

## **THE WORLD FIRST RENMINBI OFF-SHORE FINANCIAL CENTRE HONG KONG, CHINA: The Effect and Impact of RENMINBI to the Hong Kong Economy**

### **Ping-fu LAI**

Peking University - Hong Kong University of Science and Technology  
Shenzhen Hong Kong Institution, China  
E-mail: [dr.lai1000@yahoo.com](mailto:dr.lai1000@yahoo.com)

### **Otto Wing-hung LAU**

ABRS International Information and Consultancy, Hong Kong  
E-mail: [wholau@yahoo.com](mailto:wholau@yahoo.com)

### **ABSTRACT**

*Since the handover on 1 July, 1997, Hong Kong reunified with China and commenced its new era as one of the Special Administrative Regions in China. Yet, after 1997, Hong Kong Dollar (HKD) still maintained the fixed exchange rate system with its peg to the US Dollar (USD), which has been undergoing depreciation in the recent years. The currency regime together with the rising tide of (Renminbi) RMB exchange rate would certainly give in some extent an impact on Hong Kong's economy and in the role as a financial centre both in the near future. In the analytical part, a few variables were selected in the equation for ANOVA by multiple regression model, based on the outcome of the literature review and review of variables including RMB deposit rate, RMB deposit in Hong Kong, HKD deposit rate, Hang Seng index, Hong Kong inflation rate and RMB exchange rate. In term of differences between the lagged scenario of one quarter year in taking into consideration of any lagging effect on the economy, the findings show very little difference although it is noted from comparing the p-values from the lagged cases would be the significant. That is, the RMB exchange rate has direct impact with the economy of Hong Kong represented by the Hong Kong GDP growth.*

**Keywords:** *off-shore, financial centre, renminbi, fixed exchange rate system, us dollar peg*

### **1. INTRODUCTION**

In the recent decades, there are two major episodes which took place in both Hong Kong's financial and political structure. The first episode is early 1980s prior to the handover in 1997 when Hong Kong caught the international stage's attention mostly as a result of its phenomenal economic success under the British administration. The second episode can be described to be the post-1997 period as Hong Kong was integrated to China as one of special administration regions in China and has been enjoying the flexibility and support from China in various aspects across the economic activities in Hong Kong. With the continuing international pressure to China on its exchange rate policy, evolution of the RMB exchange rate regime has been one of the hot topics in recent years. It is believed that the continuing appreciation of the RMB against the US dollar and Hong Kong dollar and the related speculations have been one of the major driving forces to Hong Kong's financial markets and economic activities. The problems incurred by the appreciation in RMB and fund inflows would likely give an impact to the Hong Kong's economy.

## 2. LITERATURE REVIEW

In most countries, their currencies are usually allowed for free floating in the market with their exchange rates subject to the corresponding global demand which are primarily related to worldwide and local economic climate as well as other data including employment rates, productivity analyses and import/exports data. The free floating exchange rates have been serving a mechanism to deal with trade imbalances relative to another country. In contrast, for country, like China, fixed exchange rate regimes has been adopted as an effective means for developing countries by ensuring more stable prices to a controlled economy. In recent years, China's economy has experienced rapid development and the rising international status. With the continued depreciation of US dollar, pressure to China on the appreciation of RMB has been progressively developed. First, in 1994, China set a reference rate for the RMB against the USD, marking a new stage for the exchange rate regime. Second, in 2005 (HKTDC, 2005), after much political wrangling, China took the decision to de-peg its currency, RMB, from the US dollar. This was China's first significant milestone to its full removal of capital controls. People's Bank of China (PBoC) has deployed the floating exchange rate mechanism with reference to a basket of currencies, and adopted a managed float against a basket of currencies. Since then, there have been speculation and trend of appreciation of RMB in its exchange rate. In this literature review, exchange rate regimes and appreciation of RMB are reviewed.

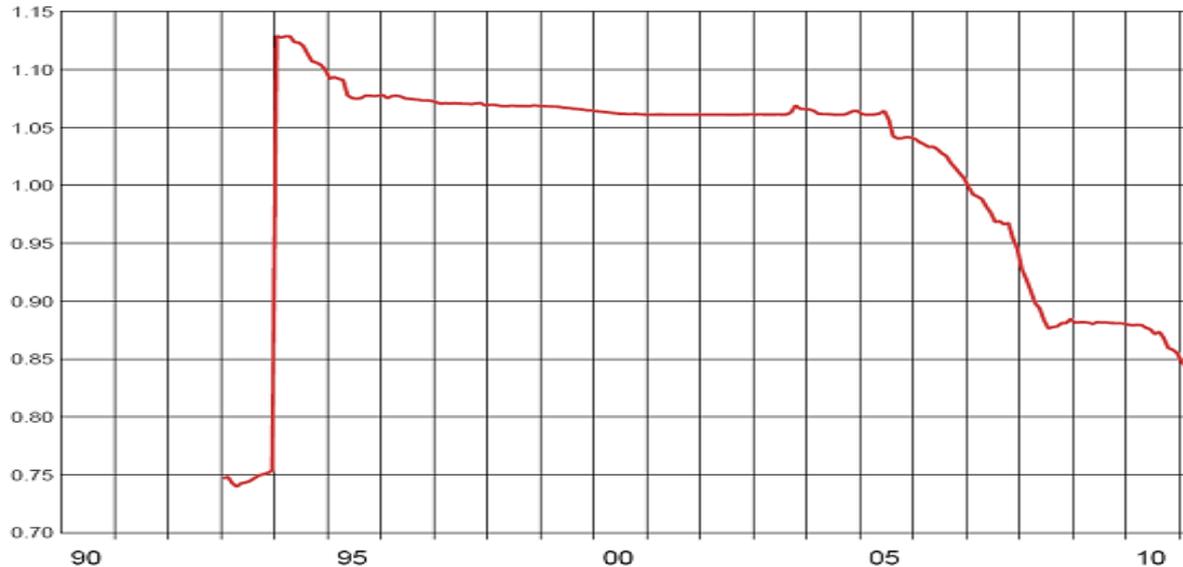
### ***Background of RMB Exchange Rate Regime***

In history, the exchange rate regime of the RMB which is the official currency of the People's Republic of China (PRC), has undergone a few major development phases and milestones including a single official rate regime, dual track rate regime and a market-based managed floating regime. At an early stage from 1949 to 1952, the exchange rate of the RMB in PRC was subject to regular adjustment. During the following period from 1953 to 1970, the exchange rate of RMB had undergone a relatively stable period. With the convertibility of the USD into gold suspended on 15 August 1971 (Gowa, J. 1983), the RMB had started to appreciate against the USD. An effective rate for the RMB against the USD was first listed in April 1972. The China's foreign exchange reform was solely driven by the foreign trade through two major stages:-

- (a) The first stage in 1979-1993 was focused on gradual changes on China's foreign exchange policy through improving incentives and adopting a dual foreign exchange rate system. The official RMB rate remained pegged to a basket of 15 currencies until 1980. During the period of 1981-1985 and 1985-1993, the RMB was placed on a dual track system which composed of the coexistence of both official rate and trade-related settlement rate, and coexistence of both official rate and swap market rate. Subsequently, the Chinese currency was pegged to the USD and allowed to float with a narrow band for more than one decade.
- (b) The second stage started in 1994 when the foreign exchange market was unified and its current account was made convertible. Both processes of reformation were taken place in a smooth manner. On 1 January 1994, the People's Bank of China (PBoC) announced a reference rate for the RMB against the USD, marking a new stage for the exchange rate regime. In accordance with the announcement, daily movements of the exchange rate of the RMB against the USD were capped at 0.3 per cent on either side of the reference rate announced by the PBOC. The unified exchange rate ended the prolonged situation of overvaluation of RMB and reversed the persistent trend of decline. During the Asia financial crisis in 1997, as the PRC did not allow the RMB to devalue while most of the Asian currencies were weakened against the USD from 1997 to 2001, the RMB became one of a few currencies in emerging markets remaining in strong form. The exchange rate of RMB to the Hong Kong Dollar (HKD) for the period of 1994 to 2010 is tabulated in table 1.

**Table 1**

**Monthly Avg. Exchange Rates: Chinese Renminbi per Hong Kong Dollar**



**Revaluation of RMB Exchange Rate under testing water**

A number of researches on the topic of RMB exchange rate and its regime have been carried out in the past and recent years. Some of those researches Tyers and Zhang (2010), Coudert, Virginie, and Couharde, Cécile, (2005), Funke, Shi, Jianhuai and Yu, Haifeng (2005) were attempted to identify any possible misalignment of the currency compared to its estimated real equilibrium rate. With regards to an equilibrium level of the exchange rate, lessons had been learnt some years ago in Japan on the sharp appreciation of the Japanese Yen (Kanamori and Zhao 2005). Bergin and Feenstra (2008) found that change in exchange rate of RMB would affect the U.S. imports and that the appreciation of the RMB would lead to more expensive Chinese exports. According to Marple et al. (2008), certain economic variables would affect the exchange rate of the RMB against US Dollars and five variables were considered to give high correlation with the Chinese exchange rate:- (1) annual Inflation; (2) annual GDP Growth; (3) household Consumption; (4) growth; (5) unemployment and exports of goods & services.

Critics for RMB appreciation or depreciation were considered as both an internal and external issue. Internally, both imports and exports have shown steady growth and that foreign exchange reserves also reached historical high. Externally, the US has been encountering a few difficulties in its economy in particular after the burst of its “bubble” economy in 2000 and 2008. In combining with Japan’s deflation and the weak recovery in economy in most European countries, the situation as a whole has further imposed pressure onto the China to expedite the revaluation of its currency. This progressively gives rise to some debates on the revaluation of the RMB. Revaluation of the RMB has been in discussion by Suzuki (2001) and Fujiki (2003) on ways of easing trade friction and to lessen the competition for foreign direct investment (FDI) in the global currency system. As China with its gross domestic product (GDP) and trade volume exceeded that of Japan in 2010 and became a key player in the Asian free trade regime, revaluation of RMB has become a more serious global issue.

On 21 July 2005, an important step was taken by China, when the People’s Bank of China (PBoC) announced a 2.1 per cent revaluation of the RMB against the USD, and that the RMB would be managed with respect to a basket of currencies instead of solely against the USD. It also indicated that the managed floating exchange rate based on the market supply and demand would be further strengthened and that the RMB exchange rate based on a basket of currencies depending on market condition was made more flexible.

Under the regime of monopoly of foreign trade, all import and export contracts with foreign corporations could only be signed by certain authorized import and export corporations. Most of these foreign trade corporations (FTCs) had to surrender their foreign exchange earnings to and purchase foreign exchange from the Bank of China at the official exchange rate and any profit or loss as a result was absorbed by the state budget. The traders under this regime would have no incentive to make trade adjustments in response to any price changes and exchange rate policy. The changes in the official exchange rate would redistribute financial profits and losses across different import and export products as well as among various individual FTCs and such losses would not be reflected in the overall balance of trade (Lardy 1992). According to Feenstra (1998), it was widely recognized that bilateral trade volumes were affected by the trading countries. Tyers and Zhang (1999) demonstrated a strong reversal of the earlier tendency for the real exchange rate and examined the exchange rate target as monetary policy. It was concluded that the consequences would be harmful to both Chinese and global interests should the Chinese government either responded to international pressure with an inappropriate nominal revaluation or imposed some form of restriction on its exports.

He Fan (2004) presented an argument on the situation of the USD resulted from the strong USD policy in the 1990s. In an article published in the *Financial Times* (26 August 2003) and the *Asian Wall Street Journal* (12 September 2003), Goldstein and Lardy (2003) argued that China aggravated the problem by joining the cheap dollar. Goldstein and Lardy (2004) repeated this view on the undervaluation of the RMB.

Lau et al. (2004) found insufficient evidence to suggest that the RMB is undervalued and that an appreciation of the RMB would not result in any increase in Chinese imports from the US with China's trade surplus declining due to strong imports. It was also opined that China's growing trade surplus with the US was largely due to its role being the final processing base of Asia's production network and that the large US current account deficit was related to structural problem of low savings rate in the US, which could not be fully corrected simply through exchange rate adjustments. It was shown that any appreciation of the RMB would have insignificant impact in the correction of the US current account deficit and the exchange rate was not a significant determinant of China's imports for domestic use.

Golley et al. (2006) carried out some work on the interactions by means of complex dynamic modelling conditions under which the Chinese real exchange rate would appreciate. It was found that increased net capital account inflows might be induced by financial reform only in the short run and that skill-upgrading and services productivity would depreciate in the long run. Morrison and Labonte (2008) stated that almost 60% of Chinese exports came from foreign multinationals in China and that the tariff would also give an adverse effect to the many US and other foreign companies exporting from China to the US. According to Ikenson (2010), Koopman et al. (2008) and Lau et al. (2006), a tariff on goods imported from China could also hurt US in areas such as engineering, design, finance, marketing, and retailing.

According to Lardy (2006), Prasad et al. (2005), Prasad and Rajan (2006) and Bernanke (2006), while the China had long been committed to maintaining a stable nominal exchange rate, it had been created an increasing pressure for the Chinese authorities to allow the currency to float more freely. Bergsten (2006) criticized that China had been keeping its own currency undervalued and that it would discourage most other Asian countries from allowing their currencies appreciating against the dollar for fear of losing competitiveness with China. At a U.S. congressional hearing in March 2007, Morris Goldstein (2007) echoed by Fred Bergsten (2007) opined that the RMB was overvalued by 40 percent against the US\$ and accused China of exchange rate manipulation. Subsequently, the US government urged China a timely revaluation of RMB and threatening China penalty of tariffs against merchandise from China and also to change regulations with respect to currency manipulation (Bhala, 2008).

According to Mussa (2007), a consenting China that enacts a gradual revaluation commencing at 10% to 15%, would be in US and Chinese interests. The economic effects

would be gradual. According to Engel 2009, Lee and Chinn 2006, Broda 2004, and Chinn 2004, the exchange rate was one of the main factors affecting trade balances, and any changes in exchange rate would have an immediate effects on US exports. According to McKinnon and Schnabl (2009), revaluation of RMB over time should have positive effects in reducing pressure on the US current account and US dollar and should also defuse inflationary pressures in China.

Tyers et al. (2008) conducted some work on quantifying the relationship between growing shocks and the Chinese real exchange rate using a dynamic model of the global economy. The results suggested that in the short run the financial capital inflows were appreciating and that in the long run the demographic forces were proved to be weak compared to skill transformation and services sectors. Tyers and Zhang (2010) used a dynamic general equilibrium model to simulate the economy and showed that, during this period, trade reforms and a rising national saving rate were offsetting forces in the presence of elastic labour supply. Tyers and Zhang (2010) also examined the possible determinants of the striking transition to real appreciation.

Qin (2010) carried out an assessment on the evolution of RMB exchange rate since 1949. From both historical and political perspectives, the Chinese exchange rate policy was found to be characterized by three factors - sovereign independence, pragmatism, and gradualism. It was anticipated that these factors would be adopted as the guiding principles behind the sequencing of capital and financial account convertibility, the liberalization of the RMB exchange rate, and the RMB internationalization strategy.

On 16 September 2010, the Treasury Secretary, Geithner, made an announcement that US would used every possible tool to urge China to let its currency appreciate more quickly and claimed China on the slow pace of appreciation. It was also claimed that China should follow through its announcement on 19 June 2010 to allow a greater flexibility in its exchange rate. In response to the above, China government reiterated its view that revaluation of RMB currency would not solve the U.S. trade deficit with China and unemployment problem in US and that it was unreasonable to politicize the RMB exchange rate issue or engage in trade protectionism against China. It was evident that there was no remarkable change in the U.S. trade deficit with China even with the appreciation of 21 % of RMB against the U.S. dollar ever since China started the reformation of RMB exchange rate formation mechanism in July 2005.

### ***Appreciation of RMB and its implication to Hong Kong economy***

As highlighted in earlier section, driven by pressures from the market as well as by external factors, different reforms and opening up of policy for RMB exchange rate system had been evolved throughout the past years. In the recent years, many indicators, including the sustaining trade surplus, massive capital inflows, rising foreign reserves and strong economic growth, have pointed to further strengthening of the RMB in the years ahead. Other than the internal factors, persistent US pressure for a substantial appreciation of the RMB is also an important factor. With the deepening economic ties between Hong Kong and mainland China, it is worth assessing how a continuing rising RMB could affect the Hong Kong economy.

China's currency regime has been one of the most visible hotspots in the U.S.-China relationship. Some of U.S. Governors and economists have strong view on China's RMB exchange rate regime for its policy. With the announcement by China on 21 July 2005, together with other reforms associated with the preceding long-standing arrangements, a 2.1% appreciation of the RMB and a fluctuation limit of 0.3 % per day for the RMB against the dollar was established. Even with such RMB exchange rate formation mechanism implemented in July 2005, no remarkable improvement in the U.S. trade deficit with China was seen. Since 2005, the RMB has been appreciating gradually, indirectly discouraging marginally priced exports and curbing inflation and while HKD is limited by the peg with the USD, the contradiction was making the Hong Kong's imports more expensive (McGregor, 2008). Such conditions have stimulated flee from HKD to RMB in speculation of capturing the

profits from RMB appreciation and the interest rate difference (Kwong 2008). According to BirdBill (2005), in the long run effects due to the reform of RMB exchange rate system and its revaluation are deemed to be significant and inevitable for Hong Kong if it is to continue with its link exchange rate system, especially towards its economic and financial markets.

Exchange rate movements should theoretically affect an economy's external trade. However, according to *Hang Sang Economic Monthly April 2006*, it was shown that exchange rate movements gave limited influence on Hong Kong's external trade due to the speed of globalization and the fact that Hong Kong has been evolved from a manufacturing to a service economy during the past two decades. Domestic economic condition in fact has played a central role in influencing inflation. Moreover, the impact of a rising RMB on imported products would not be such significant. During the period of 1999-2003, Hong Kong has emerged from the deflationary cycle. Statistics data showed that speculation over a possible appreciation of RMB has attracted substantial flows of funds flowing into Hong Kong. With the opening of financial markets and China-related assets such as H-shares in the Hong Kong stock market, investors have been provided a positive exposure to the Mainland. Under the linked exchange rate system with US dollar at 7.80, this influx of funds has provided a low-interest environment giving rise to the Hong Kong financial markets to become more volatile. With the rising RMB and closer linkages between Hong Kong and China, the rising RMB would likely give an impact to Hong Kong in its economy and financial market.

An appreciating RMB would impact the Hong Kong economy in direct and indirect ways. Indirectly, it spurs capital inflows into Hong Kong, drives down local interest rates, creates a low-interest environment giving an opportunity on substantial wealth effects from a surging stock market. On the contrary, one of the negative impacts due to the appreciation in RMB would be on Hong Kong manufacturers in the Mainland who engage in labour intensive processing trade. As the initial public offerings (IPO) of China enterprises and other H share and red chip companies are priced in Hong Kong dollar, international capitals would look at China being a good opportunity for investment in view of the growth and the premiums embedded in Chinese shares due to the RMB appreciation. When RMB is traded freely and fully convertible, and when the A-shares have the same prices as the H-shares for the same companies, then companies and investors would opt for the market where they can transact most efficiently. With the expectation of the rising RMB, Hong Kong will continue to attract foreign investment on China's companies with high growth, and the rising H-share prices which are still dominated in Hong Kong dollar.

Hong Kong is one of the major holders of US bonds after mainland China and Japan. In recent years, Hong Kong has started to introduce various kinds of RMB financial services including RMB bonds to investors. According to Heng, Cao, Li & Yang (2007), investors generally hold an optimistic towards the RMB bonds due to the relatively low interest rate for HKD deposits in Hong Kong and the expectation of depreciation of the HKD in the longer term. RMB exchange rate would certainly has an impact on HKD especially when Hong Kong gradually provides more and more RMB denominated services. For instance the price level of goods in Hong Kong has already been escalating as HKD continues to depreciate against RMB. According to Fan & Yim (2008), the outlook for inflation in Hong Kong could have three possible scenarios – namely “industrial world downturn”, “global slowdown”, and “global stagflation”. According to Yuan (2007), a 1% rise in RMB/USD would give rise to 0.3% increase in Hong Kong's CPI. Therefore, the overall risk of inflation in Hong Kong when RMB appreciates should not be neglected (Xinhua News Agency, 2007). Apart from the imported inflation due to food and consumer products from China, statistics showed that Hong Kong's average consumer inflation was driven mainly by domestic factors such as rental and miscellaneous services prices. In general, currency depreciation would give an injection to economic growth but, without any free lunch, at the cost of higher inflation. Therefore, a strengthening RMB is likely to have an impact on Hong Kong's financial system.

There are many diverse factors which contribute to the creation of a long-lived world-class financial centre and can be summarized briefly into the following important features including a stable and open political and economic regime; fair, transparent, efficient and

reasonable legal, regulatory and tax regimes; a skilled labour force and flexible labour regime; and high quality physical infrastructure. i) An open and fair market for domestic and foreign investors is essential dimension for a world-class financial centre. Open financial markets can attract world-class best practices, cutting edge technology, and the financial sector efficiency giving rise to the strengthened institutional capacity, high quality regulation and supervision, and transparency of the system as featured in world-class markets. ii) A free flow of capital and a convertible currency is important to provide the investors, either international or domestic, with a platform to convert the domestic currency into the currency of their choice for the large volume of financial flows in low administrative costs. Portfolio investment could boost economic growth and job creation adding spillover effects for a vibrant economy paving for a major financial center. iii) Skilled Workforce and flexible labour Laws. It is important to ensure sufficient availability of skilled workers including post-graduates to office workers across in the market.

### ***Hong Kong Dollar, US dollar and RMB***

Over the past years, the link system for HKD and USD has served well to maintain the stability of HKD and helped Hong Kong as an international financial and trade centre (Xinhua News Agency, 2007). In January 2007, the RMB reached the 1:1 psychological level against the Hong Kong dollar as RMB continues to appreciate against the USD while the HKD is confined to a trading band of 7.75 to 7.85 against the USD in the course of depreciation against RMB. For many years, the HKD has been pegged to the USD and so was the RMB until the exchange rate reform in 2005, mainland enterprises and individuals had encountered little exchange risk to over those years. Over the past few years, the USD has been depreciating significantly. The instability of the USD will definitely affect the stability of the HKD as it pegged with USD. This in turn would induce an unstable HKD and hence an adverse effect on the economy of Hong Kong. If USD shows further weakness against RMB, the foundation of the link will be at threat, giving rise to an impact on the peg between HKD and the USD.

### ***Hong Kong's RMB business and its role to become an offshore financial centre***

In early 2004, Hong Kong's financial institutions was first authorised to start conducting deposit-taking, remittance, currency conversion and bank card businesses. Hong Kong has also authorized as a designated offshore RMB clearing centre. In July 2007, the issuance of RMB bonds in Hong Kong by Mainland financial institutions was commenced. In July 2009, Hong Kong further became the sole proving ground for cross-border RMB trade settlement and started to operate RMB trade settlement and finance. Hong Kong has now become a widely noticed offshore RMB business base. On 19 July 2010, PBoC and the Hong Kong Monetary Authority (HKMA) signed a significant agreement on the conduct of RMB business in Hong Kong. Under the agreement, interbank transfer of RMB deposits in Hong Kong is allowed and there will no longer be any restriction on RMB exchanges by companies in Hong Kong for funds within the territory. Such new arrangement would help accelerate the development of Hong Kong as an offshore RMB centre, and to accelerate the internationalisation of the RMB and further strengthen the foundation of Hong Kong as a financial centre on the international stage.

The expansion of the business to RMB related trades has been notable since 2004 when RMB business was first launched in Hong Kong under the authorisation of the PBoC. Hong Kong was first only permitted to provide RMB deposit, exchange and remittance and credit card services to personal customers was subsequently relaxed in 2005 to provide similar services to other business groups including retail sales, beverage and transports. Further relaxation was provided in 2007 when the authorities allowed Mainland financial institutions to issue RMB bonds in the territory.

The real breakthrough of RMB deposit was in July 2009 when the Mainland authorities allowed the settlement in RMB for cross-border trades between Hong Kong/Macau and Shanghai/four Guangdong cities, and between the Association of Southeast Asian Nations (ASEAN) and Yunnan/Guangxi. In June 2010, cross border trade settlement in RMB was

further expanded to 20 provinces/ municipalities on the Mainland and to all countries/ regions overseas. As in July 2010, there have been 64 banks in Hong Kong participating in RMB business, with RMB deposits amounting to above RMB 85 billion. RMB bonds issued also reach RMB38 billion. As RMB steps closer towards an international currency, there exists an excellent opportunities for the local financial industries in Hong Kong in particular to becoming an offshore financial centre for RMB business associating various RMB financial products. It would also become an investment vehicle as well as an international reserve currency, pushing ahead as an international currency. All these moves would enhance Hong Kong's position as an international financial centre.

The fundamental objective of financial intermediation is to mobilise idle savings to meet investment needs. To serve as a centre of financial intermediation for the Mainland, Hong Kong needs to develop its capability in three areas on diverting saving Hong Kong's capacity to settle transactions in major world currencies including the US dollar and the euro constitutes a unique competitive advantage for Hong Kong to become a payment and settlement hub for the Asia-Pacific region. This potential is further strengthened by Hong Kong's role as a window to China through our cross-border payment links with the Mainland. A platform of multi-currency and multi-dimensional is an essential element for Hong Kong, such that Hong Kong is capable of processing transactions in major world currencies including the US dollar and the euro creating a unique competitive advantage for Hong Kong to become a payment and settlement hub for the Asia-Pacific region. This position is further strengthened by Hong Kong's role as a window to Mainland through the cross-border payment links with the China.

### ***Hong Kong's economy and its beneficiary role as offshore RMB market***

Companies that have cross-border businesses are anticipated to have RMB balances in their offshore bank accounts. As RMB has become widely used as the currency for trade settlement in Hong Kong, investors would possibly seek instruments with higher returns, instead of letting money saved the deposit account for marginal interests. Investment in the A-share market could be an ideal solution. It is anticipated that more A-share oriented investment products will emerge in the market. Further relaxation of RMB trading would give injection of potential in bonds and equities trading with the currency. In the coming years ahead, it is anticipated that more signings of currency swap agreements between China and its trading partners to take place, which reaffirm that the internationalization of RMB is under way.

Combined with the already established sound legal system and framework, free flow of capital and information, co-existence of both Chinese and Western cultures and simple low tax rate system, Hong Kong can be considered to be well placed in the operation of offshore RMB businesses. The development of Hong Kong's offshore RMB business would be dependent on the following factors as follows.

- (a) The Mainland's recognition and support. Since Hong Kong's reunification with the China, the central government has continued to foster Hong Kong's cross-border RMB trade settlement business, to provide continued support and to place high concern in Hong Kong to become as an international financial centre
- (b) Relevant regulations and policies. Since 2003, Hong Kong and the Mainland have signed several agreements establishing the basis for the operation of Hong Kong's offshore RMB business.
- (c) International demand for RMB businesses. As the RMB appreciates and remains to be a strong currency, investors would be prepared to hold RMB assets including deposits, bonds, stocks etc. The market's expectation on the RMB's appreciation and investment opportunities for the RMB would have significant positive impacts on offshore RMB deposits. RMB investment products (e.g. bonds, stocks, investment funds, derivatives etc.) would best serve the needs of overseas investors and also fit with the trend of Hong Kong's financial sector transformation as well as its market advantages. In fact, RMB business in Hong Kong started in 2004 and its activities has been expanded since then.
- (d) The ability of financial institutions to innovate. Apart from a sound and stable regulatory framework, the ability of financial institutions to innovate also plays an important role for the development of the offshore RMB market.

### 3. METHODOLOGY

#### **Multiple Analysis and associated variables considered in the model**

Following the first stage of literature review and second stage of various discussion with financial practitioners and experts, ideas on the methodology and the main variables have been formulated. The main theme of the study is to investigate the effect and impact of RMB exchange rate to the financial market in Hong Kong and the role of Hong Kong being an off-shore financial centre. The on-going appreciation of RMB is likely to give an impact to Hong Kong in its economy and financial market, representation in the model the gross domestic product (GDP). After the review of literatures in the preceding section, it was decided to examine the correlation of the following factors with the Hong Kong economy: (i) RMB deposit rate (% per annum), (ii) Total RMB deposits in HK (RMB B\$), (iii) HK deposit interest rate (% per annum), (iv) Hang Seng Index, (v) Hong Kong inflation rate (%) and (vi) RMB exchange rate to HK\$.

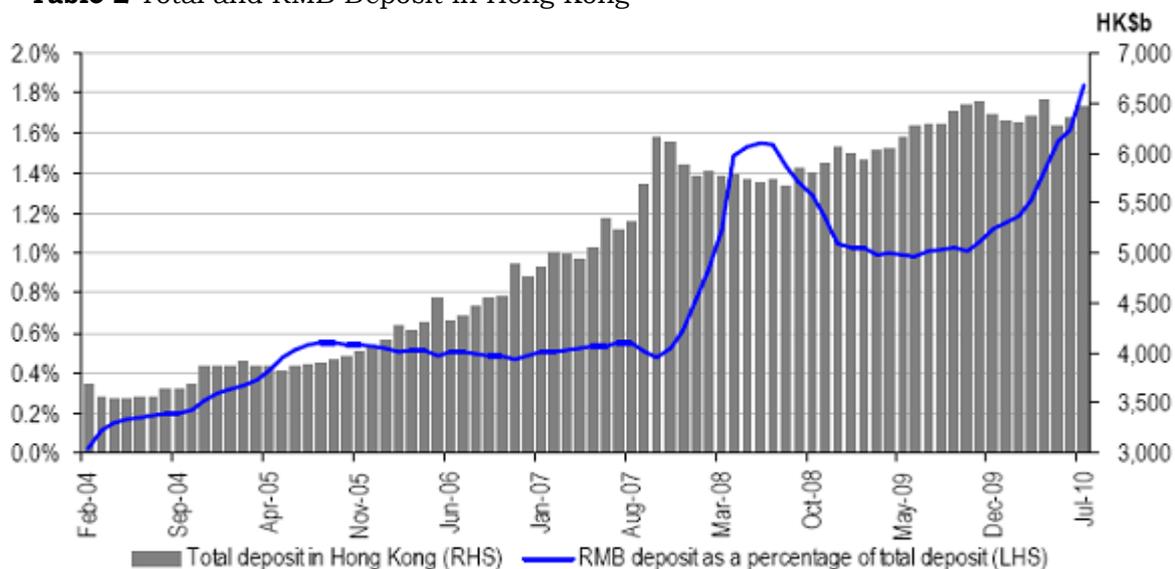
#### **Impact on Gross Domestic Product (GDP)**

According to Census and Statistics Department of the Hong Kong Special Administrative Region (HKSAR), GDP is defined as a measure of the total value of production of all resident producing units of a country or territory in a specified period, before deducting allowance for consumption of fixed capital. GDP can be measured using different approaches. For Hong Kong, GDP is compiled using the expenditure approach and the production approach. Under the expenditure approach, GDP is compiled as total final expenditures on goods and services (including private consumption expenditure, government consumption expenditure, gross domestic fixed capital formation, changes in inventories and exports of goods and services), less imports of goods and services. Under the production approach, GDP is the sum of the value added of resident producing units. Value added of a producing unit is the value of goods and services it produces less the value of goods and services it uses up in the course of production. GDP by economic activity shows the value added of individual economic activities and is adopted for the dependent variable (Y) in the regression model.

#### **Total RMB deposits in HK**

According to statistics published by the Hong Kong Monetary Authority, Hong Kong's total deposits with authorized institutions has shown fallen in its trend but RMB deposits has been growing table 2. The total remittance of RMB for cross-border trade settlement has been increasing. As the total RMB deposit in Hong Kong give an indication of inflowing of RMB to the Hong Kong financial market, RMB is adopted as one of the variables in the model.

**Table 2** Total and RMB Deposit in Hong Kong



### **Hang Seng Index**

The Hang Seng Index (HSI) is one of the best known indices in Asia and is widely used by fund managers as their performance benchmark and as the leading barometer of Hong Kong stock market. The regular adjustments of HSI constituent stocks have been made from time to time to reflect the importance of different industry sectors and to keep track of the closer economic ties between Hong Kong and China. It shows the HSI performance in the period from 2005 to 2009. The chart serves an indication on the level of economy performance in Hong Kong at the period of time since large extent of economies in Hong Kong are heavily dependent on financial services.

### **Hong Kong Inflation Rate**

Hong Kong has long enjoyed its advantage of a free market economy highly dependent on international trade and finance. According to The World Fact Book 2010, the GDP composition by sector includes 0.1% in Agriculture, 7.6 in Industry and 92.3% in Services (including the financial services). The raw data of Hong Kong inflation rate which are extracted from relevant web sites.

### **RMB exchange rate**

On July 21, 2005 the RMB de-pegged from the USD and was revalued by a one-off 2.0% against the USD to RMB\$8.11 per USD. Since then, RMB has shown a continued appreciation against the USD, and are likely to give an impact to Hong Kong in its economy and financial market. The effect and impact of RMB exchange rate on Hong Kong's economy is the main variable under investigation in the model.

### **Multiple Regression Hypotheses**

Null Hypothesis represents the hypothesis of no change or no effect due to the variable. For the analysis of the model under investigation, the statement for null hypothesis was assumed to be "RMB exchange rate has no direct correlation with the economy of Hong Kong represented by the Hong Kong GDP growth". The multiple linear regression technique was adopted in predicting the value of one dependent variable from the values of two or more independent variables and testing the hypotheses in a single model. The dependent variable would be the stress level of the participants. In the study, the rising RMB was believed to give an impact to Hong Kong in its economy and financial market and correlated variables involve the following factors:- (i) RMB deposit rate, (ii) Total RMB deposits in HK, (iii) HK deposit interest rate, (iv) Hang Seng Index, (v) Hong Kong inflation rate and (vi) RMB exchange rate.

The multiple regression equation are represented by  $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$ . Y is the value of the dependent variable (Y) for the economy of Hong Kong represented by the GDP growth of Hong Kong.  $X_1$  explains the variance in Y representing the RMB deposit rate (% per annum) in the regression model.  $X_2$  explains the variance in Y representing the total RMB deposits in HK (RMB B\$) in the regression model.  $X_3$  explains the variance in Y representing the HK deposit interest rate in the regression model.  $X_4$  explains the variance in Y representing the Hang Seng Index in the regression model.  $X_5$  explains the variance in Y representing the Hong Kong inflation rate (%) in the regression model.  $X_6$  explains the variance in Y representing the RMB exchange rate to HK\$ in the regression model. A total of 14 test cases including the delayed scenario of one quarter year to take into account of any lagging effect on the economy of Hong Kong denoted by Y, as a result of the variables in the model. The following test cases were considered in the multiple regression analysis:-

1	Model for variables $X_1, X_2, X_3, X_4, X_5$ and $X_6$
2	Model for variables $X_1, X_2, X_3, X_4, X_5$ and $X_6$ (lagged by 1 quarter year)
3	Model for variables $X_3, X_4, X_5$ and $X_6$
4	Model for variables $X_3, X_4, X_5$ and $X_6$ (lagged by 1 quarter year)
5	Model for variables $X_4, X_5$ and $X_6$
6	Model for variables $X_4, X_5$ and $X_6$ (lagged by 1 quarter year)
7	Model for variables $X_1$ and $X_6$
8	Model for variables $X_1$ and $X_6$ (lagged by 1 quarter year)
9	Model for variables $X_4$ and $X_6$
10	Model for variables $X_4$ and $X_6$ (lagged by 1 quarter year)
11	Model for variables $X_5$ and $X_6$
12	Model for variables $X_5$ and $X_6$ (lagged by 1 quarter year)
13	Model for variables $X_2$ and $X_6$
14	Model for variables $X_2$ and $X_6$ (lagged by 1 quarter year)

Output of the multiple regression analysis conducted for the above cases are tabulated in Table 3 to 4.

**Table 3** Output from Model for variables  $X_1, X_2, X_3, X_4, X_5$  and  $X_6$

<b>Regression analysis</b>						
Multiple R						0.91
R Square						0.82
Adjusted R Square						0.77
Standard Error						75.99
Observations						28.00
<b>ANOVA</b>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	6	549616.9	91602.8	15.9	7.94E-07	
Residual	21	121269.8	5774.8			
Total	27	670886.7				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower Limit 9%95% (Lower)</i>	<i>Upper Limit (Upper)</i>
Intercept	5130.69	620.98	8.26	0.00	3839.30	6422.08
( $X_1$ )	-6806.35	1218.05	-5.59	0.00	-9339.42	-4273.27
( $X_2$ )	0.42	0.62	0.67	0.51	-0.88	1.72
( $X_3$ )	-4.25	24.18	-0.18	0.86	-54.53	46.04
( $X_4$ )	0.00	0.00	0.87	0.39	-0.01	0.01
( $X_5$ )	-2.01	12.97	-0.16	0.88	-28.98	24.96
( $X_6$ )	-479.89	307.50	-1.56	0.13	-1119.37	159.60

**Table 4** Output from variables  $X_1, X_2, X_3, X_4, X_5$  and  $X_6$  (lagged by 1 quarter year)

<b>Regression analysis</b>						
Multiple R	0.85					
R Square	0.72					
Adjusted R Square	0.64					
Standard Error	94.77					
Observations	27.00					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	6	465779.02	77629.84	8.64	0.00	
Residual	20	179610.86	8980.54			
Total	26	645389.88				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower Limit 95% 9%95% (Lower)</i>	<i>Upper Limit 95% (Upper)</i>
Intercept	5298.50	988.18	5.36	0.00	3237.19	7359.80
( $X_1$ )	-6806.33	2036.46	-3.34	0.00	-11054.31	-2558.34
( $X_2$ )	0.38	0.78	0.49	0.63	-1.25	2.00
( $X_3$ )	-2.42	30.17	-0.08	0.94	-65.35	60.50
( $X_4$ )	0.00	0.01	0.43	0.67	-0.01	0.01
( $X_5$ )	11.90	16.18	0.73	0.47	-21.87	45.66
( $X_6$ )	-671.11	384.14	-1.75	0.10	-1472.40	130.19

#### 4 FINDING AND ANALYSIS

As mentioned, variables  $X_1, X_2, X_3, X_4, X_5$  and  $X_6$  respectively representing the following parameters were considered in the analysis; namely, RMB deposit rate (% per annum); total RMB deposits in HK (RMB B\$); HK deposit interest rate (% per annum); Hang Seng Index; Hong Kong inflation rate (%); and RMB exchange rate to HK. In an attempt to measure the effect of the lagging effect on the economy of Hong Kong correlating to the variables in the model, cases of lagged effect of one quarter year were also introduced in the test cases. A total of 14 test cases of different combination of the variables in the model over a period of six years from 2004 to 2010 including the following were carried out in the multiple regression analysis.

The main purpose of applying multiple regression technique in the analysis is to predict variables from one or more independent variables. Multiple regression with many predictor variables is an extension of linear regression with two predictor variables. A linear transformation of the  $X$  variables is done such that the sum of squared deviations of the observed and predicted  $Y$  is a minimum. The computations are more complex, however, because the interrelationships among all the variables must be taken into account in the weights assigned to the variables. The interpretation of the results from multiple regression analysis could be complex. For the work in this dissertation, the  $F$  test values,  $p$ -values and  $R$ -squares were captured in the output of the analysis. The null hypothesis refers to the case that each independent variable gives absolutely no effect or coefficient of zero. Hence, there is a strong a reason to reject this theory. For the model under investigation, a null hypothesis of “RMB exchange rate has no direct correlation with the economy of Hong Kong represented by the Hong Kong GDP growth” was adopted. Note that the size of the  $p$  value for a coefficient says nothing about the size of the effect that variable is having on the dependent variable - it is possible to have a highly significant result (very small  $p$ -value) for a miniscule effect.

Analysis of variance (ANOVA) as adopted in the model is a collection of statistical models and its purpose is to test for significant differences between means. Elementary Concepts provides a brief introduction to the basics of statistical significance testing. If we are only comparing two means, ANOVA will produce the same results as the t test for independent samples (if we are comparing two different groups of cases or observations) or the t test for dependent samples (if we are comparing two variables in one set of cases or observations). In the output of the regression analysis, the size of the coefficient for each independent variable gives the size of the effect that variable is having on the dependent variables, and the sign on the coefficient (positive or negative) gives the direction of the effect. The coefficients give the magnitude of the dependent variables expected in increasing (if positive) or decreasing (if negative) with increment of independent variable. In regression with multiple independent variables, the coefficient gives the magnitude of increment of the dependent variable expected with the increment of magnitude of the independent variables holding all the other independent variables constant. Coefficient for each independent variable for the following equation and test cases were conducted by means of the multiple regression analysis. Equation for multiple regression analysis model:  $Y_i = b_0 + b_1X_{1i} + b_2X_{2i} + \dots + b_kX_{ki}$ . In term of differences between the delayed scenario of one quarter year in taking into consideration of any lagging effect on the economy, the findings show very little difference although it is noted from comparing the *p-values* between the lagged and normal cases that the lagged cases would be the more significant model from a statistical point of view. From the finding of the analysis, the *p-values* were in general shown to be small and pointed that the null hypothesis is to be rejected. That is, the RMB exchange rate has direct correlation with the economy of Hong Kong represented by the Hong Kong GDP growth.

**Table 5** Summary of result for all cases (including delay cases)

Cases	Multiple Regression Equation	P-value for X6	t-value for X6	R square	F-value
Case 1	$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$	0.134	(1.56)	0.81	15.86
Case 2	<i>Lagged of an quarter</i> $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$	0.096	(1.74)	0.72	8.64
Case 3	$Y = a + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$	0.024	(2.42)	0.55	7.02
Case 4	<i>Lagged of an quarter</i> $Y = a + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$	0.011	(2.76)	0.56	7.14
Case 5	$Y = a + b_4X_4 + b_5X_5 + b_6X_6$	0.010	(2.81)	0.54	9.55
Case 6	<i>Lagged of an quarter</i> $Y = a + b_4X_4 + b_5X_5 + b_6X_6$	0.005	(3.11)	0.56	9.87
Case 7	$Y = a + b_1X_1 + b_6X_6$	0.001	(3.83)	0.80	51.25
Case 8	<i>Lagged of an quarter</i> $Y = a + b_1X_1 + b_6X_6$	0.001	(3.86)	0.69	27.45
Case 9	$Y = a + b_4X_4 + b_6X_6$	0.005	(3.09)	0.50	12.87
Case 10	<i>Lagged of an quarter</i> $Y = a + b_4X_4 + b_6X_6$	0.003	(3.31)	0.51	12.67
Case 11	$Y = a + b_5X_5 + b_6X_6$	0.001	(3.66)	0.52	13.53
Case 12	<i>Lagged of an quarter</i> $Y = a + b_5X_5 + b_6X_6$	0.001	(3.92)	0.54	14.44
Case 13	$Y = a + b_2X_2 + b_6X_6$	0.018	(2.52)	0.46	10.72
Case 14	<i>Lagged of an quarter</i> $Y = a + b_2X_2 + b_6X_6$	0.014	(2.65)	0.47	10.93

## 5. CONCLUSION

China Premier Wen Jiabao insisted that when revaluating the RMB, the PRC should consider not only its impact on the PRC's interest, but also on neighbouring countries and the rest of the world. Before the announcement of the 2% appreciation in July 2005, PRC authorities had gradually tried to lift foreign exchange controls to ease the external pressure. Since HKD is pegged to USD, purchasing power from PRC visitors in Hong Kong would be driven high and goods in Hong Kong would also become relatively cheaper than in mainland China. When Hong Kong's currency relatively depreciates against those of its trading partners, this enhances the competitiveness of its export sector and makes imported goods more expensive. At a cost of boosting up the retailing business in Hong Kong, property prices will be driven higher and higher followed by increase in inflation in due course. As a result, it may give a boost to economic growth but at the cost of higher inflation. As this is the trend that the RMB would likely have more flexibility and greater volatility, the Hong Kong government should be most cautious in tackling rising exchange risk in conducting businesses in the Mainland.

Hong Kong in the past years has enjoyed its position with a free market economy with main focus on international trade and finance. There is no doubt that Hong Kong can further develop offshore RMB businesses with its unique strength in the area, and play an important role in the internationalisation of the RMB. As an international financial centre, HKD stability is essential to capture the confidence among global investors. To a large extent, this depends on the management of Hong Kong Government and the economic conditions. As keeping the link exchange rate system has both positive and negative effects on the economy, the Government is faced with a dilemma as mentioned earlier. After reading much literature regarding the issue, it was found that there appears to be lacking a comprehensive report on the detailed impact of the RMB appreciation on Hong Kong's economic and financial systems as a whole.

In the analysis model, the multiple regression technique was employed. From the finding of the analysis, the *p-values* were found to be in general small and suggested that the null hypothesis is to be rejected. That is, the RMB exchange rate has direct correlation with the economy of Hong Kong in terms of lagged effect represented by the Hong Kong GDP growth. As RMB moves towards an international currency, enormous opportunities would be brought to Hong Kong for its local financial sectors. Hong Kong will stand an excellent position in providing the most liquid offshore financial centre for RMB business for a wide range of RMB financial products. Increasing use of the RMB will, in turn, enhance Hong Kong's long-term competitiveness as an international financial centre. Since 2004, expansion of the business has been fast in both scope and volume. Hong Kong dollar and US dollar, a strengthening RMB is likely to have more of an impact on Hong Kong's financial system. Hong Kong needs to be alert as to the potential impact of this on future fund inflows. In view of the need for China to relieve inflationary pressures and the threat of increasing trade protectionism imposed by the US, Hong Kong will inevitably be faced and prepared on a change in exchange rate policy from time to time.

Since over 70% of service industry will contribute to the GDP in Hong Kong, the GDP driven mainly by financial and economic activities will be booming. Part of the impact on Hong Kong's economy due to the incoming funds from the mainland China would be the high inflation and driving the income disparity which has aroused increasing public concern and discussions.

Hong Kong should timely monitor the impacts due to the fluctuation of RMB and make due precautionary measures for any changes of exchange risks and unexpected inflow of hot money before the situation deteriorates.

As reported in this dissertation, the on-going RMB appreciation against HKD will give rise to potential dominant pressure of inflation for Hong Kong as most major products, the price of which will reflect the appreciation of RMB in value, are imported from China. Therefore, Hong Kong should urge to step up measures and well prepare for any potential implications of this already happened and future fund inflows predominantly driven by the appreciation of RMB.

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