foreign prices and real effective exchange rates for Korea, the Philippines, Singapore and Thailand. These authors used VAR models and cointegration analysis to examine the long run relationship and short run dynamics of these variables. In these models, domestic and foreign prices are used separately to see the responses of consumers to domestic and foreign prices. The real effective exchange rate is used to capture the overall competitiveness of a country in international markets. Quarterly data from 1974 to 1995 were used. The results showed that domestic and foreign prices have a larger impact on trade flows than the real effective exchange rates in all cases (real effective exchange rates are shown to have an impact only on the imports of Singapore). There was no evidence for significant difference in the response time of import demand to shocks in prices and exchange rates. However, the response time for export supply varies among countries. In the case of Singapore, the response time is similar. Korean exports adjust more quickly to changes in real effective exchange rates than in prices. In contrast, exports adjust faster to prices than to real exchange rates for the cases of the Philippines and Thailand. Finally, Chua and Sharma's results suggested that 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.

Bahmani-Oskooee (1998) used the cointegration technique of Johansen and Juselius (1990) to estimate the trade elasticities to test the Marshall-Lerner condition in less developed countries (the Marshall-Lerner condition is a long run condition that postulates that if the sum of import and export demand elasticities add up to more than one, devaluation should improve the trade balance in the long run). In this study,

relative prices for imports and exports, nominal effective exchange rates, income (domestic and world income) were used. Quarterly data from 1973Q1 to 1990Q4 for Greece, Korea, Pakistan, the Philippines, Singapore and South Korea were employed. The results showed that the sum of the absolute values of price elasticities for import and export demands add up to more than one, and the Marshall-Lerner condition is satisfied for almost all countries. Hence, devaluation could improve the trade balance.

5.4-Error Correction Model (ECM)

The error correction specification was introduced by Phillips (1957) and Sargan (1964). The Error Correction Model (ECM) was developed by Engle and Granger (1987). This is a dynamic model that can be used to analyse long and short run relationships among variables. In this model, the short-term dynamics of the variables in the system are influenced by the deviation from the equilibrium.

The ECM focuses on the non-stationary variables, which have the same order 1, in the form of a linear combination. For instance, y_t and x_t are two I(1) variables which have a linear combination as follows:

$$y_t = a + bx_t + \varepsilon_t \qquad (5.1)$$

Where ε_t is an error term.

If these variables are cointegrated of order 1, then the equilibrium error term ε_t would be I(0) or stationary, and ε_t will rarely drift far from zero if it has a zero mean (Engle and Granger 1987). On the other hand, if ε_t can be tested and confirmed as a stationary variable then we can conclude that y_t and x_t are cointegrated of order 1.

The stationarity of residual ε_t can be carried out by the Dickey-Fuller test for unit root:

$$\Delta\varepsilon_t = a_1\varepsilon_{t-1} + \tau_t \qquad (5.2)$$

If we can reject the hypothesis $a_1 = 0$, then we can conclude that the residual series does not contain a unit root. Hence, we conclude that sequences of endogenous and exogenous variables in (5.1) are cointegrated of order (1,1) (see Kalirajan 1995).

If diagnostic checks indicate that the $\{\tau_t\}$ sequence of (5.2) exhibits serial correlation, using the Augmented Dickey-Fuller test:

$$\Delta\varepsilon_t = a_1\varepsilon_{t-1} + \sum_{i=1}^{n} a_{i+1}\Delta\varepsilon_{t-i} + \tau_t \qquad (5.3)$$

and if $-2 < a_1 < 0$, we can conclude that residual sequence is stationary and sequences of endogenous and exogenous variables in (5.1) are *CI*(1,1), (see Enders 1995, Appendix 8.11). And we can proceed to ECM for these variables in the short run according to Engle-Granger (1987).

According to the Granger representation theorem, if there is a cointegrating relationship between variables, then a dynamic error correction representation of these variables also exists and it can be expressed as follows:

$$\Delta y_t = \alpha_0 + \sum_{i=0}^{m} \alpha_{i1}\Delta x_{t-i} + \sum_{i=1}^{m} \alpha_{i2}\Delta y_{t-i} + \beta\sigma_{t-1} + \varepsilon_t \qquad (5.4)$$

where

Δ is the first difference of variables.

σ_{t-1} is the error correction term from the long run equation (5.1) regression. It contains the deviation from the long run equilibrium, which will adjust in the short run. β is the speed of adjustment. β must be negative and the magnitude is in the range $(-1 < \beta < 0)$ to ensure long run equilibrium is achieved. ε_t is the disturbance term.

Equation (5.4) is well known and already proved in the economic literature. In this chapter, for illustration, we derive equation (5.4) for the case of a simple dynamic

model, where current value of variable y is influenced by its own one period lagged and current and one period lagged value of variable x:

$$Y_t = a + b_0 X_t + b_1 X_{t-1} + \gamma Y_{t-1} + \varepsilon_t \qquad (5.5)$$

which can be written as:

$$Y_t - Y_{t-1} = a + b_0 X_t - b_0 X_{t-1} + b_1 X_{t-1} + b_0 X_{t-1} + \gamma Y_{t-1} - Y_{t-1} + \varepsilon_t \qquad (5.6)$$

$$\Delta Y_t = a + b_0 \Delta X_t + (b_0 + b_1) X_{t-1} + (\gamma - 1) Y_{t-1} + \varepsilon_t \qquad (5.7)$$

$$\Delta Y_t = a + b_0 \Delta X_t + (\gamma - 1)\left[Y_{t-1} - \phi X_{t-1}\right] + \varepsilon_t \qquad (5.8)$$

where $\phi = (b_0 + b_1)/(1-\gamma)$ (assuming that $\gamma \neq 1$)

$(\gamma-1)$ is called the speed of adjustments

$[Y_{t-1} - \phi X_{t-1}]$ is called the error correction term

If Y_t and X_t have a long run relationship, then in the steady state, $\Delta X_t = \Delta Y_t = 0$ (all t) and $Y_t = \phi X_t$. In the case of $Y_t \neq \phi X_t$, this describes the 'error' between Y_t and its long-run value.

Suppose that $Y_{t-1} > \phi X_{t-1}$, for ECM representation this ensures that there is pressure from the error correction term. For $\Delta Y_t < 0$, then $(\gamma-1)$ must be less than zero to ensure that when Y_{t-1} lies above its long run value Y_t will be less than Y_{t-1} induced by this correction term. Similar to the case of $\Delta Y_t > 0$ ($Y_{t-1} < Y_t$). Therefore, if $(\gamma-1) < 0$, in 'disequilibrium' Y_t will move toward its long run path, from both above and below. However, if $\gamma < 0$ or $(\gamma-1) < -1$ then, the correction is explosive. So, $-1 < (\gamma-1) < 0$, is the condition to ensure long run equilibrium is achieved via negative feedback and error correction.

5.5-Conclusion

Since 1973, most developed countries have adopted floating exchange rate regimes and many developing countries have increasingly adopted more flexible exchange rate arrangements. To achieve the first objective of exchange rate policy, that is maintaining international competitiveness and to ensure sustainable BOP for developing countries, devaluation and other policies such as import tariffs, export subsidies, etc had to be considered.

The responses of trade flows to changes in exchange rates and prices are important information to policy makers for choosing the appropriate policy from two possibilities: a devaluation or tariffs cum subsidies policy. Effective exchange rates and Error Correction Model (ECM) are considered as appropriate instruments to examine the responses of trade flows on the change in prices and exchange rates in both the short and long run in Vietnam in the next chapters.

Chapter 6

EXCHANGE RATE AND FOREIGN TRADE POLICY REFORMS IN VIETNAM

6.1-Introduction

The role of exchange rates in the Vietnamese economy has been increased since the comprehensive economic reform (it was neglected in the period before 1988, see Chapter 2), and exchange rate policy has attracted more attention from economists, policy makers and businessmen as well. These resulted from the development of the market-oriented economy and external economic relations with the countries in the region and in the world such as through imports and exports, FDI, services, etc.

There were some studies on the exchange rates and exchange rate policy during the 1990s and particularly after the financial crisis in the region when neighbouring countries sharply devalued their currencies. The studies from Nguyen and Le (1995), Le and Tran (1995), Le (1996), Vu (1997) mentioned about the managed floating exchange rate regime in Vietnam, and exchange rate policy and management of foreign exchange from the SBV during that time, and also about the revaluation tendency of VND. They argued that the SBV do not need to devalue VND to encourage exports and BOP, to limit imports since the increase in imports during that period is a common thing for Newly Industrialised Countries (NICs) as well as Vietnam in the first period of the

development. If the SBV devalued the Dong, this will lead to an increase in import prices and inflation, affect foreign debt and threaten stability of the economy in the restructuring process. There are some remedies to encourage exports such as improving quality of export goods, diversifying the export markets.

Dodsworth *et al* (1996a) also confirmed the VND was appreciated in the period from 1992 to 1995 and considered the exchange rate policy in Vietnam during that time was appropriate (this will be detailed in the next section). Another study by Ohno (1998) showed that from December 1992 to March 1998, the overall competitiveness of Vietnam declined by 24 per cent (overall indices weighted by bilateral trade with Vietnam), due to dramatic devaluation from neighbouring countries after the financial crisis in the region in mid 1997.

This chapter examines the reform of exchange rate policy during the 1990s. Foreign trade reform is not the purpose of this chapter, but it is reviewed to provide the basis for analysing the effects of exchange rates and prices on trade flows in the next chapter, where this information will be used to construct models, interpret results and suggest policy reforms. The outline of this chapter is as follows: Section II analyses the reform of exchange rate policy that also contains the movements of nominal and real effective exchange rates. Section III reviews the foreign trade policy reform and foreign trade performance, which includes relaxation on entry to foreign trade, controls of exports and imports, taxes on trade, and joining the bilateral and multilateral trade agreements. Section IV includes conclusions.

6.2-The reform of exchange rate policy

In the banking and financial reform process, new policies for managing the foreign exchange market were introduced. According to a foreign exchange control decree dated October 21, 1988, the market was liberalised substantially to attract foreign exchange into the banking system, and to adapt the exchange rate system to the new laws liberalising foreign trade and investment (Dodsworth *et al.* 1996a). Business units in all economic sectors and individuals were allowed to open accounts of foreign currencies. Foreign currencies could be deposited, withdrawn or transferred to individuals or economic agents through the banking system. Buying and selling gold, precious metals, precious stones and foreign currencies were opened to all businesses and individuals according to the law on banking and credit institutions. Besides the gradually liberalising of the management of the forex market, the SBV still keeps the right to intervene in the forex market when it is needed (as in a financial crisis), in order to manage this market, ensure macroeconomic stability and increase effectiveness of exchange rate policy. These will be detailed more in the exchange rate policy section below.

6.2.1- Exchange rate policy

The SBV implemented the new monetary policy after the two tier-banking system was established in 1990. Exchange rate policy has been considered as a part of monetary policy and a macroeconomic instrument. As a part of monetary policy, it also has the ultimate targets of monetary policy such as maintaining macroeconomic stability, controlling inflation and contributing to high and sustainable economic growth. As the macroeconomic tool, its main objectives include maintaining competitiveness of VND, encouraging exports and controlling imports, improving the BOP, and increasing

foreign currency reserves. In addition, creating the necessary conditions for the VND to be convertible and to contribute to overcoming "dollarisation" in the economy have been considered as the objectives of exchange rate policy (Binh and Dinh 1999). However, these later objectives are beyond the scope of this chapter, we focus only on the objectives which concern competitiveness, external balance of the economy and controls of inflation, and maintenance of macroeconomic stability.

The exchange rate policy from early 1989 can be divided into two phases as mentioned by Dodsworth *et al* (1996a: 36):

> First, through August 1991, when the authorities adjusted the unified official exchange rate at irregular intervals with the explicit objective of maintaining the official rate within a range of 10-20 per cent of the parallel market rate; and second, from September 1991 to the present, when the authorities introduced the market for foreign exchange directly into the exchange rate determination process, through the foreign exchange trading floors and subsequently through the interbank foreign exchange market.

So, in the period from March 1989 to August 1991, exchange rates were unified and adjusted following the market. In the period since September 1991, exchange rates have been gradually allowed to be determined by market forces. The details of exchange rate policy in the two periods are discussed in the section below.

The period from March 1989 to August 1991

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, the government decided to unify the three exchange rates in March 1989. After unification of the exchange rates, the Dong was devalued rapidly. The exchange rate applied to international trade was devalued from VND900: US$1 in 1988 to VND4500: US$1 in

1989. The average exchange rate for the transferable rouble was also adjusted proportionately (Vu: 1994).

After 1989, the dong was devalued several times. In January 1991, the nominal ER was VND6860: US$1; in July 1991 it was VND9000: US$1; and in December 1991, the dong fell to VND12900: US$1 (Le 1994: 3). One of main reasons for the dong devaluation probably was the collapse of the Soviet Union since the Soviet Union was Vietnam's biggest trading partner in the period from 1976 to 1989. Trade between Vietnam and the former Soviet Union accounted for 85 per cent of imports and 67 per cent of exports from the non-convertible area (Nguyen 1992). Vietnam imported strategic commodities such as steel, petrol, and fertiliser from the Soviet Union and paid for these imports by exports to the Soviet Union. Now Vietnam is buying these goods on the international markets. The huge aid flows from the former socialist countries to Vietnam were also cut when the Soviet Union collapsed. Therefore, the demand for hard currency stimulated the dong's devaluation. In addition, with the changes in the government of Cambodia in 1991, Cambodians feared a loss in value of their domestic currency, the riel. They wanted to hold gold instead of money. Consequently, there was a rush to purchase gold imported from Ho Chi Minh City. This resulted in an abrupt rise in the price of gold there, stimulating uncertainty in the dong (Brahm 1992).

To stabilise the dong, the SBV intervened by selling gold in late 1991 and simultaneously halted the issue of new dong notes, which created a shortage in the domestic currency prior to the Tet holiday. This intervention had positive effects in terms of maintaining a realistic exchange rate, while not allowing the black market to get out of control and it was praised by foreign economists: "The pragmatism

demonstrated by the State Bank's monetary intervention through the use of gold in stabilising the Dong adds further credibility to the Vietnamese banking system" (Brahm 1992: 51).

The devaluation of the VND at that time created incentives for exports and narrowed the gap between the official and the parallel market exchange rates (see Table 3.4, Chapter 3). A study by Dodsworth *et al* (1996a) showed that Vietnam was highly successful in narrowing the premium of the parallel market. The premium in the parallel foreign exchange market declined from more than 80 per cent before March 1989 to within a band of 0-20 per cent in the period 1989 to1991.

The parallel market rate can be used as an indicator for exchange rate policy by measuring the extent of real exchange rate misalignment. Studies by Edwards (1989) and Kamin (1993) showed that the parallel market premium often rises very rapidly immediately before a major devaluation and then declines just after devaluation. Therefore, there is a positive correlation between the premium and real exchange rate overvaluation. So the existence of a parallel market premium indicates an excess demand for foreign exchange at the official rate and also overvaluation of the domestic currency at the prevailing official rate. Moreover, the premium of the parallel market is observable. Many developing countries have used the parallel market premium to make judgments about exchange rate policy (Dodsworth *et al.* 1996a).

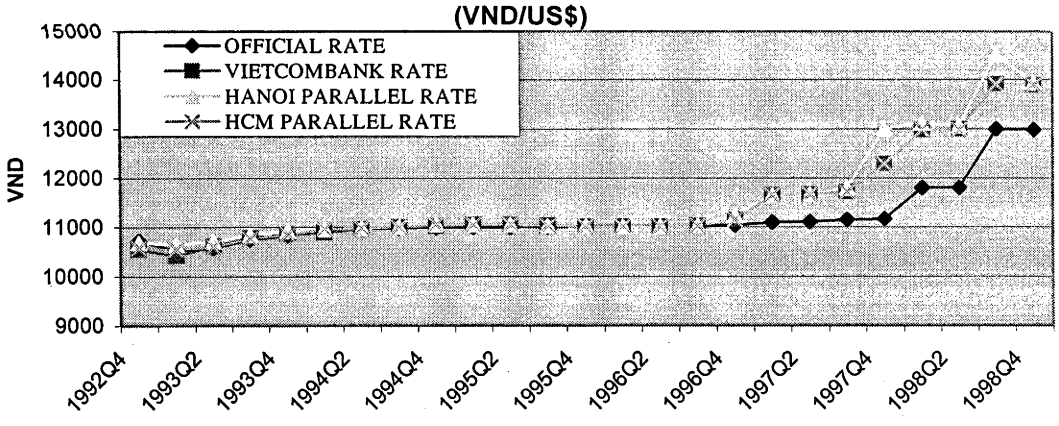
The period from September 1991 to the early 1999

In September 1991, the SBV established foreign exchange trading floors in Hanoi and Ho Chi Minh City to facilitate foreign exchange transactions. A band of ±0.5 per cent of the official exchange rate was applied for all transactions. Due to the inefficiency of

these floors, an interbank foreign exchange market was subsequently established to replace the foreign exchange trading floors (Decision No 204/QD-NHNN on October 14, 1994). The necessary legal basis was also promulgated by the SBV to assist the market to operate properly (SBV 1995). The foreign exchange trading band was still ±0.5 per cent of the official exchange rates and interbank exchange rates were used as basic information by the SBV to set the official exchange rates on the next day. Most banks and other financial institutions participated in this market.

In order to provide banks and financial institutions with more room for trading foreign exchange according to market conditions and stimulate the activities of the foreign exchange market, the SBV widened the band from ±0.5 per cent to ±1 per cent by Decision No 311/QD on November 21, 1996.

Figure 6.1. Nominal Bilateral Exchange Rates in Vietnam (VND/US$)



Source: The SBV (1995-99), SBV authorities, author's estimates

In 1997, demand for foreign currencies was higher than supply particularly when banks needed foreign currencies to pay letters of credit (LC) early that year. In March, the band was widened to ±5 per cent. From August, due to the financial crisis in the region,

speculation and hoarding of foreign exchange occurred, increasing pressure on the dong. The SBV had to intervene and widened the band to ±10 per cent in October to make exchange rates more flexible to market conditions (in the economy and region) and facilitate forex transactions.

In 1998, the economy faced more difficulties as a result of the financial crisis such as lack of foreign exchange supply, competitiveness was relatively poor due to the heavy devaluations by neighbouring countries, and 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 organisations to surrender 80 per cent of their new foreign exchange (forex) earnings to commercial banks within 15 days of receipt (when they needed forex, they could buy back the forex according to interbank rates at that time). Second, official exchange rates were devalued from VND11,175: US$1 to VND11,800: US$1 on February 16 and the band of ±10 per cent was maintained (see Figure 6.1). On August 7, the official exchange rate was set to VND 12,999: US$1 (which meant that the official exchange rate was devalued by more than 16 per cent compared to the period prior to February 16) which was equivalent to existing interbank rates (Hoang 1999: 21) and the band was narrowed to ±7 per cent. Therefore, from August 7, the official exchange rate was devalued by more than 23 per cent compared with the period before February 16 (since interbank forex rates are usually traded at the upper band rate)[42]. This measure put the exchange rates 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.

[42] During the 1998, the dong was depreciated to about 20 per cent (Kokko 1998).

In early 1999, the SBV further liberalised forex management, official exchange rates were abolished and interbank exchange rates were considered as basic rates. The SBV required banks and other financial institutions to trade forex in a band of ±0.1 per cent of interbank exchange rates, according to Decision 64 and 65/1999/QD-NHNN7 on February 25, 1999 (SBV 1999).

In general, exchange rate policy from the late 1980s has been flexible and market-oriented. In the context of comprehensive economic reform and financial sector reform, this includes the establishment of the two tier banking system and relaxation of the management of foreign exchange and foreign trade. The unification of exchange rates and the devaluation of the VND following the market, the introduction of trading floors and the interbank market for forex have had the effect of bringing a larger share of foreign exchange transactions into official markets and creating conditions for official exchange rates to be determined by market forces. The evidence of official exchange rates being determined by market forces is the parallel market premium remaining below 1 per cent in the period from the beginning of 1992 to the end of 1996 (see Figure 6.3 and Dodsworths *et al.* 1996a). However, this premium went up to 6 per cent in the first half of 1997 (before the financial crisis in the region), to around 14 per cent in the second half of 1997 (after the crisis), and fell to 7 per cent in the fourth quarter of 1998. This movement of the parallel market premium coincided with two devaluations of the VND from the SBV in 1998 and confirm the Edwards (1989) and Kamim (1993) findings that premiums often rise immediately before major devaluations and then decline after devaluations. In this case, the substantial devaluations by neighbouring countries have pressured Vietnam to devaluate its currency.

The consistency between fiscal and monetary policy and exchange rate policy was the key to the successful unification of the foreign exchange market and particularly devaluation. The devaluation of the official exchange rate was supported by cutting budget deficits and tightening domestic credit. If the supporting policies had been lacking, the devaluation may have resulted in only a temporary reduction of the parallel market premium. This is strongly suggested from theory and evidence from many countries (Dodsworth *et al.* 1996a). In the case of Vietnam, this is not exceptional. During the unification and devaluation of official exchange rates, the SBV implemented a tightening of monetary policy and gradually cut the budget deficit (see Table 1.2, Chapter 1).

Moreover, the intervention from monetary authorities to stabilise the VND has been necessary. As mentioned previously, selling gold to stabilise the VND and halting the issue of new notes in late 1991 contributed to reducing inflation and maintaining realistic exchange rates at that time. The SBV's intervention in 1993 when running down reserves and the decision that required resident business organisations to surrender 80 per cent of their foreign exchange (in a short period), balanced demand and supply for forex and stabilised exchange rates.

6.2.2- Nominal and real exchange rate movements

The period 1989-1991[43]

From March 1989, the official exchange rates were devalued from VND900 to VND4,500 per US$, resulting in the depreciation of nominal and real effective exchange rates of 500 per cent in the plan (for international trade) and about 29 per cent

[43] This section drawn from Dodswoth *et al* (1996a)

for outside plans (from VND3,500 to VND4,500 per US$). These devaluations brought a massive realignment of the exchange rate and improved Vietnam's external competitiveness. The devaluation and unification, combined with tightening fiscal policies, had an impact on public confidence and demand for Vietnamese dong. Subsequently, the official rate was revalued by about 10 per cent during the last nine months of 1989. Then the real effective rate appreciated by 23 per cent as a result, but it was lower than that before reform.

In the period 1990-91, due to relaxation of financial policies in an attempt to mitigate the impact of the collapse of the CMEA, the parallel rate depreciated by around 116 per cent. The official rate was devalued by 60 per cent in 1990 and by 40 per cent in the first eight months of 1991, while inflation was about 70 per cent per year. Exchange rate movements tracked closely the inflation differential with Vietnam's trading partners, and the official rate was devalued sufficiently to keep the parallel market premium below 20 per cent during most of 1990 and up to July 1991. As a result, while the real effective exchange rate fluctuated from month to month, it did not become increasingly overvalued, remaining in a band of 100-125 per cent (March 1989 = 100).

When the trading floors were introduced in August 1991, both official and parallel markets were devalued sharply. The exchange rate was devalued from VND9,000 to about VND12,000 per US$. By the end of 1991, however, real exchange rate returned to the level that had prevailed in March 1989. Since March 1992, official and parallel market rates have been stable between the range from VND10,500 to VND11,500 against the US$. The real effective exchange rate has been relatively constant at an appreciated level of 30 per cent compared with March 1989.

The period 1992-1998

The effective import-weighted exchange rates are appropriate for developing countries (see Chapter 5) and also for the case of Vietnam where imports always exceed exports. The nominal (NEER) and real effective exchange rates (REER) in Vietnam from 1992 to 1998 were calculated following the Bahmani-Oskooee (1995) formulas in Chapter 5. The fourth quarter of 1992 is chosen as the base quarter, since in 1992, current account deficit was the lowest in that period. BOP were positive, inflation was low (17.5 per cent pa, see Table 1.2), exchange rates were firstly stable and began to be determined by market forces (see previous part). This suggests that it could be a reasonable base quarter for our analysis.

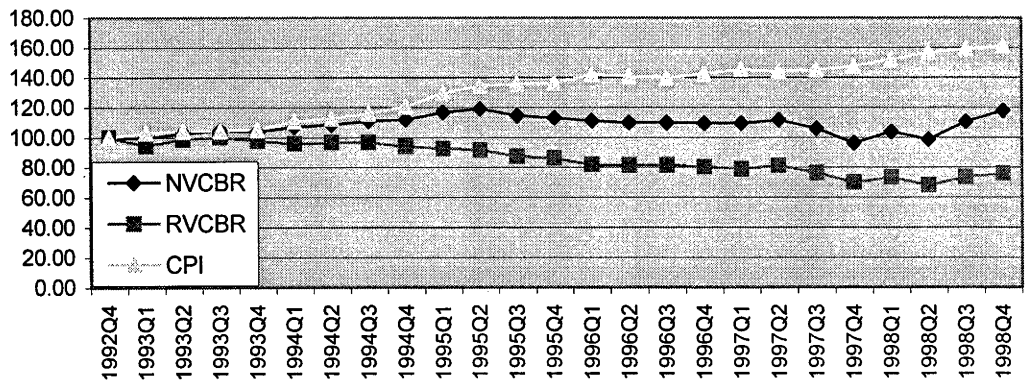
The thirteen major trading partners of Vietnam in that time were Australia, Canada, France, Germany, Japan, Netherlands, Singapore, South Korea, Sweden, Taiwan, Thailand, United Kingdom and United States. Their data are used in the calculations of NEER and REER. Since the nominal bilateral exchange rates between Vietnam and its trading partners are defined as the price of domestic currency per unit of foreign currency, an increase in NEER or REER reflects depreciation, and a decline implies an appreciation of the domestic currency.

Three kinds of bilateral exchange rates are used to calculate NEER and REER. They are VND/US$ exchange rates of Vietcombank (the biggest of SOCBs and dominating in foreign exchange transactions in the banking system, see Chapter 3), and VND/US$ exchange rates of parallel markets in Hanoi and Ho Chi Minh cities.

The results shown that over the period 1992Q4 to 1998Q4, the nominal effective

exchange rate (NEER) of Vietcombank gradually depreciated by 20 per cent up to 1995Q2, after that it returned slowly to the 1992 level by 1998Q2 before sharply depreciating (Figure 6.2). The Hanoi and Ho Chi Minh City parallel rates behaved in a similar fashion (see Appendix 6.1 and 6.2). However, over this period the real effective exchange rate (REER) gradually appreciated by around 20 per cent. The real effective exchange rate appreciated which may be explained by some factors. First, FDI increased from more than US$300 million in 1992 to more than US$2 billion in 1997. Remittances also increased from around US$60 million in 1992 to more than US$1 billion in 1996, before declining to more than US$700 million in 1997 (World Bank 1999: 72). Second, Vietnam's debt arrears have been rescheduled under Paris Club arrangements (Dodsworth *et al.* 1996a). Third, inflation increased by around 60 per cent over the period, although the NEER depreciated, this has not been enough to offset the increase in inflation, so the REER appreciated. That will erode Vietnam's competitiveness.

Figure 6.2: Nominal, real effective exchange rates of Vietcombank and CPI indices

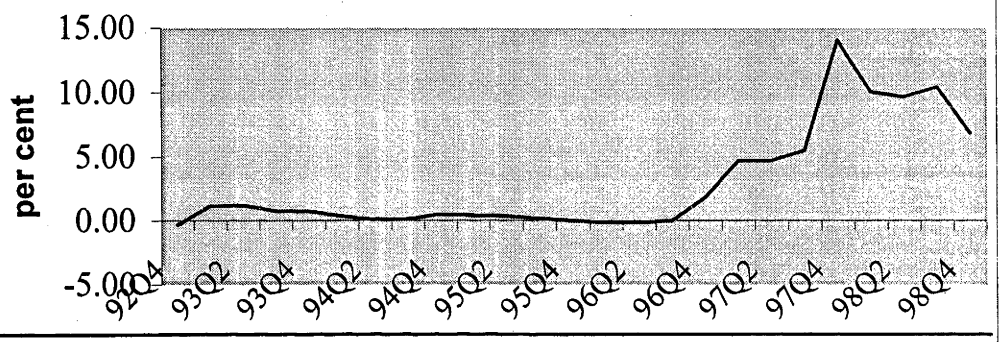


Source: Author's estimates.

Due to the impact of the financial crisis in the region, FDI slowed to US$800 million in 1998 and US$700 million in 1999 (Table 1.2). Exports also declined since demand for

exports fell, partly because neighbouring countries (Thailand, Indonesia, Malaysia and South Korea) sharply devalued their currencies. This created pressure for the VN dong to depreciate. However, the fluctuation in the NEER and REER due to the crisis has not been as great as might have been expected. The NEER has been depreciated by 20 per cent in the last two quarters of 1998, it helped to bring the REER to the appreciated level by 20 per cent at the end of 1998 for all kinds of effective exchange rates (1992Q4 = 100), this was equal to the level before the crisis.

Figure 6.3. Premium in Hanoi parallel Foreign Exchange Market



Source: Author's estimates

The exchange rate and the financial system, and the economy more generally, have not been as adversely affected by the financial crisis as neighbouring countries since the Vietnamese dong is not freely convertible; foreign exchange transactions and imports have been strictly regulated during this time. Since a stock market has not been established, this could not be affected by the withdrawing of foreign portfolio capital (Kokko 1998).

6.3- The reform of foreign trade policy

Foreign trade in Vietnam before comprehensive economic reform was monopolised by the government and only a small number of state-trading companies had rights to carry out foreign trade. Domestic firms were not allowed to contact directly with foreign partners, and they had to resort to trading companies for their external transactions. An overvalued exchange rate system and low procurement prices discouraged exports, while an extensive system of quotas and licenses impeded imports (IMF 1996).

During 1976 to 1988, foreign trade was underdeveloped. The volume of exports or imports was less than US$800 million per year and more than 60 per cent of foreign trade was with CMEA countries (non-convertible area). Moreover, structure of exports was backward, primary commodities accounted for 77 per cent to 85 per cent of total exports (see World Bank 1990, Tran 1992, Nguyen 1992).

Since 1989, external economic relations which include foreign trade were reformed substantially. This section provides the basis to examine the effects of prices and exchange rates on trade flows in the next section; it covers the changes in foreign trade policy and foreign trade performance in this period.

6.3.1-Changes in foreign trade policy

Relaxation of controls on entry to foreign trade

Since 1989[44], with comprehensive economic reforms (state economic management, SOE reform, financial sector reform and external economic relations, the controls over

[44] Actually, some foreign trading organisations were allowed to establish from 1988, but the number of such organisations in early 1988 was very small (30 units).

foreign trade were gradually relaxed. The several conditions on private sector participation in foreign trade that were imposed in the early 1990s were gradually phased out. These conditions were: foreign trade contracts, minimum capital requirements, shipment licenses, and business licenses. Foreign contracts were abolished in 1992, minimum capital requirements were removed from 1995, shipment licenses were abolished in 1996, and export/import licenses have not been required since 1998 (TG 1999a: 16). In practice, it was complicated to obtain export/import licenses, since it was difficult to have US$200,000 as working capital to meet the minimum capital conditions for Vietnamese enterprises, particularly for new enterprises (Decision 114/HDBT, April 1992). Also, each license allowed an enterprise to trade only the registered items[45].

In order to encourage exports and promote balance of payments, Decision No 28/TTg of the Prime Minister dated 13/01/1997 allowed enterprises with import/export licenses to export goods, other than the registered items (regardless of whether export goods were specified in the license or not).

There was a basic change in trade policy from early 1998. According to Decision 55/1998/QD-TTg of 3 March 1998, all enterprises can trade goods covered under their business license and there is no need to obtain export and import licenses, except for special goods[46]. Decision 57/198/ND-CP, dated 31/07/1998, provided the guidelines for implementing the Law on Trade (it was approved by the National Assembly in early 1997). According to this Decision, for goods not under special regulations, all

[45] Import and export licences were provided into two categories: first, to production enterprises which were allowed to import production inputs and to export the resulting produced products. Second, specialised trading or service supplying enterprises, which were allowed to trade a wider range of goods (TG 1999a: 16).

enterprises are encouraged to enter international trade, and do not need permission, other than their business licenses. So from early 1989 up to 1998, the controls on entry to foreign trade have been relaxed substantially. From the many conditions that had to be met in order to enter foreign trade, enterprises now have to obtain a business license.

Relaxation of controls on exports and imports

In 1989, most quotas or targets on exports were eliminated and export subsidies were also discontinued. Other controls on exports and imports have been gradually relaxed. The history of policy on non-tariff barriers (NTBs) and taxation on trade is detailed below.

- **Non-Tariff Barriers (NTBs)**

NTBs in Vietnam have involved mainly quantitative restrictions, and foreign exchange allocation and customs procedures.

In 1989, most quotas on exports were eliminated (quotas of 7 export commodities remained). From 1993 to 1995 shipment licenses for all goods not subject to regulation by technical ministries were phased out. In 1994, shipment licenses were eliminated for all exports except rice, timber and petroleum. In 1995, quotas for all export commodities were lifted, except for rice.

It is of interest to detail the history of two main export quotas: the quotas for rice, and textiles and garments. Quotas for rice exports were established by the government at the beginning of each year (the quota for 1997 was 2.0 millions tonnes, for 1998 it was 4.0

[46] Garments and textiles exported to quota markets, and the goods prohibited or those under the government management (TG 1999a: 16).

million tones), and allocated to exporters (90 per cent of the export volume was allocated at the beginning of the year, and the remainder could be allocated at the end of the year with amendments according to actual production (TG 1999a)). Before 1998, all quotas for rice exports were allocated to SOEs. In 1998 private firms were permitted to export rice. Foreign firms also were allowed to buy rice directly from farmers for export (World Bank 1998).

Export quotas for textiles and garments are determined under bilateral agreements with the European Union, Canada and Norway (CIE 1998). The enterprises which have quotas must have a certain capacity, an export or import license for textiles and garments, and the quota volume is based on the performed volume in the previous year. In 1998, private enterprises were first allowed to access export quotas for garments and in December 1998, nearly 20 per cent of export quotas of garments were auctioned (World Bank 1998).

Quotas on import goods have also been reduced gradually in this period. After 1989, many quota target controls were lifted, but 12 import commodities remained subject to quotas. In 1995, import shipment licenses for a wide range of imported goods were eliminated. In 1998, consumer goods imports were restricted by Vietnamese authorities to solve the BOP problem. Decision 28/1997/QD-TTg indicated that annual import plans for consumer goods should not exceed 20 per cent of export turnover of the preceding year. The SBV also restricted the letters of credit (L/Cs) for importing consumer goods (L/Cs were limited to producer goods) (TG 1999a, CIE 1998). In January 1998, Decision 11/1998QD-TTG reaffirmed the lifting of quotas and licensing for consumer goods not subject to specific restrictions and, as well, quotas for importing

fertiliser were first allocated to selected non-state enterprises (CIE 1998).

There are some goods prohibited[47] for export and import, which are determined by the government for security, health and environmental reasons. Export and import goods under special regulations[48] are also existed. These regulations may preserve the privileged position of state-owned traders, especially those owned by the regulating ministry (CIE 1998), but not for private traders.

Foreign exchange regulations which affect foreign trade in some respects include: restrictions on foreign currency reserves, limiting foreign currencies that travellers can carry out of the country, profit remittances from foreign invested firms, and foreign currency surrender requirements. According to circular 02/TT-NH7 of June 28, 1997, foreign invested entities are generally responsible for their own foreign exchange requirements. "Only entities involved in projects producing specific import substitutes, specified infrastructure projects and designated important projects are guaranteed conversion of local currency into foreign exchange for legitimate purposes. Tables 2.2, 2.3, and 2.4 present the current list of projects eligible for this treatment" (CIE 1998: 31).

Travelers are allowed to carry US$7,000 of the country (currently) and profit remittances of foreign invested firms are subject to a tax of 5, 7, or 10 per cent (depending on the size and sector of the investment) (CIE 1998).

[47] Export goods prohibited include arms and military equipment, toxic chemicals, antiquities, narcotics, woods, and wild and rare animals. Imported goods prohibited are arms and military equipment, toxic chemicals, antiquities, narcotics, fireworks, poisonous toys for children, cigarettes, used consumer goods, right hand drive automobiles (TG 1999a).

[48] See CIE 1998, Table 2.1, commercial minerals for exports and scrap metal are regulated by the Ministry of Industry, wood products for export are regulated by Ministry of Agriculture and Rural Development, etc.

When the financial crisis occurred in the region, the SBV more strictly controlled foreign exchange. Decision 396-TTg of April 4, 1998 required all enterprises to open a single foreign currency account only at a working bank in Vietnam. Decree 173/QD-TTg of September 12, 1998 required all economic organisations to sell 80 per cent of their foreign currencies to a Vietnamese commercial bank within 15 days. In Chapter 6, this Decision is mentioned as a useful tool in forex management by the SBV against hoarding forex activities and balancing forex demand and supply, although it was an administrative and temporary solution. In the foreign trade area, this decision was aimed at three targets: the first was to reserve foreign exchange needs for certain enterprises (mainly SOEs); the second was to control the import of consumer goods; and the third was to force foreign invested enterprises to export their products and to buy domestically produced inputs. These targets can be interpreted as policy described to promote specific industries and to narrow the trade deficit (TG 1999a).

For enterprises, buying foreign exchange from the bank is still difficult. They have to apply to the SBV and their requests are not always successful. Foreign invested firms are also required to meet certain conditions before opening accounts to borrow from abroad, such as minimum borrowings of US$3 million, and the purposes of borrowing capital must be for activities such as construction or production (this regulation is to encourage foreign firms to buy domestic inputs) (TG 1999a).

- **Taxes on Trade**

Export tax

A system of export tax has been applied in Vietnam from the early 1990s. At present,

the system includes 12 rates (11 rates in 1997) in a range from zero to 45 per cent, with an average rate of 14 per cent (TG 1999a: 27). In 1997, rates of export duties on commercial goods (CIE 1998: 47) indicate that lower export taxes (from 0 per cent to 5 per cent) have been applied for agricultural, marine products and mineral fuels such as rice, maize, fish and prawns, coal and crude oil etc. This is to encourage export and production of agriculture and aquaculture, but they could be encouraged even more with no export tax. The higher export tax rates (from 10-20 per cent) are imposed for woods and wood products, forestry, etc. The highest rates are imposed for raw materials (zinc, tin and metal scrap), these rates may protect the local steel industry. All such taxes favour local users of such inputs.

The objectives of export taxes are to raise revenue, to protect domestic consumers from price rises due to increase in export demand, and to protect scarce natural resources (CIE 1998).

Table 6.1. Export and Import Taxes, 1993-99

	1993	1994	1995	1996	1997	1998	1999*
Total (VND Bill)	6,400	9,020	13,300	15,100	13,700	16,600	19,500
Export Tax	1,600	1,220	900	1,200	2,200	4,100	4,700
Import Tax	4,800	7,800	12,400	13,900	11,500	12,500	14,800
Export Tax per 1US$ exports (US$)	0.05	0.03	0.02	0.01	0.02	0.03	0.03
Import Tax per 1US$ imports (US$)	0.13	0.14	0.15	0.12	0.08	0.09	0.10

Source: GSO authorities, Table 1.2. Author's estimates.
* include VAT (Value Added Tax)

The export tax per 1US$ of exports can be used as a proxy for actual export taxes. In

Table 6.1, the export tax per 1US$ of exports is in the range from 1 to 5 cents in the period from 1993 to 1999. This figure may be underestimated due to smuggling, tax evasion and the weakness of the tax system. Nevertheless, this indicates that export taxes have not been a big barrier to export. In addition, tax exemptions and duty drawbacks have been applied to promote exports and assist some sectors. Some foreign investment projects, export producers, and special sectors such as defense, securities, and education have been exempted from export tax. Some export enterprises can apply for drawback of import duties on imported inputs. "Foreign investment projects have special treatment in terms of tax exemption depending on the percentages of exported products" (TG 1999a: 27). Moreover, there are a number of policies that assist exporters such as export credits at preferential interest rates, export credit guarantees and accelerated depreciation according to the new decree on implementation of the Amended Law on Domestic Investment (No 07/1998/NC-CP) for domestic export oriented investment (CIE 1998: 87). Some exporters may get export bonus funds, that are awards for big exporters of the year (export turnover in excess of US$100,000, high quality of export goods etc).

Import Taxes

Import tariffs were initially applied in 1988, when the law on import and export duties was promulgated. The aims of the tariff system were to protect domestic production and to raise state revenue. The tariff system has been changed frequently: in 1988, tariff rates from 5 to 50 per cent were imposed on 124 commodities. "In 1989, the maximum tariff rate was increased to 120 per cent for some luxury goods and tariff coverage was reduced to 80 commodities. The maximum rate of tariff was further increased to 150 per cent in 1993 and 200 per cent in 1994" (TG 1999a: 24).

In Table 6.2, most nominal tariffs were in the range of zero to 10 per cent in the period from 1995 to 1999. Average tariffs increased slightly from 12.8 per cent to 13.6 per cent in 1998 and 15.9 per cent in 1999 (but actual import tax per 1US$ of imports increased from 8 cents to 9 cents in 1998 and 10 cents in 1999 only (Table 6.1), this is evidence for tax evasion and weakness of tax system). This increase reflects the import limiting policy adopted to cope with the financial crisis in the region. The maximum rates fell from 200 per cent in 1995 to 60 per cent in 1996, rose back to 100 per cent in 1997, and after that fell to 60 per cent. The variation in tariff rates also fell from around 130 per cent to 110 per cent. Thus there remains high dispersion in the tariff structure (some production inputs and capital goods had low tariff rates or were exempted from import duties, while other finished or consumer goods had high rates. This means several industries are highly protected). The number of tariff rates also decreased from 36 to 19 rates in 1999 to simplify the tariff system[49].

Table 6.2. Nominal Tariffs in Vietnam, 1989-99

Range of Tariff Rates	1989	1993	1994	1995	1996	1997	1998	1999
0 to 10%				62	65	64	62	..
Above 10 to 20%				20	13	13	11	..
Above 20 to 40%				14	17	17	18	..
Above 40%				4	5	6	7	..
Total tariff lines (%)	80a			100	100	100	100	100
Average Rate 1/				12.8	12.3	13.4	13.6	15.9
Maximum Rate	120	150	200	200	60	100	60	60
Variation 2/				131	127	128	117	..
Number of Rates				36	31	35	26	19

Source: CIE (1998) and TG (1999a: Table 4, p 25).
a is absolute number of tariff lines, 1/ It is a simple average,
2/ It is defined as standard deviation of tariff rates as a percentage of the mean of those tariff rates

[49] The 19 different tariff rates include 13 basic rates and 6 others for specific commodities (TG 1999a).

An analysis of effective protection by TG (1999b) showed that the average effective rates of protection (ERP) for the economy as a whole in 1996 were in a range of between 47.1 per cent and 51.1 per cent. These figures are calculated for 1996 only. Nevertheless, these may reflect the fact that ERP are higher than nominal rates of protection, which must be considered in the modelling of import activities.

Joining the bilateral and multilateral trading agreements in the region and the world

From 1989, Vietnam has diversified its external relationships and has participated in bilateral and multilateral trade agreements in the region and the world. In 1992, Vietnam and the European Economic Union (now the EU) signed a preferential trade agreement which granted quotas for export of garments and textiles to Europe. In 1994, Vietnam was granted observer status at GATT and also applied to the WTO for membership. In 1995, Vietnam joined ASEAN and also became a member of the Asian Free Trade Area (AFTA). As a member of AFTA, Vietnam involved commitments to reduce tariffs on imports from ASEAN to 0-5 per cent over a ten year period on a wide range of industrial and agricultural commodities under the Common Effective Preferential Tariff Scheme (CEPT). Vietnam also involved making commitments to eliminate non-tariff barriers on goods covered by CEPT and to harmonise customs, investment and standards regulations and procedures (CIE 1998). CEPT requires AFTA members to submit four lists[50] to "determine the pace and scope of the trade liberalisation" (TG 1999a: 28).

[50] IL: the inclusion list, TEL: the temporary exclusion list, SL: the sensitive list, and GEL: the general exception list.

Under the CEPT, Vietnam immediately undertook to reduce tariff rates of items in the IL to no more than 5 per cent by January 1st, 2006. On January 1st, 1996, Vietnam submitted the IL of 857 commodities and on January 1997, 640 tariff lines were further noted. In 1998, the government published the tariff-reducing schedule under CEPT for the items under IL and TEL to the year 2006 (see CIE 1998: Table 3.11). Other lists will operate over a longer period[51].

The law on export and import duties was also amended by the National Assembly in May 1998. Under the amended law, three categories of tariffs were created. They include normal, preferential (MFN) and special preferential rates of tariffs.

Vietnam also formally joined the Asia-Pacific Economic Cooperation (APEC) on November 17-18, 1998. On July 13, 2000, Vietnam and the United States signed a bilateral trade agreement. The agreement concerns comprehensive economic and commercial aspects, which include foreign trade, services, investment and intellectual property. The agreement is based on the principles of equality, mutual benefit and respect for each other's independence and sovereignty and conformity with the rules and standards of the WTO. The signing of a bilateral trade agreement between Vietnam and the United States completes the normalisation of economics and commerce between the countries; it is expected that it will create more favourable conditions to develop bilateral trade, co-operation and investment. It also creates favourable conditions for Vietnam to join the WTO[52].

[51] "The items in the TEL are to be transferred to the IL by 2003 in 5 equal instalments beginning from 2000 and then reduced to 0-5 per cent by 2006; the SL consists of unprocessed agricultural products and is to be phased into the IL between 2003-06 and to be in the range of 0-5 per cent by 2013, and in principle, the GEL should have only the items satisfying Article XX of the GATT which allows measures to protect national security, public morals, human, animal or plant life and health, and articles of artistic, historic and archaeological value" (TG 1999a: 28).

[52] Electronic NhanDan Newspapers on July 14, 2000.

6.3.2 - Export and import performances

Under the comprehensive economic reforms and the reform of external economic relations from 1989 to 1998, foreign trade has increased substantially. Average annual growth rates of exports and imports have been from 27 per cent to 28 per cent pa (although the Vietnamese economy was affected slightly by the financial crisis in the region in 1997-1998). The ratio of foreign trade (exports plus imports) to GDP as a proxy for openness has increased from more than 40 per cent in 1989 to more than 80 per cent in 1997 (it was 4 per cent lower in 1998 due to the effects of financial crisis in the region) (Table 6.3).

Table 6.3: Openness of Vietnamese Economy, 1989-98

	89	90	91	92	93	94	95	96	97	98
Share of GDP										
Exports (%)	19.6	21.2	24.7	25.0	23.3	26.1	25.2	31.0	37.7	36.2
Imports (%)	24.8	21.7	25.5	25.6	27.5	33.9	36.6	44.3	43.2	40.0

Source: Table 1.2 (Chapter 1). Author's estimates

The high growth rate of exports has contributed to economic growth. TG (1999a) estimated the impact of GDP growth rate on labour force, investment, and export growth rates from 1991 to 1998. The results indicate that a one per cent increase in exports will lead to 0.04 per cent increase in GDP in the long run. Export and import taxes also are major sources for the state budget. During 1991-92, the share of export/import taxes in total state revenue was about 10 per cent; it increased to nearly 25 per cent in 1995-96, but fell to 21 per cent in 1997-98 (TG 1999a: 31).

Exports

Exports achieved a high growth rate (25 per cent pa average) during the period 1990-98.

During that period, the structure of exports changed considerably. The share of food in total exports decreased gradually from nearly 40 per cent in 1990 to 27 per cent in 1998 (even though rice exports increased strongly from 1.6 million tons in 1990 to more than 3.0 million tons in 1998). The share of agricultural non-foods fell sharply from around 20 per cent in 1990-91 to 8 per cent and 5 per cent during 1995-96, and it was around 2 per cent in 1997-98. This was similar to the behaviour of the share of fuels to total exports; it was around 30 per cent during 1990-91 then declined to less than 20 per cent in 1997-98. In contrast, the share of manufactures in total exports has grown substantially from less than 20 per cent in 1990-91; it was 36-48 per cent in the 1992-96 period, and 54-55 per cent during 1997-98 (Appendix 6.3). This export structure reflects that Vietnam export goods have mainly included primary commodities, which are less value added and depend more on agriculture and natural resources. The exports of manufacturing goods have increased substaintly, but the share is much less than other fast-growing developing countries.[53]

Export destinations in the period 1990-98 have changed dramatically. Exports to the non-convertible area stopped from 1992 and after that foreign trade to central planned economies was cleared by hard foreign currencies (US$), but export shares to these countries were small, around 1-2 per cent (see Appendix 6.4). The largest market of Vietnam is the EU. It is a growing market and its share of total exports increased from around 10 per cent during 1991-93 to more than 30 per cent in 1998. The second largest market is Japan. Its export share has fallen but was still around 20 per cent in 1998. The third largest market is ASEAN. Its share is around 20 per cent. After that China and NAFTA also are big markets for Vietnam's exports. The Middle East and Africa were

[53] Shares of manufacturing goods in total exports of China, Indonesia, Malaysia, Philippines and Thailand in 1996 were 85.4 per cent, 60.6 per cent, 80.5 per cent, 83.3 per cent and 81.5 per cent respectively (TG 1999a: 32).

very small markets for Vietnam until 1998. Garments and textiles are mainly exported to the EU, seafood usually goes to industrial countries, and crude oil is exported to Japan and Singapore.

Imports

Vietnam's imports grew rapidly in the period before 1997. Average import growth rates were from around 39 per cent to 49 per cent pa in the period 1993-96. The strong import growth is as a result of demand for development of the economy and the "open-door" policy. However, import growth slowed down in 1997-98, due to the financial crisis in the region and the import restriction policies of the governments to reduce the trade deficit and improve the BOPs.

Vietnam imports mainly manufactured goods to meet the demand for industrialisation and modernisation. The share of manufactures in total imports has been around 77 per cent to 86 per cent during that period (Appendix 6.3). Machinery and transport equipment have the largest share in total imports (more than 30 per cent). The second largest is basic manufactures, with a share of more than 20 per cent. Chemicals have a share in the range from 15 per cent to 20 per cent of total imports. Fuels also have been important import goods for Vietnam, with a share from around 7 per cent to 10 per cent. Vietnam has to import all its petroleum while exporting crude oils, as the oil refinery industry is in the first stage of construction. Primary commodities have been imported for consumption and production, but their share is relatively small (from 12 per cent to 20 per cent) (Appendix 6.3). Domestic production can provide a major part of domestic consumption. Moreover, government wants to restrict the consumption of luxury goods and reduce the current account deficit.

ASEAN has been the largest import market during this period; its share in total imports has been around 30 per cent. After that Mainland China, Japan and South Korea have been the second, third and fourth largest import markets, with their shares from 10 per cent to 17 per cent. The EU is also a big import partner and has a share of around 10 per cent (Appendix 6.4).

6.3- Conclusion

In summary, after comprehensive economic reform in 1989, the managements of Forex and foreign trade have been relaxed. The SBV has adopted a managed float exchange rate regime and has implemented a flexible and market oriented foreign exchange rate policy. This makes exchange rates become more and more market determined. During the period 1992-1998, nominal effective exchange rate has been depreciated around 20 per cent, but the real effective rate has appreciated by around 20-30 per cent. This may lead to reduction in the competitiveness of Vietnam's export goods and discourage exports.

After nearly a decade, foreign trade policies have been reformed considerably and contributed to a high growth rate of exports and imports, which have positive effects on economic development. Entry into foreign trade has been opened widely in all sectors. NTBs and trade taxes have been reduced generally (except for import regulation in 1997-98 due to the financial crisis in the region). External relations have been developed. Vietnam joined ASEAN and APEC, and signed a bilateral trade agreement with the United States in the July 2000, that creates favourable conditions for foreign trade.

However, the level of protection in the form of quantitative restrictions and tariffs is still high. There are some problems in entering APEC and the WTO. Other reforms such as financial sector reform, SOE reform, and reform of the import-substitution strategy, need to be coordinated better to support foreign trade. These must be considered in the models in the next section that analyses the impacts of prices and exchange rates on trade flows.

Chapter 7

THE EFFECTS OF PRICES AND EXCHANGE RATES ON TRADE FLOWS IN VIETNAM

7.1. Introduction

Based on the theoretical issues, which concern the effects of exchange rates and prices on trade flows, Error Correction Models (ECMs) in Chapter 5 and the reforms of exchange rate and foreign trade policies, which were examined in Chapter 6, this chapter uses the ECMs to analyse the effects of exchange rates and prices on trade flows in both the short and long runs in Vietnam during the period 1992-1998. The Marshall-Lerner conditions for Vietnam are also calculated through regressions of long run export and import models.

As mentioned in Chapter 6, some studies on exchange rate issues in Vietnam were most likely based on institutional and policy changes, and used very simple econometric models,[54] and particularly the effects of exchange rates and prices on trade flows were not mentioned until recently. Therefore, this chapter may provide another approach to do research on exchange rates in Vietnam, and the results from this study may be used to evaluate the appropriateness of exchange rate policy, and also provide evidence for policy makers to choose appropriate policies such as import tariffs cum export subsidies, or devaluation to improve exports and trade balance in the next period.

The chapter is organised as follows: Section 1 specifies long run and short run ECMs for exports and imports, and describes the data sources. Section 2 contains empirical results and interpretations. Section 3 includes the conclusion and policy implications.

7.2. Model specifications and data description

The ECM that was introduced in Chapter 5 is used in this section to specify models for export and import demands in both short and long runs. Data are also described below.

7.2.1-Export demand models

Long run export demand models

Changes in world demand for a country's exports should depend on changes in world income, relative export prices and exchange rates. It can be specified in log-linear form for Vietnam as below[55]:

$$LnX_t^d = a + bLnYW_t + cLn\left(\frac{P_{VNX}}{P_{WXT}}\right)_t + dLnE_t + v_t \qquad (7.1)$$

where:

Ln is the log linear term

X is index of volume of Vietnam's exports to its trading partners

YW is weighted average of real GDP of Vietnam's trading partners.

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[54]see Le and Tran (1995).

[55] The equation (7.1) is taken from the Bahmani-Oskooee (1986) paper. It was also used in Houthaker and Magee (1969), and Khan (1974), but as they used data from prior to the floating rate system, the exchange rate variable (E) was excluded from their equations. The export equation adopted for this analysis is mainly the 'demand' equation such as (7.1), since in the micro level (commodity level), Vietnam has particular commodities such as rice and coffee (Vietnam has been ranked in the top 3 of rice and coffee exporting countries in the world during the period 1992-99, see Vo (2001) and Nguyen (1999)), it reflects some market power for Vietnamese exports. However, in the garment exports, Vietnam has supply constraints to provide high quality garments for export. In the macro level (aggregate level), Vietnam still is a small exporting country in the world, the proportion of Vietnam's export value to the world export value is from 0.07 per cent to 0.20 per cent during the period 1992-99 (see Appendix: 8.10). Therefore, Vietnam is a price taker; supply of Vietnam's export goods only affects the quantity of few export goods, but not for the price. So our specification based mainly on the demand equation is reasonable, and the supply side may not be important in this context (for the case of Vietnam).

P_{VNX} is Vietnam's export price index.

P_{WXT} is the world's export price index of primary commodities and non-ferrous base metals.

E is the nominal import-weighted effective exchange rate. It is defined as the number of units of domestic currency per unit of foreign currency. (Three exchange rates which were calculated in Chapter 6 are used in this study: first, VCBE- the rates from Vietcombank, which is the largest state-owned commercial bank. It dominates foreign exchange transactions in the banking system. Second, HNE- the rates from the parallel markets in Hanoi. Third, HCME- the rates from the parallel market in HoChiMinh City). v is an error term.

b is the income elasticity. We expect that $b > 0$, since an increase in world income should increase demand for exports and vice versa. c is the price elasticity. It is expected to be negative ($c < 0$), because lower prices should lead to an increase in export demand. d is the exchange rate elasticity. An increase in exchange rates indicates a depreciation. We expect d to be positive ($d > 0$), which implies a depreciation of domestic currency promotes exports.

The relative export price index, P_{VNX}/P_{WXT}, is used instead of using the ratio export price index to the weighted average of the export price index of trading partners (which was used in the Bahmani-Oskooee 1986 models), for two reasons:

First, the export structures of Vietnam and its 13 trading partners are different. The majority of export goods from Vietnam are primary commodities. Appendix 6.3 (Chapter 6) shows that the share of primary commodities in total exports was 85 per cent in 1990 and 55 per cent-52 per cent in the period 1992-96. The share fell to around

45-46 per cent in 1997-98. Manufactures exports from Vietnam are mainly garments and textiles, which are based on labour intensive industries. In contrast, the export structures of Vietnam's 13 major trading partners (used in these models) are dominated by manufactured goods (see Appendix 7.11). Therefore, the use of the export price index from Vietnam's trading partners in the denominator of the relative export price index is not appropriate, as it may affect the homogeneity of the relative export price. Using P_{WXT} instead of the export prices of trading partners may avoid the non-homogeneity problem.

Second, because the integration of world trade is so comprehensive, the world's export price index is a key indicator for exporters to take into account in international trade rather than single prices of goods or export prices in specific countries.

Adding seasonal factors (fourth quarter: S4) into equation (7.1) to account for increase in the demand on the occasions of Christmas and New Year in importing countries, we have:

$$LnX_t^d = a + bLnYW_t + cLn\left(\frac{P_{VNX}}{P_{WXT}}\right)_t + dLnE_t + S4 + v_t \qquad (7.2)$$

In the foreign trade section (Chapter 6), NTBs (non-tariff barriers) and taxes on exports in Vietnam were analysed. Quotas on exports were considered as targets (they were not fixed). Sometimes, exports did not reach these targets or they may even have exceeded the targets. Taxes on exports were only from 1 to 5 cents per dollar of exports during the period 1993-1999. Therefore, NTBs and taxes on exports in that period were not a big barrier to exports. So, we can ignore them in estimating export demand models in both the short and long run.

After the regression of equation (7.2) and the stationarity of residual is tested to confirm the long relationship between variables, the analysis can then proceed to ECM for export demand in the short run according to Engle-Granger (1987), (see Chapter 5).

Error Correction Models for export demand

The ECM for export demand can be specified as

$$DLnX_t^d = \psi_0 + \sum_{i=1}^{h1}\psi_{1i} DLnX_{t-i}^d + \sum_{i=0}^{h2}\psi_{2i} DLnYW_{t-i} + \sum_{i=0}^{h3}\psi_{3i} DLn\left(\frac{P_{VNXi}}{P_{WXCi}}\right)_{t-i} + \sum_{i=0}^{h4}\psi_{4i} DLnE_{t-i} + \rho v_{t-1} + \eta_t \quad (7.3)$$

where

DLn is the first difference operator of the log linear variable.

v_{t-1} is the error correction term (from the regression results on equation 7.2)

η_t is the disturbance term

We expect $-1 < \rho < 0$ to ensure the long run equilibrium is achieved (see Chapter 5).

7.2.2- Import demand models

Long run import demand models

Aggregate import demand for a country is hypothesed to be a function of domestic real income, the ratio of import prices to domestic prices (assuming a degree of substitutability between imports and domestic goods), the real import penetration ratio, and exchange rates[56]. The long run import demand model for Vietnam is expressed in the log linear form as follows:

$$LnM_t^d = \alpha + \beta LnIND_t + \gamma Ln\left(\frac{P_{VNM}}{P_D}\right)_t + \delta LnRIPR_t + \lambda LnE_t + \varepsilon_t \quad (7.4)$$

Where

[56] Bahmani-Oskooee (1986) used equation (7.4) in his study, except for the real import penetration ratio.

M is the index of the volume of Vietnam's imports from its trading partners.

IND is real domestic industrial output, used as a proxy for real income (IND usually has been around 30 per cent of GDP; quarterly data on Vietnam's GDP are not available).

P_{VNM} is Vietnam's import price index

P_D is the domestic price index (CPI)

RIPR is the real import-penetration rate

E is the nominal import weighted effective exchange rate (similar to export demand models, three kinds of exchange rates are included: VCBE, HNE and HCME)

ε is an error term.

Adding a seasonal factor (fourth quarter: S4) into equation (7.4) to account for increasing demand for imports on the occasions of the New Year, Lunar new year festival, and the end of the financial year, we have the long run import models as shown below:

$$LnM_t^d = \alpha + \beta LnIND_t + \gamma Ln\left(\frac{P_{VNM}}{P_D}\right)_t + \delta LnRIPR_t + \lambda LnE_t + S4 + \varepsilon_t \qquad (7.5)$$

β is the income elasticity (industrial production elasticity), which is expected to be positive, since an increase in industrial production should lead to an increase in import demand. However, the sign of β could be negative because of import substitution of the industries; imported goods may be substituted by the domestic products made by import -substitution industries. γ is the price elasticity. The sign of γ is expected to be negative, which means lower relative import prices will lead to an increase in the demand for imports. The coefficient on the real import penetration rate δ , is expected to be positive, because a rise in real import penetration indicates a relaxation in import restrictions promotes imports. The elasticity of the exchange rate variable λ is expected to be

negative, since the effective exchange rates used in these models are defined as the number of units of domestic currency per unit of foreign currency. An increase in the exchange rate denotes a depreciation of the domestic currency, making imported goods more expensive compared to domestic goods. Therefore, the depreciation should reduce import demand.

It is necessary to discuss import penetration ratio further which are defined as the ratio of total imports to total domestic consumption (imports/(gross domestic production + imports - exports)). Generally, an increase in the import penetration ratio may result from the worsening competitiveness of domestic suppliers, or from relaxation or removal of restrictions on imports. Import penetration can be considered as a reasonable proxy for the level of protection (particularly non-tariff protection) in these models for the case of Vietnam where the level of protection has been high and may have affected imports. As mentioned in the previous part, NTBs and tariffs have gradually been reduced from the beginning of the 1990s to 1996, although they were increased from 1997 to avoid harmful effects from the financial crisis in the region and improve the trade balance and the BOP. The share of import goods which were subject to quantitative restrictions under 1999 regulations (using the 1996-import structure) was 24 per cent, and the nominal average tariff was in the range from 12.3 per cent to 13.6 per cent. So the change in the average tariff was just 1.3 per cent in the period 1995 to 1998. As this tariff change is small in the short term, we can ignore it in the import models (see Edwards 1989) and we concentrate only on the NTBs that can be proxied by the import penetration ratio.

The import penetration ratio calculated in nominal terms is usually subject to distortion

due to inflation increases and changes in the real exchange rate. Therefore, use of the real import penetration ratio may avoid this problem (the change in the real term reflects the change in the volume of domestic consumption accounted for by imports, not just changes in the price of imports. The pattern of behaviour of the real import penetration ratio in Vietnam from 1992 to 1998 reflects the theory above (see Appendix 7.10). From 1992 to 1996, the rise in the import penetration ratio has coincided with the relaxation on import restrictions, and it slowed down since 1997 when import restrictions increase slightly. This is evidence to support the use of the import penetration ratio in the import demand models.

After estimating the long run import equations (7.5), the stationarity of the residuals can be tested by using the DF and ADF tests (similar to export models). If the residuals are stationary, I(0), it can be concluded that the variables in the long run import models are cointegrated of order 1, and the Error Correction Models for import demand in the short run can be specified.

Error Correction Models for import demand

The ECM for import demand is specified as follows:

$$DLnM_t^d = \phi_0 + \sum_{i=1}^{m1} \phi_{1i} DLnM_{t-i}^d + \sum_{i=0}^{m2} \phi_{2i} DLnIND_{t-i} + \sum_{i=0}^{m3} \phi_{3i} DLn\left(\frac{P_{VNMi}}{P_{Di}}\right)_{t-i} + \sum_{i=0}^{m4} \phi_{4i} DLnRIPR_{t-i} + \sum_{i=0}^{m5} \phi_{5i} DLnE_{t-i} + \sigma\varepsilon_{t-1} + \mu_t \quad (7.6)$$

where

DLn is the first difference operator.

ε_{t-1} is the error correction term (from regression results on equation 7.5), and σ is the speed of adjustment.

μ_t is the disturbance term.

7.2.3- Data description

All data used in the estimation of these models are quarterly, concerning the period from 1992Q4 to 1998Q4 for Vietnam and its 13 major trading partners (Australia, Canada, France, Germany, Japan, Netherlands, Singapore, South Korea, Sweden, Taiwan, Thailand, United Kingdom, and United States). Not only are these countries major trading partners of Vietnam, but also they have sufficient data for the analysis.

The data were collected from the following sources:

a) Monthly Statistics of Foreign Trade (1990-2000), OECD publication. Various issues

b) Direction of Trade Statistics quarterly (DOTS). Various issues

c) International Financial Statistics (Monthly). Various issues

d) International Financial Statistics Yearbook, 1990-1999.

e) Monthly Bulletin of Statistics of the Republic of China, 1992-1999

f) Taiwan Statistical Data Book, 1992-1999

g) Major Statistics of Korean Economy, 1992-1999.

h) DX database, Faculty of Economics and Commerce-ANU

i) The State Bank of Vietnam (SBV) Annual Reports, 1995-1998 and General Statistical Office of Vietnam (GSO) authorities.

j) Department for Economic and Social Information and Policy Analysis, Statistical Division, United Nations.

All data are expressed in index form, 1992Q4 =100. Most variables were introduced in both short and long run ECMs for exports and imports, There are some details for data description:

- Y = real GDP index. Quarterly data are available all countries except Thailand. In

the case of Thailand, we lack GDP quarterly data from 1992-1995. Using annual data of real GDP and volume of imports from 1990-1998, we estimate the equation: $Y_t = a + bM_t + u_t$, then using available quarterly data of M to obtain estimated quarterly data (Y) of Y. After that Y_i is adjusted: $Y_1 + Y_2 + Y_3 + Y_4 = Y$ (which is actual annual real GDP) (see Chow and Lin, 1976, Bahmani-Oskooee, 1986).

- $YW_i = \omega_{ij} Y_j \qquad j = 1...13, \sum_{j=1}^{13} \omega_{ij} = 1$

Where ωij is the export share of Vietnam's export in the market of partner j

- $P_{TX} = P_{VNX}/P_{WXT}$ is the relative export price index of Vietnam (related to the world export price index of primary commodities and non-ferrous metals).
- Pwxc is the world export price index of preliminary commodities. They include export price indexes of food, agricultural non-food, and fuels (coal, crude oil and natural gas); these indexes affect export price indexes of Vietnam, since most export goods from Vietnam are food, agricultural non-food and fuels. These indexes are weighted according to VN export shares of food, agricultural non-food and fuels from the stars system (APSEM-ANU).
- $P_X = P_{VNX}/P_{WXC}$ is the relative weighted export price index of Vietnam (including export price indexes of food, agricultural non-food, and fuels)
- $P_M = P_{VNM}/P_D$ is the relative import price index of Vietnam
- RIPR = Vietnam's real import-penetration ratio (RIPR = imports/(gross industrial production + imports - exports)). Gross Industrial Production at 1992 price in VND. Import and Export values in US$ are converted into VND according to the VND/US$ exchange rate of Vietcombank in December 1992.
- S4 = seasonal factor = (0,0,0,1).

7.3. Empirical results and interpretations

7.3.1-Unit root tests

Before conducting the ECM analysis, testing the order of integration of variables is necessary to confirm that all variables in the system have the same order.[57] In the DF and ADF tests, lag lengths of tested variables are considered, depending on the number of observations, type of data (monthly, quarterly). The quarterly data contain 25 observations only, and so four lags are appropriate for DF and ADF tests.

The unit root test results in Table 7.1 show that all variables for both export and import models in logarithm form of levels do not pass DF tests (their statistics are insignificant). There are three variables which have significant statistics in the ADF tests at the 10 per cent level (LnVCBE and LnHCME are significant at lag 3, LnHNE is significant at lag 2 and 3). LnM is significant at the 5 per cent level in lag 1 (Table 7.1). There is not sufficient evidence to say that these four variables are stationary, but these tests suggest that they are stationary in lag 2nd form, which passes ADF tests. If they are stationary, they may still be used in these models (Dagenais and Muet 1992).

DF test results for first difference logarithm linear forms of all variables are significant, but ADF tests are significant for only four variables. Therefore, according to the DF test results, we can conclude that all variables in logarithm linear form have the same order I(1), and their first differences are I(0).

[57] This is conventional, but the combination of variables which have different orders such as (2) and (1) or (1) and (0) may be accepted (see Dagenais and Muet, 1992).

Table 7.1: Unit Root Test Results

Sample period from 1994Q1 to 1998Q4

DF regression include an intercept but not a trend

	LnX	LnYW	LnPX	LnPTX	LnVCBE	LnHNE
DF	-1.89	-0.63	0.26	-0.17	-2.01	-2.17
ADF(1)	-2.14	-0.70	0.10	-0.42	-1.98	-2.06
ADF(2)	-1.76	-0.87	0.13	-0.55	-2.45	-2.67*
ADF(3)	-2.22	-1.48	0.70	-0.59	-2.74*	-2.68*
ADF(4)	-1.76	-1.03	0.76	-0.44	-1.98	-1.99

	LnHCME	LnM	LnIND	LnPM	LnRIPR
DF	-2.02	-1.92	-0.58	-0.15	-1.65
ADF(1)	-1.98	-3.31**	-0.17	-0.33	-1.60
ADF(2)	-2.46	-2.20	-0.08	-0.62	-1.66
ADF(3)	-2.81*	-1.95	-0.77	-0.60	-1.42
ADF(4)	-2.00	-1.71	-0.63	-0.85	-1.65

Sample period from 1994Q2 to 1998Q4

DF regression include an intercept but not a trend

	DLnX	DLnYW	DLnPX	DLnPTX	DLnVCBE	DLnHNE
DF	-8.71**	-5.68**	-3.70**	-3.75**	-4.33**	-4.75**
ADF(1)	-2.55	-4.22**	-2.17	-2.64*	-1.75	-1.33
ADF(2)	-2.49	-4.37**	-2.58	-2.26	-1.39	-1.33
ADF(3)	-1.83	-0.82	-2.23	-2.04	-2.35	-2.60
ADF(4)	-1.24	-0.80	-2.20	-2.45	-1.81	-1.71

	DLnHCME	DLnM	DLnIND	DLnPM	DLnRIPR
DF	-4.36**	-6.61**	-10.47**	-2.70*	-4.10**
ADF(1)	-1.75	-1.79	-5.48**	-1.46	-3.13**
ADF(2)	-1.39	-1.15	-6.79**	-1.51	-1.39
ADF(3)	-2.45	-0.48	-4.38**	-1.76	-0.73
ADF(4)	-1.82	-0.52	-2.86*	-1.75	-1.06

Note: ** is significant at 5 per cent level (given by DF regressions), * is significant at 10 per cent level (critical values are –2.62 for DF test with constant but no time trend for 25 observations, from Enders (1995: 419)).

7.3.2- Export demand model results

The results of long-run export demand equation regressions for the three models using the three different import-weighted effective exchange rates (VCBE, HNE and HCME) are reported in Table 7.2. In all three models, foreign income elasticities have positive

signs and they are highly significant (at the 1 per cent level). Their magnitudes are very large, *ceteri paribus*, a one per cent increase in world income will lead to an increase of around 6.5 per cent of exports. It means world income has a huge effect on export demand.

Price elasticities in all models have expected signs (negative), but their magnitudes are small (approximately from 0.31 to 0.33) and statistically significant at the 10 per cent level for the case of the Hanoi parallel market effective exchange rate (Model 2) and 11 per cent for the cases of Vietcombank (Model 1) and HoChiMinh City parallel market exchange rate (Model 3). This indicates that a fall in relative export prices has a small effect in terms of increasing the export volume and this also reflects the fact that the competitiveness of Vietnam's export goods is low.

Elasticities of exchange rates in export demand models have positive signs and they are highly significant at the 1 per cent level. The exchange rates are expressed as the price of domestic currency per unit of foreign currency, so an increase in exchange rates denotes depreciation of the domestic currency. This result suggests that devaluation could have stimulated exports in the period. A one per cent depreciation of exchange rates will lead to around 0.95 per cent increase in exports for Model 1 and 3, and 1.10 per cent for model 2. This difference may result from larger fluctuations of exchange rates in the Hanoi parallel market than in HCM City and Vietcombank.

These models have high R squared and R bar squared (from 0.96 to 0.97); this reflects the fitness of the models. Three models passed all F tests and diagnostic tests. Therefore, we can reject the hypothesis that all coefficients of these variables are equal

to zero. There is no evidence of serial correlation, function forms are correct, and there are no problems with respect to normality and heteroscedasticity.

Table 7.2: Long-run export demand equation regression results

$$LnX_t^d = a + bLnYW_t + cLn\left(\frac{P_{VNX}}{P_{WXT}}\right)_t + dLnE_t + S4 + v_t$$

24 observations used for estimation from 1993Q1 to 1998Q4

Variables	Coefficients		
	Model 1 (VCBE)	**Model 2 (HNE)**	**Model 3 (HCME)**
a	**-12.258***** (-16.03)	**-12.444***** (-15.97)	**-12.327***** (-15.91)
$LnYW_t$	**6.489***** (19.26)	**6.449***** (19.44)	**6.509***** (19.38)
$Ln(P_{VNX}/P_{WXT})_t$	**-0.307**[a] (-1.68)	**-0.331*** (-1.85)	**-0.306**[a] (-1.69)
LnE_t	**0.944***** (3.46)	**1.103***** (3.61)	**0.959***** (3.49)
S4	**-0.052***** (-3.48)	**-0.055***** (-3.72)	**-0.052***** (-3.50)
R^2	0.97	0.97	0.97
$\overline{R}^2$	0.96	0.96	0.96
F(4, 19)	139.37 [.000]	144.33 [.000]	140.21 [.000]
Serial correlation $\chi^2(4)$:	4.708 [.319]	6.355 [.174]	4.635 [.327]
Function form $\chi^2(1)$:	0.840 [.359]	1.135 [.287]	0.996 [.318]
Normality $\chi^2(2)$:	2.300 [.317]	2.166 [.339]	2.162 [.339]
Heteroscedasticity $\chi^2(1)$:	0.801 [.371]	1.042 [.307]	0.674 [.412]

Note: ***, ** and * are significant at 1%, 5% and 10% level, respectively.
a is significant at 11% level. The values in brackets are T-ratios and squared brackets are probabilities.

The results have some similarities to the results from the Bahmani-Oskooee (1986) models. Real income elasticities were positive and significant in most of the cases. Price elasticities in export models for South Korea, Israel, and Greece were less than unity and they had the expected signs. Elasticities of exchange rates for Vietnamese exports

are similar to the cases of Greece, India and Israel.

Table 7.3: Test for cointegration of variables in the long-run export demand equations - DF test for residual v_t

$Dv_t = a_1 v_{t-1} + \tau_t$
(H_o: $a_1 = 0$, residual is nonstationary)
23 observations used for estimation from 1993Q2 to 1998Q4

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
a_1	**-1.247*** **	**-1.210*** **	**-1.237*** **
	(-5.67)	(-5.45)	(-5.57)
R^2	0.59	0.57	0.58
Serial correlation $\chi^2(4)$:	5.851 [.211]	7.495 [.112]	5.778 [.216]
Function form $\chi^2(1)$:	0.065 [.798]	0.170 [.680]	0.124 [.725]
Normality $\chi^2(2)$:	1.362 [.506]	1.605 [.448]	1.404 [.496]
Heteroscedasticity $\chi^2(1)$:	1.269 [.260]	1.759 [.185]	1.352 [.245]

Note: *** is significant at 1 per cent level
The values in brackets are T-ratios and squared brackets are probabilities.

DF tests for non-stationarity of the residuals of long run export demand equations (with no and with constant terms) and ADF tests of residuals of models with constant terms indicate that residuals of long-run export demand equations are stationary (Table 7.3 and Appendix 7.1). Thus we can conclude that all variables in the long-run export demand equations are cointegrated at order 1 or that they have a long-run relationship. The cointegration test results above allow us to estimate ECM models for export demand in the short-run according to Engle-Granger (1987).

Table 7.4 reported the results of ECMs for export demand. The results in Model 1 and 3 are similar, and the magnitudes of coefficients in Model 2 are slightly higher than in Models 1 and 3. This may result from active movements of exchange rates in Hanoi's parallel market. However, the overall results in the three models are the same.

Table 7.4: Error Correction Model for export demand

$$DLnX_t^d = \psi_0 + \psi_{11} DLnX_{t-1}^d + \sum_{i=0}^{3} \psi_{2i} DLnYW_{t-i} + \psi_{30} DLn\left(\frac{P_{VNX0}}{P_{WXT0}}\right)_t + \psi_{40} DLnE_t + \rho v_{t-1} + \eta_t$$

21 observations used for estimation from 1993Q4 to 1998Q4

Variables	Coefficients		
	Model 1 (VCBE)	**Model 2** (HNE)	**Model 3** (HCME)
Ψ_0	**0.021**	**0.015**	**0.020**
	(1.10)	(0.85)	(1.10)
$DLnX^d_{t-1}$	**-0.134**	**-0.175**	**-0.129**
	(-0.58)	(-0.77)	(-0.56)
$DLnYW_t$	**-2.041**	**-1.518**	**-2.058**
	(-0.77)	(-0.61)	(-0.77)
$DLnYW_{t-1}$	**1.553**	**1.819**	**1.602**
	(1.06)	(1.28)	(1.10)
$DLnYW_{t-2}$	**-1.080**	**-0.509**	**-1.107**
	(-0.56)	(-0.24)	(-0.57)
$DLnYW_{t-3}$	**2.946****	**3.386****	**2.976****
	(2.30)	(2.59)	(2.32)
$DLn(P_{VNX}/P_{WXT})_t$	**-0.581***	**-0.614***	**-0.580***
	(-1.82)	(-1.81)	(-1.82)
$DLnE_t$	**0.131**	**0.270**	**0.124**
	(0.30)	(0.58)	(0.28)
v_{t-1} (Error correction term)	**-0.859****	**-0.839****	**-0.851****
	(-2.91)	(-2.82)	(-2.91)
R^2	0.83	0.82	0.83
$\bar{R}^2$	0.72	0.70	0.71
F(8, 12)	7.299 [.001]	6.955 [.002]	7.261 [.000]
Serial correlation $\chi^2(4)$:	5.188 [.269]	5.666 [.226]	5.044 [.283]
Function form $\chi^2(1)$:	2.612 [.106]	2.502 [.114]	2.783 [.095]
Normality $\chi^2(2)$:	0.659 [.719]	0.698 [.705]	0.678 [.712]
Heteroscedasticity $\chi^2(1)$:	1.225 [.268]	1.154 [.283]	1.205 [.272]

Note: ** and * are significant at 5% and 10% level, respectively.
The values in brackets are T-ratio and squared brackets are probabilities. The lagged lengths of variables are selected by using the Schwarz Bayesian Criterion (SBC).

Coefficients of lag1 of first differences of log exports are negative, but insignificant and their magnitudes are small (from 0.13 to 0.17). This indicates that exports of the current quarter may be influenced slightly by the last quarter.

Coefficients on world income from current time up to lag 2 are not statistically significant in all three models. However, they are only significant at lag 3 and have positive (expected) signs. Their magnitudes are from 2.95 to 3.39. These income elasticities are large but they are still smaller than in the long run and these suggest that a one per cent increase in world income in the previous 3rd quarter will lead to an increase of around 3 per cent in current export volume (it takes time to change technologies, products, etc), and it also indicates that world income is the biggest factor in stimulating exports during that time.

Price elasticities in all three models have the expected signs (negative) and are significant at the 10 per cent level. A one per cent decrease in relative export prices could lead to between 0.58 and 0.61 per cent increase in export demand. The results suggest that export demand has been encouraged by lower prices of exports, although they are less than unity and their effects on exports occurred only in the current period.

Exchange rate depreciation in the short run also has positive effects on export demand, but the coefficients are insignificant. The exchange rate elasticities are very small (from 0.12 to 0.27), and also smaller than those in the long run. These denote that exchange rate depreciations may have small effects in terms of promoting exports.

So, in the short term, exchange rates have smaller effects on exports (or no effects since coefficients are insignificant) than relative prices. These results are consistent with the

results of Wilson and Takacs (1979), Bahmani-Oskooee (1986), and Chua and Shama (1998). However, our empirical results have given no evidence that exports adjust more quickly to changes in exchange rates than in prices.

Coefficients of error correction terms for the "speed of adjustment" are negative and they are in the range from -0.86 to -0.84 for the three models. These negative values in the interval {-1, 0} of the speed of adjustment ensure the long run equilibrium is achieved in all models, and they suggest that from 84 to 86 per cent of any quarter's deviation between the actual export volume and the long run equilibrium, is incorporated into the next quarter's growth of export volume.

These models also passed all F tests and diagnostic tests. R squared and R bar squared values were from 0.83 to 0.70. Residuals of the ECM for export demand are stationary, confirming that these variables in the ECM for export demand are I(0) and their residuals must be I(0), so the above results are plausible (see Table 7.4 and Appendix 7.2).

Sensitivity of the study

To test the sensitivity of the export demand models in order to increase the plausibility of this study, P_{WXT} (the world's export price index of total primary commodities and non-ferrous metals) in the previous models is replaced by P_{WXC} (world's export price index of preliminary commodities). P_{WXC} includes export price indexes of food, agricultural non-food, and fuels. These indexes may affect the export price index of Vietnam, since most of its export goods are food, agricultural non-food and fuels (foreign trade section in this chapter). These indexes are weighted according to

Vietnam's export shares of food, agricultural non-food and fuels from the Stars system-ANU. However, only yearly data are available, so we assume the share of above export goods in each quarter is the same as their share in the yearly data.

The results in Appendix 7.5 indicate that the long run effects of world income and exchange rates on exports are very similar to the previous models. Only the price elasticities are slightly larger than in the official models, but less significant (they are statistically significant at 13 and 17 per cent levels). These models passed all diagnostic tests. Residuals of these regressions are also stationary (Appendix 7.6 and 7.7).

Short run effects of world income are higher, relative prices of exports are lower and not significant, and exchange rate effects on exports are like the previous models. So the weighted price index of preliminary commodities have weaker effects on trade flows than P_{WXT} (the world's export price index of total primary commodities and non-ferrous metals). The weaker effects of P_{WXC} may be explained by the lack of quarterly data of the export structure. The responses of trade flows to the change in export prices may be less well revealed in annual data. The speed of adjustments is in the same range [0.89 and 0.92] and the coefficients are significant at the 1 per cent level, ensuring that the long run equilibrium is achieved. Once again, these ECM passed all F and diagnostic tests, and their residuals are stationary. These results support the results in the previous models.

7.3.3- Import demand model results

Long run elasticities of industrial output (domestic production) have negative signs and they are statistically significant in Model 2 only. The magnitudes of these elasticities are

around 0.5 (Table 7.5). The negative signs may result from the import substitution strategy[58]. This tells us that an increase in industrial output under existing policies may reduce import demand in the long run.

Table 7.5: Long-run import demand equation regressions results

$$LnM_t^d = \alpha + \beta LnIND_t + \gamma Ln\left(\frac{P_{VNM}}{P_D}\right)_t + \delta LnRIPR_t + \lambda LnE_t + S4 + \varepsilon_t$$

23 observations used for estimation from 1993Q2 to 1998Q4

Variables	Coefficients		
	Model 1 (VCBE)	**Model 2 (HNE)**	**Model 3 (HCME)**
α	**4.778***	**4.665***	**4.521**
	(1.73)	(1.83)	(1.65)
$LnIND_t$	**-0.510**	**-0.485***	**-0.485**
	(-1.65)	(-1.81)	(-1.58)
$Ln(P_{VNM}/P_D)_t$	**-1.531****	**-1.495****	**-1.473***
	(-2.15)	(-2.29)	(-2.08)
$LnRIPR_t$	**0.925*****	**0.918*****	**0.920*****
	(8.82)	(9.22)	(8.82)
LnE_t	**-0.206**	**-0.203**	**-0.156**
	(-0.42)	(-0.42)	(-0.33)
$S4$	**0.028***	**0.029***	**0.028***
	(1.94)	(1.96)	(1.93)
R^2	0.96	0.96	0.96
$\bar{R}^2$	0.95	0.95	0.95
F(5, 17)	77.35 [.000]	77.32 [.000]	77.00 [.000]
Serial correlation $\chi^2(4)$:	7.020 [.135]	6.918 [.140]	6.853 [.144]
Function form $\chi^2(1)$:	2.973 [.085]	3.102 [.078]	2.889 [.089]
Normality $\chi^2(2)$:	0.607 [.738]	0.655 [.721]	0.601 [.740]
Heteroscedasticity $\chi^2(1)$:	1.703 [.192]	1.653 [.199]	1.655 [.198]

Note: ***, ** and * are significant at 1 per cent, 5 per cent and 10 per cent level, respectively.
The values in brackets are T-ratios and squared brackets are probabilities.

[58] The signs of import substitution were revealed through two points: First, FDI has been directed to import substitution industries, "a large share of incoming FDI is focused on import substitution... only about a quarter of FDI capital in the industrial sector has been intended mainly for exports...and foreign investment has been directed to capital intensive import substitution rather than labour intensive export production" (Kokko 1997: 15). Second, regulations on foreign trade are in favour of import substitution.

Long run elasticities of relative import prices have the expected signs (negative) and they are statistically significant at the 5-10 per cent level. The results indicate that a 1 per cent fall in relative import prices will lead to a 1.5 per cent rise of import demand. In contrast, exchange rate elasticities in all models are small. Their magnitudes are from 0.16 to 0.21 and statistically insignificant, but they still have the expected signs (negative). The results indicate that exchange rate devaluation may have a small effect in reducing import demand or import demand has a small negative response or no response to the change in exchange rates.

Table 7.6: Test for cointegration of variables in the long-run import demand equations - DF test for residual ε_t

$D\varepsilon_t = a_1\varepsilon_{t-1} + \chi_t$
(H_o: $a_1 = 0$, residual is nonstationary)
22 observations used for estimation from 1993Q3 to 1998Q4

	Model 1 (VCBE)	**Model 2 (HNE)**	**Model 3 (HCME)**
a_1	**-0.712*** **	**-0.729*** **	**-0.722*** **
	(-3.30)	(-3.36)	(-3.34)
R^2	0.34	0.35	0.35
Serial correlation $\chi^2(4)$:	6.759 [.149]	7.157 [.128]	6.974 [.137]
Function form $\chi^2(1)$:	0.087 [.768]	0.072 [.788]	0.079 [.778]
Normality $\chi^2(2)$:	0.821 [.663]	0.891 [.640]	0.795 [.672]
Heteroscedasticity $\chi^2(1)$:	3.174 [.075]	3.270 [.071]	3.196 [.074]

Note: *** and * are significant at 1 per cent and 10 per cent level
The values in brackets are T-ratios and squared brackets are probabilities.

Elasticities of the real import penetration ratio (RIPR) have the expected signs and are highly significant at the 1 per cent level. The results suggest that a 1 per cent increase in RIPR will lead to 0.92 per cent increase in import demand. This means that relaxation

Imported consumer goods have been restricted to below 20 per cent of total export revenue. Tariffs and NTBs are in favour of capital goods and intermediates (Kokko 1997).

of import restrictions (mainly NTBs) should have a significant impact in terms of liberalising imports.

Table 7.7: Error Correction Model for import demand

$$DLnM_t^d = \phi_0 + \phi_{11} DLnM_{t-1}^d + \phi_{20} DLnIND_t + \phi_{30} DLn\left(\frac{P_{VNM}}{P_D}\right)_t + \sum_{i=0}^{1} \phi_{4i} LnRIPR_{t-i} + \phi_{50} DLnE_t + \sigma\varepsilon_{t-1} + \mu_t$$

22 observations used for estimation from 1993Q3 to 1998Q4

Variables	Coefficients		
	Model 1 (VCBE)	**Model 2 (HNE)**	**Model 3 (HCME)**
Φ_0	**-0.004**	**-0.005**	**-0.004**
	(-0.36)	(-0.40)	(-0.38)
$DLnM^d_{t-1}$	**-0.113**	**-0.139**	**-0.113**
	(-0.49)	(-0.59)	(-0.49)
$DLnIND_t$	**0.364**	**0.529**	**0.390**
	(0.79)	(1.13)	(0.84)
$DLn(P_{VNM}/P_D)_t$	**-1.750***	**-1.460***	**-1.717***
	(-1.95)	(-1.76)	(-1.91)
$DLnRIPR_t$	**0.781*****	**0.757*****	**0.772*****
	(4.05)	(3.90)	(4.02)
$DLnRIPR_{t-1}$	**-0.197**	**-0.173**	**-0.194**
	(-0.78)	(-0.65)	(-0.76)
$DLnE_t$	**-0.559**	**-0.390**	**-0.516**
	(-1.19)	(-0.83)	(-1.10)
ε_{t-1} (Error correction term)	**-0.688****	**-0.722****	**-0.701****
	(-2.33)	(-2.39)	(-2.36)
R^2	0.74	0.73	0.74
$\bar{R}^2$	0.61	0.60	0.61
F(7, 14)	5.78 [.003]	5.473 [.003]	5.732 [.003]
Serial correlation $\chi^2(4)$:	6.185 [.186]	8.654 [.070]	6.241 [.182]
Function form $\chi^2(1)$:	0.017 [.897]	0.003 [.955]	0.012 [.912]
Normality $\chi^2(2)$:	0.087 [.957]	0.070 [.967]	0.077 [.962]
Heteroscedasticity $\chi^2(1)$:	0.603 [.437]	0.899 [.343]	0.661 [.416]

Note: *** ,** and * are significant at 1 per cent, 5 per cent and 10 per cent level, respectively
The values in brackets are T-ratios and squared brackets are probabilities.
The lagged lengths of variables are selected by using the Schwarz Bayesian Criterion (SBC).

Fourth quarter dummy variables are significant and have expected signs. This reflects the fact that import demand usually increases in the fourth quarter compared to other quarters to meet the increasing demand at that time.

R squared and R bar squared values are around 0.96. The F test and all diagnostic tests are passed, except the functional forms are slightly statistically significant at the 10 per cent level. This suggests that the models may be lacking some variables. Cointegration tests (DF and ADF) indicate that the residuals of the long run import demand models are stationary (Table 7.6). This means that all variables in long run import demand models are cointegrated of order 1. Thus we can proceed to analysis of the ECM for import demand in the short run.

Table 7.7 shows that short run import demand in the last quarter has a small negative effect (its elasticities are from 0.11 to 0.13) on the current quarter, and this effect could be zero since its coefficients are statistically insignificant.

Elasticities of the first difference of industrial output have positive signs but are not significant. So, in the short run, import demand may be encouraged due to increase in the industrial output, but it is not sustained in the long run.

Similar to the results from the long run models, RIPR still has positive elasticities for the current time period (lag one period variable has a negative sign, but it is very small), and their magnitudes are from 0.76 to 0.78. This means that relaxation of import restrictions could liberalise imports in the short as well as the long run.

The elasticities of relative import prices are statistically significant at the 10 per cent level and they have negative signs. A one per cent decrease in the relative prices could stimulate a 1.7 per cent increase of imports. Exchange rate elasticities have the expected signs (negative), but they are not significant. Their magnitudes are from around 0.4 to 0.55 and they are larger than in the long run. These results indicate that devaluation may have a small or no effect on imports, while higher relative prices have significant effects in reducing imports.

The speed of adjustment in the range from –0.72 to –0.69 denotes that long run equilibrium is achieved and that in each quarter 69 per cent to 72 per cent of the deviation from the long run equilibrium will be adjusted in the next quarter. All F and diagnostic tests are passed. The residuals of ECMs are also stationary (Table 7.8 and Appendix 7.4). These provide evidence for the plausibility of the models.

Table 7.8: Test for cointegration of variables in the ECM for import demand - DF test for residual μ_t

$D\mu_t = b_1\mu_{t-1} + \xi_t$
21 observations used for estimation from 1993Q4 to 1998Q4

	Model 1 (VCBE)	**Model 2 (HNE)**	**Model 3 (HCME)**
b_1	**-0.766*** **	**-0.782*** **	**-0.766*** **
	(-3.98)	(-4.09)	(-3.99)
R^2	0.44	0.45	0.44
Serial correlation $\chi^2(4)$:	6.272 [.180]	5.625 [.229]	6.099 [.192]
Function form $\chi^2(1)$:	0.482 [.487]	0.617 [.432]	0.457 [.499]
Normality $\chi^2(2)$:	0.362 [.834]	0.148 [.929]	0.346 [.841]
Heteroscedasticity $\chi^2(1)$:	3.661 [.056]	1.664 [.197]	3.484 [.062]

Note: *** is significant at 1% level.
The values in brackets are T-ratios and squared brackets are probabilities.

7.4. Conclusion and policy implications

Exchange rates and world income movements have larger effects on exports than do prices. This means that devaluation could stimulate exports over the long run. However, in the short run, price effects on exports are larger than exchange rate effects. The estimated speed of adjustment of around –0.85 also ensures equilibrium is achieved. There is no evidence of differences in the time response in exports to price and exchange rate movements. The coefficients in Model 2 (using the Hanoi parallel market exchange rates) are usually larger than in the other models estimated.

Responses of import demand to change in relative import prices are definitely larger than to changes in the exchange rates. In fact, devaluation may have a small or no effect on imports. The speed of adjustment coefficients in the ECM for imports are negative and indicate that from 0.69 to 0.72 per cent of any quarter deviation between the actual imports and the long run equilibrium is incorporated into the next quarter growth of imports. The coefficients estimated in Model 1 (using Vietcombank exchange rates) are usually larger than in Models 2 and 3 (using parallel exchange rates). Since imports are more controlled than exports in terms of foreign currency regulations, imports depend more on exchange rates from the Vietcombank which is the biggest state owned commercial bank in Vietnam and in charge of providing foreign exchange for foreign trade, especially to SOEs. Vietcombank also dominates foreign exchange transactions in the banking system.

The results from estimation of the models show that the Marshall-Lerner condition for successful use of devaluation to improving exports and trade balance in Vietnam holds

for the 1990s. Elasticities for long run export demand (ε_x) are from -0.31 to -0.33, and elasticities for long run import demand (ε_m) are from -1.47 to -1.53. Thus, the sum of absolute values of ε_x and ε_m are from 1.78 to 1.86, definitely greater than unity.

Therefore, during the 1990s, price effects on imports (both in the short and the long run) and exports in the short run are larger than the corresponding exchange rate effects. Relaxation of import controls also has significant effects on import growth. This indicates that uses of tariffs, quotas and export price policy are more effective than devaluation in controlling imports (in both the short and the long run) and encouraging exports in the short run. This supports the appropriateness of exchange rate policy by the SBV during that period in terms of choosing tariffs, quotas and export price policy rather than the devaluation to promoting exports and limiting imports, especially when the economy has been in restructuring, banking and financial system are not deep and sound in that period. The devaluation may have negative effects and threaten macroeconomic stability to the economy.

However, exchange rates have larger effects than prices in the export models in the long run and Marshall–Lerner condition holds, suggesting devaluation could be used to stimulate exports and improve trade balance. As mentioned in the previous part, Vietnam joined ASEAN and AFTA from 1995, the bilateral trade agreement between Vietnam and the United States was signed on July 2000, and Vietnam also applied to join the WTO in 1995. These agreements require Vietnam to commit to reducing tariffs and other import restrictions. So, in the long run, Vietnam cannot retain tariffs and import restrictions, which have used previously. An exchange rate policy that can be used to encourage exports and control imports will be essential to Vietnam in the future.

Chapter 8

THE LINKS BETWEEN INFLATION, EXCHANGE RATE, AND MONEY SUPPLY IN VIETNAM

8.1. Introduction

The examination of exchange rate movements in Chapter 6 showed that although nominal effective exchange rates depreciated by 20 per cent during the period 1992-1998, the real ones appreciated by around 20-30 per cent. The results from ECMs in Chapter 7 indicated that in the long run, exchange rates have larger effects than export prices in stimulating exports and the Marshall-Lerner condition for Vietnam holds. Moreover, joining bilateral and multilateral trade agreements requires Vietnam to commit to reducing tariffs and other trade restrictions in the near future. Therefore, the necessity and sufficient conditions for devaluing VND to promote exports and trade balance have been found. However, before the devaluation is implemented, the dynamic links between exchange rates and other important macroeconomic variables such as inflation, and money supply need to be considered carefully, in order to ensure successful devaluation, stimulate exports and the trade balance, and maintain macroeconomic stability.

Based on the cointegration technique, vector error correction model (VECMs), vector autoregression (VAR) models and its conventional techniques such as Granger causality tests, variance decomposition and impulse response analyses, this chapter examines the dynamic links between inflation, exchange rates and money supply in both the short and

long run. Particularly, this chapter focuses on the questions: is there a long run relationship between inflation, exchange rates and money supply in Vietnam during the period 1993-1998? Has the money supply growth and exchange rate depreciation led to a higher rate of inflation during that time?

The outline of this chapter is as follows: Section 2 reviews theoretical issues and previous studies, which concern the links between inflation, exchange rate and money supply. Section 3 summarises the VAR model and VECM for three variables. Section 4 specifies the VECM for Vietnam; Section 5 contains empirical results and interpretations; Section 6 includes the conclusion and policy implications.

8.2. Literature review

The links between inflation, exchange rate and money supply are core questions in economics and have been analysed by many authors. In this chapter, some prominent theories and previous studies that concern this relationship are reviewed.

8.2.1-The link between inflation, exchange rate and money supply

Exchange rate and inflation

The movements of exchange rate can influence domestic prices through their effects on aggregate supply and demand. On the supply side, the exchange rate could affect the prices of imported goods directly. If the exchange rate is depreciated the prices of imported intermediate inputs will be higher, which lead to an increase in the prices of domestically produced goods (Edwards 1989). On the demand side, a real depreciation of the exchange rate could increase foreign demand for domestic goods and services, and domestic producers may increase output prices. With the expansion of domestic

demand that may bid up wages and input prices, these bring inflation (see Deravi *et al.* 1995, Kahn-1987).

The exchange rate could affect inflation, but in turn inflation may affect the exchange rate through purchasing power parity (PPP). As mentioned in Chapter 5, the real exchange rate determinant through PPP indicates that when domestic price increases, that will cause pressure to depreciate the nominal exchange rate (assume foreign price is unchanged), in order to restore the equilibrium level for the real exchange rate.

Money supply and inflation

The increase in the money supply increases aggregate demand. That results in an increase in both price level and real GDP in the short run, but in the long run, real GDP moves towards its original level and the price level continues to rise. The ways in which money growth affects inflation and exchange rate in an open economy was shown by Deravi *et al* (1995: 44):

> Money growth influences the inflation rate primarily through its effect on aggregate demand. Increases in the money stock lower interest rates and stimulate interest-sensitive spending, putting upward pressure on domestic prices. Alternatively, money may stimulate domestic demand directly through its liquidity or expectation effects. Similarly, portfolio effects will work in an open economy to alter the relative price of the domestic currency. These exchange rates, in turn, may reinforce the links from money to inflation.

On the other hand, inflation also affects money supply. Unanticipated inflation can bring an increase in expenditure and reduction in investment and output. It will bring pressure to increase money supply to restore the original level of investment and output.

Money supply and exchange rate

In the monetary theory of BOP, the international monetarists believe that "Money will flow into a country where the money supply rises more slowly than national product, and out of a country where the money supply grows faster than the national product" (Eltis 1981: 2). So, if money supply rises more slowly than national product, resulting in a reduction in inflation rate, and with money inflows, supply of foreign currencies will exceed demand; then there will be a tendency to raise domestic currency or appreciate the exchange rate. The inverse is true if money supply rises faster than national product. Thus a tight monetary policy will lead to a reduction in the inflation rate and an appreciated exchange rate.

In a country where government implements monetary policy, when the central bank performs open market operations to purchase domestic securities, this will increase domestic money supply (see Chapter 2) and reduce the interest rate on the domestic currency denominated assets, whose demand falls and then the domestic currency will be depreciated. On the other hand, the central bank can achieve domestic currency depreciation by selling domestic currency denominated assets and buying foreign currency denominated assets in the foreign exchange market.

8.2.2- Previous studies

Some economists using econometric models have also examined the relationship between the exchange rate, money supply and inflation. Whitt, Koch, and Rosensweig (1986) used time series models to examine this relationship, and they found that the exchange rate Granger causes the price level. Sachs (1985) and Kahn (1987) also used structural models, and they found that feedback from the price level to exchange rate increases the inflationary impact of a dollar depreciation. Deravi *et al* (1995) used a

three vector autoregressive model of exchange rates, price level, and money supply (M2) to trace the links between these variables. There are only three of the above variables used in this model because: "In modelling 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 behaviour of exchange rates" (Deravi *et al.* 1995: 43). In this model, Granger causality tests, variance decomposition and impulse response were analysed 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 9 per cent and 11 per cent of the inflation rate variation for order 1, and around 28 per cent - 43 per cent and 41 per cent - 49 per cent respectively for order 2 after 48 months. The results in impulse response analysis also indicated that a depreciated dollar leads to a higher rate of inflation over a two-year period.

There are not many studies which examine the links between inflation, exchange rate and money supply in Vietnam. Dodsworth *et al* (1996b) analysed the stabilisation policies in Vietnam, Cambodia and Laos since the late 1980s. The VAR models for two variables: inflation and exchange rate, and inflation and money supply were carried out to answer the question of whether money growth and exchange rate movements lead or lag inflation in the short run in these countries. Monthly data from December 1990 to December 1995 were used in this model for the consumer price index, domestic currency, domestic money (M2), broad money (M3) and the parallel nominal exchange rate. All series were expressed in natural logarithms and used the first difference of these. Their results for Vietnam showed that:

> All four monetary aggregates are significantly related to future inflation rates 1-6 months ahead. However, inflation does not affect money growth, nor changes

in the exchange rate in the short run...the higher money growth or exchange rate depreciation indeed leads to higher inflation rates in the short run" (Dodsworth *et al.*1996b: 23).

In this model, however, variance decomposition and impulse response analyses had not been examined. Besides that, if effective exchange rates had been used in this model, the relationship between, exchange rate, money aggregates and inflation could have been explained more clearly.

Ngo (1997) analysed dollarisation in Vietnam from the 1980s to 1995, also confirming that fiscal deficits financed mostly by monetary expansion were the most important factors of inflation. Vo (1997) used a model of seigniorage, inflation and expectation to analyse the successful combating of inflation in Vietnam from the 1980s to 1995. He found that money growth rates, the expected depreciation rate and the deposit interest rates, were the key determinants of the inflation rate.

8.3- A VAR model and VECM for three variables

The VAR model has been analysed by many econometricians (see Lutkepohl 1993; Enders 1995; Pesaran and Pesaran 1997). Based on the above authors' analyses, in this section, we only introduce very briefly the VAR model for three variables with conventional VAR analyses such as the Granger-causality test, variance decomposition, and impulse response analysis, in order to understand basic questions of this model before an analysis is undertaken.

8.3.1- The VAR Model

The VAR model can be expressed in two forms: the structural form and the reduced form. They are as follows:

The structural form

The structural form of the VAR model is a form which expresses the endogenous variables as being dependent on the current realisation of other endogenous variables and the lags of each of the endogenous variables, exogenous variables, constant and disturbance terms (Enders 1995).

$$\begin{aligned}
y_{1t} &= a_{10} + b_{11}y_{2t} + b_{12}y_{3t} + \sum_{i=1}^{p}\alpha_{11i}y_{1t-i} + \sum_{i=1}^{p}\alpha_{12i}y_{2t-i} + \sum_{i=1}^{p}\alpha_{13i}y_{3t-i} + \beta_1 w_t + \varepsilon_{1t} \\
y_{2t} &= a_{20} + b_{21}y_{1t} + b_{22}y_{3t} + \sum_{i=1}^{p}\alpha_{21i}y_{1t-i} + \sum_{i=1}^{p}\alpha_{22i}y_{2t-i} + \sum_{i=1}^{p}\alpha_{23i}y_{3t-i} + \beta_2 w_t + \varepsilon_{2t} \\
y_{3t} &= a_{30} + b_{31}y_{1t} + b_{32}y_{2t} + \sum_{i=1}^{p}\alpha_{31i}y_{1t-i} + \sum_{i=1}^{p}\alpha_{32i}y_{2t-i} + \sum_{i=1}^{p}\alpha_{33i}y_{3t-i} + \beta_3 w_t + \varepsilon_{3t}
\end{aligned} \qquad (8.1)$$

The system of equations (8.1) is a structural form of a 3 variable VAR model; y_{1t}, y_{2t}, y_{3t} depend on the current realisation of other endogenous variables, and the lags of each of the endogenous variables, exogenous variable w_t, constant a_{io} and disturbance terms ε_{it} ($i = 1...3$).

Or in matrix form with a slight modification of (8.1)

$$BY_t = \Gamma_0 + \Gamma_1 Y_{t-1} + \Gamma_2 Y_{t-2} + \ldots + \Gamma_p Y_{t-p} + \Gamma_w W_t + \varepsilon_t \qquad (8.2)$$

Where

$$B = \begin{bmatrix} 1 & -b_{11} & -b_{12} \\ -b_{21} & 1 & -b_{22} \\ -b_{31} & -b_{32} & 1 \end{bmatrix}; Y_t = \begin{bmatrix} y_{1t} \\ y_{2t} \\ y_{3t} \end{bmatrix}; \Gamma_0 = \begin{bmatrix} a_{10} \\ a_{20} \\ a_{30} \end{bmatrix}; \Gamma_i = \begin{bmatrix} \alpha_{11i} & \alpha_{12i} & \alpha_{13i} \\ \alpha_{21i} & \alpha_{22i} & \alpha_{23i} \\ \alpha_{31i} & \alpha_{32i} & \alpha_{33i} \end{bmatrix};$$

$$Y_{t-i} = \begin{bmatrix} y_{1t-i} \\ y_{2t-i} \\ y_{3t-i} \end{bmatrix}; \Gamma_w = \begin{bmatrix} \beta_1 & 0 & 0 \\ 0 & \beta_2 & 0 \\ 0 & 0 & \beta_3 \end{bmatrix}; W_t = \begin{bmatrix} w_t \\ w_t \\ w_t \end{bmatrix}; \varepsilon_t = \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix}$$

$i = 1, 2...$ p: number of lags

Y_t: vector of jointly endogenous variables at time t

Y_{t-i}: vector of lagged endogenous variables at time t-i

W_t: vector of exogenous variables at time t

ε_t : vector of white-noise disturbances at time t

$$E(\varepsilon_t) = 0$$

$$E(\varepsilon_t \varepsilon_i') = \begin{cases} \Sigma & t = i \\ 0 & otherwise \end{cases}$$

Σ is a (3×3) symmetric positive definite matrix

B: a (3×3) matrix of coefficients of endogenous variables

Γ_0: vector (3×1) of constant terms

Γ_i: (3×3) matrices of autoregressive coefficients for i = 1, 2…p

Γ_w: a (3×3) matrix of coefficients of exogenous variables

The reduced form

The reduced form of the VAR model is a form which expresses the value of a variable in terms of each of its own lags, lags of other endogenous variables, current and past values of exogenous variables, and disturbance terms (Enders 1995).

Multiply both sides of (8.2) by B^{-1}

$$B^{-1}BY_t = B^{-1}\Gamma_0 + B^{-1}\Gamma_1 Y_{t-1} + B^{-1}\Gamma_2 Y_{t-2} + \ldots + B^{-1}\Gamma_p Y_{t-p} + B^{-1}\Gamma_w W_t + B^{-1}\varepsilon_t$$

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \Psi W_t + u_t \qquad (8.3)$$

Where

$A_0 = B^{-1}\Gamma_0$; $A_1 = B^{-1}\Gamma_1 \ldots A_p = B^{-1}\Gamma_p$; $\Psi = B^{-1}\Gamma_w$

$u_t = B^{-1}\varepsilon_t$, Vector of white–noise disturbances

$$E(u_t) = 0$$

$$E(u_t u_i') = \begin{cases} \Omega & t = i \\ 0 & otherwise \end{cases}$$

(Ω is an (3×3) symmetric positive definite matrix, $\Omega = B^{-1} \Sigma B^{-1'}$)

(8.3) is called the reduced form of the VAR (p) model, and we assume that it is stable.

(8.3) can be rewritten as a moving average representation:

$$Y_t = \text{initial conditions} + \sum_{i=0}^{\infty} C_i u_{t-i} + \sum_{i=0}^{\infty} D_i W_{t-i} \qquad (8.4)$$

See Lutkepohl (1993), and Pesaran and Pesaran (1997).

where

$$C_i = A_1 C_{i-1} + A_2 C_{i-2} + \ldots + A_p C_{i-p}$$

For $i > 1$

$C_i = 0$ for $i < 0$;

$C_0 = I_n$; $C_1 = A_1$

$D_i = C_i \psi$

Granger-causality Test

The idea of the Granger causality test is that the past can cause the future, but the future cannot cause the past, and it is also possible that there is no causal relationship between them. This means that when the lags of a variable have explanatory power to the current value of another variable, we can say that the former variable 'Granger causes' the latter variable. See the example in the form (8.5) below:

From (8.3) we have a reduced form VAR(p) model:

$$\begin{aligned}
y_{1t} &= \nu_{10} + \sum_{i=1}^{p} \phi_{11i} y_{1t-i} + \sum_{i=1}^{p} \phi_{12i} y_{2t-i} + \sum_{i=1}^{p} \phi_{13i} y_{3t-i} + \varphi_{14} w_t + u_{1t} \\
y_{2t} &= \nu_{20} + \sum_{i=1}^{p} \phi_{21i} y_{1t-i} + \sum_{i=1}^{p} \phi_{22i} y_{2t-i} + \sum_{i=1}^{p} \phi_{23i} y_{3t-i} + \varphi_{24} w_t + u_{2t} \\
y_{3t} &= \nu_{30} + \sum_{i=1}^{p} \phi_{31i} y_{1t-i} + \sum_{i=1}^{p} \phi_{32i} y_{2t-i} + \sum_{i=1}^{p} \phi_{33i} y_{3t-i} + \varphi_{34} w_t + u_{3t}
\end{aligned} \qquad (8.5)$$

In (8.5), for example, the test is whether lags of variable y_{3t} Granger cause y_{1t} and y_{2t}. And the hypothesis is that

H_0 : $\phi_{13i} = \phi_{23i} = 0$ (for all i = 1...p)

The test is carried out by Microfit 4.0 and it includes two stages: first, estimating equations for y_{1t} and y_{2t}, using lagged values of y_{1t}, y_{2t}, and y_{3t} and calculating Ωu which is a variance-covariance matrix of the unrestricted system; second, re-estimating the two equations (y_{1t} and y_{2t}) excluding the lagged value of y_{3t} and calculating Ωr which is a variance-covariance matrix of the restricted system; after that calculating the likelihood ratio statistic:

(T-c)(Log|Ωr| - log|Ωu|) (Enders 1995: 316).

where

T = number of useable observations

c = number of parameters estimated in each equation of the unrestricted system

Log|Ωr| and log|Ωu| are natural logarithms of the determinants of Ωr and Ωu.

This statistic has a χ^2 distribution with degrees of freedom equal to the number of restrictions in the system.

If the Likelihood Ratio statistic is significant, we can reject H_0: $\phi_{13i} = \phi_{23i} = 0$ (for all i = 1...p), and conclude that y_{3t} "Granger causes" y_{1t} and y_{2t}.

The Granger Causality test may give misleading results if the variables in the VAR model are non stationary (Pesaran and Pesaran 1997: 131).

Forecast error variance decomposition

This calculates the proportion of the uncertainty in a forecast that is attributable to one source of shocks.

From (8.4), we have:

Y_t = initial conditions + $\sum_{i=0}^{\infty} C_i B^{-1} \varepsilon_{t-i} + \sum_{i=0}^{\infty} D_i W_{t-i}$ (8.6)

Then: $\text{Var}(y_{t+k}) = \sum_{i=0}^{k} C_i \Omega C_i' = \sum_{i=0}^{k} C_i B^{-1} \Sigma (B^{-1})' C_i'$

If Σ is diagonal and we define $D_i = C_i B^{-1}$ so

$$Var(y_{j,t+k}) = \sigma_{11} \sum_{i=0}^{k} d_{i,j1}^2 + \sigma_{22} \sum_{i=0}^{k} d_{i,j2}^2 + \ldots + \sigma_{nn} \sum_{i=0}^{k} d_{i,jn}^2 = \sum_{r=1}^{n} \sigma_{rr} \sum_{i=0}^{k} d_{i,jr}^2 \qquad (8.7)$$

where

σ_{ii} is the iith element of Σ and $d_{i,jr}$ is the jrth element of Di

The proportion of $\text{Var}(y_{j,t+k})$ associated with ε_{1t} is $\dfrac{\sigma_{11} \sum_{i=0}^{k} d_{i,j1}^2}{\sum_{r=1}^{n} \sigma_{rr} \sum_{i=0}^{k} d_{i,jr}^2}$ (8.8)

And the proportion of $\text{Var}(y_{j,t+k})$ associated with ε_{it} is $\dfrac{\sigma_{ii} \sum_{i=0}^{k} d_{i,ji}^2}{\sum_{r=1}^{n} \sigma_{rr} \sum_{i=0}^{k} d_{i,jr}^2}$ (8.9)

This proportion of $\text{Var}(y_{j,t+k})$ associated with ε_{it} is calculated and reported by Microfit 4.0.

Impulse response analysis

This explores the impact on each of the variables over time from a single shock to the system.

Usually, from (8.6)

Y_t = initial conditions + $\sum_{i=0}^{\infty} C_i B^{-1} \varepsilon_{t-i} + \sum_{i=0}^{\infty} D_i W_{t-i}$

The first derivative of y_{it} until time s with respect to ε_{jt} ($\frac{\partial y_{it+s}}{\partial \varepsilon_{jt}}$) was calculated and plotted by Microfit 4.0. (Note: initial conditions and exogenous variables have no effects in this derivative).

The VAR model is a very good tool to examine the interactive relationship between variables, but there are still some disadvantages that include the difficulty in interpreting the results.

8.3.2- The VECM and cointegration

The cointegration techniques suggested by Engel and Granger (1987) allow us to identify and estimate the long run relationship between a set of time series variables (The cointegration for single equations and error correction models was examined in Chapters 5 and 7). Johansen (1988) and Johansen and Juselius (1990) developed a powerful test to detect and estimate the number of cointegration vectors for a VAR system of non-stationary variables.

The Johansen procedure applied for the reduced form of the VAR model such as (8.3):

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \Psi W_t + u_t$$

In this case, Y_t is assumed as a vector of time series $(y_{1t}, y_{2t}, y_{3t})'$, it includes 3 variables that are non-stationary, and Wt is assumed as a vector of a dummy variable. p is selected lag length. Other assumptions are the same as in (8.3).

According to Johansen, the VAR system like (8.3) can be rewritten in the form below, which is called the vector error correction model (VECM):

$$\Delta Y_t = A_0 + K_1 \Delta Y_{t-1} + K_2 \Delta Y_{t-2} + \ldots + K_{p-1} \Delta Y_{t-p+1} + \Pi Y_{t-p} + \Psi W_t + u_t \qquad (8.10)$$

where:

$$K_i = -\left(I - \sum_{j=1}^{p-1} A_j\right)$$

$$\Pi = -\left(I - \sum_{j=1}^{p} A_j\right)$$

where I is an (3×3) identity matrix; A_j is an (3×3) matrix of parameters and already defined in (8.3).

Model (8.10) is considered as a traditional first difference VAR model, except for the term ΠY_{t-p}. The cointegration test focuses on the matrix Π, which contains the long run relationships between the Y_t variables. The rank of Π is equal to the number of independent cointegrating vectors. If rank (Π) = 0, the matrix Π is the null matrix and (8.10) is a traditional VAR model in the first difference. If rank (Π) = 3 (full rank), this indicates the vector process Y_t is stationary in levels. And if rank (Π) = 1, it means there is only one cointegrating vector and the term ΠY_{t-p} is the error correction factor. There are also 2 cointegrating vectors (multiple cointegrating vectors) when the rank (Π) = 2 (see Johansen and Juselius 1990).

As we know the rank of a matrix is equal to the number of its characteristic roots that differ from zero. In practice, the estimates of matrix Π and the characteristic roots can be obtained. There are two common test statistics used to examine the number of characteristic roots that are different from zero. They are as follows:

$$\lambda_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \lambda_i)$$

$$\lambda_{\max} = -T \ln(1 - \lambda_{r+1})$$

where T is the number of useable observations, and λ_i and λ_{r+1} are the estimated values of the characteristic roots (eigenvalues) from the estimated Π matrix.

The first test statistic is the trace statistic (λ_{trace}), its null hypothesis is that the number of cointegration vectors is less than or equal to r against a general alternative. The second test statistic is the maximum eigenvalue statistic (λ_{max}), which tests the null hypothesis that there are r cointegrating vectors against the alternative of r +1 cointegrating vectors. The critical values for the λ_{trace} and λ_{max} are also provided in Johansen and Juselius (1990).

8.4. The VECMs for the inflation, exchange rate and money supply in Vietnam

This section includes model specifications and data description. They are as below:

8.4.1. Model specifications

Long run models

Drawing on Deravi *et al* (1995), and based on the particular economic conditions and data set in Vietnam, the long-term VECMs (they are also VAR models in levels) for inflation, exchange rates and money supply are set up. These models are expressed in reduced forms where inflation, exchange rates and money supply each depend on their own lags, lags of other variables, constant (v_{io}) and disturbance terms (u_{it}, i = 1...3). See the models below:

$$
\begin{aligned}
LnCPI_t &= v_{10} + \sum_{i=1}^{p} \phi_{11i} LnCPI_{t-i} + \sum_{i=1}^{p} \phi_{12i} LnE_{t-i} + \sum_{i=1}^{p} \phi_{13i} LnM^S_{t-i} + u_{1t} \\
LnE_t &= v_{20} + \sum_{i=1}^{p} \phi_{21i} LnCPI_{t-i} + \sum_{i=1}^{p} \phi_{22i} LnE_{t-i} + \sum_{i=1}^{p} \phi_{23i} LnM^S_{t-i} + u_{2t} \\
LnM^S_t &= v_{30} + \sum_{i=1}^{p} \phi_{31i} LnCPI_{t-i} + \sum_{i=1}^{p} \phi_{32i} LnE_{t-i} + \sum_{i=1}^{p} \phi_{33i} LnM^S_{t-i} + u_{3t}
\end{aligned}
\qquad (8.11)
$$

where

$LnCPI_t$ is the domestic Consumer Price Index in the logarithm form at time t. The CPI is used in this model instead of inflation, since a positive percentage rate of change in CPI is called inflation, which will be used in the short run of these models.

LnE_t are the import-weighted effective exchange rates in the logarithm forms at time t. The import-weighted effective exchange rates of Vietcombank (VCBE) and Hanoi parallel market (HNE) are used in these models to compare their effects on the CPI and money supply and vice versa. The import-weighted effective exchange rates of HoChiMinh parallel market (HCME) are not used here because its pattern and effects on trade are similar to VCBE (see Chapter 6)

LnM_t^s is the money supply in a logarithm form at time t. Both M1 and M2 are used in these models to examine the different responses of other variables on M1 and M2 in the interactive relationship among variables. (M3 data are not available).

V_{i0} are constant terms (i = 1...3)

u_{it} are white-noise disturbance terms (i = 1...3)

p is the maximum number of lags.

Before testing cointegration between variables in the models (8.11), DF and ADF tests for stationarity of these variables are needed. If these variables are integrated of order one, I(1), we will proceed to the cointegration tests. The Johansen procedure to test the cointegration in the multivariate system is used. If the above variables are cointegrated, then an error correction term that contains long run relationships among the variables is reintroduced back into a short run VECM.

Short run models

The short run VECMs for CPI, exchange rates and money supply are presented as follows:

$$DLnCPI_t = \theta_{10} + \sum_{i=1}^{p} \theta_{11i} DLnCPI_{t-i} + \sum_{i=1}^{p} \theta_{12i} DLnE_{t-i} + \sum_{i=1}^{p} \theta_{13i} DLnM_{t-i}^{S} + \theta_{14} ECT_{t-p} + \zeta_{1t}$$

$$DLnE_t = \theta_{20} + \sum_{i=1}^{p} \theta_{21i} DLnCPI_{t-i} + \sum_{i=1}^{p} \theta_{22i} DLnE_{t-i} + \sum_{i=1}^{p} \theta_{23i} DLnM_{t-i}^{S} + \theta_{24} ECT_{t-p} + \zeta_{2t} \quad (8.12)$$

$$DLnM_t^{S} = \theta_{30} + \sum_{i=1}^{p} \theta_{31i} DLnCPI_{t-i} + \sum_{i=1}^{p} \theta_{32i} DLnE_{t-i} + \sum_{i=1}^{p} \theta_{33i} DLnM_{t-i}^{S} + \theta_{34} ECT_{t-p} + \zeta_{3t}$$

where

$DLnCPI_t$ is the first difference of $LnCPI_t$. It indicates the growth rate of CPI, and a positive percentage rate of change in CPI is called inflation.

$DLnE_t$ is the first difference of LnE_t. E_t is defined as the price of domestic currency per unit of foreign currency. Therefore, an increase in DLnE_t is called the depreciation of domestic currency, and an appreciation for the inverse case.

$DLnM_t^s$ is the first difference of LnM_t. It denotes the money supply growth rate.

ECT_{t-p} is the error correction term, which is a residual obtained from regressions in models (8.11), at the last lag.

ζ_{it} is the disturbance term

In Models (8.12), tests for block non-causality, variance decompositions and impulse responses are examined as a VAR model, which is introduced in the previous parts.

Other variables such as domestic interest rates or international interest rates are excluded from these models since, during that time, domestic interest rates have been controlled by the SBV; they have not been moved flexibly and reflected truly demand and supply of funds. Moreover, the Dong is not convertible, the capital market in Vietnam is not freely mobilised yet. So, the economy is less influenced by international interest rates. In addition, other variables do not appear in these models so as not to impact the interactive relationship between the CPI, exchange rates and money supply.

8.4.2- Data description

The data used in these long and short run VAR models are quarterly data series of exchange rates, CPI and money supply. Exchange rate data include import-weighted effective exchange rates of the Vietcombank (VCBE) and Hanoi Parallel market (HNE). These exchange rates are calculated in Chapter 6. CPI data are from the SBV annual reports (1995-1999). Money supply data contain M1 and M2, and are collected from the SBV authorities. All data are expressed in the indexes from 1992Q4 to 1998Q3, 1992Q4 =100.

8.5. Empirical results and interpretations

8.5.1. Long run models and cointegration tests

The DF and ADF test results (see Appendix 8.8) indicate that CPI and both M1 and M2 are I(1) and their first differences are stationary, I(0). Import-weighted effective exchange rates of Vietcombank (VCBE) and Hanoi parallel market (HNE) are I(1) and their first differences are also I(0) (see Table 7.1, Chapter 7).

With all variables in the level integrated in the same order 1, we can proceed to the cointegration tests. There are four long run models (see Models 8.11), which are used to examine the relationship between CPI, exchange rate and money supply. Model 1 contains CPI, VCBE and M1. Model 2 includes CPI, VCBE and M2. Model 3 contains CPI, HNE and M1. Model 4 contains CPI, HNE and M2.

Before testing the cointegration of VAR models, the test of lag length is important in order to find the optimal lag length of these models. The unrestricted VAR models with CPI, exchange rates and money supply variables were estimated at order 3 (since we have a small number of observations-24, see Table 8.1).

Among the information criteria, the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) are chosen in this study to select the lag length of our models, but the SBC usually gives a lag length that is shorter than the AIC (Pesaran and Pesaran 1997). Table 8.1 indicates that Models 2 and 4, have the highest SBC values in order 1; Models 1 and 3 have similar highest SBC values in order 1 and 2. Since the number of observations of these data is small (24), we do not take the risk of over-parameterisation and to be able to compare the results in all four models, therefore, order 1 is chosen for all four VAR models.

Table 8.1: Test Statistics for Selecting the Order of the VAR Models

Based on 21 observations from 1993Q3 to 1998Q3. Order of VAR = 3
List of variables included in the unrestrcited VAR:
LnCPI LnE LnMs & CONST

	Model 1		Model 2		Model 3		Model 4	
Order	AIC	SBC	AIC	SBC	AIC	SBC	AIC	SBC
3	185.26	169.59	184.98	169.31	184.54	168.87	187.42	171.75
2	186.16	175.19	188.03	177.06	186.79	175.82	188.93	177.96
1	179.37	173.1	187.81	181.55	181.78	175.51	188.75	182.49
0	120.47	118.9	125.85	124.28	121.55	119.98	125.47	123.9

Note: LnE and LnMs contain logarithms of VCBE and HNE, M1 and M2, respectively.
AIC is Akaike Information Criterion, SBC is Schwarz Bayesian Criterion.
Source: These results are calculated by Microfit 4.0.

The tests to determine the numbers of cointegration vectors were reported in Table 8.2. The trace and max eigenvalue statistics indicate that the null hypothesis of no cointegration ($r = 0$) for all four models are rejected. Both these statistics are significant at the 5 per cent level to support the null hypothesis that there is one cointegrating vector for all four models. However, the null hypothesis of two cointegrating vectors are weakly supported, since trace statistics are insignificant in Model 1 and significant at the 10 per cent level for Model 2 and 3 (similar to eigenvalue statistics for Models 2

and 4). Therefore with the Log-likehood ratio of restrictions, DF and ADF tests are necessary to confirm the case of two cointegrating vectors.

Table 8.2: Test for Multiple Cointegrating Vectors

Cointegration with restricted intercepts and no trends in the VAR
21 observations from 1993Q3 to 1998Q3

H0	H1	95% Critical Values	90% Critical Values	**Model 1** Order =1	**Model 2** Order = 1	**Model 3** Order = 1	**Model 4** Order = 1
1-Trace Statistics							
r = 0	r> =1	34.87	31.93	63.46**	63.61**	68.62**	67.09**
r <=1	r> =2	20.18	17.88	17.65	18.39*	19.52*	21.67**
r <=2	r = 3	9.16	7.53	2.87	2.32	2.87	2.3
2-Max Eigenvalue Statistics							
r = 0	r =1	22.04	19.86	45.81**	45.22**	49.10**	45.41**
r <=1	r =2	15.87	13.81	14.78*	16.07**	16.65*	19.37**
r <=2	r = 3	9.16	7.53	2.87	2.32	2.88	2.3

Note: ** and * are significant at 5% and 10% level, respectively.
Lists of eigenvalues in descending order in these models are as follows:
Model 1: 0.887, 0.505, 0.128; Model 2: 0.884, 0.535, 0.105;
Model 3: 0.903, 0.547, 0.128; Model 4: 0.885, 0.602, 0.104.
Source: Author's estimates by using Microfit 4.0.

Table 8.3 reports the normalised cointegrating vectors and their tests of restrictions in the above four models. Since our main purposes of this Chapter are to examine the effects of exchange rate depreciation and money supply growth on inflation, the cointegrating vectors are normalised by LnCPI. In addition, the Log-likelihood ratio statistics of testing restrictions of coefficients are statistically significant at the 1 per cent level, which suggests that the null hypothesis of coefficients of LnCPI are equal to one and coefficients of other variables are equal to zero which is rejected (similar to the null hypothesis of coefficients of LnE are equal to one and coefficients of other variables equal to zero). These support the hypothesis of two cointegrating vectors.

The stationary tests of residuals from all cointegrating vectors in the four models were carried out by DF and ADF tests. The results in Appendix 8.1 show that all residuals passed the DF and ADF tests but a few of them passed marginally (DF and ADF test

results are significant at the 10 per cent level). Therefore, there are two cointegrating vectors for each model, and we select one cointegrating vector for each model based on the sign and size of coefficients as suggested by the economic theory and the one that has better DF and ADF test results for its residuals in Appendix 8.1. The following are selected long run equilibrium relationships for the LnCPI equations:

Model 1: LnCPI = 1.309*LnVCBE + 0.559*LnM1 – 1.814

Model 2: LnCPI = 0.893*LnVCBE + 0.407*LnM2 – 0.634 (8.13)

Model 3: LnCPI = 1.642*LnHNE + 0.522*LnM1 – 2.405

Model 4: LnCPI = 1.105*LnHNE + 0.388*LnM2 – 1.017

Table 8.3: The Normalised Cointegrating Vectors and their LR Tests of Restrictions

	Cointegrating Vectors	LR Tests of Restrictions
Model 1:	LnCPI, LnVCBE, LnM1, CONST (-1.000, 0.708, 0.429, -0.251) (-1.000, 1.309, 0.559, -1.814)	CHSQ(4)=23.66 [.000] (A1=0; A2=1; A3=0; A4=0 and B1=1; B2=0; B3=0; B4=0)
Model 2:	LnCPI, LnVCBE, LnM2, CONST (-1.000, 0.685, 0.363, -0.057) (-1.000, 0.893, 0.407, -0.634)	CHSQ(4)=18.23 [.001]
Model 3:	LnCPI, LnHNE, LnM1, CONST (-1.000, 0.954, 0.419, -0.729) (-1.000, 1.642, 0.522, -2.405)	CHSQ(4)=27.11 [.000]
Model 4:	LnCPI, LnHNE, LnM2, CONST (-1.000, 0.894, 0.357, -0.475) (-1.000, 1.105, 0.388, -1.017)	CHSQ(4)=21.33 [.000]

Note: LR is the log- likelihood ratio, CHSQ is Chi squared. Values in the square brackets are probabilities.

All coefficients of exchange rates and money supply in the LnCPI in the long run have correct signs (positive). This is appropriate with the macroeconomic theories, when the exchange rates depreciated and money supply increased, which will lead to an increase in CPI and cause inflation. The elasticities of exchange rates are larger than that of money supply in all four equations. Coefficients of both exchange rate and money

supply in the equations, which have M1 bigger than in the equations, which include M2. This may result from M1 that is more active than M2 (M2 includes M1 plus time and saving deposits).

In short, the equations in (8.13) indicate that CPIs have been affected by exchange rates and money supply in the long run. A 1 per cent increase in the exchange rates can lead to 0.89 - 1.64 per cent increase in CPI and 1 per cent increase in the money supply can bring an increase of 0.39 - 0.56 per cent in CPI.

In the long run models, cointegrating vectors are selected and their residuals are confirmed to be stationary, then we can proceed to the short run models.

8.5.2. Short run models

In the short run, the links between inflation, exchange rate depreciation and money supply growth can be studied more clearly through testing Granger-causality, corresponding variance decompositions and impulse-response functions.

We have four VECMs in the short run, resulting from the long run models. Each VECM contains a constant, the log first difference of all the three variables and the error correction terms obtained form the residuals of the selected cointegrating vectors in four equations in (8.13). The order 1 for each VECM is applied and error correction terms also imposed lag 1 to correspond to the long run models.

The purpose of this section is not to estimate the coefficients of variables in the models, but it is necessary to briefly review the results of single equation regression in all

models to get more information and check the paucity of our short run models before examining subsequent sections.

The results of single equation regressions in all four models are reported from Appendix 8.2 to 8.5. In the inflation rate (DLnCPI) equations in all models, coefficients of depreciation rates in the last quarter DlnE(-1) (which indicates DLnVCBE(-1) and DLnHNE(-1)) have correct signs (positive), but they are small (from 0.002 to 0.14) and not statistically significant. These suggest that depreciation rates have little effect (or no effect) to increase inflation in the short run. In contrast, coefficients of money supply growth rates in the lag 1 quarter $\{DLnM^S(-1)\}$ are larger than those of DLnE(-1) and they are significant in all models. These coefficients all have positive signs, but coefficients in the cases of M2 (from 0.40 to 0.47) are bigger than in the cases of M1 (from 0.26 to 0.27). The volume of M2 is usually bigger than M1, so it may have a larger effect on inflation rate. These results indicate that growth rates of money supply in the last quarter have strong effects to increase inflation in the current quarter. The speeds of adjustment (coefficients of error correction terms in the last quarter) are very small (from 0.001 to 0.007) and not significant. Their signs are negative in Model 1 and are positive in other models[59], but they are acceptable, since all characteristic roots in the difference equation system are less than one in absolute values (see Table 8.2). Those represented by an error correction imply convergence. Thus, any deviation from equilibrium level is incorporated for a relatively long period of time.

[59] See Enders (1995: 412). "As in any difference equation system, the speed of adjustment term can be positive or negative. The critical factor is whether the characteristic roots of the system are all less than unity in absolute value. Notice that these roots are the estimated values of λ_i from the matrix of canonical correlations. In a sense, the Johansen (1988) procedure is a method to determine whether the characteristic roots of the difference equation system represented by an error correction system imply convergence".

Inflation has positive effects to stimulate depreciation rates, since coefficients of inflation rates are positive in depreciation rate equations (DLnE) in the short run in all models and significant in Models 1 and 3. Coefficients of inflation rates (DLnCPI) in lag 1 quarter are negative and significant in the money supply growth rate equations ($DLnM^S$). These reflect the fact that when inflation increases, the SBV has to reduce the growth rate of money supply to avoid further inflation and keep stability for the economy. This is detailed in the subsequent sections.

R squared from all equations is in the range from 0.22 to 0.47. Most diagnostic tests are passed. However, there are slight problems of function forms in Models 2 and 4 that may result from the short time series data.

Granger-causality tests

The results of block Granger non-causality tests were reported in Table 8.4. The log-likelihood ratio (LR) statistics of money supply growth and exchange rate depreciation tests of Granger causality to inflation are significant at the 5 per cent and around 10 per cent level for Models 1, 3 and 2, respectively. Thus, we can reject the hypothesis that coefficients of lag 1 of money supply growth and depreciation rates in the inflation rate equations in Models 1, 2 and 3 are equal to zero. This means that growth rates of money supply and depreciation rates in the past have explanatory power in the prediction of inflation.

Growth rates of money supply Granger cause both inflation and depreciation, but this is presented more clearly in the case of M1 than the case of M2. On the other hand, inflation and exchange rate depreciation also influence growth rates of money supply in the future in all models.

Table 8.4 also reveals that exchange rate depreciation does not Granger cause inflation and growth rates of money supply in all models. In contrast, inflation and growth rates of money supply Granger cause modest exchange rate depreciation (LR tests are significant at the 10 per cent level in all models). LR tests also reject the hypothesis of deletion of constant or error correction terms (ECT) in these models.

Table 8.4: Log-Likelihood Ratio (LR) Tests of Block Granger Non-Causality

	Model 1 (CPI, VCBE, M1)	**Model 2** (CPI, VCBE, M2)	**Model 3** (CPI, HNE, M1)	**Model 4** (CPI, HNE, M2)
$DLnM^S$ & DLnE → DLnCPI	9.11**	4.01[a]	8.20**	2.87
DLnCPI → $DLnM^S$ & DLnE	11.89***	5.85*	13.79***	6.93**
$DLnM^S$ → DLnCPI & DLnE	10.07***	4.04[a]	8.77**	3.38[b]
DLnCPI & DLnE → $DLnM^S$	8.44**	4.53*	8.09**	4.67*
DLnE → DLnCPI & $DLnM^S$	0.008	0.74	0.27	0.46
DLnCPI & $DLnM^S$ → DLnE	5.46*	4.47*	5.78*	5.15*
LR tests of Deletion of:				
CONST	17.17***	21.60***	19.37***	19.98***
ECT_i (i =1...4)	10.67**	7.25*	11.75***	8.16**

Note: ***, ** and * are significant at the 1 per cent, 5 per cent and 10 per cent level, respectively.
a and b are significant at the 13 per cent and 18 per cent level, respectively.
These tests are carried out by Microfit 4.0.

In sum, the results of causality tests indicate that both exchange rate depreciation and money supply growth Granger cause the inflation. The growth rates of money supply affect inflation and exchange rate depreciation in the future, while exchange rate depreciation does not influence the future money supply growth and inflation. In addition, inflation also influences the exchange rate depreciation and then reveals the

possibility of adjusting money growth rates by the SBV to stabilise the economy. We can see the interrelationship between these variables more accurately through forecast error variance decomposition in the next section.

Forecast error variance decomposition

Before analysing variance decompositions and impulse responses, it is necessary to confirm the combination of variables in the VECM is linear or non-linear, in order to choose the orthogonal or general case of variance decompositions as well as impulse responses. The covariance matrices of errors from all VECM models in the short run are reported in Appendix 8.6. These matrices are considered diagonal matrices since their covariances are very small and approaching zero, this suggests that combinations of variables in these models are linear. Therefore, we can apply the orthogonal case for both variance decompositions and impulse responses.

In this section, the forecast error variances of each variable are decomposed into the proportion attributable to each of the random shocks. The results of forecast error variances of inflation are reported in Table 8.5. The time horizon equals 12 quarters taking in all decompositions since, after 3 quarters in all models, the proportions of variances of each variable attributable to each shock are constant. At the forecast horizon of 12 quarters, the variations of inflation were explained by their own shock from around 70 per cent to 83 per cent in four models.

Money supply growth is the most important source of variability for inflation. The shocks of M1 growth contribute a substantial change from around 23 per cent to 28 per cent of inflation variations (Models 1 and 3), the contributions of M1 growth to inflation variation are larger than for the case of M2 (from around 12 per cent to 15 per

cent) in Models 2 and 4 (M1 is more active and flexible than M2 since M2 includes M1 plus time and saving deposits). In contrast, depreciation of exchange rate accounts for only around 0.4 per cent to 3.9 per cent of the forecast error variance of inflation in the case of Vietcombank exchange rates and from around 2.6 per cent to 6.0 per cent for the case of Hanoi parallel market rates (Models 3 and 4). This means that the shocks of exchange rate depreciation affect the variation of inflation only a little. These results are consistent with the Granger causality tests in Table 8.4.

Table 8.5: The Variance Decomposition of Inflation Rate (DLnCPI)

20 observations from 1993Q4 to 1998Q3

Proportion of forecast variance explained by changes in:

Time Horizon	DLnCPI	DLnE	$DLnM^S$
Quarter		**Model 1 (CPI, VCBE, M1)**	
1	72.18	0.37	27.45
3	70.99	0.41	28.60
6	70.71	0.41	28.88
9	70.71	0.41	28.88
12	70.71	0.41	28.88
		Model 2 (CPI, VCBE, M2)	
1	81.40	3.83	14.77
3	81.02	3.86	15.12
6	80.98	3.87	15.15
9	80.98	3.87	15.15
12	80.98	3.87	15.15
		Model 3 (CPI, HNE, M1)	
1	73.59	2.59	23.82
3	71.52	3.68	24.80
6	71.35	3.72	24.93
9	71.35	3.72	24.93
12	71.35	3.72	24.93
		Model 4 (CPI, HNE, M2)	
1	83.66	5.28	11.06
3	81.99	6.07	11.94
6	81.96	6.08	11.96
9	81.96	6.08	11.96
12	81.96	6.08	11.96

Source: Author's estimates by using Microfit 4.0

The variance decompositions of exchange rate depreciation and money supply growths are reported in Appendix 8.7. Inflation accounts for from around 24 per cent to 27 per cent of forecast error variance of exchange rate depreciations in all models, while the shocks of money supply growth explained only from around 5 per cent to 9 per cent of exchange rate depreciation in these models. Similarly to the variance decomposition of exchange rate depreciation, inflation also contributes to money supply growth's variations from 20 per cent to 30 per cent. Depreciation accounts for less than 1 per cent of the variance of money growth in the cases of VCBE and they account for around 4 per cent to 9 per cent of money growth variances for HNE (HNE and M1 are more active and flexible than VCBE and M2).

So through variance decompositions, money growth is determined as a major source of variation of inflation, while exchange rate depreciation has contributed a small proportion of inflation's variation. One again, the shocks of inflation account for a large proportion of variations of both exchange rate depreciation and money growth. The impact of the shock from each variable to others will be illustrated more clearly by impulse response analysis in the section below.

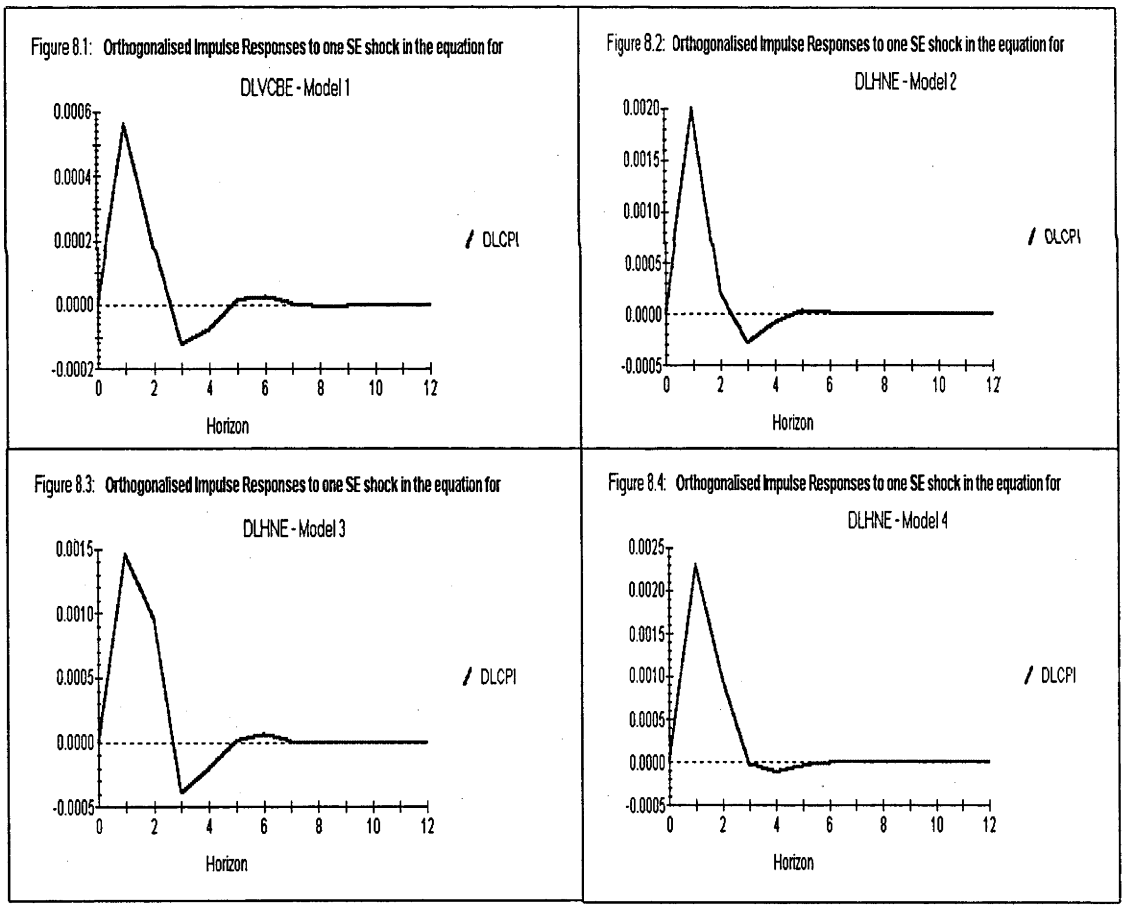
Impulse response analysis

In this section, the direction and magnitude of response from each variable to one standard error shock of another variable is examined. Microfit 4.0 was used to carry out this impulse response in the orthogonalised impulse response case, as mentioned in the previous part.

- **Exchange rate depreciation and inflation**

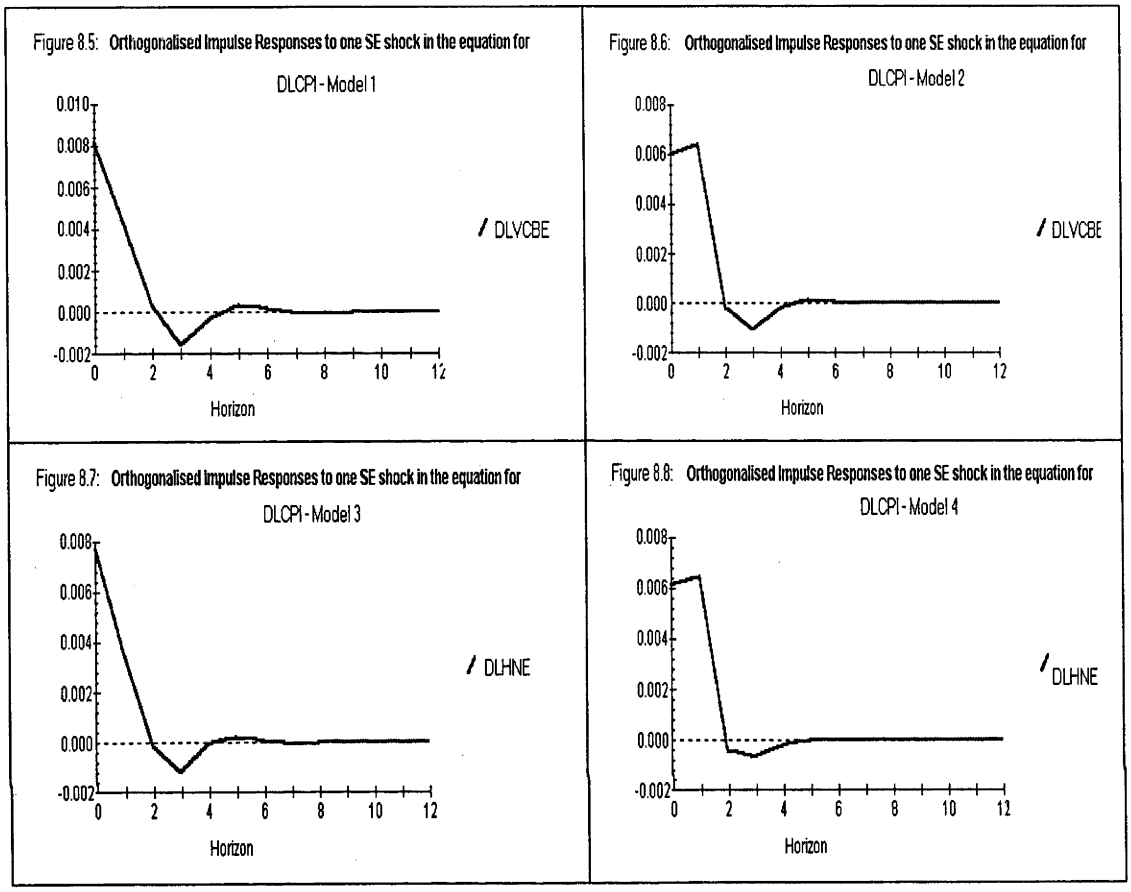
From Figures 8.1 to 8.4, inflation is increased to respond to an SE shock from exchange rate depreciations in the first quarters in all four models. After the first quarter, inflation starts to fall sharply to below zero level and then returns to zero level and dies on the sixth or seventh quarter. The magnitudes of inflation responses are relatively small, they reached the highest level from 0.15 per cent to 0.23 per cent in these models.

These results are coincident with forecast error variance decompositions and consistent with economic theory. Since exchange rate depreciation will result in an increase in the domestic currency price of imported intermediate inputs, this will increase the prices of final goods including non-tradable goods (see Edwards 1989).



During the 1990s, Vietnam imported mainly machinery and intermediate goods and imports were usually in excess of exports (Chapter 6). However, exchange rates and

foreign exchange transactions have been managed by the SBV[60]. So exchange rate depreciation may have led to an increase in inflation at only very small levels in the short term.



On the other hand, the exchange rate depreciation also increased in response to an SE shock from inflation in all models; this is showed from Figures 8.5 to 8.8. However, the responses of depreciation rates are above zero level in only the first 2 quarters, then they go down and come back to a zero level after the fourth quarter. Under purchasing power parity (PPP) condition, an increase in domestic price level (suppose foreign price is constant) could make real exchange rates appreciate, and then create pressure to depreciate nominal exchange rates to restore the equilibrium level of real exchange rates. As mentioned above, real exchange rates of VND against US$ still appreciate

[60] Although exchange rates have been more market determined and foreign exchange managements have been liberalised during the 1990s (see Chapter 6).

during this time, then a shock of inflation could lead to a further appreciation of real exchange rates, thus increasing the pressure to depreciate the nominal exchange rates. This issue must be taken into account for policy makers and economists when they implement monetary and exchange rate policies, to maintain macroeconomic stability.

- **Money Growth and Inflation**

Figure 8.9: Orthogonalised Impulse Responses to one SE shock in the equation for DLM1 - Model 1

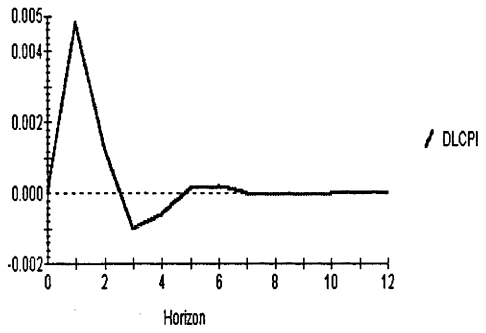


Figure 8.10: Orthogonalised Impulse Responses to one SE shock in the equation for DLM2 - Model 2

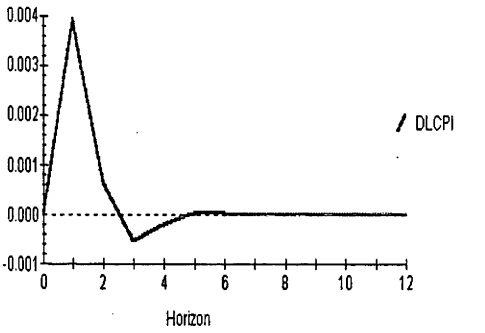


Figure 8.11: Orthogonalised Impulse Responses to one SE shock in the equation for DLM1 - Model 3

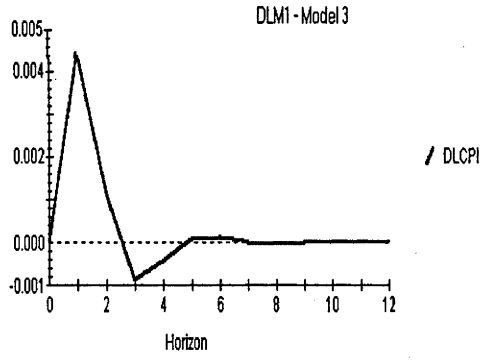
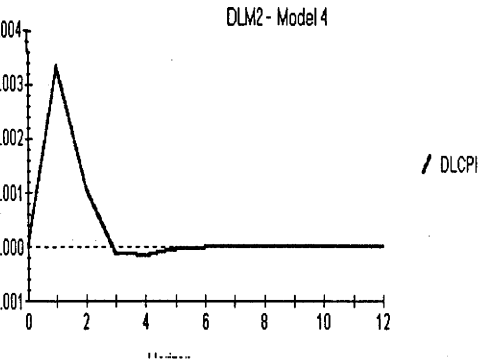


Figure 8.12: Orthogonalised Impulse Responses to one SE shock in the equation for DLM2 - Model 4



All Figures from 8.9 to 8.12 show that inflation rates in all models are increased strongly in the first quarter and then reduced to the zero level in a period of the 2 following quarters in response to the SE shocks of money supply growth. The highest level of inflation response to money growth shock reaches from 0.35 per cent to 0.5 per cent in all models, larger than the responses of inflation to exchange rate depreciation.

In the four Figures from 8.13 to 8.16, money supply growths are reduced sharply to below the zero level during 1 quarter, and they are turned up to zero in the second quarter to respond to the shock of inflation (M2 responses to a shock of inflation are slower than M1). The magnitude of reduction in M1 to respond to the shock of inflation is –1.0 per cent, that is the highest level of response of all variables in the impulse response analysis in these models. This indicates that the growth rates of money supply were controlled effectively by the SBV to cope with inflation in order to stabilise the economy.

Figure 8.13: Orthogonalised Impulse Responses to one SE shock in the equation for DLCPI - Model 1

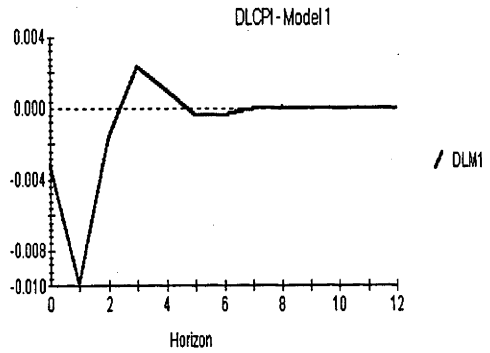


Figure 8.14: Orthogonalised Impulse Responses to one SE shock in the equation for DLCPI - Model 2

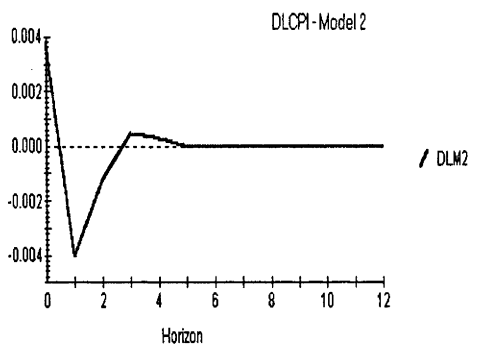


Figure 8.15: Orthogonalised Impulse Responses to one SE shock in the equation for DLCPI - Model 3

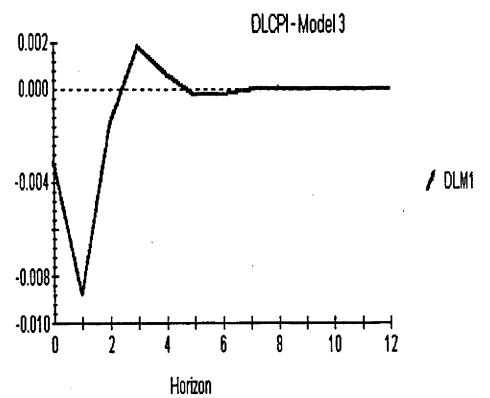
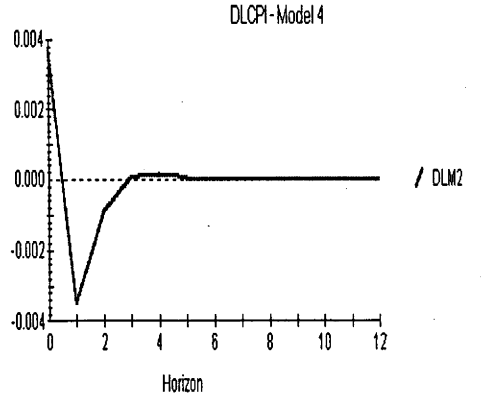


Figure 8.16: Orthogonalised Impulse Responses to one SE shock in the equation for DLCPI - Model 4



- **Money growth and exchange rate depreciation**

Exchange rate depreciations (for both VCBE and HNE) rose by around 0.4 per cent during the first 2 quarters in response to a shock of money growth in all four models

(see from Figures 8.17 to 8.20). The increase in depreciation rates when there is a shock of money growth is also consistent with macroeconomic theory. Since money supply increases, this will reduce the interest rates on the domestic currency denominated assets; demand for them falls then domestic currency will be depreciated. Besides that, money growth will raise the inflation rate, which may indirectly affect the depreciation rates.

Figure 8.17: Orthogonalised Impulse Responses to one SE shock in the equation for

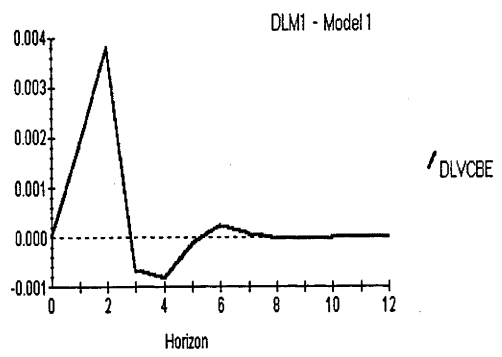


Figure 8.18: Orthogonalised Impulse Responses to one SE shock in the equation for

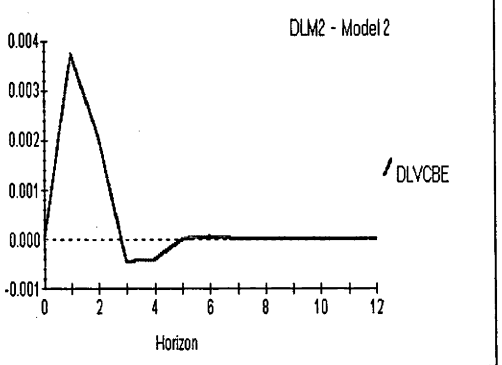


Figure 8.19: Orthogonalised Impulse Responses to one SE shock in the equation for

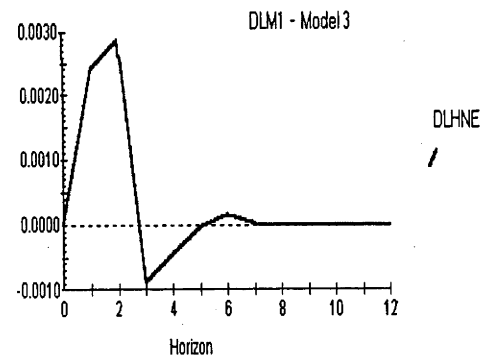
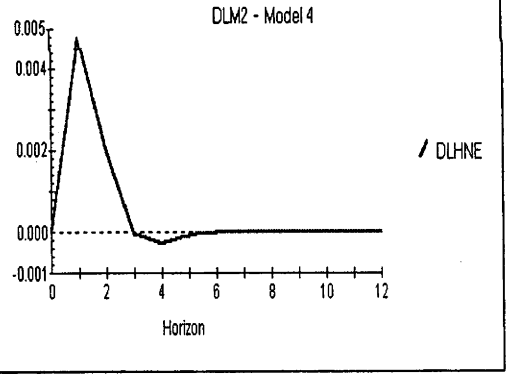


Figure 8.20: Orthogonalised Impulse Responses to one SE shock in the equation for



So from impulse response analysis, we can conclude as follows:

The inflation rate increased to respond to an SE shock of depreciation rates, and the depreciation rate also rose to respond to an SE shock of the inflation rate. The inflation rate increased substantially to respond to an SE shock of the growth rates of money supply, but in turn money growth decreased sharply to respond to an SE shock of inflation. The depreciation rates increased to respond to an SE shock of money growth.

The empirical results in this chapter are consistent with the findings in Chapter 4, which showed that the use of indirect instruments contributed to increased monetary control by the SBV during that time. The results in this chapter are also similar to results of the VAR model for two variables from Dodsworth *et al.* (1996b) (higher money growth or exchange rate depreciation indeed led to higher inflation rates in the short run in Vietnam in the period 1990 - 1995). The results also coincided with Vo's (1997) results (growth rate of money supply M2 and exchange rate depreciation were key factors to determine the inflation rate in the 1980s and 1990s in Vietnam).

However, our results in Granger causality tests and other tests differ from the findings of Dodsworth *et al.* (1996b). These authors found that inflation did not affect money growth and exchange rate depreciation in the short run in Vietnam in the period 1990 - 1995, while our results show that inflation did affect money growth and exchange rate depreciation. This difference may occur since there is a difference in period of time, where foreign trade between Vietnam and its partners has been more developed, exchange rates are more market determined and also the SBV's ability to control money supply in response to a shock of inflation has been increased.

8.6. Conclusion and policy implications

The dynamic links between inflation, exchange rate and money supply in the period from 1993 to 1998 were examined by using VECMs, cointegration and VAR techniques in this chapter. The results from this empirical study show that CPI, exchange rates and money supply have a long run relationship. Exchange rates have a larger effect on CPI than money supply; a 1 per cent increase in exchange rates leads to a 0.89-1.64 per cent increase in CPI, and a 1 per cent increase in money supply results in a 0.39-0.56 per cent increase in CPI in the long run.

In the short run, through Granger causality tests, the results show that both exchange rate depreciations and growth rates of money supply Granger cause the inflation. Money supply growth has affected inflation and exchange rate depreciation in the future, while exchange rate depreciation alone does not influence or weakly influence inflation. In addition, inflation also stimulates depreciation.

The results of forecast error variance decomposition and impulse response analyses indicate that money growth is the most important source of variation (from 12 per cent to 30 per cent) of inflation and inflation increases substantially to respond to a shock of money growth. Exchange rate depreciations account for a small proportion of inflation's variation (from 0.4 per cent to 6.0 per cent) and inflation still rises to respond to the shock of depreciation, even though the response is weak. The shock of inflation can be explained for large proportions of variations of both the depreciation and money growth rates (24 per cent to 27 per cent for the variation of depreciation and 24 per cent to 30 per cent for variation of the money growth rates). Exchange rate depreciation is increased to respond to the shock of inflation, but money growth is brought down substantially. This reflects the effective controls of money supply by the SBV during that time.

These analyses are mainly consistent with the previous studies, which show that money growth and exchange rate depreciation could have led to a higher rate of inflation in the short run.

The results from analyses in both the long and short run in this chapter and previous chapters suggest that devaluation can be implemented in the near future to encourage

exports and improve current account balance and BOP, and also reduce the real exchange rate appreciation in the short run. Because, the depreciations have a small effect on stimulating inflation in the short run (assume money supply growth is constant), they also have positive effects on encouraging exports (although exchange rate's effects on exports in the long run are larger than that in the short run) and limiting imports, and the Marshall-Lerner condition holds (Chapter 6). In addition, regional and multiple trade agreements between Vietnam and other countries require the reductions in tariffs and other barriers to foreign trade. Therefore, Vietnam has to rely on the flexible exchange rate policy to encourage exports and BOP rather than using tariffs and export price policy in the previous period.

However, this study shows that the depreciations of exchange rates do have a strong effect to stimulate inflation in the long run, and money growth rates are the most important source to generate inflation in both short and long runs. The potential of high inflation is possible if the SBV implements an easy monetary policy. Therefore, it is necessary to coordinate closely between monetary and exchange rate policies to perform successfully the devaluation of domestic currency. The effective controls of money supply are the most important measure to control inflation and this must be put as the first priority of the SBV.

Controlling money supply in the face of large capital inflows as in Vietnam in the previous period (see Table 1.2) is not an easy job for the SBV. The large capital inflows will cause an increase in domestic inflation (more currencies to buy few goods) and real exchange rate appreciation (excess supply for foreign currencies). To sterilise these consequences of large capital flows, indirect monetary instruments such as OMO,

refinancing, RRs, foreign exchange swaps, and variable deposit requirements have been implemented.

The foreign exchange swaps, variable deposit requirements are effective tools in terms of sterilising capital flows that have been successfully implemented in Indonesia and Spain. Especially, through foreign exchange swaps, the central bank can make an agreement to sell foreign exchange against the domestic currency and simultaneously to buy it at a specific date in the future. The foreign exchange is bought by banks and may be invested abroad or be lent to domestic residents, but its effects are to reduce the domestic currency base (at given money multiplier, money supply will be reduced). With foreign exchange swaps, the central banks are highly flexible at times to buy and sell foreign exchange (Lee 1997). Foreign exchange swaps have been implemented in Vietnam since 1998, but they are still little used. Although this instrument still has disadvantages[61], with the development of the financial sector and experience gained by the SBV during the banking and financial reform, this instrument could be increasingly introduced in the near future.

Other macroeconomic policies such as fiscal policy, reform of SOEs, and external economic relation policies are considered when implementing the devaluation policy in order to stimulate exports and to improve BOP, but inflation still must be controlled and macroeconomic stability maintained.

[61] This instrument may cause losses for the central bank if the difference between the spot rate and forward rate is smaller than the interest rate differential between the foreign and domestic markets; this also contains the foreign exchange risk when the central bank converts foreign currency into local currency (Lee 1997)

Chapter 9

CONCLUSION

The purpose of this thesis is to analyse the reforms of monetary and exchange rate policies in Vietnam during the 1990s. The thesis focuses on the transition from direct to indirect monetary policy instruments, the effects of exchange rates and prices on trade flows and the possibility and a policy coordination to use devaluation as a tool to encourage exports, improve the trade balance and BOP.

Theories and experiences from transitional economies and developing countries showed that in the expansion of domestic and international financial markets, indirect instruments have more advantages than direct ones in terms of financial intermediation and allocating financial resources. The use of indirect instruments allows monetary authorities more flexibility in implementing monetary policy. The transition from CPEs to a market economy changes the nature of financial and banking systems. In this context, therefore, monetary and exchange rate policies and their instruments must be changed basically. The transition from direct to indirect monetary instruments is an indispensable required process. However, the pace and use of indirect instruments depend on the macroeconomic conditions and the development of the financial market.

Prior to 1980 the Vietnamese economy followed the Soviet economic model. In the period 1979-1980, this model revealed its inappropriateness. Moreover, a US embargo and a cut in foreign aid from the former Soviet Union and Eastern Europe Countries

worsened the economic situation and put the Vietnamese economy in a serious recession. This created the critical demand for economic reform. During the period 1980-88, some partial economic reforms were undertaken in agricultural and industrial areas, but these reforms did not make fundamental changes in the economy. In particularly, the reform of 'price-wage-money' in 1985 failed and caused a severe crisis in the economy. Therefore, the comprehensive reform package was necessary. In March 1989, the comprehensive economic reform was launched, which includes the reform of state managements, SOE reform, financial sector reform, and external economic relation reform. As a result, the economy achieved a high growth rate and macroeconomic stability during the 1990s. It also significantly contributed to the development of the private sector and poverty alleviation. Since 1998, Vietnamese economy was still slightly affected by the financial crisis in the region and faced difficulties in FDI reduction, slow GDP growth rate, poor performance of SOEs and the problems of efficiency and soundness in the banking system. These require further reforms to stimulate the growth of the economy.

As in the Soviet economic model and other CPEs, Vietnam had a passive financial and a mono-banking systems in the period before 1988. Monetary policy only provided money (cash) and credits to the real sector according to the production plans set by the government. Exchange rates were considered as a convertible tool to clear barter trade between Vietnam and other countries in the CMEA. After 1988 the banking system started to reform and in 1990, the two tier banking system was established in the context of financial sector reform. After 10 years of reform, the two tier banking system has been developed in both the number of financial institutions and their assets, these created a framework and facilitated the reforms of monetary and exchange rate policies. However, the degree of monetisation being low, money markets are underdeveloped.

The problems of bank soundness and outstanding issue of SOEs limit the scope and effectiveness of monetary and exchange rate policy. These must be considered when analysing monetary and exchange rate policies during that time.

Since the two tier banking system was established in 1990, the SBV has firstly conducted monetary policy in the environment of a market oriented economy. The ultimate targets of monetary policy are to stabilise the value of VND, restrain inflation and contribute to economic growth. Based on the macroeconomic conditions and the development of financial market, the SBV has used both direct instruments such as interest rate controls, credit ceilings, directed credits, and indirect instruments which include reserve requirements, refinancing facilities, and open market type operations (T-bill auctions) to achieve these targets.

During that time, the SBV relied still more on direct instruments than indirect ones. Direct instruments were used as effective tools to control inflation and maintain macroeconomic stability and they have been liberalised step by step. However, the use of direct instruments induced the inefficiency in financial intermediation and misallocation of financial resources. Indirect instruments have been increasingly introduced, but their role is limited due to low level of monetisation, underdevelopment of the money market and securities market not being established at that time. The results from empirical analysis indicated that the use of indirect instruments contributed to increase the degree of money control from the SBV, but it was not enough evidence to conclude that the use of indirect instruments improved financial sector efficiency.

Further reforms of indirect instruments are necessary because Vietnam has not completed its transition from direct to indirect instruments nor the transition to a market

oriented economy. In the next period, direct instruments should be more liberalised and gradually phased out, but the SBV must still keep them in hand when needed. Indirect instruments should be increasingly and effectively implemented and begin to replace the direct ones. However, other reforms such as the restructuring of the banking system, improving legal frameworks, scrutinising balance sheets of commercial banks and stimulating SOE reform are needed to support the transition from direct to indirect instruments.

Flexible exchange rate arrangements have been adopted by some developing countries since the mid -1970s. Exchange rate policy in these countries has been used generally as a macroeconomic tool to achieve and maintain international competitiveness, and a viable BOPs. The theories and empirical evidence from developing countries strongly support the idea that devaluation can be used to improve exports, trade balance and BOPs. The impact of devaluation on trade flows is considered as equivalent to the effects of import tariffs and export subsidies.

Exchange rate policy in Vietnam since 1990 has been considered as a part of monetary policy and it has been implemented flexibly and market oriented. During the period 1992 - 1998, nominal effective exchange rates were depreciated by 20 per cent, but the real effective exchange rates were appreciated by around 20 per cent to 30 per cent. Foreign trade policy was also reformed in terms of relaxing controls of foreign trade, reducing tariffs and NTBs, and as a result, exports and imports grew on average by 20 per cent to 30 per cent pa, and consequently, the current account and BOP were improved.

The effects of exchange rates and prices on trade flows in Vietnam were examined from 1992 to 1998. The results from ECMs for exports and imports in both the short and long runs indicated that prices have larger effects than exchange rates in the short run for exports and in both the short and long runs for imports. In contrast, exchange rates have larger effects on trade flows in the long run for exports and the Marshall-Lerner condition holds. Moreover, joining bilateral and multilateral trade agreements require Vietnam to commit to reducing tariffs and other trade restrictions in the near future. So, in the long run, Vietnam cannot retain tariffs and import restrictions, which have been used in the last period. These suggest that devaluation could be used to encourage exports in the near future.

The possibility of using devaluation to promote exports can be considered more carefully when the dynamic links between inflation, exchange rate and money supply are examined. The results from VECMs show that exchange rates and money supply indeed lead to higher inflation in the long run. In the short run, both money growth and exchange rate depreciation are major sources to increase inflation (particularly, the money growth contributed to 30 per cent of inflation variation), but exchange rate depreciation alone increased inflation very little. Therefore, the devaluation can be used to stimulate exports and reduce the appreciation of real exchange rates in the short run. However, the devaluation policy needs close coordination with monetary policy, in which money supply must be controlled effectively. In the condition of large capital inflows, indirect monetary policy instruments such as OMO, foreign exchange forwards, variable deposit requirements are considered as appropriate tools to sterilise capital inflows, to avoid inflation and real exchange rate appreciation.

Although the statistical system in Vietnam has been improved step by step, data collection is still difficult for economists who are doing research on the Vietnamese economy. Most data used in this thesis are quarterly data covering the period 1992 to 1998. As the length of the time series data is short, the results of econometric models in this thesis should be viewed with 'normal' caution. If the data are sufficient, a CGE (Computable General Equilibrium) model with more variables and more equations may be useful to examine the effects of exchange rates and prices on trade flows.

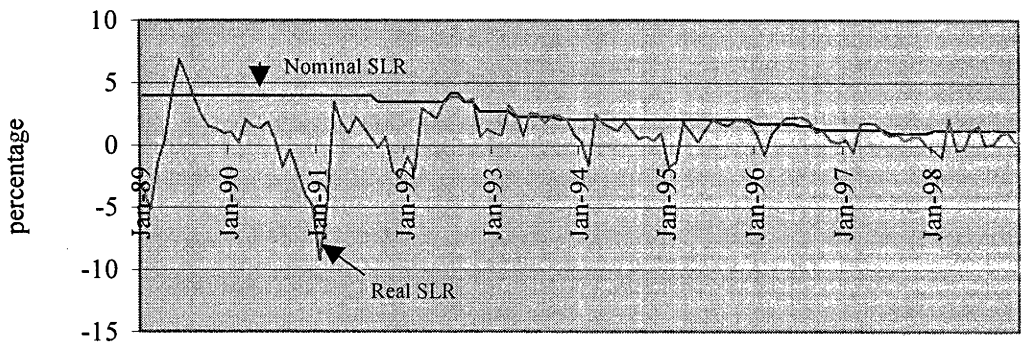
Appendices

Appendix 3.1. Vietnam: Overdue Loans of Deposit Money Banks, 1994-98 1/

	1994	1995	1996	1997	Sep-98
			In billions of VND		
Deposit Money Banks	3,152	3,337	4,726	7,682	8,592
SOCBs	3,004	3,052	4,209	5,769	6,246
Non-SOCBs	148	285	517	1,913	2,346
			As % of total loans		
Deposit Money Banks	8.9	7.9	9.3	12.3	12.5
SOCBs	11.1	9.1	11.0	12.0	11.3
Non-SOCBs	1.7	3.3	4.2	13.5	17.5
			As % of total assets		
Deposit Money Banks	5.6	4.8	5.5	7.4	7.3
SOCBs	6.7	5.2	6.4	7.1	6.5
Non-SOCBs	1.3	2.9	2.6	8.5	10.6
			As % of total overdues		
SOEs	58.8	49.7	44.2	34.8	35.5
Cooperatives	2.1	2.1	1.7	1.3	1.6
Joint-stock companies	3.4	5.3	11.8	45.7	46.1
Joint venture	0.1	0.2	0.6	0.6	1.3
Private sector	35.7	42.7	41.7	17.5	15.6
			As % of total loans to the sector		
SOEs	9.1	6.9	7.8	8.6	8.5
Cooperatives	22.5	26.3	29.7	40.2	43.0
Joint-stock companies	4.5	3.7	7.4	34.3	37.6
Joint venture	0.3	0.4	1.0	1.2	2.7
Private sector	11.7	12.7	14.9	8.1	7.4

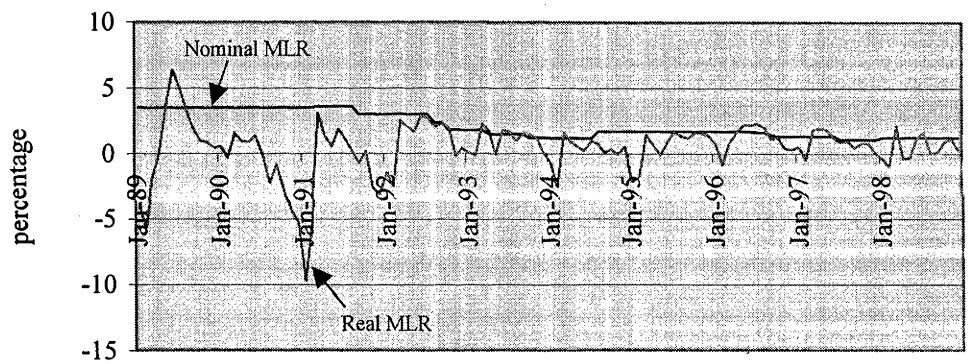
Note: 1/ Comprising 4 SOCBs and 24 non-SOCBs.
Source: IMF (1999b: 27)

Appendix 4.1: Monthly Short-Term Lending Interest Rate, 01/1989-12/1998



Note: SLR is Short-term lending rate. Author estimates the real SLR.
Source: Mori (1997), SBV (1995-98), Bach and Nguyen (1999).

Appendix 4.2: Monthly Medium and long-Term Lending Interest Rates, 01/1989-12/1998



Note: MLR is Medium and long-term lending rate. Author estimates the real MLR.
Source: Mori (1997), SBV (1995-98), Bach and Nguyen (1999).

Appendix 4.3: Credit Share of the Big Six Commercial Banks (Per cent)

Year	Total	Vietcom bank	Agri bank	IDBV	Incom bank	EXIM bank	Maritime bank
1993	100	21.9	27.6	28.8	17.4	2.8	1.4
1994	100	19.8	29.9	25.2	20.0	3.6	1.6
1995	100	21.1	31.5	21.4	21.0	3.5	1.5

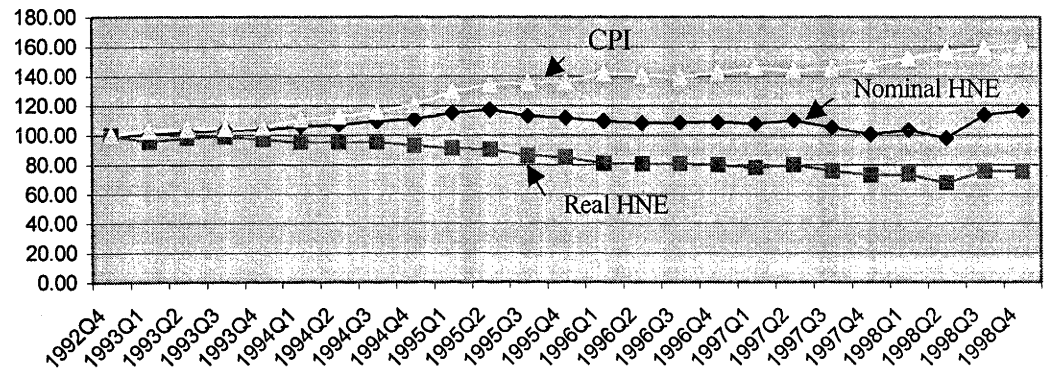
Note: EXIM bank is the Export and Import Bank, Maritime bank is the Maritime Commercial Stock Bank.
Source: Amano (1997: 14).

Appendix 4.4: Capital mobilisation from 955 People's Credit Funds and Cooperatives in 1998

Capital mobilised (VND Bill)	Less than 1	Less than 2	From 2 To 5	From 5 To 10	Over 10
Number of Credit Funds and Cooperatives	624	204	93	19	15
(% in total)	65.34	21.36	9.74	1.99	1.57

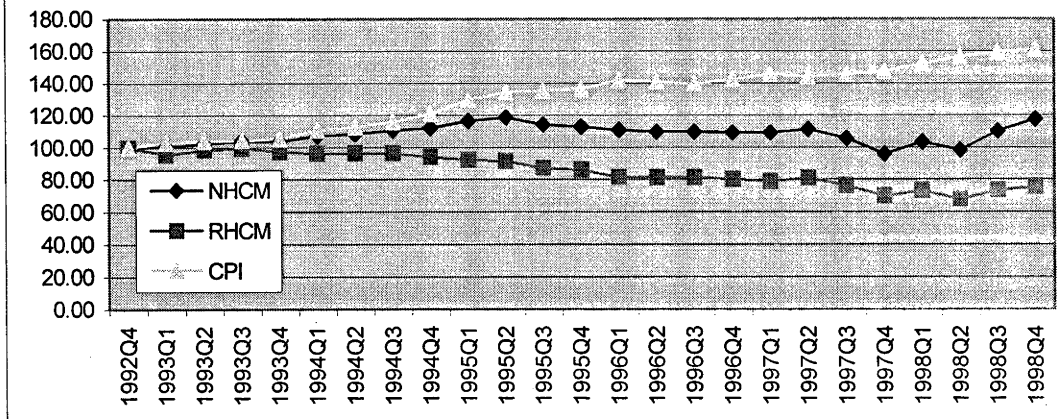
Source: SBV, 1998. *Banking Review*, July 7.

Appendix 6.1: Nominal, real effective Exchange rates of Hanoi's Parallel Market and CPI



Source: Author's estimates

Appendix 6.2: Nominal, real effective exchange rates of HCM City's parallel Market and CPI



Source: Author's estimates

Appendix 6.3. Vietnam's Structure of Exports and Imports (Per cent), 1990-98									
EXPORTS	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Total	100	100	100	100	100	100	100	100	100
0 - Food and live animals	38.7	33.7	23.1	21.6	34.0	27.9	25.5	23.3	27.2
1 - Beverages and tobacco	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2
2 - Crude matls excl fuels	19.5	20.1	8.1	7.9	7.0	5.3	4.1	2.4	1.9
3 - Mineral fuels etc	26.8	30.0	23.8	23.9	22.1	17.3	21.4	19.6	15.1
4 - Animal, vegetable oil, fat	0.3	0.1	0.3	0.1	0.2	0.8	0.7	0.3	0.3
5 - Chemicals	0.3	0.2	0.6	0.7	0.4	1.2	1.0	1.0	1.0
6 - Basic manufactures	5.4	5.3	19.6	17.3	6.3	13.6	6.9	5.9	5.8
7 - Machines, transport equip	0.5	0.3	6.9	5.3	1.3	5.5	2.8	6.9	8.3
8 - Mis manufacture goods	7.8	10.2	17.1	22.8	28.1	28.0	37.1	40.3	39.9
9 - Goods not classd by kind	0.7	0.1	0.5	0.4	0.5	0.3	0.4	0.2	0.3
Total primary commodities for exports (0+1+2+4+3)	85.3	83.8	55.4	53.5	63.4	51.4	51.9	45.7	44.7
Food (0+1)	38.8	33.7	23.1	21.6	34.1	28.0	25.7	23.4	27.4
Agriculture non-food (2+4)	19.8	20.1	8.4	8.0	7.2	6.1	4.9	2.7	2.2
Fuels (3)	26.8	30.0	23.8	23.9	22.1	17.3	21.4	19.6	15.1
Total manufactures (5+6+7+8)	13.9	16.1	44.2	46.1	36.1	48.3	47.7	54.1	55.0
IMPORTS	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Total	100	100	100	100	100	100	100	100	100
0 - Food and live animals	7.2	4.8	2.6	3.0	3.3	4.2	3.1	4.0	4.1
1 - Beverages and tobacco	1.3	0.5	1.8	2.3	4.8	4.9	3.6	2.5	3.3
2 - Crude matls excl fuels	2.6	5.6	2.8	1.6	2.4	2.6	2.1	1.7	2.0
3 - Mineral fuels etc	1.8	2.0	12.4	12.7	11.8	8.5	6.0	8.5	6.6
4 - Animal, vegetable oil, fat	0.0	0.1	0.2	0.3	0.3	0.8	0.8	0.7	1.0
5 - Chemicals	17.8	33.2	21.5	14.8	14.6	16.0	13.9	16.0	16.6
6 - Basic manufactures	25.2	19.4	19.4	22.9	23.6	25.4	26.1	24.3	23.8
7 - Machines, transport equip	37.3	28.5	32.5	37.4	32.9	31.5	38.1	32.3	31.6
8 - Mis manufacture goods	5.4	5.3	6.2	4.7	5.6	5.4	5.6	7.0	6.9
9 - Goods not classd by kind	1.4	0.5	0.6	0.4	0.6	0.7	0.7	3.0	4.1
Total primary commodities for imports (0+1+2+4+3)	12.8	13.0	19.8	19.9	22.7	21.0	15.6	17.4	17.1
Total manufactures (5+6+7+8)	85.7	86.4	79.6	79.8	76.7	78.3	83.7	79.5	78.9
Source: IEDB - Stars									

Appendix 6.4. Exports by Destinations and Imports by Original Countries (Per cent), 1990-98

	1990	1991	1992	1993	1994	1995	1996	1997	1998
TOTAL EXPORTS	100	100	100	100	100	100	100	100	100
EEC-12	7.0	12.4	12.3	16.3	22.9	20.4	23.8	30.1	33.7
Japan	39.5	38.1	25.1	26.1	30.0	25.9	29.4	25.8	19.8
ASEAN (incl SING)	19.6	18.0	11.1	14.3	15.5	11.7	14.4	15.3	18.3
Mainland China 1/	10.9	10.6	6.4	6.4	7.5	7.6	7.4	7.3	5.1
Korea, Rep	0.0	2.4	1.7	2.2	2.5	2.9	3.4	2.8	2.0
NAFTA 2/	0.9	0.7	0.5	0.5	2.0	4.1	6.2	6.3	8.6
Australia+New Zealand	1.0	1.4	4.3	4.2	4.8	3.3	4.7	5.4	5.7
Cent Planned Europe	7.3	1.4	0.8	0.8	1.3	1.3	1.6	2.2	2.4
Middle East	0.2	0.2	26.7	20.1	0.5	15.2	0.3	0.2	0.4
Africa	3.3	1.0	1.6	0.9	1.4	1.2	1.3	0.8	0.4
Rest of the World	10.3	13.8	9.4	8.2	11.4	6.4	7.5	3.8	3.7
TOTAL IMPORTS	100	100	100	100	100	100	100	100	100
EEC-12	16.9	13.7	9.7	10.7	10.7	8.5	12.8	11.5	11.1
Japan	22.7	13.0	11.4	12.0	9.5	9.9	10.8	12.8	14.3
ASEAN (incl SING)	7.6	13.1	24.5	31.2	33.4	30.4	24.1	30.2	31.5
Mainland China 1/	15.0	24.2	26.5	14.8	12.8	14.7	13.8	17.2	16.7
Korea, Rep	0.0	11.9	11.0	13.8	15.2	14.6	15.2	16.0	14.3
NAFTA 2/	1.6	1.2	0.4	0.4	2.8	3.0	6.2	3.2	3.4
Australia+New Zealand	1.8	2.1	1.1	1.6	1.5	1.6	1.7	1.7	2.5
Cent Planned Europe	20.0	0.2	0.6	0.5	0.8	0.7	1.7	3.6	3.4
Middle East	0.3	8.2	6.3	2.5	0.2	3.3	0.6	0.4	0.4
Africa	0.4	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Rest of the World	13.6	12.2	8.4	12.5	12.9	13.3	12.9	3.4	2.2

Note: 1/ including China, Hongkong and Macau; 2/ including United States, Canada and Mexico

Source: IEDB - Stars, 2000

Appendix 7.1: Test for cointegration of variables in the long-run export demand equations - DF test for the residuals

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
	DF regressions include an intercept but not a trend		
DF	**-4.53****	**-4.43****	**-4.51****
ADF(1)	-3.35**	-3.53**	-3.34**
ADF(2)	-3.42**	-3.65**	-3.44**
ADF(3)	-1.98	-1.96	-2.01
ADF(4)	-2.40	-2.34	-2.42
	DF regressions include an intercept and a linear trend		
DF	**-4.33****	**-4.23****	**-4.30****
ADF(1)	-3.19	-3.36*	-3.18
ADF(2)	-3.27*	-3.48*	-3.28*
ADF(3)	-1.76	-1.72	-1.79
ADF(4)	-2.17	-2.09	-2.19

Note: ** and * are significant at 5% and 10% level, respectively

Appendix 7.2: Test for cointegration of variables in the ECM for export demand - DF test for the residuals

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
	DF regressions include an intercept but not a trend		
DF	**-3.74****	**-3.74****	**-3.81****
ADF(1)	-1.67	-1.72	-1.70
ADF(2)	-1.87	-1.97	-1.85
ADF(3)	-2.80*	-2.72*	-2.78*
ADF(4)	-2.12	-1.95	-2.13
	DF regressions include an intercept and a linear trend		
DF	**-5.06****	**-4.93****	**-5.13****
ADF(1)	-2.56	-2.57	-2.58
ADF(2)	-2.94	-3.01	-2.92
ADF(3)	-4.12**	-3.95**	-4.08**
ADF(4)	-4.36**	-3.71*	-4.34**

Note: ** and * are significant at 5% and 10% level, respectively

Appendix 7.3: Test for cointegration of variables in the long-run import demand equations - DF test for the residuals

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
	DF regressions include an intercept but not a trend		
DF	**-3.05****	**-3.11****	**-3.07****
ADF(1)	-2.96*	-2.97*	-2.96*
ADF(2)	-2.32	-2.27	-2.34
ADF(3)	-2.77*	-2.84*	-2.82*
ADF(4)	-2.72*	-2.73*	-2.73*
	DF regressions include an intercept and a linear trend		
DF	**-3.17**	**-3.24***	**-3.19**
ADF(1)	-3.24*	-3.27*	-3.23*
ADF(2)	-2.66	-2.64	-2.68
ADF(3)	-2.99	-3.07	-3.03
ADF(4)	-3.00	-3.03	-3.01

Note: ** and * are significant at 5% and 10% level, respectively

Appendix 7.4: Test for cointegration of variables in the ECM for import demand - DF test for the residuals

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
	DF regressions include an intercept but not a trend		
DF	**-2.72***	**-2.89***	**-2.72***
ADF(1)	-2.86*	-2.92*	-2.85*
ADF(2)	-1.93	-1.86	-1.94
ADF(3)	-1.47	-1.50	-1.48
ADF(4)	-2.09	-1.92	-2.08
	DF regressions include an intercept and a linear trend		
DF	**-2.77**	**-3.05**	**-2.79**
ADF(1)	-3.59*	-3.83**	-3.55*
ADF(2)	-2.71	-2.70	-2.70
ADF(3)	-2.24	-2.53	-2.26
ADF(4)	-3.34*	-3.53*	-3.34*

Note: ** and * are significant at 5% and 10% level, respectively

- **Sensitivity of analysis:**

Appendix 7.5: Long-run export demand equation regression results

$$LnX_t^d = a + bLnYW_t + cLn\left(\frac{P_{VNX}}{P_{WXC}}\right)_t + dLnE_t + S4 + v_t$$

24 observations used for estimation from 1993Q1 to 1998Q4

Variables	Coefficients		
	Model 1 (VCBE)	**Model 2 (HNE)**	**Model 3 (HCME)**
a	**-12.194*** **	**-12.373*** **	**-12.261*** **
	(-15.71)	(-15.64)	(-15.58)
LnYW$_t$	**6.551*** **	**6.524*** **	**6.568*** **
	(16.68)	(16.86)	(16.77)
Ln(PVNX/PWXC)$_t$	**-0.378[a]**	**-0.416[b]**	**-0.376[a]**
	(-1.44)	(-1.61)	(-1.43)
LnE$_t$	**0.922*** **	**1.075*** **	**0.936*** **
	(3.32)	(3.46)	(3.34)
S4	**-0.052*** **	**-0.054*** **	**-0.052*** **
	(-3.39)	(-3.62)	(-3.41)
R^2	0.97	0.97	0.97
$\bar{R}^2$	0.96	0.96	0.96
F(4, 19)	134.32 [.000]	138.84 [.000]	134.99 [.000]
Serial correlation $\chi^2(4)$:	4.688 [.321]	5.963 [.202]	4.597 [.331]
Function form $\chi^2(1)$:	0.693 [.405]	0.906 [.341]	0.836 [.361]
Normality $\chi^2(2)$:	2.236 [.327]	2.111 [.348]	2.111 [.348]
Heteroscedasticity $\chi^2(1)$:	0.817 [.366]	1.086 [.297]	0.694 [.405]

Note: *** and ** are significant at 1% and 5% level, respectively.
a is significant at 17% level. **b** is significant at 13% level.
The values in brackets are T-ratios and squared brackets are probabilities.

Appendix 7.6: Test for cointegration of variables in the long-run export demand equations - DF test for residual v_t (Case for PWXC)

$Dv_t = a_1 v_{t-1} + \tau_t$

(H_o: $a_1 = 0$, residual is nonstationary)

23 observations used for estimation from 1993Q2 to 1998Q4

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
a_1	**-1.257*** **	**-1.218*** **	**-1.247*** **
	(-5.71)	(-5.50)	(-5.62)
R^2	0.60	0.58	0.59
Serial correlation $\chi^2(4)$:	5.744 [.219]	7.237 [.124]	5.674 [.225]
Function form $\chi^2(1)$:	0.036 [.849]	0.099 [.753]	0.080 [.777]
Normality $\chi^2(2)$:	1.531 [.465]	1.744 [.418]	1.569 [.456]
Heteroscedasticity $\chi^2(1)$:	1.048 [.306]	1.448 [.229]	1.104 [.293]

Note: *** and ** are significant at 1% level

The values in brackets are T-ratios and squared brackets are probabilities.

Appendix 7.7: Test for cointegration of variables in the long-run export demand equations - DF test for residual v_t (PWXC)

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
	DF regressions include an intercept but not a trend		
DF	**-4.55****	**-4.43****	**-4.52****
ADF(1)	-3.36**	-3.48**	-3.34**
ADF(2)	-3.46**	-3.62**	-3.46**
ADF(3)	-1.98	-1.93	-2.00
ADF(4)	-2.37	-2.29	-2.39
	DF regressions include an intercept and a linear trend		
DF	**-4.34****	**-4.22****	**-4.31****
ADF(1)	-3.19	-3.29*	-3.17
ADF(2)	-3.30*	-3.45*	-3.30*
ADF(3)	-1.72	-1.65	-1.75
ADF(4)	-2.12	-2.03	-2.14

Note: ** and * are significant at 5% and 10% level, respectively

Appendix 7.8: Error Correction Model for export demand (Case of Pwxc)

$$DLnX_t^d = \psi_0 + \sum_{i=1}^{1} \psi_{1i} DLnX_{t-i}^d + \sum_{i=0}^{3} \psi_{2i} DLnYW_{t-i} + \sum_{i=0}^{0} \psi_{3i} DLn\left(\frac{P_{VNXi}}{P_{WXCi}}\right)_{t-i} + \sum_{i=0}^{0} \psi_{4i} DLnE_{t-i} + \rho v_{t-1} + \eta_t$$

21 observations used for estimation from 1993Q4 to 1998Q4

Variables	Coefficients		
	Model 1 (VCBE)	**Model 2** (HNE)	**Model 3** (HCME)
Ψ_0	**0.013**	**0.005**	**0.013**
	(0.62)	(0.24)	(0.62)
$DLnX^d_{t-1}$	**-0.157**	**-0.235**	**-0.152**
	(-0.62)	(-0.95)	(-0.60)
$DLnYW_t$	**-0.910**	**0.113**	**-0.931**
	(-0.31)	(0.04)	(0.31)
$DLnYW_{t-1}$	**1.435**	**1.783**	**1.484**
	(0.94)	(1.19)	(0.98)
$DLnYW_{t-2}$	**-0.426**	**0.553**	**-0.453**
	(-0.19)	(0.24)	(-0.21)
$DLnYW_{t-3}$	**3.198****	**3.628****	**3.229****
	(2.29)	(2.55)	(2.31)
$DLn(P_{VNX}/P_{WXC})_t$	**-0.372**	**-0.342**	**-0.372**
	(-0.76)	(-0.66)	(-0.75)
$DLnE_t$	**0.173**	**0.433**	**0.165**
	(0.35)	(0.85)	(0.33)
v_{t-1} (Error correction term)	**-0.917*****	**-0.886****	**-0.910*****
	(-3.05)	(-2.89)	(-3.05)
R^2	0.80	0.79	0.80
$\bar{R}^2$	0.67	0.65	0.66
F(8, 12)	5.988 [.003]	5.694 [.004]	5.955 [.003]
Serial correlation $\chi^2(4)$:	4.682 [.321]	3.011 [.556]	4.726 [.317]
Function form $\chi^2(1)$:	3.206 [.073]	2.701 [.100]	3.300 [.069]
Normality $\chi^2(2)$:	0.448 [.799]	0.502 [.778]	0.465 [.793]
Heteroscedasticity $\chi^2(1)$:	0.862 [.353]	0.424 [.515]	0.834 [.361]

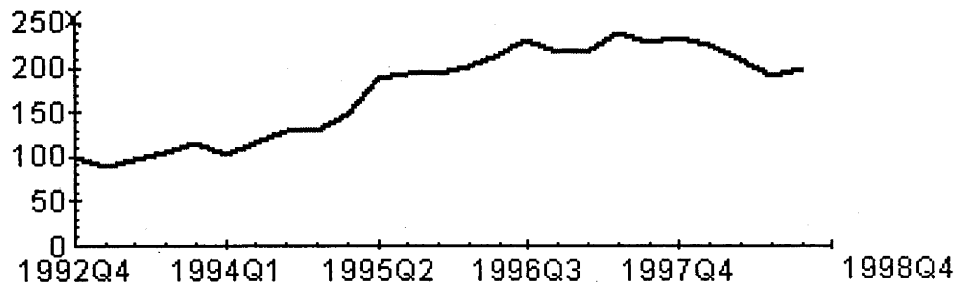
Note: ***, ** and * are significant at 1%, 5% and 10% level, respectively
The values in brackets are T-ratio and squared brackets are probabilities. The lagged lengths of variables are selected by using Schwarz Bayesian Criterion (SBC).

Appendix 7.9: Test for cointegration of variables in the ECM for export demand - DF test for the residuals (Case of PWXC)

	Model 1 (VCBE)	Model 2 (HNE)	Model 3 (HCME)
	DF regressions include an intercept but not a trend		
DF	-3.86**	-3.81**	-3.92**
ADF(1)	-1.78	-1.78	-1.80
ADF(2)	-1.56	-1.55	-1.55
ADF(3)	-2.16	-1.94	-2.16
ADF(4)	-2.06	-1.90	-2.05
	DF regressions include an intercept and a linear trend		
DF	-5.94**	-5.97**	-5.99**
ADF(1)	-3.47*	-3.62*	-3.49*
ADF(2)	-3.38*	-3.50*	-3.36*
ADF(3)	-3.76*	-3.65*	-3.74**
ADF(4)	-4.08**	-3.82**	-4.06**

Note: ** and * are significant at 5% and 10% level, respectively

Appendix 7.10: Real Import Penetration Rate, 1992-98



Source: SBV' authorities. Author's estimate

Appendix 7.11: Export Structure of 13 Trading Partners of Vietnam (% of total exports), 1992-98

	1992	1993	1994	1995	1996	1997	1998
1-AUSTRALIA							
TM	0.26	0.35	0.36	0.38	0.37	0.36	0.36
TPC	0.58	0.64	0.61	0.59	0.60	0.61	0.59
2-CANADA							
TM	0.64	0.66	0.67	0.67	0.67	0.67	0.70
TPC	0.31	0.30	0.29	0.29	0.28	0.28	0.25
3-FRANCE							
TM	0.80	0.79	0.80	0.79	0.81	0.80	0.81
TPC	0.20	0.21	0.20	0.19	0.19	0.18	0.16
4-GERMANY							
TM	0.90	0.88	0.89	0.86	0.86	0.87	0.88
TPC	0.08	0.08	0.08	0.08	0.08	0.08	0.08
5-JAPAN							
TM	0.97	0.97	0.96	0.96	0.96	0.96	0.95
TPC	0.02	0.02	0.02	0.02	0.02	0.02	0.02
6-NETHERLANDS							
TM	0.61	0.60	0.62	0.64	0.64	0.72	0.72
TPC	0.35	0.36	0.34	0.32	0.32	0.27	0.28
7-SINGAPORE							
TM	0.78	0.80	0.83	0.86	0.85	0.86	0.87
TPC	0.21	0.19	0.15	0.12	0.13	0.11	0.12
8-KOREA, REP							
TM	0.93	0.94	0.94	0.94	0.93	0.92	0.93
TPC	0.06	0.06	0.06	0.06	0.07	0.08	0.07
9-SWEDEN							
TM	0.86	0.86	0.87	0.78	0.82	0.82	0.83
TPC	0.13	0.13	0.13	0.11	0.11	0.12	0.10
10-THAILAND							
TM	0.67	0.71	0.73	0.73	0.73	0.72	0.75
TPC	0.32	0.27	0.27	0.26	0.26	0.25	0.24
11-TAIWAN							
TM	0.94	0.94	0.94	0.94	0.94	0.95	0.96
TPC	0.06	0.06	0.06	0.06	0.06	0.04	0.03
12-UNITED KINGDOM							
TM	0.82	0.82	0.83	0.83	0.84	0.84	0.87
TPC	0.16	0.17	0.16	0.15	0.15	0.14	0.12
13-UNITED STATES							
TM	0.78	0.79	0.79	0.79	0.79	0.82	0.83
TPC	0.18	0.17	0.17	0.18	0.17	0.15	0.13

Note: TM = Total manufactures = 5+6+7+8, TPC = Total Primary Commodities = 0+1+2+4+3.
Source: STARS-IEDB, ANU, 2000

Appendix 8.1: DF and ADF Tests for Residuals of Model (8.11) Regressions

	Model 1		Model 2		Model 3		Model 4	
	R11	**R12s**	R21	**R22s**	R31	**R32s**	R41	**R42s**
The DF regressions include an intercept but not a trend								
DF	-2.68*	-4.32**	-2.96*	-3.09**	-3.46**	-4.40**	-3.31**	-3.26**
ADF(1)	-1.55	-2.60	-2.59	-2.67**	-2.47	-3.41**	-2.70*	-2.57
ADF(2)	-1.71	-2.78*	-2.52	-2.57	-2.41	-3.35**	-2.42	-2.37
The DF regressions include an intercept and a linear trend								
DF	-2.94	-4.32**	-2.94	-3.17	-3.88**	-4.30**	-3.20	-3.33*
ADF(1)	-1.90	-2.61	-2.60	-2.79	-2.89	-3.00	-2.59	-2.68
ADF(2)	-2.05	-2.69	-2.52	-2.75	-2.76	-2.86	-2.35	-2.50

Note: ** and * are significant at the 5% and 10% level.
Rij (i=1...4, j=1,2) means the residual from each cointegrating vector which obtained in (8.11)
S indicates the selecting residual for the short run VECMs

Appendix 8.2: Single equation regression results of Model 1

20 observations used from 1993Q4 to 1998Q3

Regressor	DLnCPI	DLnVCBE	DLnM1
DLnCPI(-1)	0.491**	1.008**	-1.469**
	(2.30)	(2.12)	(-2.78)
DLnVCBE(-1)	0.005	-0.335	0.014
	(0.05)	(-1.37)	(0.05)
DLnM1(-1)	0.273***	0.106	-0.240
	(2.93)	(0.51)	(-1.04)
CONST	-0.401E-3	-0.012	0.036***
	(-0.10)	(-1.48)	(3.95)
ECT1(-1)	-0.006	0.045**	0.013
	(-0.75)	(2.36)	(0.61)
R square	0.47	0.42	0.40
Serial Correlation	5.098 [.277]	7.401 [.116]	0.696 [.952]
Function Form	2.696 [.101]	1.465 [.226]	1.662 [.197]
Normality	0.384 [.825]	2.867 [.238]	0.653 [.721]
Heteroscedasticity	1.235 [.266]	0.12E-3 [.991]	0.094 [.760]

Note: ***, ** and * are significant at 1%, 5% and 10%, respectively.
Values in brackets are T-ratios and in square brackets are probabilities.

Appendix 8.3: Single equation regression results of Model 2

20 observations used from 1993Q4 to 1998Q3

Regressor	DLnCPI	DLnVCBE	DLnM2
DLnCPI(-1)	0.045	0.538	-0.468*
	(0.18)	(1.14)	(-1.76)
DLnVCBE(-1)	0.132	0.008	0.013
	(0.71)	(0.02)	(0.07)
DLnM2(-1)	0.469*	0.447	-0.013
	(1.81)	(0.93)	(-0.05)
CONST	-0.002	-0.015	0.029***
	(-0.38)	(-1.40)	(4.62)
ECT2(-1)	0.003	0.066**	-0.006
	(0.20)	(2.39)	(-0.41)
R square	0.27	0.46	0.23
Serial Correlation	5.543 [.236]	6.829 [.145]	5.269 [.261]
Function Form	7.972 [.005]	1.556 [.212]	0.314 [.575]
Normality	1.198 [.549]	0.270 [.874]	0.844 [.656]
Heteroscedasticity	1.554 [.213]	0.022 [.883]	0.156 [.693]

Note: ***, ** and * are significant at 1%, 5% and 10%, respectively.
Values in brackets are T-ratios and in square brackets are probabilities.

Appendix 8.4: Single equation regression results of Model 3

20 observations used from 1993Q4 to 1998Q3

Regressor	DLnCPI	DLnHNE	DLnM1
DLnCPI(-1)	0.476*	1.014**	-1.483**
	(2.16)	(2.21)	(-2.74)
DLnHNE(-1)	0.002	-0.444	0.173
	(0.01)	(-1.34)	(0.44)
DLnM1(-1)	0.263**	0.144	-0.221
	(2.76)	(0.73)	(-0.94)
CONST	0.122E-3	-0.014	0.035***
	(0.031)	(-1.65)	(3.64)
ECT3(-1)	0.007	-0.049**	-0.018
	(0.79)	(-2.46)	(-0.78)
R square	0.47	0.46	0.41
Serial Correlation	5.078 [.279]	5.205 [.267]	0.657 [.957]
Function Form	4.097 [.043]	4.890 [.027]	1.385 [.239]
Normality	0.189 [.910]	0.169 [.919]	0.815 [.665]
Heteroscedasticity	1.318 [.251]	9.408 [.002]	0.078 [.780]

Note: ***, ** and * are significant at 1%, 5% and 10%, respectively.
Values in brackets are T-ratios and in square brackets are probabilities.

Appendix 8.5: Single equation regression results of Model 4

20 observations used from 1993Q4 to 1998Q3

Regressor	DLnCPI	DLnHNE	DLnM2
DLnCPI(-1)	0.066	0.478	-0.512*
	(0.26)	(1.09)	(-1.92)
DLnHNE(-1)	0.143	0.036	0.120
	(0.55)	(0.08)	(0.43)
DLnM2(-1)	0.397[a]	0.567	0.052
	(1.52)	(1.24)	(0.19)
CONST	-0.64E-3	-0.018	0.027***
	(-0.10)	(-1.66)	(4.15)
ECT4(-1)	0.001	-0.070**	-0.003
	(0.07)	(-2.49)	(-0.18)
R square	0.27	0.49	0.22
Serial Correlation	5.902 [.207]	2.784 [.595]	4.478 [.345]
Function Form	7.048 [.008]	5.524 [.019]	0.103 [.748]
Normality	1.191 [.551]	0.591 [.744]	0.891 [.641]
Heteroscedasticity	1.518 [.218]	10.075 [.002]	0.344 [.557]

Note: ***, ** and * are significant at 1%, 5% and 10%, respectively. a is significant at the 15% level. Values in brackets are T-ratios and in square brackets are probabilities.

Appendix 8.6: Estimated System Covariance Matrix of Errors

Model 1

	DLnCPI	*DLnVCBE*	*DLnM1*
DLnCPI	.535E−4	.597E−4	−.235E−4
DLnVCBE	.597E−4	.265E−3	−.121E−5
DLnM1	−.235E−4	−.121E−5	.326E−3

Model 2

	DLnCPI	*DLnVCBE*	*DLnM2*
DLnCPI	.760E−4	.523E−4	.321E−4
DLnVCBE	.523E−4	.261E−3	.223E−4
DLnM2	.321E−4	.223E−4	.833E−4

Model 3

	DLnCPI	*DLnHNE*	*DLnM1*
DLnCPI	.532E−4	.570E−4	−.230E−4
DLnHNE	.570E−4	.230E−3	.461E−4
DLnM1	−.230E−4	.461E−4	.321E−3

Model 4

	DLnCPI	*DLnHNE*	*DLnM2*
DLnCPI	.756E−4	.532E−4	.317E−4
DLnHNE	.532E−4	.231E−3	.331E−4
DLnM2	.317E−4	.331E−4	.843E−4

Source: Author's estimates

Appendix 8.7: The Variance Decompositions of Depreciation (DLnE) and Money Supply Growth ($DLnM^S$) Rates

20 observations from 1993Q4 to 1998Q3

Proportion of forecast variance explained by changes in:

Time horizon (Quarter)	DLnE			$DLnM^S$		
	DLnCPI	DLnE	$DLnM^S$	DLnCPI	DLnE	$DLnM^S$
			Model 1			
1	27.65	71.21	1.14	24.38	0.73	74.89
3	26.60	67.86	5.54	23.77	0.80	75.43
6	26.59	67.65	5.76	23.83	0.81	75.36
9	26.59	67.65	5.76	23.83	0.81	75.36
12	26.59	67.65	5.76	23.83	0.81	75.36
			Model 2			
1	24.28	71.31	4.41	29.96	0.04	70.00
3	24.09	70.19	5.72	29.92	0.87	69.21
6	24.09	70.14	5.77	29.95	0.88	69.17
9	24.09	70.14	5.77	29.95	0.88	69.17
12	24.09	70.14	5.77	29.95	0.88	69.17
			Model 3			
1	26.77	71.09	2.14	21.01	7.42	71.57
3	24.87	70.17	4.96	20.14	9.03	70.83
6	24.86	70.11	5.03	20.17	9.03	70.80
9	24.86	70.11	5.03	20.17	9.03	70.80
12	24.86	70.11	5.03	20.17	9.03	70.80
			Model 4			
1	26.65	65.72	7.63	25.79	3.51	70.70
3	26.05	65.22	8.73	25.76	4.41	69.83
6	26.05	65.20	8.75	25.78	4.41	69.81
9	26.05	65.20	8.75	25.78	4.41	69.81
12	26.05	65.20	8.75	25.78	4.41	69.81

Source: Author's estimates

Appendix 8.8: Results of DF and ADF tests

Sample period from 1994Q1 to 1998Q3
The Dickey-Fuller regressions include an intercept but not a trend

	LnM1	LnM2	LnCPI
DF	-0.49	-0.91	-2.29
ADF(1)	-0.49	-1.05	-2.10
ADF(2)	-0.59	-1.56	-2.22
ADF(3)	-0.55	-1.67	-1.96
ADF(4)	-0.58	-1.61	-1.89
	DLnM1	**DLnM2**	**DLnCPI**
DF	-4.18**	-5.14**	-3.20**
ADF(1)	-4.89**	-7.28**	-2.82
ADF(2)	-2.83*	-2.92*	-1.72
ADF(3)	-1.67	-1.14	-1.23
ADF(4)	-1.89	-1.71	-1.98

Note: ** and * is significant at the 5% and 10% level.

Appendix 8.9: Share of the Private Sector in the total Economy (Per cent), 1991-99

	1991	**1993**	**1995**	**1997**	**1999**
Total GDP	100	100	100	100	100
Sectors					
Private	27.4	31.8	39.14	37.70	36.53
State	33.3	39.2	40.18	40.48	39.48
Collective	39.3	29.0	10.06	8.91	8.6
Mixed	n.a	n.a	4.32	3.84	3.64
Foreign Investment	n.a	n.a	6.30	9.07	11.75

Note: For comparison with the 1991-93 period, data of the private sector in the 1995-99 period include share of private economy plus share of household economy in the total GDP.
Source: GSO (1994-99) and Dao (1995).

Appendix: 8.10. Total Value of World and Vietnam's Exports (US$ billion), 1992-99								
	92	**93**	**94**	**95**	**96**	**97**	**98**	**99**
World's Exports (1)	3755	3742	4241	5073	5345	5529	5422	5587.5
Vietnam's Exports (2)	2.48	2.99	4.05	5.2	7.33	9.15	9.37	11.54
Proportion of (2) to (1), (%)	0.07	0.08	0.10	0.10	0.14	0.17	0.17	0.21
Source: WTO, 1999. Table A3, p144, and Table 1.2 (chapter 1)								

Appendix: 8.11.

The lower bound on a_1 for (5.2) and (5.3) is exactly as $-2 < a_1 < 0$ for confirming that the residual sequence is stationary. We can prove it simply:

Before getting (5.2) we have:

$\varepsilon_t = a_0\varepsilon_{t-1} + \tau_t$ (5.2a)

Be aware that stationarity necessitates that for (5.2a): $-1 < a_0 < 1$. If the estimated value of a_0 is close to -1, we should also be concerned about nonstationarity.

By adding $-\varepsilon_{t-1}$ in both sides of (5.2a), we have:

$\varepsilon_t - \varepsilon_{t-1} = a_0\varepsilon_{t-1} - \varepsilon_{t-1} + \tau_t$

$\Delta\varepsilon_t = (a_0 - 1)\varepsilon_{t-1} + \tau_t$ (5.2b)

So if we define: $a_1 = a_0 - 1$, then (5.2b) becomes: $\Delta\varepsilon_t = a_1\varepsilon_{t-1} + \tau_t$ (5.2)

The condition $-1 < a_0 < 1$ above is equivalent to $-2 < a_0 - 1 < 0$

Or $-2 < a_1 < 0$ (see Enders 1995, pp215, 374-75).

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