POST-CRISIS EXCHANGE RATE REGIMES
IN SOUTHEAST ASIA:
AN EMPIRICAL SURVEY OF DE-FACTO POLICIES

By Rajnish Tiwari

(Rajnish.Tiwari@uni-hamburg.de)

http://www.rrz.uni-hamburg.de/RRZ/R.Tiwari/

July 2003
University of Hamburg
Faculty of Economics and Business Administration

TABLE OF CONTENTS

Table Index

Figures Index

Abbreviations

EUR   *Euro*

IMF   *International Monetary Fund*

JPY   *Japanese Yen*

n.a.   *not available*

n.c.   *not calculated*

US   *United States*

USD   *United States Dollar*

1   Introduction

In recent years there has been a growing trend of countries abandoning their soft-peg exchange rate regimes and opting for one of the "corner-solutions". Soft-pegs are no more considered to be viable, particularly since the Asian crisis of 1997/98. The *de facto* pegging regimes of Southeast Asia shifted to flexible exchange rate regimes in the wake of the crisis and under IMF pressure. However, there have been reports of these countries **reverting to** their **pre-crisis practices** of maintaining soft-pegs to US dollar, while retaining the official tag of "free-floating regimes".[1]

This paper attempts to crystallise the prevailing, *de facto* exchange rate regimes in the Southeast Asian countries of **Indonesia**, (South) **Korea**, **Malaysia** and **Thailand**, using a wide range of instruments like volatility tests, flexibility index and regression analysis, and comparing the data with some benchmark countries.

This paper comes to the conclusion that developments in exchange rate policies of the surveyed countries have not been uniform. While Malaysia has moved to a fixed-peg, others have liberalised their exchange rate regimes, even if to differing degrees. Though there is, indeed, some evidence of exchange rate "management" vis-à-vis US dollar and to a smaller extent Japanese Yen, it can not be termed a complete reversal to old systems. The exchange rate regimes can be still classified as "managed-float" and thus, belong to the category of floating regimes.

The paper is organised in seven chapters. After this introduction, different exchange rate regimes and their possible variations are discussed. The 3rd chapter introduces the Bipolar View, also known as the "**Hollow Middle**". The 4th chapter introduces the *de jure* **regimes** in the surveyed countries. In the 5th chapter the prevailing *de facto* regimes are characterised, employing a wide variety of instruments. A **flexibility index** is constructed to examine the relative flexibility of different currencies, and a **regression test** is performed to examine the possibility of an informal, *de facto* peg, for example to the US dollar. The results are then interpreted and compared with the *de jure* positions. Finally the reasons for the discrepancy in official and actual positions are discussed and the "**fear of floating**" syndrome introduced in the 6th chapter. This chapter also examines and criticises the concept of "Hollow Middle" in respect of its practical applicability. Finally there is a short summary with concluding remarks.

---

[1]   See, for example, Calvo / Reinhart (2000) and Mckinnon (2000)

2   Possible Exchange Rate Regimes

Exchange Rate systems are classified on the basis of the flexibility that the monetary authorities show towards fluctuations in the exchange rates and have been traditionally divided into 2 categories, namely systems with a fixed exchange rate and systems with a flexible exchange rate. In the former system the exchange rate is usually a political decision, in the latter the prices are determined by the market forces, in accordance with demand and supply (Duwendag et al., 1999, P. 284). These systems are often referred to as **Fixed Peg** (sometimes also described as "**hard peg**") and **Floating** systems. But as usual, between these two extreme positions there exists also an intermediate range of different systems with limited flexibility, usually referred to as "**soft pegs**".

In the following, some of these systems are described in short to show which possibilities exist to choose an exchange rate regime from.

2.1 Fixed Pegs

A fixed peg regime exists when the exchange rate of the home currency is fixed to an anchor currency. This is the case with economies having currency boards or with no separate national currency of their own (Fischer, 2001, P. 4). Countries do not have a separate national currency, either when they have formally **dollarized**,[2] or when the country is a member of **a currency union**, for example Euro. The IMF categorises these two processes as "Exchange Arrangement With No Separate Legal Tender" (IMF AR, 2002, P. 117).

A "**Currency Board Arrangement**" is a "monetary regime based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate…" (IMF AR, 2002, P. 117). This means that domestic currency is fully backed by foreign assets and is issued only against foreign exchange. An example of a currency board arrangement has been pre-crisis Argentina (in late 1990s).

2.2 Floating Regimes

Floating exchange rate regimes consist of independent floating and managed floating systems.

---

[2]   The term "dollarization" refers to the adopting of not only US dollar as the sole legal tender. It has come to be used as a general term, e.g. the adopting of the Deutsche Mark in some Balkan states is also referred to as "dollarization".

In **Independent Floating** systems the exchange rate is market determined and monetary policy usually functions without exchange rate considerations. Foreign exchange interventions are rare and meant to prevent undue fluctuations. But no attempt is undertaken to achieve/maintain a particular rate (IMF AR, 2002, P. 117).

Managed Floating systems usually let the market take its own course but the monetary authorities intervene in the market to "manage" the exchange rate, if needed, to prevent high volatilities and to stimulate growth, without committing to a particular exchange rate level (Fischer, 2001, P. 4). The monetary authorities do not specify an in their opinion "suitable" exchange rate level. The IMF calls this practice a "Managed Floating With No Predetermined Path for the Exchange Rate" (IMF AR, 2002, P. 117).

2.3 Intermediate Regimes

Intermediate exchange rate regimes consist of an array of differing systems allowing a varying degree of flexibility, such as conventional fixed exchange rate pegs, crawling pegs and exchange rate bands (Fischer, 2001, P. 117). In the following such systems are briefly introduced:

In a **Conventional Fixed Peg** arrangement a currency is pegged at a fixed rate to a major currency or a basket of currencies, allowing the exchange rate to fluctuate within a narrow margin of ±1 percent around a formal (or *de facto*) central rate (IMF AR, 2002, P. 117). The monetary authority intervenes in the market, if the fluctuation is outside these limits. An example of such an arrangement is post-crisis Malaysia, fixing Ringgit against US dollar for a rate of RM 3,8 per $1.

A **Horizontal Band** is somewhat similar to a conventional fixed peg. But it is softer, in that it allows the exchange rate level to fluctuate "within certain margins" of a formal (or *de facto*) central rate (IMF AR, 2002, P. 117). The central bank commits itself to keep the exchange rate within a specified range (Fischer, 2001, P.5).

In a **Crawling Peg** arrangement the currency is adjusted periodically "in small amounts at a fixed rate or in response to changes in selective quantitative indicators (past inflation differentials vis-à-vis major trading partners…)" (IMF AR, 2002, P.117). Maintaining a credible crawling peg imposes constraints on monetary policy in a similar manner as a fixed peg system.

A **Crawling Band** allows a periodic adjustment of the exchange rate band itself. Bands are "chosen to be symmetric around a crawling central parity or to widen gradually with an asymmetric choice of the crawl of upper and lower bands…" (IMF AR, 2002, P.117). The central bank commits to maintain the exchange rate within

the band. Pre-Crisis Korea (between 1990-1997)[3] and Israel are examples of a crawling band exchange rate regime (IMF AR, 2002, P. 119).

This classification is naturally not all-exhaustive, since possibilities remain to mix these systems to produce new hybrid systems. Also the question, whether a very broad exchange rate band should be considered to be a soft peg or a managed float, can not be answered easily (Fischer, 2001, P.5).

Fixed Pegs Regimes (Hard Pegs)	Intermediate Group (Soft Pegs)	Floating Regimes (Flexible Regimes)
• "Dollarization" • Currency Union • Currency Board	• Conventional Fixed Peg • Horizontal Band • Crawling Peg • Crawling Band	• Independent Float • Managed Float

Table 1:   *An overview of exchange rate regimes*

---

[3]   See Chapter 4 – "Classifying de jure Regimes in Southeast Asia".

3   Bipolar View – "Hollow Middle"

In recent years a new theory of "hollow middle" has gained ground that is also known as the "Bipolar View". According to this view countries increasingly face the choice between a **"Hard Peg"** exchange rate regime, e.g. a currency board, or a **free-floating** regime.[4] The choice of a middle ground in the form of a "**Soft Peg**" is thought to be no more viable since it is supposed to make a country more prone to financial crises.[5]

A "**Soft Peg**" is defined as "exchange rates that are currently fixed in value (or in a narrow range of values) to some other currency or basket of currencies, with some commitment by the authorities to defend the peg, but with the value likely to change if exchange rates come under significant pressure" (Fischer, 2001, P. 3).

More and more countries are abandoning their intermediate exchange rate regimes and adopting a "corner solution", as seen in Figure-1.[6]
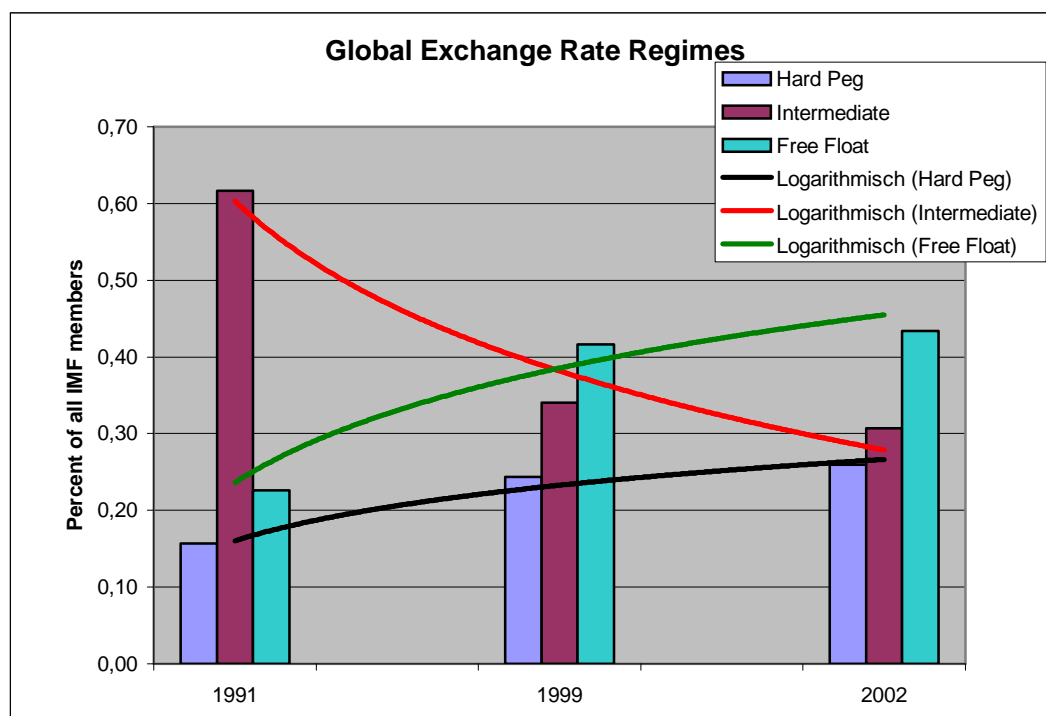
Figure 1:   *Trends in Global Exchange Rate Regimes*

The percentage of total number of IMF member countries having intermediate exchange rate regimes has gone down significantly in the previous decade. A whop-

---

[4]   For classification and definitions of exchange rate regimes see chapter-2.
[5]   Fischer (2001, P. 3) mentions that all major capital market related crises since 1994 have involved a fixed or pegged (soft peg) exchange rate regime.
[6]   For data source of this diagram see Appendix-B.

5

ping 62% of IMF members used to have a soft peg exchange rate regime in 1991, which has come down to 31% at the end of 2002. On the other hand free floating regimes registered an impressive growth In the same period almost doubling from 23% to 43%. Hard peg regimes also registered a modest growth of about 10%.[7] Thus an actual trend of a "vanishing middle" can be observed.

Are these shifts only changes in official labels, as Calvo and Reinhart suggest (2002, P. 404), if not, what could be the reason behind this shift?

The reason, as Fischer (2001, P. 9-13) argues, is that **soft peg systems have proved to be nonviable in the longer run**, especially for countries that are open or opening to international capital flows. If and when such a system breaks down, it causes **serious economic damage** to the economy, for a few years at least.

3.1 Laxity and False Perception of Stability

Once a pegged arrangement has been in place for a few years, a false perception arises that the exchange rate won't change *ever*, leading to reduced risk perception while borrowing in foreign currencies and "eliminating" the need to hedge. Thus when a crisis does occur, its effects are unusually severe. Though principally it is possible to put regulations in place limiting the foreign exchange positions of banks, but it is difficult to enforce such regulations in a period of stability (Fischer, 2001, P. 10). Moreover these transactions are profitable and hence attractive and it would be a loss to ban such transactions in a period of stability.

3.2 Impossible Trinity

The goals of having a **fixed exchange rate, capital mobility** and a **monetary policy dedicated exclusively to domestic considerations –** *simultaneously* **–** are referred to as an impossible trinity, since a domestically oriented monetary policy is not compatible with fixed exchange rates (Fischer, 2001, P. 10). Such attempts of reaching the "magic triangle" are practically doomed to fail" (Duwendag et al., 1999, P. 263). The question arises: why can't domestic monetary policy be used effectively to maintain the fixed exchange rate arrangement?

Fischer (2001, P. 10-11) sees the root cause of the problem in the inconsistency of the political system – "if the option of changing the exchange rate is open to the political system, then at a time when the short-run benefits of doing so outweigh the costs, the option is likely to be chosen".

---

[7]   See Appendix-B for more detailed data.

Domestic and external economic shocks (including those arising out of policy actions) tend to **disturb the equilibrium of official and nominal exchange rates**. If the official rate is overvalued then usually interest rates have to be raised. This could work out for short and small disturbances but for larger and longer-lasting crises it would put the monetary authorities in a very peculiar situation, where **raising interest rates may hurt the aggregate demand** and hurt the banking system, besides it **may not be a politically viable option**. All this could intensify the crisis by encouraging speculators to attack the currency by selling and hoping to force the government to devalue the currency (Fischer, 2001, P. 11).

3.3 Futility of Capital Controls

Imposing capital controls is sometimes suggested as a way out and to protect the exchange rate from the effects of unwanted capital flows. But this is problematic on many counts. Imposing capital controls on outflows would scare the potential investors and affect the capital inflows, drying up the foreign investment.[8] Besides controls on outflows have to be very extensive to prevent loopholes. If domestic policies are "fundamentally inconsistent with the maintenance of the pegged exchange rate", then even such controls can not prevent a devaluation (Fischer, 2001, P.12). Apart from that controls generally lose their effectiveness in the longer run. Fischer suggests, instead, a tax on short-term capital inflows and shifting of "the composition of capital inflows towards longer-term investments".

Since most of the developed economies do have open capital markets, it can be reasonably assumed that this system is helpful for the growth and that most of the emerging market economies are interested in that system. Besides most of the developed and emerging market economies are members of international accords on free trade, such as WTO (World Trade Organisation) and capital controls would be problematic to apply.

Proponents of the bipolar view argue that the only way out of the trouble faced by soft peg regimes is offered by the corner solutions. The countries ought to **either let the exchange rate float freely**, so that the currency does not become a target of speculative attacks. Alternatively the monetary authorities could go for a **very hard peg making institutional commitments** that "both constrain and enable monetary policy to be devoted to the sole goal of defending the parity" (Fischer, 2001, P. 6).

---

[8]   An example is provided by the capital controls on outflows by Pakistan in the aftermath of its nuclear tests and subsequent international sanctions. Pakistani immigrants abroad, a regular and large source of foreign exchange for Pakistan, reacted by postponing their remittances over an extended period of time.

4 Classifying *de jure* Regimes in Southeast Asia

Before beginning with the characterisation of prevailing *de facto* Exchange Rate Regimes in the Southeast Asian countries of **Indonesia, Korea, Malaysia,** and **Thailand**, it is useful to have a glance at the officially stated positions of these countries. Since many central banks routinely declare a position that is somewhat different from their actual practice, a *de facto* classification by the IMF is also provided.[9]

Indonesia

Indonesia describes its exchange rate system as a "**free foreign exchange system**", that it claims to be following since 1970.[10] On the other hand Bank Indonesia has put certain restrictions on free movement of currency, e.g. on forward sales of foreign exchange to non-residents, in order to reduce exchange rate volatility (IMF EAER, 2002, P.444).

The IMF classifies Indonesia's exchange rate regime as "**Managed floating with no pre-announced path for the exchange rate**" (IMF EAER, 2002, P. 444).

Korea

South Korea has adopted a "**free-floating exchange rate system**" since December, 1997.[11] Earlier it had followed several different exchange rate regimes, e.g. a fixed exchange rate system until 1980, a multiple-basket pegged exchange rate system from 1980 to 1990 and a Market Average Exchange Rate System till 1997, in which the exchange rate was allowed to move within an upper and a lower limit around each day's basic exchange rate. In December 1997 Korea shifted to a free-floating regime.[12] The foreign exchange market has been liberalised, allowing participants to buy and sell spots, forwards and foreign exchange swaps. The ceiling on foreign investment in Korean equities and money markets has been abolished.

The IMF classifies Korea's exchange rate regime as "**independently floating**" (IMF EAER, 2002, P. 505).

---

[9] See Bubula / Ötker-Robe (2002, P. 11-12) for the IMF classification guidelines.

[10] See "Elucidation of the Act of the Republic of Indonesia no. 24 of 1999 concerning the Foreign Exchange Flow and Exchange Rate System", the state gazette no. 3844, online: http://www.bi.go.id/bank_indonesia2/utama/publikasi/upload/eluact2499.pdf, as on 09.06.2003.

[11] See FX-System -> Introduction -> Historical Development, online: http://www.bok.or.kr/boks/pgm/svc/html/bulletin.htm?v_logchk=yes&v_current=00000903, as on 09.06.2003.

[12] See Exchange Rate Market -> Foreign Exchange System, online: http://www.bok.or.kr/boks/pgm/svc/html/bulletin.htm?v_logchk=yes&v_current=00000905, as on 09.06.2003.

Malaysia

After experimenting with managed float in 1998 vis-à-vis an undisclosed basket of major trading partners' currencies, Malaysia has adopted a **fixed peg exchange rate regime** since Sept. 1998 and has introduced a wide range of capital controls, removing all legal channels of transferring Ringgit abroad, or vice versa (IMF MRED, 1999, P.23) in order to insulate the monetary policy from external volatility.

The IMF classifies Malaysia's exchange rate regime as a "**conventional pegged arrangement**", whereby the Ringgit is pegged against the US dollar at RM 3,8 per $1 (IMF EAER, 2002, P. 576).[13]

Thailand

The Bank of Thailand declares to be following a "**managed float**" policy since July 1997.[14] It claims to let the value of the Baht get determined by market forces, on the basis of supply and demand, in both on-shore and off-shore foreign exchange markets and to let the currency move in line with "economic fundamentals".

It however **reserves the right to intervene** in the market, *if necessary*, to prevent, what it calls are, excessive volatilities and to achieve its economic policy targets of enhancing flexibility and efficiency in monetary policy implementation,[15] and to improve supervision of foreign capital flows.

The IMF classifies Thailand's exchange rate regime as "**Managed floating with no pre-announced path for the exchange rate**" (IMF EAER, 2002, P. 933).[16]

Country	Since	*de jure* Exchange Rate regime	IMF Classification (31 Mar. 2002)
Indonesia	1970	**Free floating system**	Managed Float
Korea	Dec. 1997	**Free floating system**	Independent Float
Malaysia	Sept. 1998	**Fixed Peg to US Dollar**	Conventional Peg
Thailand	July 1997	**Managed float**	Managed Float

Table 2:   *The de jure Exchange Rate Regimes in Southeast Asia*

---

[13] The author did not find any official information about the exchange rate regime on the Internet site of Central Bank of Malaysia, online: http://www.bnm.gov.my, as on 09.06.2003.

[14] See *Exchange Rate Policy* statement by the Bank of Thailand, online: http://www.bot.or.th/BOTHomepage/BankAtWork/Monetary&FXPolicies/EXPolicy/8-23-2000-Eng-i/exchange_e.htm, as on 09.06.2003.

[15] Thailand's current monetary policy, since May 2002, is inflation-targeting. See online: http://www.bot.or.th/bothomepage/BankAtWork/monetary&fxpolicies/index_eng_i.asp, as on 09.06.2003.

[16] All the quoted positions from IMF EAER (2002) are as of March 31st, 2002.

5   Characterisation of *de facto* Regimes in Southeast Asia

As discussed earlier, the officially stated positions of many central banks about their exchange rate system sometimes differ from their actual practice. There can be several reasons for this discrepancy, e.g. countries some time switch over to a more liberal exchange rate regime only under the **IMF pressure**, but they do retain a longing for more stability and usually display a "**fear of floating**".[17]

In order to find out the *de facto* policies pursued by the four Southeast Asian nations studied in this paper, the **exchange rate volatility, foreign reserves volatility** and **interest rate volatility** are calculated for the post-crisis period. Further a **flexibility index** is also constructed. Finally **a regression test** is done to see if the respective currencies are influenced by the movements of US dollar. This data is then compared with the pre-crisis and mid-crisis data and with selected **benchmark countries**. **Australia** and **Denmark** have been selected as benchmarks for the post-crisis period. Australia is known for its floating exchange rate regime, Denmark on the other hand has an exchange rate band to Euro. Both the countries are middle-sized economies and thus comparable to the Southeast Asian economies. Australia also has a larger share of commodity exports, like some of the Southeast Asian countries. Additionally for some other countries e.g. **Germany, Japan** and **India** are also compared to broaden the comparability of volatilities.

This paper builds primarily on Baig (2001) and Hernández/Montiel (2001) and uses their data for years 1995-2000.[18] The data for 2000 has also been calculated anew for this paper by the author to test the compatibility of the data basis of this paper and Baig (2001).[19] Years, for which the data is calculated by the author, are marked with a red colour in the tables. Since the data is from different sources there are sometimes minor discrepancies, which can be ignored, because the overall direction of the indicators is in fundamental conflict to each other.

5.1 Comparison of Volatilities

We first examine the volatility in exchange rates. Then we turn our attention to the volatilities in interest rates and foreign currency reserves, as the authorities might be targeting the exchange rate through monetary policy and/or intervention in the foreign exchange market (Baig, 2001, P.11).

---

[17] See „Fear of Floating" by Calvo and Reinhart, 2002.
[18] Baig (2001) and Hernández/Montiel (2001) are IMF Working Papers. See References.
[19] Since this seminar topic is being covered by a few more colleagues, a certain range of data has been searched and prepared together in groups.

5.1.1 Exchange Rate Volatility

Volatility of exchange rate shows whether the value of a currency is determined by the market forces or the monetary authorities. It is defined as the standard deviation of the percent change of the exchange rates against a reference currency (Baig, 2001, P. 6), in this paper US dollar, unless otherwise specified.

Volatility of Daily Exchange Rates (see appendix-A, 2003 only first quarter)											
Country	Reference	1995	1996	1997	1998	1999	2000	2000	2001	2002	2003
Indonesia	USD	0,15	0,15	2,49	4,86	1,88	1,05	**1,32**	**1,70**	**0,73**	0,38
Korea	USD	0,25	0,23	2,65	1,75	0,48	0,42	**0,42**	**0,51**	**0,53**	0,70
Malaysia	USD	0,23	0,15	0,90	1,75	0,01	0,01	**0,01**	**0,08**	**0,01**	0,01
Thailand	USD	0,12	0,08	1,71	1,58	0,56	0,45	**0,45**	**0,30**	**0,34**	0,22
Benchmark countries											
Australia	USD	0,53	0,40	0,60	0,84	0,58	0,76	**0,74**	0,78	0,55	0,60
Germany	USD	0,79	0,41	0,62	0,56	0,60	0,77	**0,74**	0,69	0,57	0,56
India	USD	0,37	0,43	0,27	0,39	0,11	0,17	**0,18**	0,14	0,07	0,11
Japan	USD	0,90	0,48	0,75	1,08	0,83	0,63	**0,74**	0,78	0,55	0,60
Euro	USD	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	**0,74**	0,69	0,57	0,56
Denmark	USD	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	**0,74**	0,68	0,56	0,55
Denmark	EUR	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	**0,14**	0,11	0,06	0,03

Table 3:   *Volatility of daily exchange rates*

As can be seen in the Table-1, the Southeast Asian countries experienced relative stability and little volatility in the pre-crisis period, which took a dramatic turn in the crisis period of 1997/98, for example Indonesia's volatility jumped from 0,15 in 1995 to 4,86 in 1998. In the post-crisis period (since 1999) the volatility has receded for most of the countries in the region, except Korea. The exchange rate volatility of Korea and Indonesia has continued to be high and comparable to known floaters like Australia, Japan and Germany, Thailand has become relatively stable, its exchange rate volatility is probably comparable to India's, an another known managed floater. Malaysia is not experiencing any significant volatility, which is consistent with its declared exchange rate regime of a fixed peg.

This is also comparable with Danish's Kroner's volatility, when referenced against Euro. Denmark has a declared and de facto exchange rate band to Euro (IMF AR, 2002, P. 118). Not surprisingly Kroner reflects the exchange rate volatilities of Euro, when referenced against US dollar. The volatilities for Germany and Euro-Area are same, since the inception of Euro.

Having analysed the volatilities of daily exchange rates, it is also useful to take a glance at those of monthly exchange rates.

Volatility of Monthly Exchange Rates (see appendix-A, 2003 only first quarter)										
Country	Reference	1995	1996	1997	1998	1999	2000	2000	2001	2002	2003
Indonesia	USD	0,51	0,65	11,25	32,66	10,25	3,85	4,16	7,86	3,11	3,07
Korea	USD	1,06	0,93	10,06	7,49	2,86	2,44	2,61	2,49	2,17	2,85
Malaysia	USD	1,06	0,61	4,48	7,21	0,01	0,01	0,01	0,01	0,01	0,01
Thailand	USD	0,59	0,34	8,45	8,93	3,08	2,18	2,22	2,07	1,25	1,26
Benchmark Countries											
Australia	USD	1,84	1,84	2,00	3,73	2,53	3,55	3,55	3,86	2,20	2,50
Germany	USD	3,25	2,05	2,92	2,06	2,03	3,70	3,74	2,58	2,59	2,07
India	USD	1,81	1,99	2,08	1,53	0,47	0,77	0,81	0,51	0,39	0,29
Japan	USD	4,89	2,04	3,84	6,30	2,60	3,44	3,39	3,69	2,13	1,99
Denmark	USD	n.c.	n.c.	n.c..	n.c.	n.c.	n.c.	3,66	2,56	2,57	2,07
Denmark	EUR	n.c.	n.c.	n.c..	n.c.	n.c.	n.c.	0,18	0,14	0,07	0,07
Saudi Arabia	USD	n.c.	n.c.	n.c..	n.c.	n.c.	n.c.	0,05	0,02	0,04	0,06

Table 4:   *Volatility of monthly exchange rates*

The data in Table-2 points generally in the same direction. Remarkable is that the volatility for Korea is stabilising gradually and is in the same region as Australia, Germany and Japan. Indonesia seems to be on a roller coaster ride, which points to the turbulent period in years 2000/01. Malaysia is consistent with low volatility, which shows a remarkable comparability with another known fixed peg regime of Saudi Arabia, categorised by the IMF in the same group as Malaysia (IMF AR, 2002, S.118).[20] Thailand's volatility has decreased. It is significantly lower than those of known floaters but is still considerably higher than India's, another managed floater.

Country	Volatility of Daily Rates	Volatility of Monthly Rates
Indonesia	High	High/unstable
Korea	High	High
Malaysia	Low	Low
Thailand	Medium	Medium/Low

Table 5:   *Overview of exchange rate volatilities*

---

[20] Saudi Arabia and Malaysia are both categorised by the IMF as "other conventional fixed peg arrangements (including de facto peg arrangements under managed floating) against a single currency" (IMF AR, 2002, P. 118).

5.1.2 Interest Rates Volatility

Since it is possible that two countries with similar exchange rate volatilities have two very different exchange rate regimes – one might be a stable **free-float** and the other a **dirty float** "kept in check through interest changes or foreign exchange market interventions" (Baig, 2001, P.11) – it is necessary to examine the volatility of interest rates in Southeast Asia.

Volatility of Interest Rates (see appendix-A, 2003 only first quarter)										
Country	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2000**	**2001**	**2002**	**2003**
Indonesia	1,28	1,17	15,60	14,75	4,06	0,88	**0,90**	**0,79**	**1,61**	**n.a.**
Korea	1,16	1,30	2,27	1,99	0,29	0,08	**n.a.**	**0,13**	**0,07**	0,04
Malaysia	0,13	0,34	2,45	1,12	0,48	0,06	**0,05**	**0,09**	**0,05**	0,06
Thailand	2,53	1,84	5,54	4,76	0,35	0,41	**n.a.**	**0,31**	**0,09**	0,14
Benchmark Countries										
Australia	0,16	0,20	0,16	0,07	0,07	0,16	**0,18**	0,20	0,09	0,00
Denmark	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	**0,20**	0,19	0,17	0,25
Germany	0,10	0,15	0,10	0,10	0,17	0,11				
Japan	0,20	0,02	0,03	0,05	0,04	0,05	**0,07**	0,07	0,00	0,00
India	8,57	6,75	3,00	5,55	1,92	1,72	**2,77**	1,49	0,54	0,10

Table 6:   *Volatility of interest rates*

Interest rates volatility in pre-crisis Southeast Asia, with the only exception of Malaysia, was substantially higher than in the floating countries of Australia, Germany or Japan, but significantly lower than in managed-floating regime of India. The volatility in Southeast Asia increased dramatically during the crisis – in Indonesia it jumped from 1,28 in 1995 to 15,6 in 1997 and in Malaysia from 0,13 to 2,45 in the same period.

In the post-crisis period this volatility has receded considerably, with Indonesia (1,61) being the only country in Southeast Asia in year 2002 with a volatility greater than 0,10. Korea (0,07), Malaysia (0,05) and Thailand (0,09) all have a volatility that is comparable to those of the known floaters e.g. Australia (0,09). Managed-floater India had a volatility of 0,54 in year 2003, down from 8,57 in year 1995, and a with recession confronted Japan had experienced no volatility at all.

So it can be said that amongst the surveyed countries only Indonesia had a relatively high volatility in interest rates. All other surveyed countries in the region had a low interest rate volatility in the post-crisis period.

5.1.3 Reserves Volatility

As discussed above, the volatility in foreign reserves is one of the instruments, which might give valuable information on the exchange rate interventions by a central bank. However one has to keep in mind that fluctuations in foreign reserves do not necessarily reflect interventions in foreign exchange markets. They might also occur on account of other factors such as debt repayments, value adjustment owing to exchange rate movements etc. (Baig, 2001, P. 12) Apart from that forward market interventions by central banks are not fully reflected by the gross reserves figures.[21]

Volatility of Foreign Reserves (Total Reserves) (see appendix-A, 2003 only first quarter)										
Country	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2000**	**2001**	**2002**	**2003**
Indonesia	1,58	3,58	4,79	6,45	2,39	7,58	**n.a.**	**1,06**	**1,50**	0,02
Korea	2,78	3,77	8,50	4,97	1,90	1,60	**n.a.**	**1,21**	**0,88**	0,71
Malaysia	2,64	2,72	6,06	4,55	3,36	2,82	**2,97**	**3,53**	**1,47**	0,29
Thailand	2,52	1,40	9,18	4,17	2,10	2,12	**2,07**	**1,31**	**2,30**	2,77
Benchmark Countries										
Australia	4,88	10,32	3,45	6,21	7,63	11,01	**10,92**	4,14	4,89	4,20
Denmark	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	**3,77**	5,82	3,79	0,57
India	3,11	3,49	4,92	3,63	1,87	4,23	**4,11**	1,38	1,40	2,89

Table 7:   *Volatility of foreign reserves*

Indonesia seems to have stabilised in previous two years. If the first quarter of this year is an indicator than this trend can be expected to continue, its volatility in year 2003 reaching the pre-crisis level of 1995. Korea, on the other hand, which had quite high volatilities in pre-crisis period and during crisis (2,78 in 1995) had quite a low volatility of 0,88 in 2002. Malaysia reserves continue to be volatile in the post-crisis period, though in 2002 they were lower than usual. Thailand has also had a medium level of reserves volatility in the post-crisis period.

But there emerges no clear picture on this front. Free-floater Australia also has a higher level of reserves volatility[22] than managed-floating India or Denmark with a horizontal band.

---

[21] See two very interesting articles on this (Neely, 2000, P. 17-32 and Neely, 2001, P.1-10).
[22] Reserve Bank of Australia intervenes sometimes in the forward market to manage its exchange rate.

5.2 Exchange Rate Flexibility Index

Since movements in exchange rate or reserves can only offer a partial view of a *de facto* exchange rate regime, if viewed in isolation, they need to be integrated in a composite index. This index is expected to capture the different manifestations of the instruments that are at the disposal of the monetary authorities to stabilise the exchange rate (Calvo / Reinhart, 2002, P. 402). This index can be calculated by dividing the standard deviation of exchange rate movements by an index of exchange market pressure. The exchange market pressure is a "function of reserves volatility, scale by base money" (Baig, 2001, P. 13).

$$index = \frac{SDEX}{(SDEX + SDREV)}$$

where:

SDEX: standard deviation of changes in log values of exchange rates.

SDREV: standard deviation of the "changes in reserves[23] divided by lagged stock of base money" (with a lag of one month).

The index can take values in the range of 0 to 1. A **lower value signifies relative inflexibility**, a 0 indicating a peg or a very high commitment to inflation targeting (Calvo / Reinhart, 2002, P. 402).

Here the index is calculated for the four Southeast Asian countries as well as for the benchmark countries of Australia and Denmark for the period of 2000 to 2002 and for the first quarter of 2003. For the years 1995 to 2000 the pre-calculated index values are taken from Baig (2001, P. 13). The values for year 2000 are thus calculated twice, to test the compatibility of the data used for this paper. The results are quite similar except for the discrepancies shown for Indonesia and Thailand. Since full data on foreign reserves was not always available, this study had to sometimes track data from different sources or press releases issued by the central banks. Due to this sometimes also provisional data may have been employed, which might explain the differences. Nonetheless the data points to a similar direction and hence can be utilised for calculating the exchange rate flexibility index.

This index broadly confirms the findings of previous instruments. Indonesia, is found to be very inflexible in the pre-crisis period with a flexibility index of just 0,03 in 1995. It was forced to liberalise its exchange rate regime in the wake of the crisis, which is recognised in higher values for the index in the years 1997 to 1999.

---

[23] This study has used foreign exchange reserves of a country expressed in the home currency so as to retain the compatibility of the ratio of the base money to foreign reserves.

Exchange Rate Flexibility Index (see appendix-A, 2003 only first quarter)										
Country	1995	1996	1997	1998	1999	2000	2000	2001	2002	2003
Indonesia	0,03	0,09	0,28	0,42	0,62	0,13	**0,21**	**0,60**	**0,36**	n.a.
Korea	0,30	0,19	0,44	0,50	0,31	0,30	**0,31**	**0,78**	**0,78**	0,80
Malaysia	0,22	0,16	0,49	0,49	0,00	0,00	**0,00**	**0,00**	**0,00**	0,02
Thailand	0,09	0,09	0,31	0,50	0,41	0,38	**0,21**	**0,35**	**0,21**	0,10
Benchmark Countries										
Australia	0,36	0,21	0,54	0,46	0,27	0,27	0,25	0,46	0,26	0,44
Denmark	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0,01	0,01	0,00	0,03

Table 8:   *Index of exchange rate flexibility*

The latest values for Indonesia's flexibility index seem to be comparable with those of Australia, but still significantly less than those of Korea. It is also not clear how the political crisis in Indonesia has affected the volatilities. On the whole Indonesia seems to be on a zigzag course, displaying some preference for managing its exchange rates.

The flexibility index for Korea suggests a highly flexible exchange rate regime. In fact the Korea index is even greater than that of Australia. In the post-crisis period the flexibility index dipped a little at first, reverting shortly to the pre-crisis level, only to increase significantly. The trend in the first quarter of 2003 is also that of a high flexibility.

If Korea is a show-case example of flexibility, Malaysia represents the opposite pole on the flexibility index. Post-crisis Malaysia has consistently shown a flexibility index of (almost) zero, with the index carrying a value of 0,0012 in 2002. This is also comparable with almost the same values for the Denmark index, when referenced against Euro.

Thailand's flexibility index is though significantly higher than in the pre-crisis period, it has shown a declining tendency compared to the crisis period of 1997/98 and immediately afterwards. Its flexibility index is lower than Korea and Indonesia in the region and also lower than Australia, whose flexibility index is lower than that of Korea. The trend in the first quarter of 2003 is also lower than other countries, whose data is available. Thailand also seems to be displaying a preference for managing its exchange rate and to nurture a "fear of float".

5.3 Regression Analysis for a Peg to US Dollar

Having tested the volatilities of exchange rates, interest rates and foreign currency reserves, we turn our attention to the dollar peg by Southeast Asian nations. As is

known the Southeast Asian currencies used to maintain a *de facto* dollar peg in the pre-crisis period.[24] In this section we try to find out with the help of a regression test if they have reverted back to this practice.

5.3.1 Model Framework

For this purpose we use a "high frequency pegging" test developed by Frankel and Wei and widely used to characterise *de facto* pegging of currencies.[25] In this test daily movements of each Southeast Asian currency's exchange rate is put to a regression test against the daily movements in exchange rates of three major world currencies, i.e. US **dollar**, **Euro**[26] and Japanese **Yen**. In the test **changes in the log exchange rate** of each Southeast Asian currency **is regressed** on the changes in log exchange rates of the dollar, Euro and Yen. Further the exchange rates of the Australian dollar and the Danish Kroner are also regressed to build the benchmarks, that we have continuously used in this study. The exchange rate movements are measured against Swiss Frank, a *numéraire* currency.[27] This way we can identify if and which major currency or currency basket is chosen as an anchor for the exchange rate of a particular country (Kawai, 2002, P. 171).

$$d.\log\left(\frac{LC}{SF}\right) = b_1 + b_2.d.\log\left(\frac{USD}{SF}\right) + b_3.d.\log\left(\frac{JPY}{SF}\right) + b_4.d.\log\left(\frac{EUR}{SF}\right) + e$$

Where:[28]

LC   = Local Currency

SF   = Swiss Frank

USD   = US Dollar

JPY   = Japanese Yen

EUR   = Euro

5.3.2 Interpretation Framework

The estimated coefficients can be interpreted as the "weights assigned by the authorities to the corresponding currencies in their exchange rate policies" and the estimated standard error of regression residuals as a "measure of exchange rate volatility" (Kawai, 2002, P. 183). Thus a large estimated standard error implies that a

---

[24] See, for example, McKinnon (2000, P. 1, 10-13) and Calvo / Reinhart (2000, P. 34-35)
[25] See Baig (2001, P. 16). It is also used by Kawai (2002, P.182) and Mckinnon (2000, P.9).
[26] For the time period before introduction of Euro the ECU can be taken.
[27] It can be expected that neither the Southeast Asian currencies nor the three major world currencies are pegged against Swiss Frank, making it a neutral currency.
[28] Model is adopted in a slightly modified form from Baig (2001, P. 16).

relatively large exchange rate flexibility is allowed by the authorities. A small standard error implies, in contrast, attempts by the authorities to stabilise the exchange rate.

If a currency is identified with a significant and large positive coefficient, while other currencies' coefficients are small and statistically insignificant", it can be interpreted as "exchange rate stabilisation" (Kawai, 2002, P. 172).

5.3.3 Analysis of Post-Crisis Regression Results[29]

The regression test is done for the period 2000 – 2002 and for the first 3 months of 2003.[30] The regression results for this post-crisis period reveal very interesting trends. However, before we begin with the analysis of the results, it would be useful to have a look at the Australian and Danish results for the comparability.

Australia, *a recognised floater*, had its US dollar coefficient between 0,4425 and 0,6141 in the years 2000 and 2002. In the first quarter of 2003 even as low as 0,3703. The standard error was between 0,062 and 0,094. The coefficient to Euro was between 0,3555 and 0,7215 with a large margin of standard error of up to 0,1875. The total explained variance was low keeping between 0,30 and 0,45.

Denmark, with an *exchange rate band to Euro*, had an Euro-coefficient of almost 1 throughout this period with a very high total explained variance and extremely low estimated standard error in the range of 0,022 and 0,034.

Having set up these two different benchmarks, we can begin with the analysis of the results for the Southeast Asian countries.

i) Indonesia

Indonesia showed a very **high positive coefficient** (0,8199) for dollar in 2000, which went down dramatically to 0,2350 in 2001 but along with that the goodness-of-fit (R^2)[31] went down to 0,01 from 0,13 in the previous year. That means only 0,01 percent of variance could be explained through this test. That points out to other significant incidences in Indonesia in that year. Incidentally Indonesia experienced politically two very turbulent years in 2000 and 2001, which might have caused much of the variation. But in the year 2002 the estimated coefficient had gained ground again with a weight of 0,7249 and a goodness-of-fit of 0,31. This trend was also visible in the first quarter of 2003 with the estimated coefficient reaching 0,8324

---

[29] The complete data on regression results is provided in a table in Appendix-C.

[30] For pre-crisis, mid-crisis and post-crisis (1999/2000) regression data see McKinnon (2000) and Baig (2001).

[31] The goodness-of-fit (R^2) shows the total explained variance (in percent), which can be explained with this regression test. **In German**: „*Bestimmtheitsmaß*".

and the goodness-of-fit of explained variance was unusually high with 0,67. The estimated standard error for USD was throughout lower than that for Yen and Euro, indicating to the possibility be the authorities to stabilise the exchange rate against dollar. These results **suggest a possible "managing" of exchange rates in recent periods** by Indonesian authorities.

No significant estimated coefficient was found against Yen or Euro. For Euro also larger standard error were estimated than for USD in particular and Yen in general, pointing out a relatively flexible attitude of the authorities towards Euro, which would be also consistent with the fact that the Indonesian economy is more Japan than Europe-centred.

When compared with the pre-crisis and mid-crisis data,[32] it may point out to **some reverting back to old ways**, as seen in Table-9.

Pre-Crisis (Jan 94-May 97)			Mid-Crisis (Jun 97-Dec 98)			Post-Crisis (2002)		
Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2
0,999	0,008	0,965	0,550	0,388	0,038	0,7249	0,087	0,31

Table 9:   Comparison of Regression Results for Indonesia

ii) Korea

Regression results for post-crisis Korea show a different picture. In 2000 the coefficient for US dollar was 1,0395 with a standard error of 0,0545. R^2 of 0,79 shows that almost 80% of total variance in exchange rate could be explained through this regression test and hence it is an excellent goodness-of-fit. The coefficient receded in the following years, reaching 0,6046 in 2002. The explained variance also came down to less than half (0,48). If the first quarter of 2003 is a trend, then though the coefficient for US dollar increased but so did the standard error. Hence it can be assumed that **Korea has progressed towards further liberalisation of its exchange rate regime** when referenced against US dollar. This assumption seems to justified when compared with the pre-crisis and mid-crisis data as seen in Table-10.

Pre-Crisis (Jan 94-May 97)			Mid-Crisis (Jun 97-Dec 98)			Post-Crisis (2002)		
Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2
1,021	0,016	0,883	1,086	0,226	0,087	0,6046	0,0578	0,48

Table 10:   Comparison of Regression Results for Korea

But at the same time it has begun to show a **larger coefficient for Yen**, increasing from 0,0839 in 2000 to 0,2672 in 2002 with a relatively stable and small estimated

standard error of around 0,05 pointing to a **possible USD/JPY-basket referencing** of Won. Euro did not seem to play any significant role.

iii) Malaysia

The Malaysian results are consistent with its declared policy of a fixed peg exchange rate regime against dollar. The coefficient remained significantly high (ca. 0,99) throughout the post-crisis period, with a very low estimated standard error of as low as 0,0014 and the total explained variance of 0,99.

As Table-11 shows **Malaysia has moved in the opposite direction** after the crisis. Yen and Euro are not found to play any role in the exchange rate policy.

Pre-Crisis (Jan 94-May 97)			Mid-Crisis (Jun 97-Dec 98)			Post-Crisis (2002)		
Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2
0,886	0,014	0,889	0,755	0,138	0,161	1,0009	0,0014	0,99

Table 11:   *Comparison of Regression Results for Malaysia*

iv) Thailand

Regression results for Thailand show **a high coefficient** for US dollar (0,8174) in 2000. Though this receded to 0,6485 in 2002, it increased in 2001 to 0,8439 with an explained variance of 88%. The estimated **standard error was quite low** in this period with the highest value being as low as 0,059 in 2000 and the lowest value 0,034 in 2002, pointing to some interference by the authorities, as a small standard error usually implies **attempts by the authorities to stabilise the exchange rate**.

The Japanese Yen also seems to have been gaining importance, its coefficient increasing steadily from 0,1420 in 2000 to 0,2521 in 2002 with a very small standard error of 0,0329. The coefficients for both dollar and yen increased in the first quarter of 2003. Though the estimated standard error also increased, albeit very slightly. The explained variance increased to 0,90.

Pre-Crisis (Jan 94-May 97)			Mid-Crisis (Jun 97-Dec 98)			Post-Crisis (2002)		
Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2	Coeff.	Std.Err.	R^2
0,995	0,012	0,923	0,688	0,165	0,107	0,6485	0,0337	0,75

Table 12:   *Comparison of Regression Results for Thailand*

If we also consider the data for the period immediately after the crisis (Jan 1999 – May 2000) the coefficient for US dollar was 0,858, standard error 0,049 and goodness-of-fit 0,639 (McKinnon, 2000, P. 14). When compared with this data, **Thailand**

---

[32] See McKinnon (2000, P. 13-14) for all post-crisis and mid-crisis data used in this section.

does seems to be reverting back to some *informal, de facto* pegging to a dollar/yen basket, with a clear preference for dollar.

5.4 Comparing the *de jure* and *de facto* Positions

Considering the findings of different tests and surveys done in this section, we can summarise the findings in the following table. Since the obtained results were of a quantitative nature, it is difficult to put them in a qualitative context. This is however an attempt to at least show the direction, in which the different countries are letting their currencies fluctuate.

Though most of the indicators for **Korea** point to a free-floating regime, the high co-efficient to US dollar displays some stabilising attempts by the monetary authorities. Though no more as strong as earlier but still significant and the Japanese Yen also seems to influence the exchange rate of the Korean Won.

Criteria		Indonesia	Korea	Malaysia	Thailand
Volatilities	**Daily ER**	High	High	Low	Medium
	Monthly ER	High/Unstable	High	Low	Low
	Interest Rates	High	Low	Low	Low
	Foreign Res.	Low/Medium	Low	Medium/High	Medium
Flexibility Index		Unstable	Flexible	Inflexible	Limited flex.
USD coefficient		High	High	Very High	High
***de facto* Classification**		Managed Float	Largely Free	Fixed Peg	Managed Float
***de jure* Classification**		Free Float	Free Float	Fixed Peg	Managed Float
***de jure / de facto* Compatible?**		**No**	**Largely Yes**	**Yes**	**Yes**

Table 13:   *Overview of de facto exchange rate regimes in Southeast Asia*

Malaysia, with an official fixed peg arrangement to dollar, has no difference between its *de jure* and *de facto* exchange rate regimes.

Thailand sometimes does seem to be unable to decide over its exchange rate policy. Though it sometimes seem to get too involved in managing its exchange rate and starts looking like a peg arrangement, it can be argued that its *de jure* position is not in a fundamental contradiction to its de facto policies. But it could be prone to a soft peg approach.

Indonesia seems to be the only of the surveyed countries, whose de facto policies seem to be in a fundamental conflict with its official position. The high volatilities seem to be inspired from political instability and the monetary authorities seem to try to stabilise the thus affected exchange rate by discrete interventions.

6   Reasons for Discrepancy in *de jure* and *de facto* Regimes

As we have seen in the previous chapter none of the surveyed Southeast Asian country seems to have adopted a truly free-floating exchange rate regime, even when Korea comes quite close to it. Thailand and Indonesia seem to manage-float their currency, but the difference between a managed-float and a soft-peg can be very subtle and fine. Also Malaysia is having a soft-peg exchange rate regime.

In fact there is only a 12% probability that managed-floaters' exchange rates change more than a narrow band of ±2,5% in a month, much less than the 30% for Australia and 41% for US dollar against Euro. This does not look like "only" managed-float. There seem to be soft-pegs at work, e.g. a crawling peg or an exchange rate band. This seems to be in a stark contrast to the classic bipolar view, which talks of a "hollowing middle".

In fact in many emerging market countries the interest rate policy seems to be just replacing the foreign exchange intervention policy as a more preferred means of smoothing foreign exchange rate fluctuations, prompting Calvo and Reinhart to comment: "when it comes to exchange rate policy, **the middle has not disappeared**" (Calvo / Reinhart, 2002, P. 404).

That countries usually do not like to have a hard-peg arrangement is obvious. Dollarization is usually not preferred politically, since it might invoke tough backlash of public opinion in medium and large sized countries. Besides that "dollarization" means the loss of seignorage revenue, that comes with the authority to print fiat currency. For some developing economies it is a substantial part of total revenue (Antinolfi / Keister, 2001, P.31). This is usually done only by (small) countries with so little credibility in international markets that adopting another country's currency is just a small sacrifice of autonomy (Reinharts, 2003, P.1). Even currency unions are not easily accepted, as is evident from the British reluctance to join Euro. Secondly, countries like to retain their sovereignty over monetary policy. Even currency boards might lead to a loss of price compatibility in international markets, as and when the anchor currency appreciates, as happened with Argentina in late 1990s.

But **why is there such a widespread resistance to independent floats**, particularly in emerging market economies? Reinhart and Calvo try to answer this question through a "fear of float". This "fear of float" in emerging markets is described here briefly.

Inflation and Exchange Rate Pass-Through

Many emerging market countries are reluctant to allow their currencies to float since any high voltage devaluation has a significant effect on domestic inflation. For many

of developing countries with large imports (e.g. food-products, oil, etc.) this could have serious economic and political affects. This is also of particular concern for countries with an inflation targeting monetary policy.

Besides large-scale deprecations could mean severe financial problems for countries that are primarily commodity exporters, as the real income would suffer. Deprecations and devaluations have historically been associated with recessions and not export-led booms in most of the developing countries. Thus in countries where the pass-through from exchange rates to prices is high, a *de facto* soft-peg is a logical development, since swings in the exchange rate are and have to be resisted (Calvo / Reinhart, 2000, P. 34).

<u>Loss of international compatibility</u>

Most of the emerging market economies also have to worry about an appreciation of their currency, since it could lead to a loss of competitiveness in international markets and has adverse affects on exports in general.

<u>Unequal Market Access</u>

Most of the emerging markets do not have the same level of access to international financial markets, as developed nations. High volatility of exchange rate usually leads to a downgrade of by sovereign credit rating agencies, drying up the foreign investment in the country, possibly triggering a financial crisis (Calvo / Reinhart, 2000, P. 13). Advanced countries do not (in fact never) have to worry about losing access to capital markets and can let their exchange rates float. Besides that very volatile exchange rates tend to be problematic for the trade and international partners tend to get vary of dealing with a country whose currency is too volatile (Calvo / Reinhart, 2000, P. 34).

Hence Calvo and Reinhart do not see emerging markets agreeing to let their currencies really float and come to the conclusion that exchange rate movements are costly for emerging market economies. In fact, Hernández and Montiel (2001, P.25-26) term discrete interventions by Southeast Asian countries to achieve some degree of exchange rate smoothing "an appropriate response", and see them as an attempt to strike a balance between the potentially conflicting objectives of **i)** preserving the perception that the exchange change rate is free to move and **ii)** ensuring that the exchange rate does not take extreme, self-reinforcing high-frequency fluctuations.

7 <u>Conclusions and Summary</u>

Having characterised the de facto exchange rate regimes in Southeast Asia, it can be said that the surveyed countries have displayed varying degrees of commitment to floating regimes. While Malaysia has decided against a free-float for Ringgit, others have shifted towards **greater flexibility in their exchange rate policies**. Korea is more inclined towards an independent-float and Thailand has opted for a managed-float. Indonesia continues to claim an independent-float but can be, at best, classified as a managed-floater. However, one must also mention that Indonesia has gone through a period of political instability that might have prompted the monetary authorities to undertake anticipatory, preventive measures.

Nonetheless, all the concerned countries display **some traits of involvement in exchange rate management**, actively following the US dollar and thus **indulging in a "dirty-float"** even while officially remaining committed to flexible exchange rate policies. Important is that they are clearly not following the pattern, they used to in the pre-crisis period. It can be claimed that they have understood the virtue of at least "relatively" flexible exchange rate regimes and dangers of soft-pegs.

That they are not willing to let the currency float freely, is an arena, where they are in a good company of many emerging market economies. As Calvo and Reinhart (2000) show, the emerging market economies indeed have **good reasons to be afraid of large-scale exchange rate volatilities**. Thus some sort of soft-peg tendencies are going to remain present. In fact what prevails in most of the emerging market economies are varieties of soft-pegs, despite their poor track-record. The variability of exchange rates is contained relative to a typical asset price but not so much to classified it as a peg. These "**very dirty floats**" or quite soft-pegs show an **unwillingness of the authorities to trust the foreign exchange markets** enough to either float freely or to be fixed" (Reinharts, 2003, P. 2-3).

So the scenario in global exchange rate regimes is not expected to become *de facto* bipolar in near future. As Fischer (2001) point out, policy in most countries can not remain indifferent to exchange rate movements and **a wide variety of flexible rate arrangements, including managed-float, remain possible** for countries open to international capital flows, **as long as the government is not seen to be committed to defending a particular exchange rate level** without making necessary institutional commitments for the purpose.

References

Antinolfi, Gaetano / Keister, Todd (2001): *Dollarization as a Monetary Arrangement for Emerging Market Economies*, in Federal Reserve Bank of St. Louis Review, Vol. 83, No. 6, Nov./Dec. 2001.

Baig, Taimur (2001): IMF Working Paper *Characterizing Exchange Rate Regimes in Post-Crisis East Asia*, Washington D.C., October 2001.

Bubula, Andrea / Ötker-Robe, İnci (2002): IMF Working Paper *The Evolution of Exchange Rate Regimes since 1990: Evidence from De Facto Policies*, Washington D.C., September 2002.

Calvo, Guillermo / Reinhart, Carmen (2000): *Fixing For Your Life*, NBER Working Paper Series, Working Paper 8006, November 2000.

Calvo, Guillermo / Reinhart, Carmen (2002): *Fear of Floating*, in: The Quarterly Journal of Economics, Vol. CXVII, Issue 2, May 2002.

Duwendag, Dieter / Ketterer, Karl-Heinz; et al. (1999): *Geldtheorie und Geldpolitik in Europa – Eine problemorientierte Einführung*, 5. Auflage, Berlin u.a., 1999.

Fischer, Stanely (2001): *Exchange Rate Regimes: Is the Bipolar View Correct?*, in: Journal of Economic Perspectives, Volume 15, No. 2, Spring 2001.

Hernández, Leonardo / Montiel, Peter (2001): IMF Working Paper *Post-Crisis Exchange Rate Policy in Five Asian Countries: Filling in the "Hollow Middle"?*, Washington D.C., November 2001.

IMF AR (2002): IMF Annual Report *Exchange Rate Arrangements and Anchors of Monetary Policy as of December 31, 2001*, Washinton D.C., 2002.

IMF EAER (2002): IMF Annual Report on *Exchange Arrangements and Exchange Restrictions*, 2002, Washington D.C., Positions as of March 31st, 2002.

IMF MRED (1999): IMF Staff Country Report 99/85: *Malaysia: Recent Economic Developments*, Washington D.C. August 1999.

Kawai, Masahiro (2002*): Exchange Rate Arrangements in East Asia: Lessons from 1997-98 Crisis*, in: Monetary and Economic Studies (Special Edition), December 2002.

McKinnon, Ronald (2000): *After the Crisis, the East Asian Dollar Standard Resurrected: An Interpretation of High-Frequency Exchange-Rate Pegging*, Stanford University, August 2000.

Monetary Authority of Singapore (2000): *Exchange Rate Policy in East Asia After the Fall: How Much Have Things Changed?,* Occasional Paper No. 19, February 2000.

Neely, Christopher (2000): *Are Changes in Foreign Exchange Reserves Well Correlated with Official Interventions?* in Federal Reserve Bank of St. Louis Review, Vol. 82, No. 5, Sep./Oct. 2000.

Neely, Christopher (2001): *The Practice of Central Bank Intervention: Looking under the Hood*, in Federal Reserve Bank of St. Louis Review, Vol. 83, No. 3, May./June. 2001.

Reinhart, Carmen / Reinhart, Vincent (2003): *Twin Fallacies About Exchange Rate Policy in Emerging Markets*, NBER Working Paper Series, Working Paper 9670, April 2003.

APPENDIX – A

NOTES ABOUT TABLES USED IN THE 5TH CHAPTER

Exchange Rate volatilities

1) Values for year 2000 have been calculated once more by the author. These values are shown in a column highlighted in yellow colour.

2) These values vary sometimes from the values taken from Baig (2001) owing to different data used.

3) The data for the year 2003 is only from the first quarter (January-March). This data is therefore only meant to show the trend and should not be interpreted on an equal footing with other data.

4) Some countries have a financial year that is not the calendar year, e.g. India (April-March). This difference has not been considered here.

5) Source of exchange rate data: www.pacific.commerce.ubc.ca/xr/data.html.

Interest Rate volatilities

1) Indonesia: Interbank Call Money Overnight
2) Korea: Overnight Call Rates
3) Malaysia: Interbank Overnight Borrowing Rates
4) Thai Interest Rates: Interbank Overnight Borrowing Rates (average)
5) India Interest Rates: Overnight Call Money Markets Rates
6) Australia: Overnight and Call Funds (weighted average)

Reserve volatilities

1) Input is the foreign currency reserves and total foreign reserves or total foreign assets because the currency reserves indicate the volatilities better, e.g. when the central bank intervenes in a forward market, the foreign currency reserves are affected but not total foreign reserves.

2) Full data for year 2000 was not available on the web-site of Bank of Korea.

APPENDIX – B

BIPOLAR VIEW – "HOLLOW MIDDLE"

Trends in Global Exchange Rate Regimes						
	1991		**1999**		**2002**	
	No. Countries	Percentage	No. Countries	Percentage	No. Countries	Percentage
Hard Peg	25	15,72%	45	24,32%	49	25,93%
Intermediate	98	61,64%	63	34,05%	58	30,69%
Free Float	36	22,64%	77	41,62%	82	43,39%
Totals	**159**	**100,00%**	**185**	**100,00%**	**189**	**100,00%**

Table 14:   *Trends in Global Exchange Rate Regimes*

Data source: *Years 1991 and 1999 (Fischer, 2001, P. 4)*

Year 2002 (IMF AR, 2002, P. 118-119)

APPENDIX – C

REGRESSION TEST RESULTS

		2000				2001				2002				1st Quarter 2003			
		Est. Coeff.	Std. Err.	R^2	F-Stat.	Est. Coeff.	Std. Err.	R^2	F-Stat.	Est. Coeff.	Std. Err.	R^2	F-Stat.	Est. Coeff.	Std. Err.	R^2	F-Stat.
Indonesia	Dollar	0,8199	0,1962	0,13	11,81	0,1904	0,2350	0,01	0,52	0,7249	0,0872	0,31	37,59	0,8324	0,0945	0,67	39,45
	Yen	-0,0272	0,1456			0,0279	0,1981			0,0670	0,0860			0,1297	0,1075		
	Euro	0,2368	0,3649			-0,1755	0,4091			0,2492	0,2684			-0,3720	0,3618		
Korea	Dollar	1,0395	0,0545	0,79	299,57	0,7978	0,0578	0,76	258,55	0,6046	0,0578	0,48	76,67	0,7933	0,1723	0,49	19,07
	Yen	0,0839	0,0404			0,3658	0,0488			0,2672	0,0564			0,4629	0,1960		
	Euro	-0,1975	0,1007			0,0497	0,1009			0,0176	0,1759			0,4103	0,6594		
Malaysia	Dollar	0,9993	0,0015	0,99	309433,25	0,9853	0,0107	0,99	5826,44	1,0009	0,0014	0,99	251331,95	0,9989	0,0025	0,99	77606,31
	Yen	0,0005	0,0011			0,0111	0,0090			-0,0015	0,0013			0,0006	0,0028		
	Euro	0,0031	0,0028			0,0095	0,0187			-0,0038	0,0041			-0,0013	0,0094		
Thailand	Dollar	0,8174	0,0590	0,70	191,05	0,8439	0,0344	0,88	595,10	0,6485	0,0337	0,75	253,59	0,7562	0,0453	0,90	183,90
	Yen	0,1420	0,0437			0,2074	0,0291			0,2521	0,0329			0,2542	0,0515		
	Euro	0,4690	0,1090			0,0199	0,0601			0,1133	0,1025			0,0750	0,1734		
Australia	Dollar	0,5657	0,0936	0,30	34,61	0,4425	0,0883	0,30	34,92	0,6141	0,0616	0,45	67,88	0,3703	0,1273	0,29	8,11
	Yen	0,0716	0,0695			0,0786	0,0746			0,0382	0,0601			0,3121	0,1447		
	Euro	0,3555	0,1731			0,6471	0,1542			0,7215	0,1875			0,3596	0,4870		
Denmark	Dollar	0,0306	0,0188	0,77	275,44	0,0426	0,0136	0,89	671,30	0,0070	0,0073	0,91	842,64	0,0083	0,0081	0,96	469,29
	Yen	0,0006	0,0140			-0,024	0,0115			0,0139	0,0071			0,0084	0,0092		
	Euro	0,9960	0,0348			1,0002	0,0237			0,9989	0,0221			1,0396	0,0310		

Note: Significance level at 5% (alpha = 0,05) for estimated coefficient and the F-statistic.