

**INVESTMENT OPPORTUNITIES FOR FOREIGN CAPITAL AND  
INTERNATIONAL FINANCIAL CRISIS:  
EVIDENCE FROM RUSSIA AND HONG KONG**

Saziye Gazioglu<sup>1</sup>  
And  
Ülkem Başdaş<sup>2</sup>

THE DEPARTMENT OF  
ECONOMICS  
MIDDLE EAST TECHNICAL UNIVERSITY  
ANKARA  
January 2008

This paper revisits the relation among real stock returns, real capital flows and real exchange rate starting from a theoretical model. The model foresees that the capital inflows affect the real exchange rate via stock returns. Besides, there is an asymmetry between the effect of capital inflows and outflows on real exchange rate causing a “Debt Trap”. As an extension of Gazioglu and Başdaş (2007) on Turkey, empirical evidence from Russia and Hong Kong also confirm the theoretical findings and dependence on capital flows accumulating the risk for a crisis.

**Keywords:** Foreign Direct Investment, Turkey, Russia, Hong Kong, Capital Flow, Banking Sector, Crisis

---

<sup>1</sup> Corresponding author: Middle East Technical University and University of Aberdeen, Aberdeen, UK. Contact: pec086 abdn.ac.uk, or gazioglu metu.edu.tr

<sup>2</sup> Research Assistant, PhD Student, Department of Business Administration, Middle East Technical University. Contact: ulkem@ba.metu.edu.tr

## 1. INTRODUCTION:

The debate over capital flows, especially in developing countries, is one of the most popular topics in economics. Whether government must impose restrictions on capital flows is discussed by two opponents. The people in favor of unrestricted capital flows argue that the restrictions cause inefficiency and higher costs so that must be eliminated to secure markets. On the contrary, the capital movement has to be regulated since studies as Eichengreen (1996) and Cohen (1998) show that the capital mobility has not affected all countries in the same manner. Financial markets can include risk in case of reversal of capital inflow if there does not exist sufficient regulatory framework. Alfaro, Chanda, Özcan and Sayek (2003) states that there can be significant gains from foreign direct investment in case of well-developed financial markets, otherwise foreign direct investment alone has an ambiguous effect on development.

Gazioğlu and Başdaş (2007) studied the case of Turkey to investigate the reversal effects of capital inflows on a developing country. After 1980's Turkey experienced an urgent and quick liberalization of markets where the restrictions on capital flows eliminated prior to a regulatory framework. As Gazioğlu and Başdaş (2007) suggest this economic nature of Turkey forces the economy to be more volatile depending on external shocks and more open to crises. Loewendahl and Ertugal-Loewendahl (2001) evaluates the performance of Turkey in the context of the EU enlargement and emphasizes the importance of FDI for Turkey and comparatively higher dependence to capital flow for technological and innovation activities. Çulha (2006) draws attention to the example of Turkey in 2001 when the potential risk on banking sector, inflation and exchange rate, causing a macroeconomic instability, realized as a consequence of the sudden reversal of capital inflow.

According to the figures for Turkey, Gazioğlu and Başdaş (2007) underline the upward trend in capital flows and the share of financial intermediation, nearly 40% of capital inflows. This figure shows us the great importance of banking sector within the FDI. Gazioğlu and Başdaş (2007) claim that the rise in foreign ownership is closely related to the economic crises and latest crisis in 2001 can be easily detected from foreign custody ratios in Istanbul Stock Exchange. Besides, there is a significant asymmetry between the effects of inflows and outflows causing a Debt Trap. Not only for Turkey, but also for the countries with high foreign ownership ratios in their financial markets the risk of financial crisis exists in case of lacking of well developed financial regulations for capital flows. As Kaminsky and Reinhart (1999) suggest, banking and currency crises deepen via feeding back each other. The analysis over many industrial and developing countries, including Turkey, shows that after a boom sourced by capital inflow and credit the crises occur as entering. Levine and Zervos (1998) underline the significant effect of financial factors on future rates of economic growth, capital accumulation and productivity growth. Therefore, capital inflow and the share of banking sector within FDI play a vital role not to experience twin crises.

The aim of this paper is to revisit the link between capital flows, banking sector, stock market returns and crisis over Russia and Hong Kong examples as a continuation of the study on Turkey and to prove that the increase in foreign share in financial services can be an indicator of overall economic performance for the countries which heavily dependent on capital flows. Besides, our aim is to show that capital flows has a deeper effect on the

exchange rate when it moves out causing an asymmetric impact. This asymmetric effect causes a debt trap for the home country. Our basic innovation is to integrate a theoretical model in this analysis. Contrary to many studies evaluate the relation among the exchange rate, stock returns and capital flows by using actual figures, this paper also benefits from a theoretical model. The Johansen cointegration method together with impulse response analysis is used to figure out the link.

The paper is organized as follows; Part 2 introduces the model to test for relation between capital flow, stock returns and the exchange rate; Part 3 analyzes the empirical evidence for Russia and Hong Kong; Part 4 concludes.

## 2. MODEL:

### 2.1 Theoretical Model<sup>3</sup>:

As in Gazioglu and Başdaş (2007), the same model of Gazioglu (2001, 2002, 2003, 2005) is adopted. The model solves the profit maximization problem of firm and time separable utility function and the maximization problem of a representative domestic consumer. The stock market constraint is given as:

$$V^d \dot{X}^d \equiv X^d \dot{V}^d + X^d D^d \quad (1)$$

$V^d \dot{X}^d$ ,  $X^d \dot{V}^d$  and  $X^d D^d$  denote the value of domestic firms owned by domestic individuals, domestic proportion of stock market valuation of these shares, and their proportion of dividends respectively.

Gazioglu (2005) summarizes the equilibrium in economy as follows;

$$\begin{aligned} \dot{X} - E\dot{H} = Y - A - I + X^d (\dot{V}^d / V^d + D^d / V^d) + X^f (\dot{V}^f / V^f + D^f / V^f) \\ + H(1 + \dot{E} / E)(1 + R^f) \end{aligned} \quad (2)$$

Where the balance of payment equation can be given as;

$$\dot{H} = \Pi - T + H(1 + \dot{E} / E)(1 + R^f) \quad (3)$$

The definitions of the variables are summarized in Table 1. Gazioglu (2005) states that “net accumulation of assets can be accumulated by a trade surplus and capital gain from holding foreign money in terms of foreign goods”, which is shown by equation (3). Then, equation (2) implies the equilibrium condition, where the right hand side is equal to net domestic income minus consumption and the left hand side is the net wealth accumulation. This equilibrium proves that a change in shares under foreign ownership in the domestic stock market is reflected to the domestic economy in terms of domestic debt. Therefore, a foreign shock can affect the domestic market via a change in shares under foreign ownership. The percent of shares under foreign ownership has a vital role in evaluating the sensitivity of the economy to foreign shocks. Greater percentage implies higher sensitivity and more volatile

---

<sup>3</sup> This section is similar to the part from Gazioglu and Başdaş (2007) and included here to revisit the model.

economy.

Gazioğlu (2005) states the dynamics of the whole system as follows;

$$\begin{bmatrix} \dot{E} \\ \dot{H} \\ \dot{V} \end{bmatrix} = \begin{bmatrix} \dot{E}_E & \dot{E}_H & \dot{E}_V \\ \dot{H}_E & \dot{H}_H & \dot{H}_V \\ \dot{V}_E & \dot{V}_H & \dot{V}_V \end{bmatrix} \begin{bmatrix} E \\ H \\ V \end{bmatrix} + \begin{bmatrix} \dot{E}_k \\ \dot{H}_k \\ \dot{V}_k \end{bmatrix} [k] \quad (4)$$

Where  $\dot{E}_E > 0$ ,  $\dot{E}_H < 0$ ,  $\dot{E}_V > 0$ ,  $\dot{E}_k < 0$ ;  $\dot{H}_E < 0$ ,  $\dot{H}_H < 0$ ,  $\dot{H}_V < 0$ ,  $\dot{H}_k > 0$ ;  $\dot{V}_E < 0$ ,  $\dot{V}_H > 0$ ,  $\dot{V}_V < 0$  and  $\dot{V}_k > 0$ . The solution of this dynamic system is explained in Gazioğlu (2005). The model has two stable equilibria and one unstable equilibrium. Higher percentage of shares under foreign ownership causes an asymmetry between the capital inflows and outflows, which leads to "Ponzi Game" position; the country borrows further to be able to repay debts (Gazioğlu, 2001, 2002, 2003).

This model has superiority over the models trying to prove the link between exchange rates, capital flows and economic crises using only empirical methods. Firstly, the dynamics are tested via cointegration analysis, where the ordering of variables does not matter. Consequently, the causality test is not carried out. Ghosh (2000), Tan and Hook (2000) study only the real exchange rate and real stock market index within the framework of causality. Secondly, use of capital inflows and outflows separately enables the measurement of the asymmetry effect. Thirdly and most importantly, the researches questioning the capital flows, exchange rate and financial crises are lacking in theoretical background. Though the theory clarifies the relation between these variables, most of the studies follow actual parameters to explain the economic situation rather than testing and analyzing the theoretical model. This paper enables us both to test the dynamics and to explain the actual situation. The main aim is to show the importance of percentage of shares under foreign ownership in domestic market to test vulnerability of a domestic economy.

## 2.2. Estimation of the Structural Model:

The "Structural VAR" approach is adopted to test the dynamics of the system. The structural VAR approach captures not only the joint dynamics of variables but also the underlying, "structural", economic relationships. Besides, two basic features of the Structural VAR makes it preferred; error terms are not correlated, so structural, economic shocks are independent and variables can have a contemporaneous impact on other variables.

The Structural VAR econometric model is based on the macro model introduced in 4.1. The model suggests long term and short term trends of the variables, so that estimation of the data will enable us to test whether actual data confirms the theoretical findings. Behaviors of the real exchange rate, capital inflows, capital outflows and stock returns are evaluated to draw policy implications. The simplifying assumptions on the model are;

- (i) The solution of (4) for 2 by 2 combinations together with stability conditions is done in Gazioğlu (2005).
- (ii) The ordering of the variables is not important so following restrictions are imposed on the simultaneous estimations of three variables;  $\dot{H}_E = 0$ ,

$$\dot{H}_H = 0, \dot{H}_V = 0, \dot{H}_k = 0; \dot{V}_E = 0, \dot{V}_H = 0, \dot{V}_V = 0 \text{ and } \dot{V}_k = 0 \text{ to estimate only } \dot{E}_H < 0 \text{ and } \dot{E}_V > 0.$$

Based on the empirical results, it is tested whether the actual data confirms the stability conditions of our model.

### 3. EMPIRICAL EVIDENCE FROM RUSSIA AND HONG KONG:

Gazioğlu and Başdaş (2007) proved that for Turkey there is a link between the capital flows, real exchange rate and stock returns. Foreign share in the domestic economy is an important parameter affecting the whole economy. Besides, capital outflows have greater impact than inflow causing a debt trap for Turkey. The case of Turkey can be investigated for other developing or under-developed countries, where there is a reliance on capital flows, or the capital flows captures a significant portion of the economy, or allow mobility of capital without prior construction of regulatory framework. To test our aim Russia and Hong Kong are chosen.

#### 3.1 Russia:

Russia experiences difficulties to attract foreign direct investment though main macroeconomic indicators show an upward trend during recent years. High growth rates are accompanied with rapid production growth and investment boom (Table 2). Inflation considerably falls and the reserves, current account balance and government balance strengthens over 2001-2007. Besides these improvements, there exist several researches criticizing the FDI climate of Russia (Buiter and Szegravi, 2002; Buiter and Taci, 2003; Broadman and Recanatini, 2001). OECD Report on Russia by Öğütçü (2002) underlines that Russia has to modernize to attract foreign direct investment in order to break off the dependence on raw materials and oil. This report introduces necessary reforms in banking sector from one of the weakest elements. Economist Intelligence Report on Eastern Europe (2003) explains the slow growth of FDI in 2003 with the dwindling privatization, increases in the wage rates and relocation of investment to cheaper destinations.

Table 3 shows the net capital flows to the private sector. The considerable capital flows to banking sector reversed by the end of quarter 1 in 2007 following a high inflow in 2006. Considering the total inflows, the Central Bank of Russia projects about USD 45 billion for the first five months of 2007 where only USD 8 billion came from an IPO of Vneshtorgbank (World Bank, 2007).

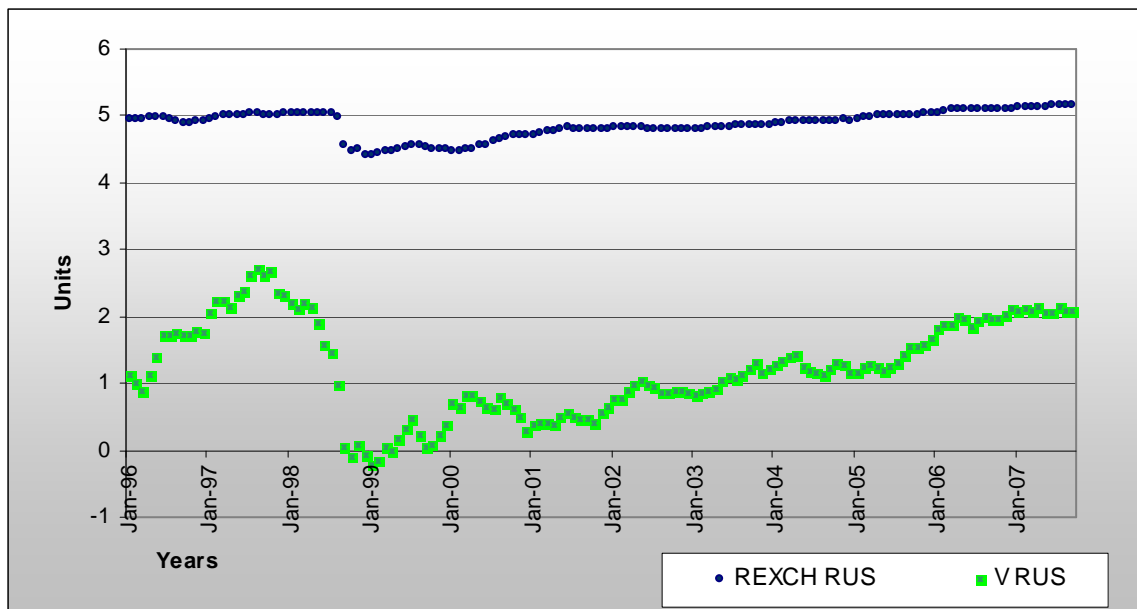
The economic and investment climate of Russia is appropriate to analyze the link between capital flows, stock returns and exchange rate. Firstly, Russia has not completed necessary reforms both to eliminate difficulties related to foreign direct investment and to stimulate the economy. This feature makes the Russian economy more sensitive and volatile. Secondly, the capital inflows and outflows follow high deviations rather than smooth transitions. Thirdly, there is only small number of theoretical studies on Russian economy questioning the link between macroeconomic variables. Fourthly, it is important to test our claim in Russian economy whether our proposition can be supported with evidence from other countries.

### 3.1.1 Evidence from Russia:

The real effective exchange rate based on CPI, foreign assets and liabilities of banking sector and CPI are obtained from International Monetary Fund International Financial Statistics from 1996:1 to 2007:9. The stock returns index is obtained from close values of RTS Index announced by the Russian Trading System Stock Exchange. The sources and definitions of variables are explained in Table 4.

Figure 1 and 2 show the trends in selected parameters (in log form) over 1996:1-2007:9. The effect of Asian Crisis can be clearly measured in all variables. The crisis caused a considerable depreciation and decrease in stock returns. After crisis the gap between foreign assets and liabilities had widened until 2003. Recently, real exchange rate and real stock returns become closer to pre-crisis period levels. Real stock returns are still comparatively lower.

**Figure 1 – The Real Effective Exchange Rate and Real Stock Returns in Log for Russia: 1996-2007:**



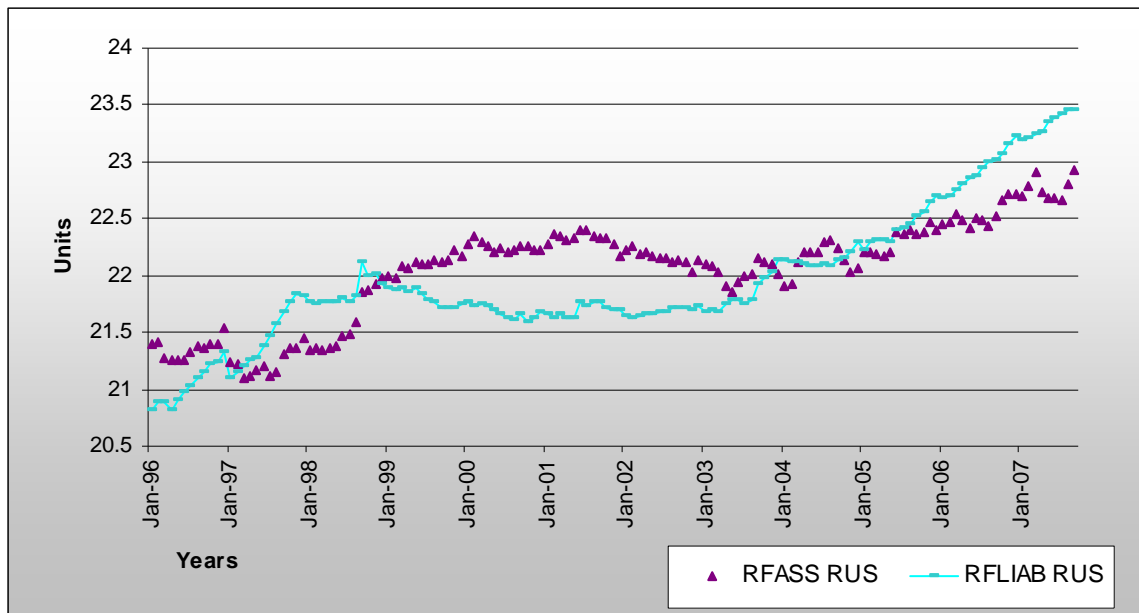
Source: Authors' own calculations. Sources of data are summarized in table 4.

Similar to the methodology adopted for Turkey, ADF test for unit root is carried out for Russia. Table 5 lists the results of ADF test for REXCH, V, RFASS and RFLIAB. The real exchange rate, real foreign assets and liabilities, and real stock returns (all in log form) are integrated of order one.

To investigate the long run relation between the variables the Johansen multivariate technique is adopted (Johansen, 1988; Pesaran and Smith, 1998) similar to Turkey. In order to capture the effect of crisis dummy variable, DUM98 RUS<sup>4</sup>, is introduced for 1998:8 where the data indicates a structural break. In unrestricted VAR model, the lag order selection test proves that lag order one is preferred due to the Schwarz Bayesian Criterion.

<sup>4</sup> DUM98 RUS is equal to 1 for 1998:8 and onwards; 0 otherwise. The model is also studied without dummy, but it has found no cointegration.

**Figure 2 – Real Foreign/Liabilities in Log for Russia: 1996-2007:**



Source: Authors' own calculations. Sources of data are summarized in table 4.

Table 6 gives the results of the test for the number of cointegrating vectors for Model 1<sup>5</sup>. Both Eigenvalue Test and Trace Test verify that there is only one cointegrating vector. Estimation of vector via Johansen Estimation is calculated in table 7. One per cent increase in RFASS will increase REXCH by nearly 0.095 per cent implying that higher foreign assets will end up with appreciation of the domestic currency. Stock returns index negatively affects the real effective exchange rate. Dummy variable has a negative sign, meaning that for the crisis period domestic currency depreciation has experienced.

Table 8 and 9 summarizes the cointegration analysis for Model 2<sup>6</sup>. For the capital outflow case, one per cent increase of RFLIAB causes depreciation of 1.979 per cent. Compared to inflow case (Model 1), capital outflow has nearly 20 times higher effect on the exchange rate. Considering the coefficients of stock returns in Model 1 and Model 2, the coefficient is more significant for outflow case. This indicates that capital inflows increase the stock returns and when an economic turbulence occurs it immediately moves out. The impact of capital inflow is higher than stock returns whereas effect of capital outflow has nearly same effect with stock returns. This proves that the greater importance of capital flows on real exchange rate than of stock returns. The signs of coefficients are in line with the theoretical findings confirming our model.

Impulse Responses Analysis show the time plots of logarithms of real exchange rate, real stock market returns, and capital inflows (Model 1), capital outflows (Model 2). In model 1, a positive REXCH RUS (appreciation of domestic currency) causes a decrease in stock returns and slight increase in real foreign assets (Figure 3(a)). A positive shock to V leads to appreciation of currency and leaves real foreign assets nearly unaffected (Figure 3(b)). Lastly,

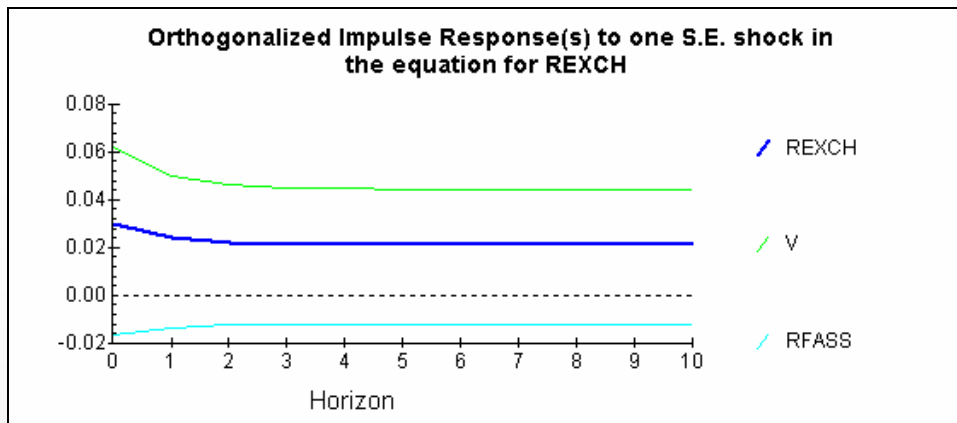
<sup>5</sup> In model 1 and model 2, unrestricted constant term and unrestricted trend term constraints are applied in order to acquire cointegration relation among variables.

<sup>6</sup> 2nd vector of the Cointegrating Analysis is considered to compare the results with theoretical model's findings.

one standard error shock on real foreign assets ends up with higher stock returns implying that rising capital inflows are invested in stock market (Figure 3(c)). In Model 2, a shock to real exchange rate (appreciation) causes a decrease in LFLIAB (rise in capital outflows) (Figure 4(a)). Shock to  $V$  affects RFLIAB negatively meaning higher capital outflows (Figure 4(b)). Lastly, a shock to RFLIAB (fall of capital flows) causes higher stock returns and appreciation of the home currency (Figure 4(c)).

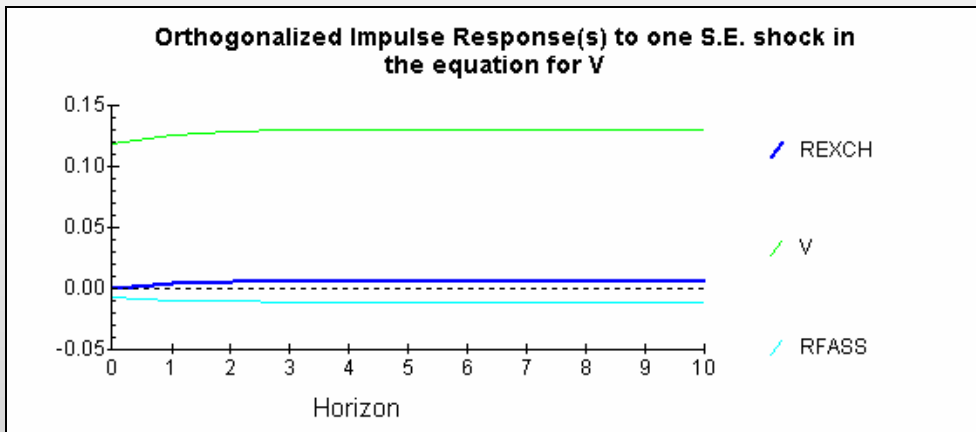
Comparing IR figures of Model 1 and Model 2 it is clear that our theoretical findings in line with the empirical data. Increase in real foreign assets is invested in stock returns, so that increasing the stock returns. Then, a rise in  $V$  causes appreciation of the domestic currency. On the other hand, as mathematically shown in cointegrating vector estimates and IR (Impulse Responses), RFLIAB has higher effect on real exchange rate verifying the discussion on “debt trap”. The capital outflow has a deeper effect on real exchange rate than the inflows.

**Figure 3 (a) – Impulse Responses Analysis for Russia: 1996-2007 (Model 1):**



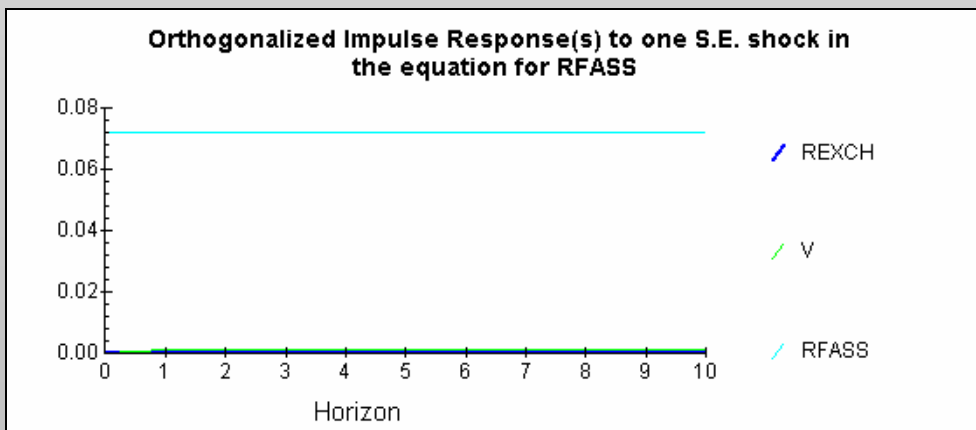
Source: Dataset and Microfit Output

**Figure 3 (b) – Impulse Responses Analysis for Russia: 1996-2007 (Model 1):**



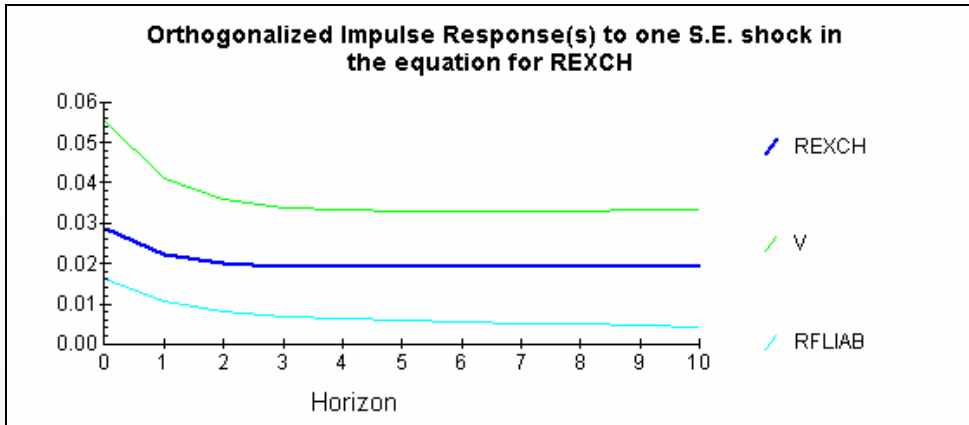
Source: Dataset and Microfit Output

**Figure 3 (c) – Impulse Responses Analysis for Russia: 1996-2007 (Model 1):**



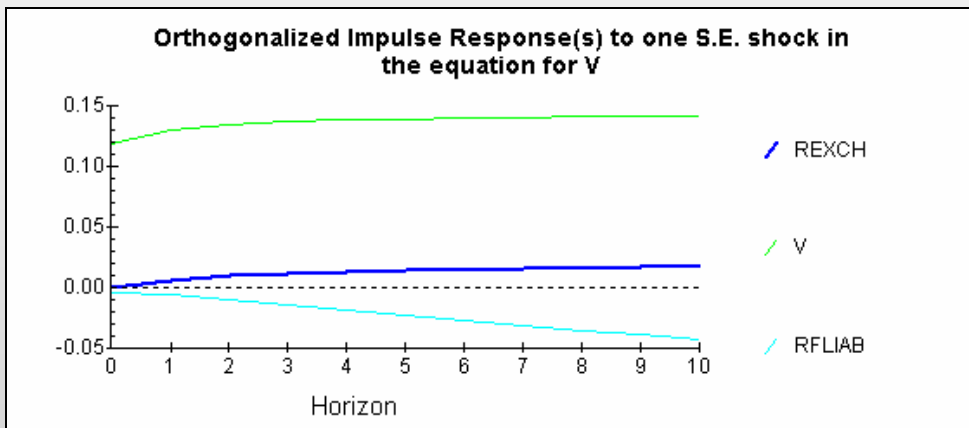
Source: Dataset and Microfit Output

**Figure 4 (a) – Impulse Responses Analysis for Russia: 1996-2007 (Model 2):**



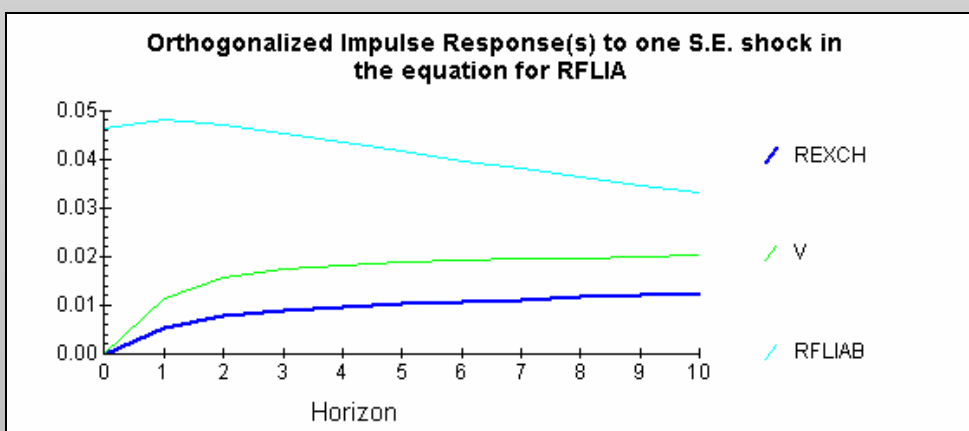
Source: Dataset and Microfit Output

**Figure 4 (b) – Impulse Responses Analysis for Russia: 1996-2007 (Model 2):**



Source: Dataset and Microfit Output

**Figure 4 (c) – Impulse Responses Analysis for Russia: 1996-2007 (Model 2):**



Source: Dataset and Microfit Output

### 3.2 Hong Kong:

China<sup>7</sup> is one of the biggest economic players in the world because of both its size and importance for attracting foreign direct investment from various countries. Table 10 summarizes economic indicators of the People's Republic of China, which is more developed compared to the Republic of China. High growth rates and high gross domestic product levels are remarkable. Economist Special Report (2007) states that China's share of world GDP is already closer to the rich countries. Indeed, the GDP share of EU and the U.S. shows a declining trend starting from 1980's and reaches to nearly 20 per cent whereas China and the rest of Asia follows an upward trend reaching to above 15 per cent. Japan has less than 10 per cent of the world GDP. Nevertheless, the population of China, nearly 1.3 billion, clearly affects the GDP per capita. The forecasts for 2007 were still expecting high rates for China (Table 11). According to the recent forecast of Economic Intelligence Unit (2007) the GDP forecasts of China would be 10% for 2008 and 9.3% for 2009 after experiencing 11.5% in 2007.

The foreign direct investment figures are given in table 12 both for China and Hong Kong. China region excluding Hong Kong attracts a remarkable amount of foreign direct investment which mainly flows from Asia region, especially Hong Kong. Nevertheless, inward flows to Hong Kong are remarkable compared to the flows to China region. Therefore, this paper concentrates on Hong Kong region where the foreign direct investment is higher and the financial market is relatively well-developed. In table 13, capital flows to Hong Kong is given by sector. The significant share of financial institutions rises over the last years. After the investment holding, real estate and various business services, the financial institutions including banking sector is the most important sector for FDI inflows. Besides, there are considerable outflows in financial sector. This composition of FDI enables us to test our claim on stock returns, exchange rate and capital flows.

Focusing on Hong Kong, Hong Kong was under the British control in the 19<sup>th</sup> century. According to the terms of the Sino-British Joint Declaration on the Question of Hong Kong, signed in 1984, Hong Kong became a Special Administrative Region (SAR) of China promising "a high degree of autonomy" for at least 50 years (Economist Intelligence Unit, 2007). Hong Kong has lower growth rates, around 5.5 per cent, than China has. Besides, Hong Kong is one of Asia's leading financial centers and the key international financial center servicing China (Hsu, Arner, Tse and Johnstone, 2006). As emphasized above, it attracts a huge amount of FDI. Consequently, the structure of economy is the basic motivation to test our claim. Another reason is the rising importance of China and Hong Kong within China region. It is helpful to analyze the linkages of capital flows for this new player for the sake of future economic policies of China, which will affect the world markets deeper and deeper.

#### 3.2.1 Evidence from Hong Kong:

The nominal effective exchange, foreign assets, foreign liabilities of the banking sector and the consumer price index are gathered from the International Monetary Fund International Financial Statistics for 1994:M1- 2006:M12 time period. All Ordinaries Index series is used as

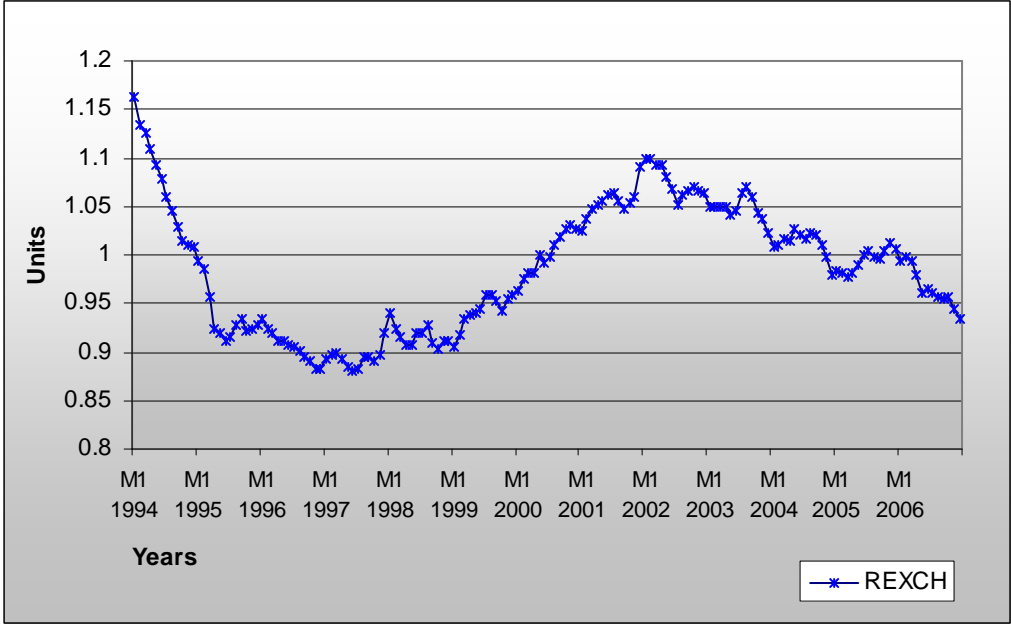
---

<sup>7</sup> Considering China, it comprises the People's Republic of China, which governs Mainland China, Hong Kong and Macau, and the Republic of China, which governs Taiwan, the Pescadores, the Matsu Islands, and Kinmen.

the stock returns index. More details on the definitions and sources are provided in table 14.

In figure 5, 6, and 7, the selected variables are plotted for 1994:M1- 2006:M12. Focusing on the year 1994, there is a considerable rise in real liabilities, depreciation of the home currency and decrease in the stock returns. After 1995, there is an improvement for all variables. In 1994, the conflicts between Britain and China in politics over reform for Hong Kong (Burns, 1993), which are continued through out 1993, or delayed effects of the reforms taken in early 1990's both in Hong Kong and China (the introduction of the Special Economic Zones in China) can be underlying reasons of this trend. Besides this trend, the effects of Asian Crisis in 1998 have a minor impact on the variables even though these impacts are not experienced as significant as in Russia.

**Figure 5 – The Real Effective Exchange Rate for Hong Kong: 1994-2006:**



Source: Author’s own calculations. Sources of data are summarized in table 14.

For all variables ADF unit root test is applied and all are integrated of order one (Table 15)<sup>8</sup>. Johansen multivariate technique is applied after including a dummy for 1998<sup>9</sup>. Similarly, the results for the number of cointegrating vectors are listed in table 16 and 17<sup>10</sup>. For model 1, an increase in stock returns causes depreciation of the home currency and capital inflows positively affects the real exchange rate, appreciation. The sign of DUM 98 HK is positive meaning that through out the crisis Hong Kong Dollar still appreciated. The controversial effect of this dummy variable proves the minor impact of Asian Crisis and improving economy of Hong Kong contrary to the recession experienced by other Asian countries. Abeyasinghe (1999) declares that the effect of Asian Crisis transmitted to Hong Kong is very

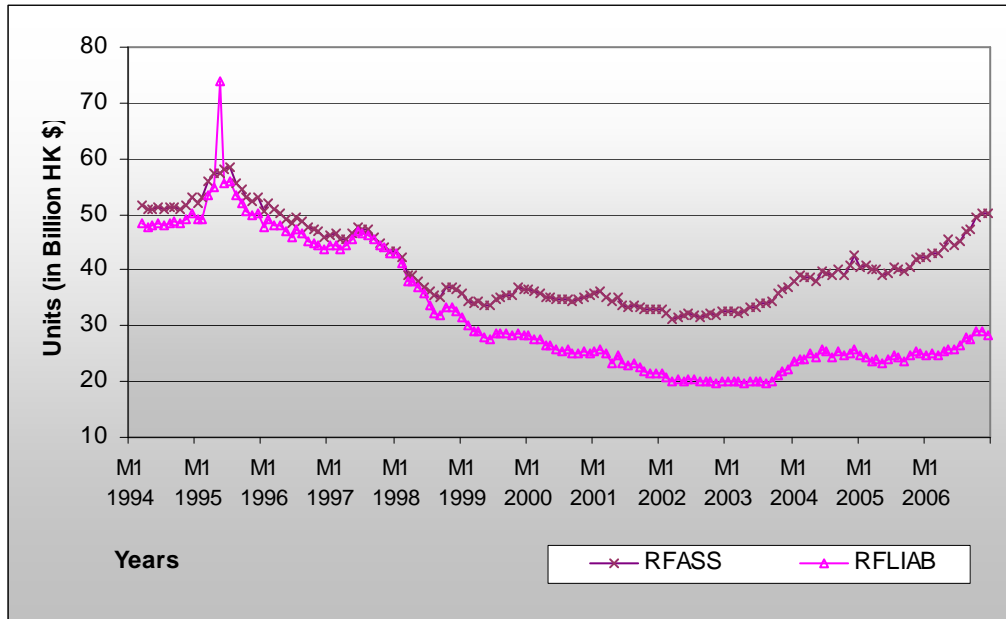
<sup>8</sup> Different from Turkey and Russia, the level values of variables are used for Hong Kong in order to acquire a cointegration vector. The model in log form is lag order of zero in unrestricted VAR model whereas model in levels is lag order of one in unrestricted VAR model according to the Akaike Information Criterion and Schwarz Bayesian Criterion.

<sup>9</sup> DUM 98 HK is introduced. DUM98 HK takes value of 1 from 1998:1 onwards, 0 otherwise.

<sup>10</sup> In model 1 and model 2 no constant term and no trend term constraints, and in model 2 unrestricted constant term and no trend term constraints are applied in order to acquire cointegrating vector.

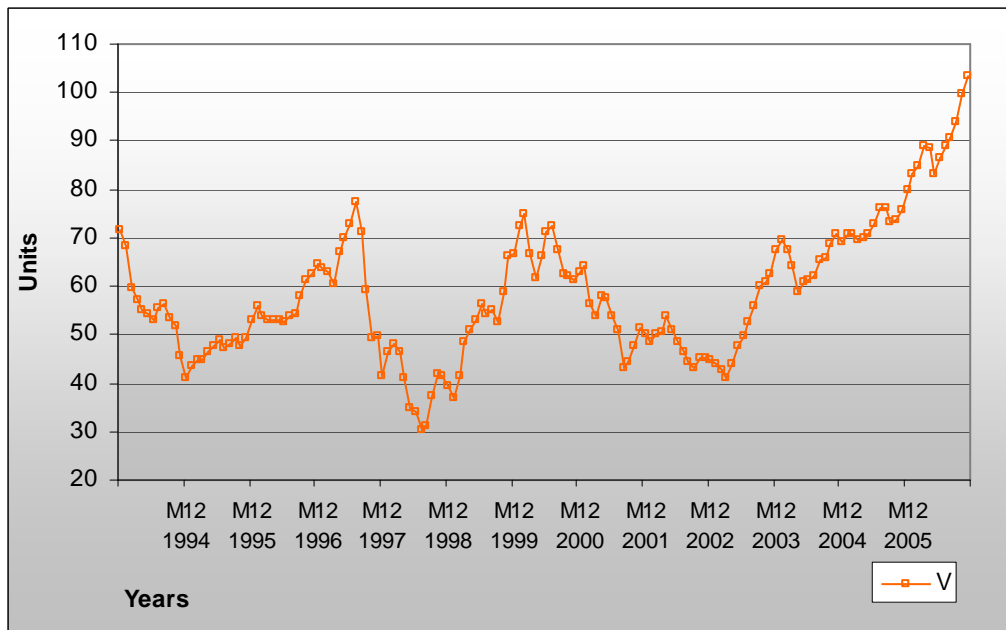
limited.

**Figure 6 – Real Foreign/Liabilities for Hong Kong: 1994-2006:**



Source: Author's own calculations. Sources of data are summarized in table 24.

**Figure 7 – Real Stock Returns for Hong Kong: 1994-2006:**



Source: Author's own calculations. Sources of data are summarized in table 24.

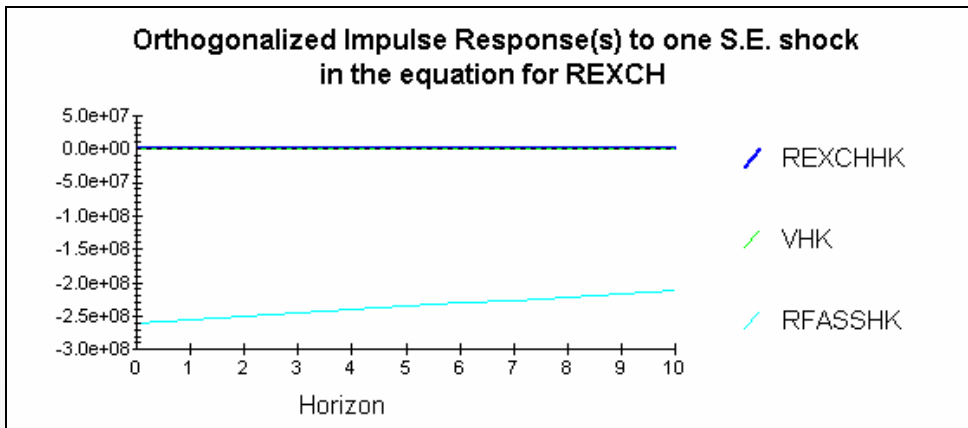
For model 2, decrease in capital outflows cause appreciation of Hong Kong dollars. Similar to model 1, the link between stock returns and exchange rate is again negative. Comparing capital outflows and inflows the signs of both flows are less than the effect of stock returns. This finding is contrary to the results of Russia and Turkey. Besides, the coefficients of foreign assets and liabilities are not comparable not helping us to evaluate the asymmetric effects. Though the signs of parameters are in line with our predictions, IR analysis is needed to comment.

In Figure 8, the IR analysis for model 1 is given. One positive standard error shock to exchange rate, appreciation of the Hong Kong dollar, causes a decrease in stock returns (an insignificant decrease in the figure 8(a)) and increase in the capital flows. A positive shock to stock returns ends up with the appreciation and higher capital inflows (Figure 8(b)). Lastly, rise in capital inflows causes increase in stock returns (Figure 8(c)). These findings support our predictions, which expect that increasing capital inflows to be invested in the stock market and stimulating V appreciates the currency. For model 2, shock to REXCH HK, appreciation of the currency, ends up with lower capital outflow (Figure 9(a)). Depreciation and decrease in capital outflows follow to a shock to stock returns (Figure 9(b)). A shock decreasing the capital outflows causes appreciation and a rise in stock returns (Figure 9(c)). Because in the cointegrating vectors the comparison of the effects of capital inflows and outflows is impossible, the IR analysis in table 20 proves that capital outflow has deeper effect than capital inflow on the exchange rate. For each period capital outflow has nearly more than 4 times larger effect than capital inflow. The asymmetric effect of inflows and outflows is also verified for Hong Kong. Nevertheless, important difference of Hong Kong is the lower impact of capital flows compared to stock returns. The basic reason of this finding can be the economic structure of Hong Kong, which greatly differs from Turkey's and Russia's. The economy of Hong Kong has ranked the world's freest economy in the Index of Economic Freedom for 13 consecutive years<sup>11</sup>. Besides, Hong Kong Stock Exchange is one of the largest markets in the world. In 2006 the value of initial public offerings was second highest in the world after London (International Herald Tribune, 2006). Accompanied with consecutive high growth rates and developed stock market, the economic performance is comparatively higher for Hong Kong. Consecutively, Hong Kong may not experience the volatility depending on the sudden capital flow shocks as in Turkey or Russia. Rather than the movements of capital, the change in stock returns matter for Hong Kong. Considering the size of stock market this finding is not in contrary to our predictions but support the claim that sudden capital flow shocks matter for the countries where there is not enough regulation or institutional framework.

---

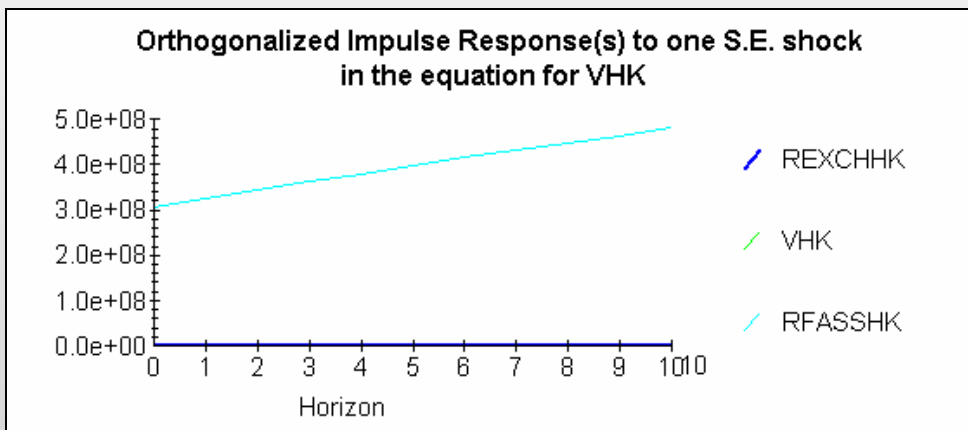
<sup>11</sup> 2007 Index of Economic Freedom, Heritage Foundation  
(<http://www.heritage.org/research/features/index/>)

**Figure 8 (a) – Impulse Responses Analysis for Hong Kong: 1994-2006 (Model 1):**



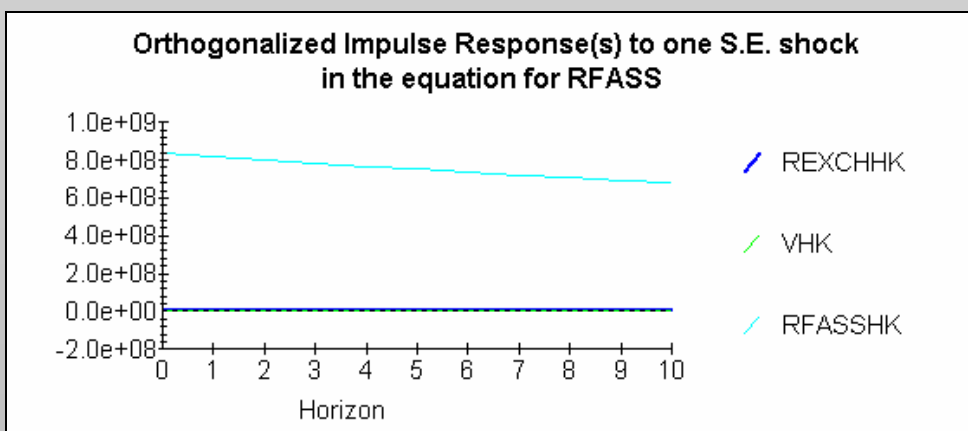
Source: Dataset and Microfit Output

**Figure 8 (b) – Impulse Responses Analysis for Hong Kong: 1994-2006 (Model 1):**



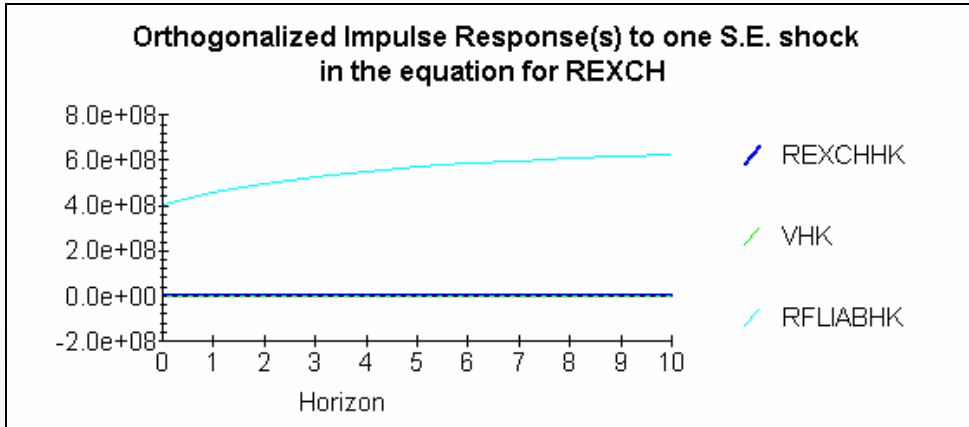
Source: Dataset and Microfit Output

**Figure 8 (c) – Impulse Responses Analysis for Hong Kong: 1994-2006 (Model 1):**



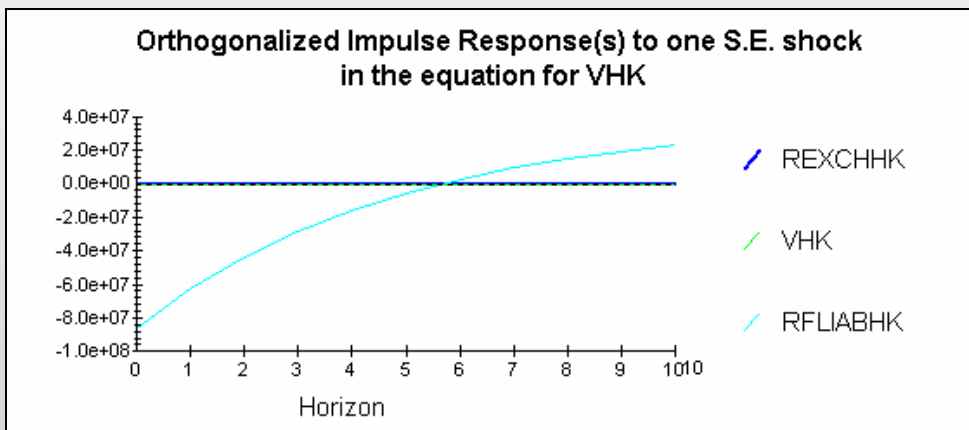
Source: Dataset and Microfit Output

**Figure 9 (a) – Impulse Responses Analysis for Hong Kong: 1994-2006 (Model 2):**



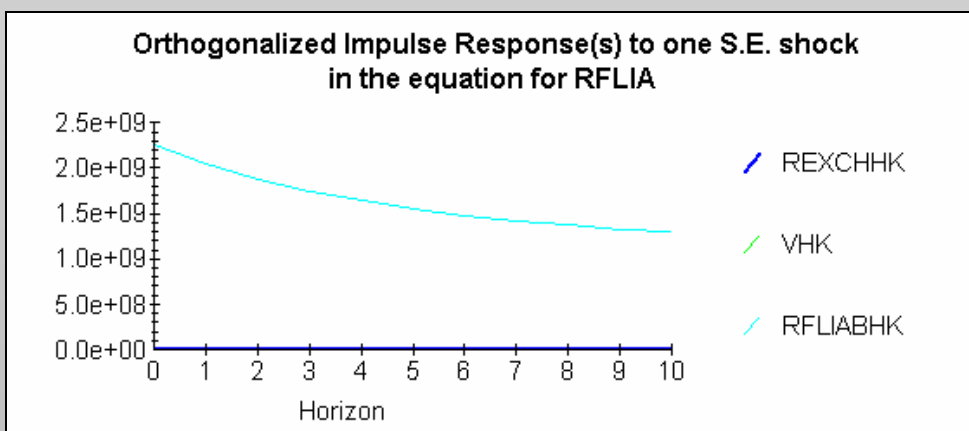
Source: Dataset and Microfit Output

**Figure 9 (b) – Impulse Responses Analysis for Hong Kong: 1994-2006 (Model 2):**



Source: Dataset and Microfit Output

**Figure 9 (c) – Impulse Responses Analysis for Hong Kong: 1994-2006 (Model 2):**



Source: Dataset and Microfit Output

#### **4. CONCLUSION:**

This paper considers the relation among real exchange rate, real capital flows and real stock returns for Russia and Hong Kong as a continuation of the Turkey case including a theoretical model. The theoretical model of Gazioglu (2001, 2002, 2003) foresees that capital inflows via effect on stock returns leads to appreciation, and there is an asymmetry between the effect of inflows and outflows. Our empirical findings from Russia and Hong Kong confirm the theoretical forecasts. Comparing the results of Gazioglu and Başdaş (2007), impact of real liabilities is higher than of real assets meaning that capital outflows has a significant effect for Turkey and Russia. Besides, capital inflow is an important parameter affecting the real exchange rates. Only for Hong Kong the stock returns are more effective than the capital flows because of its exceptional performance of stock markets and overall economy compared to Turkey and Russia.

Policy implication of this theory on countries, where the elimination of barriers of capital flows done without regulatory framework or the share of foreign investment captures a significant portion of the economy without enough regulative or precautionary background, is the risk of huge amount of capital outflows on the exchange rate. Because of the asymmetry, the capital outflows will have deeper effects on exchange rate than it caused as entering the country. These countries are more open to the foreign shocks. Some form of capital control has to be utilized in these countries to be able to smooth the foreign shocks. Further research is needed both to extend the data for other countries and to develop the theoretical model.

## BIBLIOGRAPHY:

- Abeyasinghe, T. (1999) "Thai Meltdown and Transmission of Recessions within ASEAN4 and NIE4", Paper presented at the conference on International Financial Contagion, How it Spreads, How it Can be Stopped, February 2000, International Monetary Fund, Washington DC
- Alfaro, L., A. Chanda, Ş. Özcan and S. Sayek (2003), "FDI Spillovers, Financial Markets, and Economic Development", *International Monetary Fund Working Paper*, African Department, No.03/186, September.
- Broadman, H. G. and F. Recanatini (2001), "Where Has All the Foreign Investment Gone in Russia?", *The World Bank Europe and Central Asia Region Poverty Reduction and Economic Management Sector Unit Policy Research Working Paper*, No. 2640, July.
- Buiter, W. H. and I. Szegvari (2002), "Capital Flight and Capital Outflows from Russia: Symptom, Cause and Cure", *European Bank for Reconstruction and Development Working Paper*, No. 73, June.
- Buiter, W. H. and A. Taci (2003), "Capital Account Liberalization and Financial Sector Development in Transition Countries", in Age F. P. Bakker and Bryan Chapple (eds.) "Capital Liberalization in Transition Countries: Lessons from the Past and for the Future": pp. 105-141. Edward Elgar, Cheltenham, UK.
- Burns, J. P. (1993) "Hong Kong in 1993: The Struggle for Authority Intensifies", *Asian Survey*, Vol. 34, No. 1, A Survey of Asia in 1993: Part I, pp. 55-63, January.
- Cohen, B. (1998), *"The Geography of Money"*, Ithaca, NY: Cornell University Press.
- Çulha, A. (2006), *"A Structural VAR Analysis of the Determinants of Capital Flows into Turkey"*, The Central Bank of the Republic of Turkey Research and Monetary Policy Department Working Paper, No.06/05, October.
- Economist (2007), *"Reaching For a Renaissance"*, the Economist Newspaper and the Economist Group, March 29 2007.
- Economist Intelligence Unit (2007), *"Country Forecast: China"*, Country ViewsWire, London, October.
- Economist Intelligence Unit (2007), *"Country Forecast: Hong Kong"*, Country ViewsWire, London, June.
- Economist Intelligence Unit (2003), *"FDI into Eastern Europe: Focus to Shift Away from EU Accession Countries"*, London, September.
- Eichengreen, B. (1996), *"Globalizing Capital: A History of the International Monetary System"*, Princeton, NJ: Princeton University Press.

- Gazioğlu, Ş. (2001), "An Emerging Market, Volatility of Real Exchange Rate : The Turkish Case' Middle East and North African Economies", *Online Journal of MMEA*.
- Gazioğlu, Ş. and D. McCausland (2002), "A Non-linear Currency Substitution Model of Hysteresis in Debt and Competitiveness", *METU Studies in Development*, Vol. 29, No. 3-4.
- Gazioğlu, Ş. and Ü. Başdaş (2007), "Investment Opportunities for Foreign Capital and Economic Fragility in Turkey", 28th Annual Meetings of the MEEA, Middle East Economic Association (MEEA), New Orleans, LA, US
- Gazioğlu, Ş. (2003), "Capital Flows to an Emerging Market: Turkish Case Study", *International Advances in Economic Research*, Vol. 9, No. 3.
- Gazioğlu, Ş. (2005), "Stock Market, Financial Crisis and Capital Flows in an Emerging Market: Turkish Case Study" in Gazioğlu, S. (eds): *Emerging Markets in Financial Crisis: Capital Flow, Saving, Debt and Banking Reform*, J-Net Publications, pp. 62-95, 2005.
- Ghosh, D. (2000), "*From Turbulence to Tranquility: Reform and Restructuring in Malaysia*", in *Regional Financial Markets: Issues and Policies*, Dilip K. Ghosh (ed.) and Mohamed Ariff (ed.) Praeger Publishers.
- Hsu B., D. Arner, K.-S. Tse and S. Johnstone (2006) "*Financial Markets in Hong Kong: Law and Practice*", Oxford University Press.
- International Herald Tribune (2006) "Hong Kong surpasses New York in IPOs" (<http://www.iht.com/articles/2006/12/25/business/borse.php>), published in 25/12/2005
- Johansen, S. (1988), "Statistical Analysis of Cointegrated Vectors", *Journal of Economic Dynamics and Control*, Vol.12, pp. 231-254.
- Kaminsky, G. L. and C. M. Reinhart (1999), "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems", *The American Economic Review*, Vol. 89, No.3, pp. 473-500.
- Levine, R. and S. Zervos (1998), "Stock Markets, Banks, and Economic Growth", *The American Economic Review*, Vol. 88, No.3, pp.537-558.
- Loewendahl, H. and E. Ertugal-Loewendahl (2001), "*Turkey's Performance in Attracting Foreign Direct Investment: Implications of EU Enlargement*", ENEPRI Working Paper, No.3, November.
- Öğütçü, M. (2002), "Attracting Foreign Direct Investment for Russia's Modernization", *OECD-Russia Investment Roundtable*, Saint Petersburg, Russia, June.
- Pesaran, M Hashem and Ron P. Smith (1998), "Structural Analysis of Cointegrating VARs," *Journal of Economic Surveys*, Blackwell Publishing, vol. 12(5), pages 471-505, December.

Tan, H. B. and S. Hook Law (2000), "Financial Volatility and Stock Prices: The Malaysian Experience Before and During the Asian Crisis", 1<sup>st</sup> International Conference on Banking and Finance, University of Utara, Malaysia, August. 1.

World Bank (2007), Russian Economic Report 14, *the Moskow Office of the World Bank*, June.

## APPENDIX A:

**Table 1 – Definitions of Symbols:**

<b>Symbol</b>	<b>Definition</b>
<b>A</b>	Domestic consumption
<b>D</b>	Real dividends
<b>E</b>	Exchange rate
<b>H</b>	Domestic net international debt
<b>I</b>	Domestic physical capital investment expenditure
<b>R</b>	Real interest rate
<b>T</b>	Real domestic trade balance
<b>V</b>	Stock market value of physical capital
<b>X</b>	Domestic share of domestic shares
<b>Y</b>	Real domestic income
<b><math>\pi</math></b>	Foreign owned share of domestic dividends
<b>d</b>	Domestic (superscript)
<b>f</b>	Foreign (superscript)

**Table 2 – Main Macroeconomic Indicators for Russia:**

	2001	2002	2003	2004	2005	2006	2007-4M
GDP Growth (%)	5.1	4.7	7.3	7.2	6.4	6.7	n/a
Industrial Production Growth, y-o-y (%)	4.9	3.7	7.0	8.3	4.0	3.9	7.5
Fixed Capital Investment Growth, y-o-y (%)	8.7	2.6	12.5	10.9	10.5	12.6	19.9
Federal Government Balance (% GDP)	3.0	2.3	1.7	4.2	7.5	7.5	5.9
Inflation (CPI), y-o-y (%)	18.6	15.1	12.0	11.7	10.9	9.0	4.0
Current Account (billion \$)	35.1	32.8	35.9	60.1	86.6	94.5	21,8*
Reserves (including gold), end y-o-y (billion \$)	36.6	47.8	76.9	124.5	182.2	303.7	369.1

(\*) Data for the first quarter

Source: Russian Economic Report 14, the Moskow office of the World Bank (2007)

**Table 3 – Net Capital Inflows to the Private Sector in Russia:**

	2006	Q4-2006	Q1-2007
Total Net Capital Inflows to the Private Sector*	41.7	14.3	13.0
<i>Net Capital Inflows to the Banking Sector</i>	27.5	11.8	-8.9
<i>Net Capital Inflows to the non-Banking Sector</i>	14.2	2.5	21.9

(\*) All figures in USD billion

Source: Russian Economic Report 14, the Moskow office of the World Bank (2007)

**Table 4 – Definitions and Sources of Data for Russia:**

<b>Variable</b>	<b>Source of Data</b>	<b>Definition</b>
<b>Real Exchange Rate</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	CPI Effective Exchange Rate (Real) (2000=100) CBRT Monthly. CPI based real effective exchange rate index calculated using the IMF weights for 36 countries. An increase in the index denotes an appreciation.
<b>REXCH RUS</b>		Real Exchange Rate in logarithm
<b>Stock Market Price Index</b>	Russian Trading System Stock Exchange ( <a href="http://www.rts.ru/">http://www.rts.ru/</a> )	Closing values of Stock Market Price Index Daily.USD based. (01.09.1995=100)
<b>V RUS</b>		Stock Market Price Index monthly data is recalculated monthly by taking averages for each month ((summation of closing indices for month)/(number of observations for that month)). Stock Market Price Index Monthly-CPI ratio in logarithm is denoted by "V".
<b>Foreign Assets</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	Foreign Assets of the Banking Sector.
<b>RFASS RUS</b>		Foreign Assets-CPI ratio in logarithm
<b>Foreign Liabilities</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	Foreign Liabilities of the Banking Sector.
<b>RFLIAB RUS</b>		Foreign Liabilities-CPI ratio in logarithm
<b>CPI RUS</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	Laspeyres index using weights of the previous year, including 412 goods and services since 2003 in a sample circle of towns.

**Table 5 – Augmented Dickey Fuller Test for Unit Root Russia:****Augmented Dickey Fuller Test for Unit Roots**

<b>Variable Definition</b>	<b>Variable</b>	<b>ADF Test Statistics with constant</b>	<b>ADF Test Statistics with constant and linear trend</b>
Real Effective Exchange Rate in log	REXCH RUS	-1.3911	-1.9301
First Difference of Real Effective Exchange Rate in log	DREXCH RUS	***-8.9026	***-8.9547
Real Stock Return Indices in log	V RUS	-1.6341	-1.6967
First Difference of Real Stock Return Indices in log	DV RUS	***-7.7649	***-7.7493
Real Foreign Assets of Banking Sector in log	RFASS RUS	-0.5674	-1.7015
First Difference of Real Foreign Assets of Banking Sector in log	DRFASS RUS	***-10.9599	***-10.9333
Real Foreign Liabilities of Banking Sector in log	RLIAB RUS	0.6585	-0.2921
First Difference of Real Foreign Liabilities of Banking Sector in log	DRFLIAB RUS	***-11.1478	***-11.1997

Source: Author's own calculations via E-views

Note:

1. Test critical values (with constant) for 1 %(\*\*\*) , 5 %(\*\*) , 10 %(\*) are -3.4778; -2.8823; -2.5779 respectively.
2. Test critical values (with constant and linear trend) for 1 %(\*\*\*) , 5 %(\*\*) , 10 % (\*) are -4.0254; -3.4425; -3.1459 respectively.

**Table 6 – Test for the Number of Cointegrating Vectors for Russia (Model 1):**

**Cointegration Analysis Model 1**

<b>Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix</b>		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r=1	**116.33
r<=1	r=2	13.17
r<=2	r=3	4.67
<b>Cointegration LR Test Based on Trace of the Stochastic Matrix</b>		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r>=1	**135.87
r<=1	r>=2	19.54
r<=2	r>=3	6.36

Source: Microfit Output

Note:

1. (\*\*) denotes rejection of null hypothesis at both 5 % and 10 % significance levels.
2. Cointegration with unrestricted intercepts and unrestricted trends in the VAR is adopted with 140 observations from 1996M2 to 2007M9. Order of VAR = 1.
3. List of variables included in the cointegrating vector: REXCH RUS, V RUS, RFASS RUS and DUM98 RUS. List of eigenvalues in descending order: .56437 .089788 .032782 .012059, respectively.
4. r is the number of cointegrating vectors.

**Table 7 – Estimated Cointegrated Vectors in Johansen Estimation for Russia (Model 1):**

**Cointegration Analysis Model 1**

<b>Estimated Cointegrated Vectors in Johansen Estimation</b>	
	VECTOR 1
REXCH RUS	-1.1276 (-1,0000)
V RUS	-0.1142 (-0.1013)
RFASS RUS	0.1068 (0.0947)
DUM 98 RUS	-1.0403 (-0.9226)

Source: Microfit Output

Note:

1. The normalized coefficients are given in brackets.
2. Cointegration with unrestricted intercepts and unrestricted trends in the VAR is adopted with 140 observations from 1996M2 to 2007M9. Order of VAR = 1, chosen r=1.
3. List of variables included in the cointegrating vector: REXCH RUS, V RUS, RFASS RUS and DUM98 RUS.

**Table 8 – Test for the Number of Cointegrating Vectors for Russia (Model 2):**

**Cointegration Analysis Model 2**

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r=1	**123.53
r<=1	r=2	**34.72
r<=2	r=3	13.39
Cointegration LR Test Based on Trace of the Stochastic Matrix		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r>=1	**175.11
r<=1	r>=2	**51.58
r<=2	r>=3	16.86

Source: Microfit Output

Note:

1. (\*\*) denotes rejection of null hypothesis at both 5 % and 10 % significance levels.
2. Cointegration with unrestricted intercepts and unrestricted trends in the VAR is adopted with 140 observations from 1996M2 to 2007M9. Order of VAR = 1.
3. List of variables included in the cointegrating vector: REXCH RUS, V RUS, RFLIAB RUS and DUM98 RUS. List of eigenvalues in descending order: .58619 .21965 .091217 .024444
4. r is the number of cointegrating vectors.

**Table 9 – Estimated Cointegrated Vectors in Johansen Estimation for Russia (Model 2):**

**Cointegration Analysis Model 2**

Estimated Cointegrated Vectors in Johansen Estimation		
	VECTOR 1	VECTOR 2
REXCH RUS	-1.2263 (-1,0000)	-0.0879 (-1,0000)
V RUS	-0.0819 (-0.0668)	0.2142 (2.4368)
RFLIAB RUS	0.0851 (0.0693)	0.1740 (1.9793)
DUM 98 RUS	-0.9708 (-0.7916)	0.1881 (2.1393)

Source: Microfit Output

Note:

1. The normalized coefficients are given in brackets.
2. Cointegration with unrestricted intercepts and unrestricted trends in the VAR is adopted with 140 observations from 1996M2 to 2007M9. Order of VAR = 1, chosen r=2.
3. List of variables included in the cointegrating vector: REXCH RUS, V RUS, RLIAB RUS and DUM98 RUS.

**Table 10 – Main Macroeconomic Indicators for the People’s Republic of China:**

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
GDP	7,897.3	8,440.2	8,967.7	9,921.5	10,965.5	12,033.3	13,582.3	15,987.8	18,282.0	20,940.7
Real GDP Growth	9.3	7.8	7.6	8.4	8.3	9.1	10.0	10.1	10.2	10.7
Consumer Price Index	2.8	-0.8	-1.4	0.4	0.7	-0.8	1.2	3.9	1.8	1.5
Urban Per Capita Disposable Income (RMB)	5,160.3	5,425.1	5,854.0	6,280.0	6,859.6	7,702.8	8,472.2	9,421.6	10,493.0	11,759.0
Rural Per Capita Net Income (RMB)	2,090.1	2,162.0	2,210.3	2,253.4	2,366.4	2,475.6	2,622.2	2,936.4	3,254.9	3,587.0
Unemployment rate (do not include underemployment of migrant population)	3.1	3.1	3.1	3.1	3.6	4.0	4.3	4.2	4.2	4.1
Government Deficit	58.2	92.2	174.4	249.1	251.7	315.0	293.5	209.0	228.1	NA
Domestic debt	247.7	331.1	371.5	418.0	460.4	567.9	615.4	687.9	692.3	NA
Foreign Debt (\$ Billion)	12.6	146.0	151.8	145.7	170.1	171.4	1,936.3	228.6	281.0	NA

(\*) Data for the first quarter

Source: PRC National Bureau of Statistics (NBS), China Statistical Yearbook, 2004: The People's Bank of China

Notes:

1. All figures are in billions of RMB or percentage unless otherwise indicated.

**Table 11 – China Gross Domestic Product Growth Rate Forecasts for 2007:**

<b>2007 GDP FORECASTS (%)</b>	
Asian Development Bank	10.0
Chinese Academy of Social Sciences	10.9
Citigroup	10.3
Deutsche Bank AG	10.0
HSBC	10.0
International Monetary Fund	10.0
JP Morgan Chase	10.0
People Bank's of China	10.0
Standard Chartered plc	9.7
UBS AG	9.5
World Bank	10.4
Economist Intelligence Unit	10.5

Source: the US-China Business Council, Economist Intelligence Unit  
Country Reports

**Table 12 – Foreign Direct Investment Inflows to China and Hong Kong:**

<b>FOREIGN DIRECT INVESTMENT INFLOWS...</b>	<b>TO CHINA</b>	<b>TO HONG KONG</b>
2004	64.07	450.56
2005	63.80	518.96

Source: China Statistical Yearbook 2006, the Government of the Hong Kong  
Special Administrative Region Census and Statistics Department

Notes:

1. The values for Hong Kong were presented in HK\$ and exchange rate of 1  
HKD = 0.127931 USD is used to convert these figures.

**Table 13 – Inward and Outward Direct Investment of Hong Kong by Major Economic Activity of Hong Kong Enterprise Groups at Market**

**Value:**

<b>Inward Direct Investment (DI) of Hong Kong by Major Economic Activity of Hong Kong Enterprise Groups at Market Value (in HK\$)</b>					
	2001	2002	2003	2004	2005
Financial institutions other than banks and deposit-taking companies	110.90	90.70	108.80	148.90	155.90
Banks and deposit-taking companies	365.30	325.40	414.60	481.20	510.00
<b>Inward Direct Investment Total</b>	<b>3,269.70</b>	<b>2,622.30</b>	<b>2,960.40</b>	<b>3,521.90</b>	<b>4,056.30</b>
<b>Outward Direct Investment (DI) of Hong Kong by Major Economic Activity of Hong Kong Enterprise Groups at Market Value (in HK\$)</b>					
	2001	2002	2003	2004	2005
Financial institutions other than banks and deposit-taking companies	63.70	60.00	40.90	72.30	83.20
Banks and deposit-taking companies	34.50	28.50	41.80	58.90	96.50
<b>Outward Direct Investment Total</b>	<b>2,749.20</b>	<b>2,412.90</b>	<b>2,636.70</b>	<b>3,133.60</b>	<b>3,653.90</b>

Source: the Government of the Hong Kong Special Administrative Region Census and Statistics Department

Notes:

1. A Hong Kong Enterprise Group (HKEG) mainly consists of a Hong Kong parent company, its Hong Kong subsidiaries, associates and branches.

**Table 14 – Definitions and Sources of Data for Hong Kong:**

Variable	Source of Data	Definition
<b>Nominal Exchange Rate</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	Effective Exchange Rate (Nominal) (2000=100) CBRT Monthly. Effective exchange rate index calculated using the IMF weights for 36 countries. An increase in the index denotes an appreciation.
<b>REXCH HK</b>		Nominal Exchange Rate divided by CPI
<b>Stock Market Price Index</b>	the Hong Kong Exchanges and Clearing Limited ( <a href="http://www.hkex.com.hk/">www.hkex.com.hk/</a> )*	Closing values of All Ordinaries Index series announced by the Hong Kong Exchanges and Clearing Limited (HKEx)**.
<b>V HK</b>		Stock Market Price Index monthly data is recalculated monthly by taking averages for each month ((summation of closing indices for month)/(number of observations for that month)). Stock Market Price Index Monthly-CPI ratio is denoted by "V HK".
<b>Foreign Assets</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	Foreign Assets of the Banking Sector.
<b>RFASS HK</b>		Foreign Assets-CPI ratio
<b>Foreign Liabilities</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	Foreign Liabilities of the Banking Sector.
<b>RFLIAB HK</b>		Foreign Liabilities-CPI ratio
<b>CPI HK</b>	International Monetary Fund International Financial Statistics ( <a href="http://ifs.apdi.net/imf/">http://ifs.apdi.net/imf/</a> )	Source S. Weights reference period: 2004–2005; Geographical Coverage: The whole HKSAR territory; Number of Items in Basket: 984; Basis for Calculation: The weights are derived from the expenditure patterns of households collected from the Household Expenditure Survey, and the indices are re-based and the weights revised every five years.

Notes:

(\*) "Hong Kong Exchanges and Clearing Limited (Chinese: 香港交易及結算所有限公司, also 香港交易所 or 港交所; abbreviated as HKEx; SEHK: 0388) is the stock exchange of Hong Kong. HKEx is the holding company for The Stock Exchange of Hong Kong Limited (SEHK), Hong Kong Futures Exchange Limited (HKFE) and Hong Kong Securities Clearing Company Limited. HKEx was formed in March 6, 2000 by a merger of its three main constituent companies. The company itself is listed on its own exchange, the HKSE. As of 2006, the Hong Kong Stock Exchange ranks 8th in the world by market capitalization of listed companies."

This information is acquired from [www.hkex.com.hk](http://www.hkex.com.hk)

(\*\*) All Ordinaries Index (AOI) is a representative of the Hang Seng Index (HSI), which is a capitalization-weighted stock market index in the Hong Kong Stock Exchange showing the daily changes of the largest companies of the Hong Kong stock market as the main indicator of the overall market performance in Hong Kong.

**Table 15 – Augmented Dickey Fuller Test for Unit Root Hong Kong:**

**Augmented Dickey Fuller Test for Unit Roots**

Variable Definition	Variable	ADF Test Statistics with constant	ADF Test Statistics with constant and linear trend
Real Effective Exchange Rate	REXCH HK	-2.0649	-2.4960
First Difference of Real Effective Exchange Rate	DREXCH HK	***-8.1690	***-8.1603
Real Stock Return Indices	V HK	-1.1713	-2.2392
First Difference of Real Stock Return Indices	DV HK	***-8.3728	***-8.5783
Real Foreign Assets of Banking Sector	RFASS HK	-0.9376	-0.7946
First Difference of Real Foreign Assets of Banking Sector	DRFASS HK	***-10.7617	***-11.2790
Real Foreign Liabilities of Banking Sector	RLIAB HK	-0.9376	-0.7946
First Difference of Real Foreign Liabilities of Banking Sector	DRFLIAB HK	***-10.7617	***-11.2790

Source: Author's own calculations via E-views

Note:

1. Test critical values (with constant) for 1 %(\*\*\*) , 5 %(\*\*) , 10 %(\*) are -3.473096; -2.880211; -2.576805 respectively.
2. Test critical values (with constant and linear trend) for 1 %(\*\*\*) , 5 %(\*\*) , 10 % (\*) are -4.0,18748; -3.439267 ; -3.143999 respectively.

**Table 16 – Test for the Number of Cointegrating Vectors for Hong Kong (Model 1):**

**Cointegration Analysis Model 1**

<b>Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix</b>		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r=1	**24.82
r<=1	r=2	14.09
r<=2	r=3	2.13
<b>Cointegration LR Test Based on Trace of the Stochastic Matrix</b>		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r>=1	**41.21
r<=1	r>=2	16.38
r<=2	r>=3	2.28

Source: Microfit Output

**Note:**

1. (\*\*) denotes rejection of null hypothesis at both 5 % and 10 % significance levels.
2. Cointegration with no intercepts and no trends in the VAR is adopted with 153 observations from 1994M4 to 2006M12. Order of VAR = 1.
3. List of variables included in the cointegrating vector: REXCH HK, V HK, RFASS HK and DUM98 HK. List of eigenvalues in descending order: 0.14979; 0.088017; 0.013883 and 0.9636e-3, respectively.
4. r is the number of cointegrating vectors.

**Table 17 – Estimated Cointegrated Vectors in Johansen Estimation for Hong Kong**

**(Model 1):**

**Cointegration Analysis Model 1**

<b>Estimated Cointegrated Vectors in Johansen Estimation</b>	
	VECTOR 1
REXCH HK	0.2053 (-1.0000)
V HK	0.0035 (-0.0171)
RFASS HK	-0.0000 (0.0000)
DUM 98 HK	-0.0450 (0.2191)

Source: Microfit Output

Note:

1. The normalized coefficients are given in brackets.
2. Cointegration with no intercepts and no trends in the VAR is adopted with 153 observations from 1994M4 to 2006M12. Order of VAR = 1, chosen  $r=1$ .
3. List of variables included in the cointegrating vector: REXCH HK, V HK, RFASS HK and DUM98 HK.

**Table 18 – Test for the Number of Cointegrating Vectors for Hong Kong (Model 2):**

**Cointegration Analysis Model 2**

<b>Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix</b>		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r=1	**43.81
r<=1	r=2	17.80
r<=2	r=3	3.15
<b>Cointegration LR Test Based on Trace of the Stochastic Matrix</b>		
Null Hypothesis	Alternative Hypothesis	Statistic
r=0	r>=1	**64.78
r<=1	r>=2	20.97
r<=2	r>=3	3.16

Source: Microfit Output

**Note:**

1. (\*\*) denotes rejection of null hypothesis at both 5 % and 10 % significance levels.
2. Cointegration with unrestricted intercepts and no trends in the VAR is adopted with 153 observations from 1994M4 to 2006M12. Order of VAR = 1.
3. List of variables included in the cointegrating vector: REXCH HK, V HK, RFLIAB HK and DUM98 HK. List of eigenvalues in descending order: 0.24900; 0.10988; 0.020425 and 0.5170e-4, respectively.
4. r is the number of cointegrating vectors.

**Table 19 – Estimated Cointegrated Vectors in Johansen Estimation for Hong Kong**

**(Model 2):**

**Cointegration Analysis Model 2**

<b>Estimated Cointegrated Vectors in Johansen Estimation</b>	
	VECTOR 1
REXCH HK	1.4035
	(-1.0000)
V HK	0.0017
	(-0.0012)
RFLIAB HK	-0.0000
	(0.0000)
DUM 98 HK	0.2069
	(-0.1474)

Source: Microfit Output

Note:

1. The normalized coefficients are given in brackets.
2. Cointegration with no intercepts and no trends in the VAR is adopted with 153 observations from 1994M4 to 2006M12. Order of VAR = 1, chosen  $r=1$ .
3. List of variables included in the cointegrating vector: REXCH HK, V HK, RFLIAB HK and DUM98 HK.

**Table 20 – Orthogonalized Impulse Response of REXCH HK to Shock in Equation for RFASS**

**HK and RFLIAB HK:**

	<b>Orthogonalized Impulse Response of REXCH HK to one S.E. Shock in the Equation for RFASS HK</b>	<b>Orthogonalized Impulse Response of REXCH HK to one S.E. Shock in the Equation for RFLIAB HK</b>
Horizon	REXCH HK	REXCH HK
0	0.00000	0.00000
1	-2.80E-04	0.00187
2	-5.55E-04	0.00339
3	-8.25E-04	0.00462
4	-0.00109	0.00562
5	-0.00135	0.00642
6	-0.00161	0.00708
7	-0.00186	0.00761
8	-0.00210	0.00804
9	-0.00235	0.00839
10	-0.00258	0.00867

Source: Microfit Output

Note:

1. (\*\*) denotes rejection of null hypothesis at both 5 % and 10 % significance levels.
2. Cointegration is adopted with 153 observations from 1994M4 to 2006M12. Order of VAR = 1.