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**AN ANALYSIS OF THE IMPACT
OF RMB DEPRECIATION ON
HONG KONG**

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Johns Hopkins Institute for Applied Economics,
Global Health, and Study of Business Enterprise



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An Analysis of the Impact of RMB Depreciation on Hong Kong

By Richard (Ziyuan) Li

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About the Series

The Studies in Applied Economics series is under the general direction of Professor Steve H. Hanke, Co-Director of The Johns Hopkins Institute for Applied Economics, Global Health and the Study of Business Enterprise (hanke@jhu.edu). The authors are mainly students at The Johns Hopkins University in Baltimore. Some performed their work as summer research assistants at the Institute. This working paper is one in a series on currency boards. The currency board working papers will fill gaps in the history, statistics, and scholarship of the subject.

About the Author

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Abstract

Hong Kong is one of the main economies operating a currency board system today. With its currency fixed to the U.S. dollar, the system has functioned successfully since it was restarted in 1983. The last time it faced severe challenges was during the East Asian financial crisis of 1997-98. However, with the comparatively large depreciation of renminbi (RMB, and sometimes referred to as Yuan) during the past two years, a rising question is how Hong Kong might be affected by a possible future crisis originating from China. In this paper, we examine the impact of RMB depreciation on Hong Kong, with a focus on three sectors of Hong Kong's economy: foreign direct investment, external trade, and tourism.

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Keywords: RMB, China, Hong Kong, Asian financial crisis, FDI, trade, tourism, retail sales
JEL codes: E39, O53

1. Introduction

Under the currency board system, the Hong Kong dollar has never been devalued against its anchor currency—first the pound sterling, later the U.S. dollar. The Hong Kong dollar did depreciate in the early 1980s, but it was during a period of a floating exchange rate, when the Hong Kong dollar was off the currency board system for about a decade. During the East Asian financial crisis of 1997-98, Hong Kong experienced strong pressures in financial markets and suffered a recession, but the exchange rate of HK\$7.80 per U.S. dollar held firm.

A circumstance that contributed to Hong Kong being able to avoid devaluation during the Asian crisis, unlike many countries in the region, was that China did not devalue. The Hong Kong dollar appreciated against many other currencies, but not against the renminbi (RMB), the currency of its most important trading partner and already by that time a financial partner of growing importance.

Today, 20 years later, there is concern that pressures in the foreign exchange market might force China to depreciate the RMB. Currently, substantial depreciation appears to be a low probability event, at least for the next couple of years. But, it is worth thinking about the effects that a depreciation of the RMB might have on Hong Kong. Since the East Asian financial crisis, British rule has ended and Hong Kong has reverted to China. Hong Kong's trade, finance, politics, and almost any other aspect one might consider are more closely tied to China than they have been at least since the 1940s, and possibly ever. Circumstances have changed since the 1990s. Would the effects of a substantial depreciation by China be so strong that Hong Kong would have to follow, or else endure a markedly more severe recession than it did during the Asian crisis?

This paper investigates the effects of a hypothetical sudden RMB depreciation of 10-30 percent on three aspects of Hong Kong's economy that would be most strongly affected: investment, trade, and tourism. As defined by Hong Kong Census and Statistics Department, there are four traditional key industries in Hong Kong: financial services, tourism, trading and logistics, and professional and producer services. All these sectors are closely connected with China, and thus would be first and most impacted by sudden situations in its giant neighbor. There is plenty of literature and data for tourism and trade. Meanwhile it is hard to perform aggregate analysis on the financial services sector and the professional and producer services sector. This paper examines foreign direct investment by business, which is one of the factors making Hong Kong an important international financial center.

The remainder of the paper is structured as follows. Section 2 reviews Hong Kong's situation during the 1997-98 East Asian financial crisis. Section 3, 4 and 5 investigate the foreign direct investment, external trade and tourism, respectively. Section 6 offers concluding remarks. Sections 3-5 are developed independently.

2. Hong Kong during the East Asian Financial Crisis, 1997-98

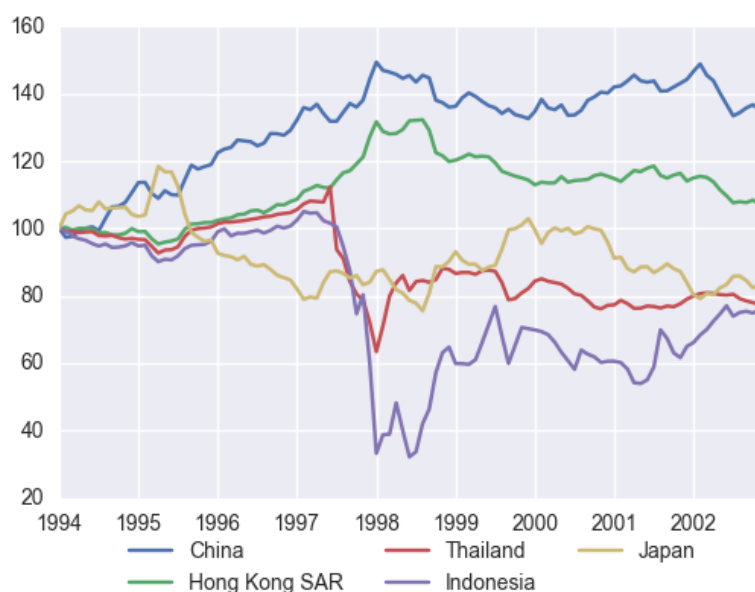
The 1997-98 East Asian financial crisis originated in Thailand, and then rapidly spread through other East and South Asian economies. Directly influenced economies included Thailand, the Philippines, Indonesia, Malaysia, Vietnam, Singapore, Taiwan, Hong Kong, South Korea, and Japan. The crisis was a mixture of crises in currency, banking, and debt, resulting in disastrous turbulence in financial markets and a sharp slowdown of the real economy.

The crisis “officially” started on July 2, 1997, when Thailand announced the floating of the baht, which depreciated by 19.5 percent immediately. It was only one day after the sovereign transfer of Hong Kong back to China. After that, Hong Kong experienced a two-year recession and had a hard time recovering. There is an extensive body of literature on the East Asian financial crisis, including works focused on Hong Kong. Y. C. Jao’s *The Asian Financial Crisis and the Ordeal of Hong Kong* (2001) provides a comprehensive introduction and analysis to the crisis and its impact on Hong Kong, and underlies the account here. What Hong Kong suffered during the East Asian financial crisis serves as a benchmark and comparison for our discussion of the possible effects of a Chinese devaluation today.

Currency

As is shown in Appendix 1, all important economies in East Asia except China and Hong Kong chose to allow their currencies float during the crisis. All of them depreciated by more than 10 percent versus the U.S. dollar by the end of 1997, and the worst performing, the Indonesian rupiah, depreciated by more than 80 percent at its low point in 1997.

Figure 1: Effective Exchange Rate (1994=100)



Source: Bank for International Settlements, calculations by Richard Li

From time to time during 1997-98, international speculators accumulated massive short positions in Hong Kong dollars. To counter the speculative selling, the Hong Kong Monetary Authority (HKMA) sold huge amounts of U.S. dollars to preserve the fixed rate of the Hong Kong dollar with the U.S. dollar. The Hong Kong dollar was successfully defended, and the currency board system survived. However, as a result of depreciation of other currencies in the region, the effective exchange rate of the Hong Kong dollar appreciated substantially.

Financial Markets

In the first few months of the crisis, Hong Kong's financial markets seemed immune to the external chaos, because of the optimism over the smooth transition and the inflow of Chinese capital prior to the transfer. The Hang Seng Index (HSI, the major equity index in Hong Kong) even reached a historic peak on August 7, 1997. Starting in October, however, securities markets experienced a rapid downturn. Extremely high volatility, including days during which the index moved more than 10 percent up or down, occurred during the period. The turmoil lasted a long time, and by mid-August 1998, the HSI was down by 60 percent from its high a year earlier.

As speculators accumulated larger and larger short positions, finally on August 14, 1998 Hong Kong authorities decided to directly enter securities markets by purchasing shares to push up the prices. The Hong Kong government also announced tighter regulatory rules afterwards. The government's unprecedented intervention was strongly criticized by many politicians and economists at home and abroad as a violation of Hong Kong's longstanding free market principles. Whether due to those measures or not, Hong Kong's financial markets did start to stabilize. By the end of August, the HSI rebounded by 9 percent, and continued to recover, surpassing its former peak in the first quarter of 2000. The government's "intervention portfolio" generated a return of more than 100 percent.

Foreign Direct Investment (FDI)

Due to unavailability of data and changes of statistical methods, we are not able to comprehensively review the performance of foreign direct investment during the East Asian financial crisis.¹ Still, for inward FDI stocks, published statistics during 1996-1999 shows a slight increase in 1997 and a sharp decrease in 1998.² However, inward and outward FDI, in terms of both stocks and yearly flows, resumed large positive growth in 1999. A main reason for these fluctuations was large ups and downs in asset market prices.

¹ Prior to 1998, the Hong Kong Census and Statistics Department did not publish statistics about outward FDI. In addition, before 1998, only the inward FDI stock was published, not annual inward inflows. Furthermore, from 1998 the department adopted a new statistical method, basically shifting from book value to market value as the basis of compilation.

² Hong Kong, Census and Statistics Department, *External Direct Investment Statistics of Hong Kong* (2015).

External Trade

Hong Kong has always been an open and trade-dependent economy. By the time of the East Asian financial crisis, the ratio of total external trade to GDP had been consistently larger than 200 percent. The trade sector consequently deteriorated severely during the crisis. As Appendix 2 shows, the hardest time for the trade sector was the fourth quarter of 1998, a year after the crisis started affecting Hong Kong. Total exports fell 10 percent year over year.³ Domestic exports dropped much more than re-exports, partly due to the appreciation of the effective exchange rate of the Hong Kong dollar. Total imports decreased by 13 percent year over year, while retained imports decreased 24 percent, reflecting weak domestic consumption during the crisis.

Tourism

The tourism industry was hard hit during the crisis. Tourist numbers from Japan, a major tourist source at the time, began to drop as early as the second quarter of 1997, before the crisis broke out. Tourist spending also decreased sharply in tandem with tourist numbers. However, numbers swiftly resumed growth after the crisis, making the tourism industry one of the most sensitive sectors to macroeconomic performance.

Table 1: Tourist Numbers and Spending (year-on-year rate of change, %)

1997	Number	Spending	1998	Number	Spending	1999	Number	Spending
Annual	- 11%	- 14.7%	Annual	- 8%	-26.3%	Annual	12%	-4%
Q1	9%		Q1	- 25%		Q1	13%	
Q2	2%		Q2	- 16%		Q2	10%	
Q3	- 27%		Q3	10%		Q3	11%	
Q4	- 23%		Q4	5%		Q4	12%	

Source: Calculations by Jao (2001)

3. Foreign Direct Investment (FDI) and Outward Foreign Direct Investment (OFDI)

FDI of China and Hong Kong

Both China and Hong Kong are important international FDI participants. According to *World Investment Report 2016* published by United Nations Conference on Trade and Development (UNCTAD), in 2015 Hong Kong was the world's second-largest recipient of FDI inflows, after only the United States, and the ninth-largest source of FDI outflows.⁴ China was the world's third-largest recipient of FDI inflows, and the third-largest source of FDI outflows after the United States and Japan.

³ In real terms, which in this context means that the change in prices has been taken into consideration.

⁴ When this paper was written, the latest version available was 2016, and its statistics are actually for 2015.

Table 2: Hong Kong & China FDI Flows (bn US\$)

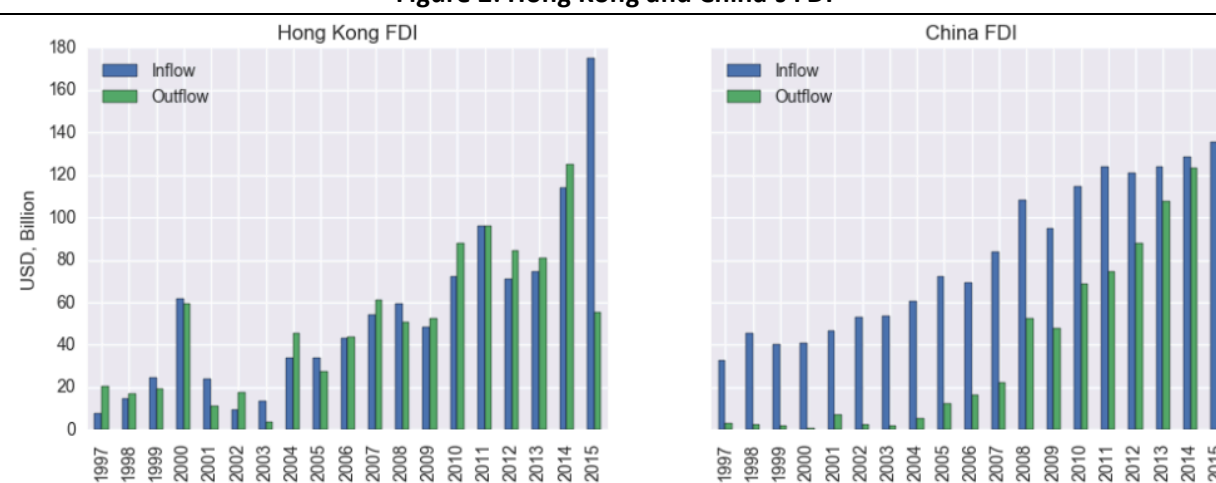
	2013	2014	2015	% of GDP (2015)
Hong Kong FDI Inflow	74.5	114.1	174.9	56.6%
Hong Kong FDI Outflow	81.0	125.1	55.1	17.8%
China FDI Inflow	123.9	128.5	135.6	1.2%
China FDI Outflow	107.8	123.1	127.6	1.2%

Source: Word Bank, UNCTAD, *World Investment Report 2016*

Table 3: Hong Kong and China FDI Stocks

	2000		2010		2015	
	Bn US\$	% of GDP	Bn US\$	% of GDP	Bn US\$	% of GDP
HK Inward FDI Stock	435.4	253.6%	1067.2	466.8%	1572.6	508.5%
HK Outward FDI Stock	379.3	220.9%	943.6	412.7%	1485.7	480.4%
China Inward FDI Stock	193.3	16.0%	587.8	9.6%	1220.9	11.0%
China Outward FDI Stock	27.8	2.3%	317.2	5.2%	1010.2	9.1%

Source: Word Bank, UNCTAD, *World Investment Report 2016*

Figure 2: Hong Kong and China's FDI

Remark: 1997 is actually the average of 1993 – 1997

Source: UNCTAD, *World Investment Report*

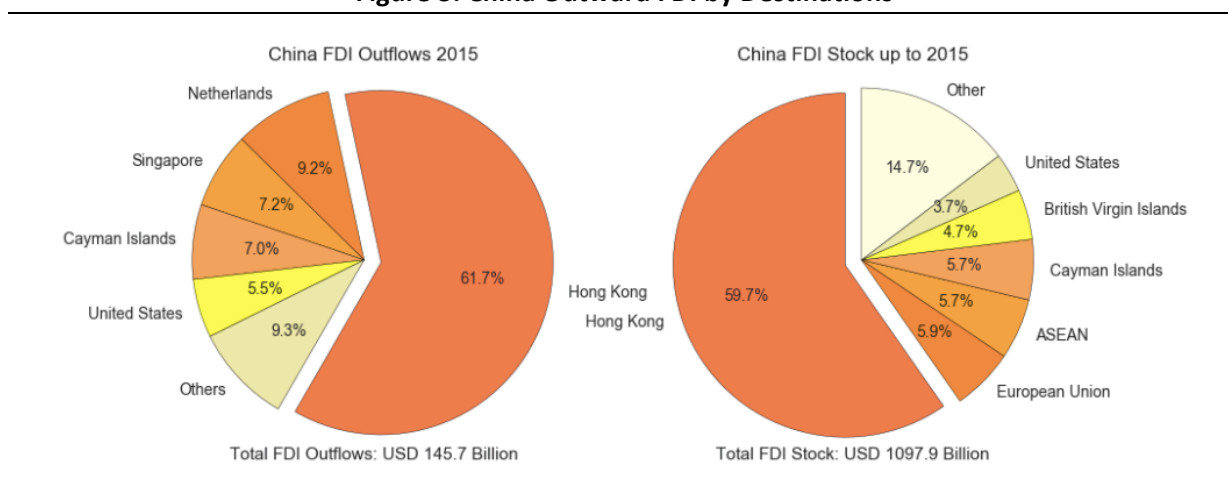
China sees large amounts of inward FDI and fast-expanding outward FDI, while Hong Kong is a balanced FDI receiver and generator. Since 1978, when it began to introduce elements of a market economy and opened itself to the rest of the world, China has been attracting large amounts of FDI from all over the world, which is one of the main drivers of its very fast growth. China's outward FDI remained small until 2001, when China was accepted into the World Trade Organization. After that, Chinese enterprises began expanding their business overseas. From 2002 to 2015, China's outward FDI grew at an average annual rate of about 35 percent, and exceeded its inward FDI in 2014, making China a net capital exporter. On the other hand, Hong Kong has long been an important financial center in Asia, originating

large amounts of outward FDI and receiving a lot of inward FDI. Its FDI inflows and outflows have been more or less balanced over last two decades, with the notable exception of 2015.⁵

The FDI Connection between China and Hong Kong

There is close connection between China and Hong Kong in terms of FDI flows, as Hong Kong has long been the preferred gateway and service platform for Chinese enterprises looking to invest overseas, as well as for foreign capital looking to invest in China. Around 60 percent of China's outward FDI goes to Hong Kong, of which a large proportion then goes farther afield to invest abroad. For China's inward FDI, according to China's Ministry of Commerce (2016), in 2015, Hong Kong accounted for 73.4 percent. As is shown in Appendix 3, China is the largest source and recipient of Hong Kong's FDI, aside from offshore financial centers like the British Virgin Islands and the Cayman Islands (which themselves may in part be disguised Chinese FDI). Until 2015, China represented 26.5 percent of Hong Kong's inward FDI stock, and 39.6 percent of outward FDI stock.

Figure 3: China Outward FDI by Destinations



Source: 2015 Statistical Bulletin of China's Outward Foreign Direct Investment⁶

With China's great efforts in advancing its Belt and Road Initiative, it is believed that China will be involved in even more FDI activities in the coming years. However, despite state-level policies and strategic plans, there are many factors influencing FDI, among which the exchange rate is a very important one. Below we review some academic literature on this subject, and offer our judgment.

Literature on the Exchange Rate and FDI

⁵ According to UNCTAD (2016), part of the sharp uptick in inward FDI to Hong Kong results from the restructuring of two large conglomerates.

⁶ The latest version when this paper was written was for 2015, published in September 2016.

Considerable research has been done on the relationship between the exchange rate and FDI. Though various methodologies and models have been deployed, there is still no consensus either in theory or empirical studies. Some argue that domestic currency depreciation stimulates inward FDI. For instance, Froot and Stein (1991) develop an imperfect capital market model and concluded that depreciation of domestic currency, by lowering the relative wealth of domestic agents, can lead to foreign investment. However, other research shows the opposite result. For example, Campa (1993) explains that if a firm produces products domestically, and sets up a foreign subsidiary to sell the goods, the appreciation of the host country's currency could generate higher revenue, thus stimulating FDI.

Carruth, Dickerson, and Henley (2000) point out that one possible reason for the mixed results is that the impacts of exchange rate changes on FDI differ across industries and FDI types. That is, analysis based on aggregate data might lead to ambiguous conclusions. Some later research was based on categorization of industries or FDI types,⁷ to partly disaggregate the analysis. For instance, Chen, Rau, and Lin (2006) use data of Taiwan's FDI into China to investigate the impacts of exchange rate on cost-oriented FDI and market-oriented FDI separately, and conclude that while the depreciation of a host country's currency tends to stimulate inward FDI activity of cost-oriented firms, the depreciation tends to deter inward FDI activity for market-oriented firms.

In addition, studies have been carried out specifically on China. Their results are also mixed. In terms of inward FDI, Yu and Cheng (2010) show that expected appreciation of RMB could stimulate FDI inflow in a short run, but the long-term effect is ambiguous; they also pointed out that appreciation of RMB would reduce the inflow of resource-seeking FDI, while increasing that of market-seeking FDI, which was consistent with research by Chen, Rau and Lin (2006) mentioned above. For outward FDI, Liu and Deseatnicov (2016) find that RMB appreciation has a negative effect on China's outward FDI. Chao's research (2015), however, shows a significant positive correlation between the RMB's exchange rate level and China's outward FDI.

Due to Hong Kong's role as a gateway for capital in and out of China, one should first analyze the impact of RMB depreciation on China's FDI, and then extend the analysis to Hong Kong through the channel of direct investment between the two.

The Exchange Rate and China's Inward FDI

Depreciation in the RMB may deter market-oriented FDI, but stimulates export-oriented FDI. As China is a resource consumer itself, there is little resource-seeking FDI into China. It is appropriate to distinguish whether FDI is market-oriented or export-oriented. In the first

⁷ Typically, the literature identifies three types of FDI: market-seeking (rent-oriented), efficiency-seeking (cost-oriented, export-oriented) and resource-seeking. "Seeking" or "oriented" are only terminologies here.

case, foreign firms set up affiliates to sell goods in China. Given fixed sale prices in terms of RMB, depreciation of the RMB leads to exchange losses when profits are repatriated back to the home countries, and thus deters market-seeking inward FDI. In the second case, foreign firms set up manufacturing facilities in China to produce products for exporting to their home countries or third countries. RMB depreciation results in lower production costs, including wages, rent, facility investment, etc. This comparative advantage would benefit exporting, therefore foreign firms are more likely to make export-oriented FDI in China.

With the gradual shift from export-oriented to market-oriented FDI, the overall effect of RMB depreciation should be negative. As there are no published statistics of FDI by sectors from Chinese authorities, we are not able to analyze its components directly. But according to UNCTAD's *World Investment Report 2016*, while FDI inflows into the manufacturing sector stagnated, inflows to the service sector expanded by 17 percent, rising to a record 61 percent of total FDI inflows. The share of the manufacturing sector fell to 31 percent. The report claims that rising wages and production costs have put an end to the significant edge that China once held in manufacturing. On the other hand, with three decades of wealth accumulation and residents' expectations for higher living quality, Chinese consumption has grown rapidly and still has great potential for further growth, which implies opportunities for foreign companies. A good example would be the automotive industry, in which foreign automotive companies build manufacturing facilities in China and sell products to local consumers. Based on this judgment, it is appropriate to assume the main component of inward FDI to China will gradually shift from export-oriented to market-oriented. And from the analysis above, depreciation of the RMB might deter this process.

To sum up, with inward FDI shifting from export-oriented to market-oriented, RMB depreciation is likely to deter FDI. But taking into account other factors, such as the huge potential of the Chinese market, it is hard to predict to what extent the effect of depreciation will be negative.

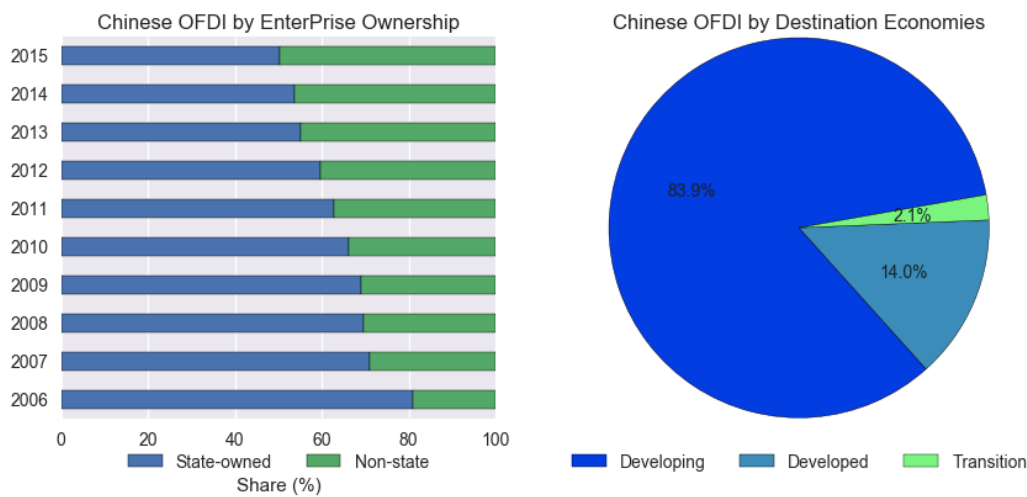
The Exchange Rate and China's Outward FDI

It is more complicated to analyze China's outward FDI, as outward FDI is still at a fast-expanding stage, while inward FDI has entered a more mature and stable period.

Unlike the analysis of inward FDI, for China's outward FDI, it is more appropriate to decompose its origins by ownership types, namely, state-owned enterprise or not. When making FDI decisions, enterprises owned and backed by the Chinese government aim not only at profit maximization, but also political objectives, because their foreign investments usually follow the government's national strategies and foreign policies. This type accounted for 50.4 percent of total outward FDI in 2015. In recent years, private Chinese enterprises have played a more and more active role in purchasing foreign assets. Currently, though, private enterprises generate only 2.1 percent of total FDI outflows. Mixed-ownership

enterprises account for the remaining 47.5 percent. We assume that they act more like private companies, as they are not directly owned and controlled by the government.

Figure 4: Decomposition of China's Outward FDI

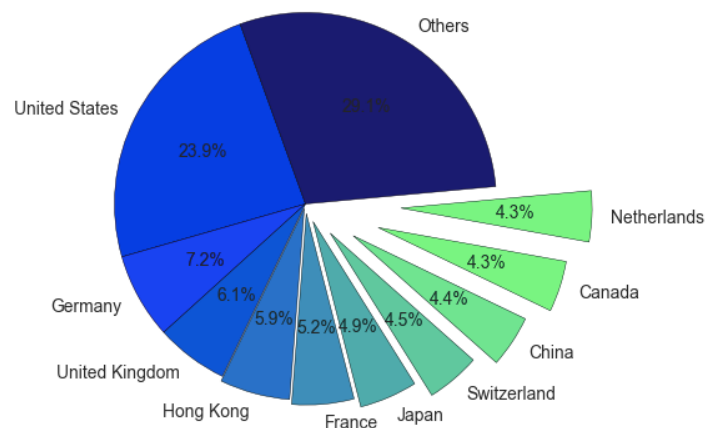


Source: 2015 Statistical Bulletin of China's Outward Foreign Direct Investment

As the private sector plays a more and more important role, RMB depreciation has a negative impact on China's outward FDI. State-owned enterprises used to be the main source of China's outward FDI, naturally leading to a larger proportion of FDI to less developed economies, because of the political peculiarity mentioned above. In this regard, as long as government planning is still the core driver, the exchange rate level plays only a minor role in influencing state-owned enterprises' FDI activities. However, as can be seen from the graph above, the share of non-state-owned enterprises has been steadily expanding in recent years, and we have every reason to assume this trend will continue in the coming years. Thus, China's future outward FDI will be more constrained by standard economic principles. Furthermore, at least in the near future, Chinese enterprises' outward FDI is by no means efficiency-seeking (export-oriented), so it is reasonable to assume that their FDI decisions would be negatively influenced by the depreciation of RMB, which is consistent with the most findings of the literature.

However, China's outward FDI is still expected to grow in the long term. Under its latest national strategy, the Belt and Road Initiative, China will continue to expand its business overseas. Furthermore, at present China accounts for only 4.4 percent of global FDI—small compared with its roughly 15 percent share in global GDP (evaluated in purchasing power parity terms). In the long run, China's outward FDI can be expected to expand further, regardless of temporary exchange rate fluctuations.

Figure 5: Global Outward FDI Stock by Economies



Source: 2015 Statistical Bulletin of China's Outward Foreign Direct Investment

Impact on Hong Kong

So far, we have investigated inward FDI based on categorizing it as market (cost)-oriented or export-oriented, and we have examined outward FDI by decomposing the sources into state-owned and non-state-owned enterprises. The qualitative result is that the depreciation of RMB has a negative impact on both inward and outward FDI.

Hong Kong's FDI, as well as related business sectors, would suffer from a depreciation of the RMB. As we already mentioned, it is no secret that many Chinese enterprises use Hong Kong as a channel to invest overseas, and much foreign capital enters China through the same gateway. These money flows, though not directly invested in Hong Kong, are counted as inward or outward FDI. In this regard, if our analysis that RMB depreciation would deter both inward and outward FDI for China is correct, it would also cut Hong Kong's FDI. In fact, Hong Kong benefits substantially from its role as a financial platform for China, which is also a reason for its status as an international financial center. Thus, a deterioration of China's FDI caused by RMB depreciation would lead to loss in related sectors in Hong Kong, including banking, financial service, business consulting and etc.

Summary

The impact of RMB depreciation may be negative for FDI, but the big picture suggests that the effect would be temporary. According to logical analysis based on previous literature and the latest statistics, RMB depreciation alone is likely to deter both China's inward and outward FDI, and thus also reduce Hong Kong's FDI as well as hurt related business sectors. However, we have argued that one should not analyze FDI based on only one factor. In fact, as Athukorala (2003) has pointed out, FDI was much more stable than other forms of foreign capital inflows (portfolio investment, bank credit and etc.) during the East Asian financial crisis and the subsequent depression. Hill and Jongwanich (2009) reached a similar

conclusion for outward FDI during the crisis and afterwards. Looking at an overall picture, then, fluctuations in the RMB are not likely to have long-lasting negative effects on FDI.

4. External Merchandise Trade

Hong Kong's External Trade Industry

Hong Kong is the eighth-largest trading economy and the largest re-export economy in the world.⁸ In 2016, Hong Kong's total external merchandise trade was US\$973.9 billion. In 2015, only 25.7 percent of its total imports were retained for use in Hong Kong; the rest was re-exported to other markets.⁹ The retained imports ratio has stayed at around 25 percent over the last decade. In 2016, domestic exports (goods produced in Hong Kong) accounted for only 1.2 percent of total exports, the rest being produced in other economies and re-exported to other markets. The domestic export ratio was around 6 percent in 2005, and has been declining steadily over the last decade. After the transfer of sovereignty to China in 1997, Hong Kong's economy structure experienced great changes. With most of its manufacturing industry having moved to China, Hong Kong's present economy is largely services-based. This is also reflected in the trading sector.

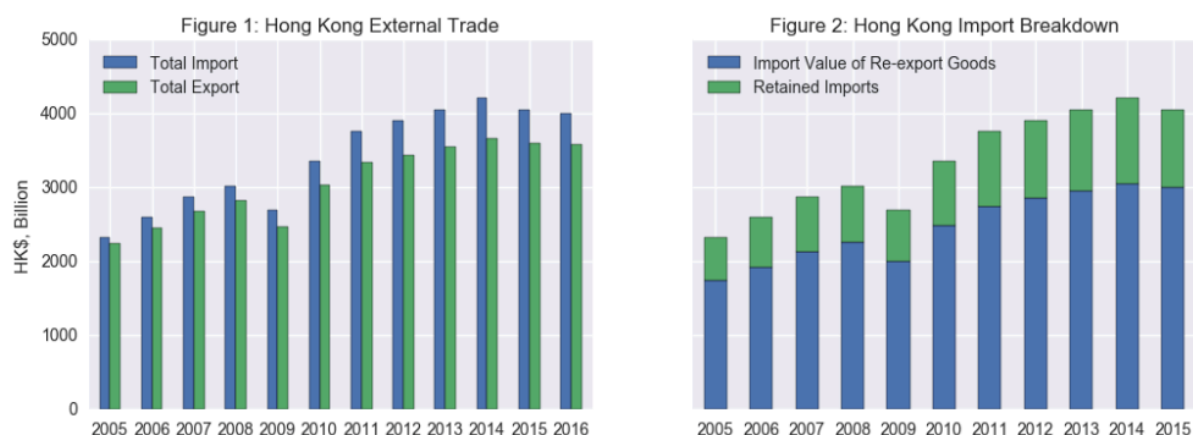
Hong Kong's external trade sector relies heavily on re-exportation, which represents over 98 percent of total exports. Re-exports consist of foreign goods exported in the same state as previously imported. Profit in the re-export business comes from the difference between the import value of goods and the re-export value of goods—the re-export margin. As a percentage of the import value, the re-export margin ranged from 18 percent to 21 percent over the decade from 2005 to 2015.

China is the largest trade partner for Hong Kong. It accounted for 50.8 percent of total trade value of Hong Kong in 2016. It is also the largest re-export partner of Hong Kong, in terms of both origins and markets. In 2016, 58.8 percent of Hong Kong's re-exports originated from China, while 54.3 percent of re-exported goods were sold to China.

⁸ Considering re-exportation, the only likely rivals to Hong Kong are Singapore and Netherlands. In 2016, re-export values of Hong Kong, Singapore and Netherlands are about 450 billion US\$, 176 billion US\$ and 227 US\$, respectively.

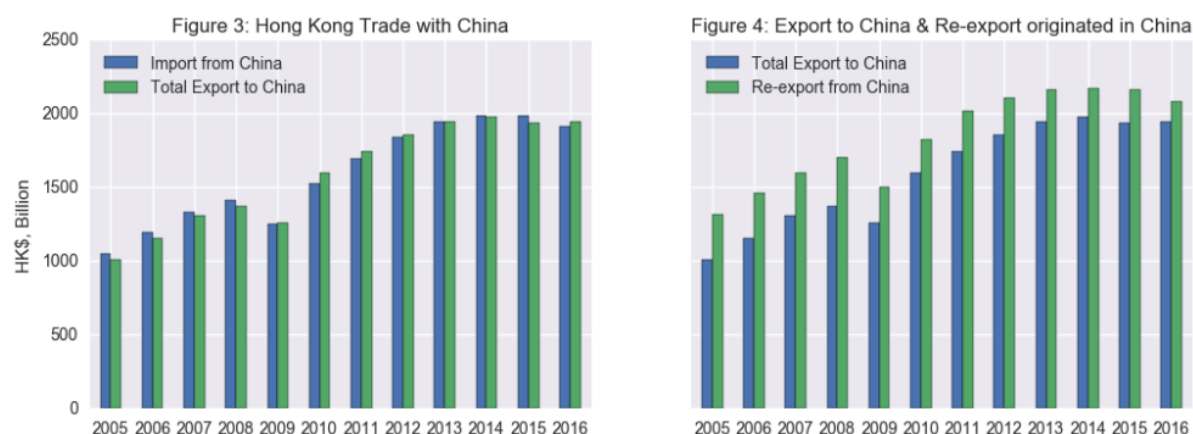
⁹ The latest data of retained imports are for 2015.

Figure 6: Hong Kong's Overall External Trade



Source: Hong Kong Trade and Development Council (HKTDC)

Figure 7: Hong Kong's Trade with China



Source: Hong Kong Trade and Development Council (HKTDC)

RMB Depreciation and Hong Kong's External Trade

A depreciation of the RMB would influence Hong Kong's trade industry in two opposite directions through the re-export channel, and the overall effect is likely to be positive. Devaluation would stimulate China's exports, and thus increase Hong Kong's re-exports originating in China. On the other hand, devaluation would also reduce Hong Kong's exports to China (both domestic exports and re-exports originating in third countries). The net effect of these changes is likely to be positive, because as shown in Figure 4 above, the value of re-export originating in China is larger than Hong Kong's total exports to China.

The higher re-export margin rate from China strengthens this effect. Re-export margins of goods from different origins vary considerably. Available data are somewhat old,¹⁰ but

¹⁰ The Hong Kong Census and Statistics Department has ceased to publish the statistics because of the limitations of available data.

historically, according to calculations by Hang Seng Bank (2015),¹¹ re-exports originating in China are much more profitable than re-exports from other regions. In this regard also, then, the influence of a depreciation in the RMB on Hong Kong's trade industry would likely be positive.

Quantitative estimates for this effect could be obtained by calculations based on certain assumptions of the connection between currency depreciation and net exports. According to IMF research (2015), "a 10 percent real effective depreciation in an economy's currency is associated with a rise in real net exports of, on average, 1.5 percent of GDP, with substantial cross-country variation around this average."¹² Let us assume the estimated mean is approximately true with China for the following analysis.

A 10 percent depreciation in RMB would lead to a 27.5 percent rise in Hong Kong's net re-exports from China, and thus generate more profits for the trade sector. If we assume that the effective exchange rate of the RMB depreciates 10 percent, then according to IMF research, China's net exports would increase by 1.5 percent of GDP. That is, based on data in 2015, China's net exports would increase by 27.5 percent. This would influence Hong Kong through the re-export channel: re-exports originating in China would rise, while re-exports to China would likely decline. The total effect should be an increase in net re-exports from China. We assume it would be of the same percentage as the change in China's net exports, 27.5 percent. Taking the re-export margin premium from China into account, it would result in a considerable profit surge for Hong Kong's trade sector.

Table 4: Estimated Effect of 10% Depreciation in RMB on Hong Kong's Net Exports*

	Billion US\$	Billion HK\$	%
Estimated Rise in China's Net Exports (1)	165.1	= 1282.9	1.5%
- China's Nominal GDP	11007.7		
- Assumed RMB Depreciation			10%
China's Net Export (2)	600.2	= 4663.4	
- China's Import Value	1681.7	= 13066.6	
- China's Export Value	2281.9	= 17730.0	
Estimated Rise in China's Net Export (%): (1) / (2)			27.5%
HK's Net Re-exports Originating in China (5): (3) – (4)		226.5	
- Re-export Originating in China (3)		2163.0	
- Re-exports to China (4)		1936.5	
HK's Share (Re-exports) of China's Net Exports: (5) / (1)			4.9%
Estimated Rise in HK's Net Re-exports Originating in China		62.3	27.5%

Source: World Bank, HK Census and Statistics Department, calculations by Richard Li.

*Due to data availability, all values above are 2015 based.

¹¹ Shik (2015), figure in Appendix 4.

¹² IMF (2015), figure in Appendix 5.

However, the accuracy of the estimate is uncertain due to the complicated components and trends of re-exports. First, a large portion of re-exports originating in China are re-exported to China. That means Hong Kong's trading companies resell products to China after purchasing and processing (in some cases) goods originally produced in China. In this case, changes in the RMB would influence both directions in trade, which makes it hard to estimate the overall effect. In 2016, this type of trade represented 40.8 percent of Hong Kong's total re-exports. Second, the surplus between re-exports originating in China and Hong Kong's total exports to China has actually been declining over last decade, as China's trade surplus has been shrinking. Third, as is shown in Appendix 4, the gap between re-export margins from China and from other economies has been narrowing over time.

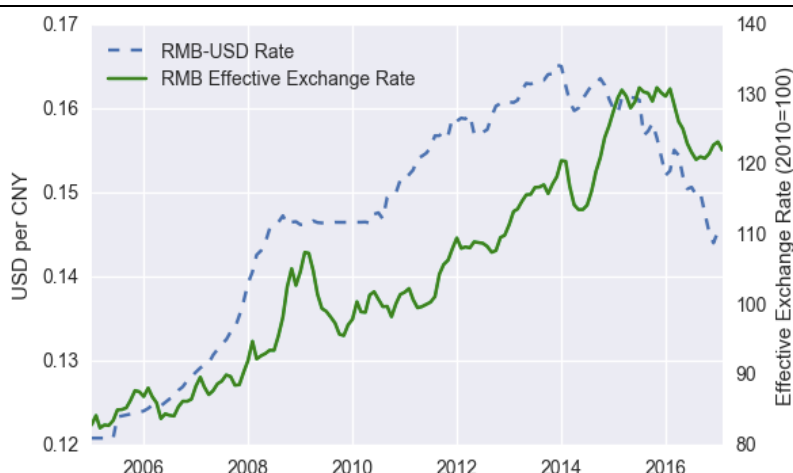
Table 5: Re-exports Originating in China by Destinations in 2016

Destination	Value (million HK\$)	Share (%)
China	851,427	40.8
United States	276,730	13.3
Japan	95,483	4.6
India	65,521	3.1
Germany	60,053	2.9

Source: Hong Kong Trade and Development Council (HKTDC)

Finally, in the current situation, referring only to the RMB-U.S. dollar rate exaggerates the effect of the depreciation of the RMB, and results in misleading conclusions about its impact on net exports. Typically, when people talk about the RMB's depreciation, they are referring to the bilateral exchange rate with the US dollar. However, what really matters to the overall performance of China's exports is the effective exchange rate, which is calculated based on weights of trading partners and changes in their currencies versus the RMB. The figure below shows historical data on the RMB-U.S. dollar rate and the RMB effective exchange rate. Relative to the dollar, the RMB started depreciating at the beginning of 2014. However, the effective exchange rate continued to rise until the end of 2015, which means the RMB was still appreciating relative to currencies of other trading partners during the period. The RMB has depreciated by 11.8 percent relative to the U.S. dollar since its peak in 2014, while its effective exchange rate has only depreciated by 6.8 percent. But the two rates have declined at roughly the same pace since 2016. In this regard, depreciating only relative to the U.S. dollar may not boost China's exports much, hence it may require a larger devaluation to benefit Hong Kong's trade industry substantially through the channels just discussed.

Figure 8: RMB-U.S. Dollar Rate and RMB Effective Exchange Rate



Source: Bank for International Settlements; Federal Reserve Bank of St. Louis FRED database

Summary

RMB depreciation is likely to have a positive impact on Hong Kong's trade industry through the re-export channel. According to our estimate based on IMF research, a 10 percent depreciation would result in a 27.5 percent increase in Hong Kong's net re-exports from China.

5. Tourism & Retail Sales

Tourist Numbers

Tourist arrivals to Hong Kong boomed between 2003 and 2014, because of positive changes in China. Hong Kong has long been a popular travel destination in Asia, and tourism is one of the four pillar industries for Hong Kong's economy (along with financial services, trading and logistics, and professional and producer services). It developed faster than ever from 2005 to 2014, when the total number of tourists to Hong Kong increased from 23 million to 61 million. China contributed over 90 percent of the increase over the period, and accounted for 77.7 percent of visiting tourists in 2014. Many factors caused the sharp increase of Chinese tourists, among which the Chinese government's relaxation of restrictions on tourism was the most significant one, as pointed out by Cheng (2011). In July 2003, the Chinese government announced an Individual Visit Scheme (IVS) for Hong Kong travel, allowing Chinese residents to visit Hong Kong at their own expense. It was the first time in more than 100 years that Chinese citizens were able to visit Hong Kong freely. Chinese tourists flooded into Hong Kong over the decade afterwards. Also, the political atmosphere was still mild following the smooth transfer in 1997; tension between Hong Kong democracy activists and the Chinese government, currently high, was then low. In addition, rising income and the appreciation of the RMB against the U.S. and Hong Kong dollars increased the consumption power of Chinese tourists.

However, falling tourism demand from China caused tourist numbers to fall from their peak of 2014. Annual tourist numbers dropped by around 7 percent from 2014 to 2016. China accounted for all the decrease, since tourist arrivals from other places were still increasing. Several factors combined to cause the sudden drop from China. First, China's economic growth slowed in the 2010s, casting a shadow on Chinese households' expectations for income growth. Second, political tensions with the Chinese government arose in Hong Kong, deterring Chinese tourists. In the meantime, Chinese travel preferences began to change rapidly as a result of competition from other destinations, including southeast Asia, Japan, South Korea, and Europe. And finally, the RMB depreciated against the Hong Kong dollar, which can be viewed as the most important reason.

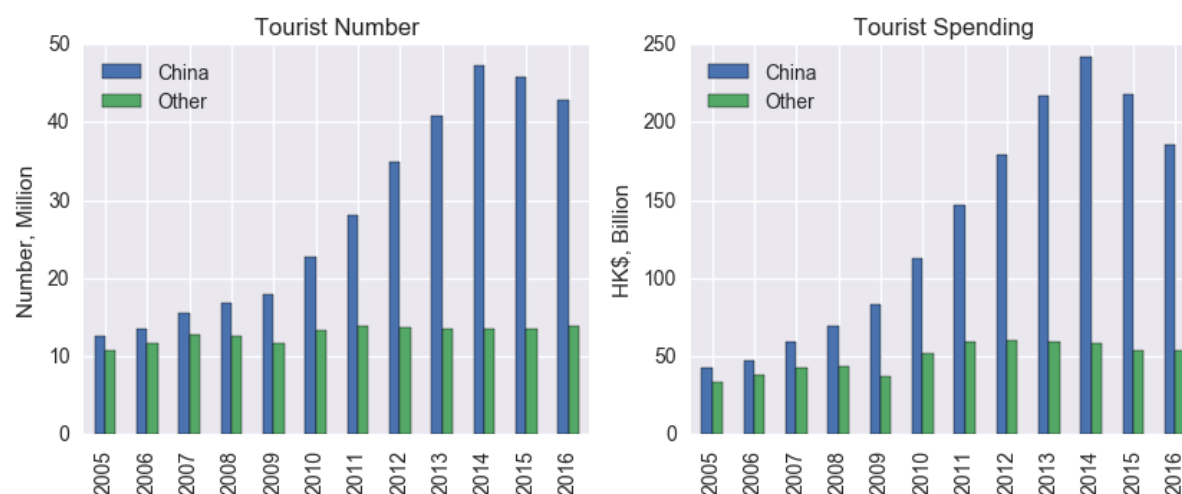
Figure 9: RMB-U.S. Dollar Exchange Rate and Chinese Tourist Numbers



Source: Federal Reserve Bank of St. Louis FRED database; Hong Kong Tourism Board

Currently, the exchange rate plays a more important role in Hong Kong's tourism industry than it did a few years ago, because shopping is now the main purpose of Chinese tourists. Over the booming decade from 2005 to 2014, Chinese tourists visited Hong Kong for various reasons: sightseeing, entertainment, good food, shopping, etc. Nowadays, most visit Hong Kong mainly for shopping. Furthermore, Chinese tourists used to shop mainly for luxury goods, but in recent years, Chinese visitors have been using Hong Kong as a kind of supermarket, as they are buying daily essentials. This change makes such shopping trips more sensitive to exchange rate changes. Stephen (2014) points out that it results from the cheap prices of such goods resulted from Hong Kong's separate currency and tax regime from China. When the RMB was appreciating, shopping trips boomed, and when the RMB depreciated unexpectedly, they slowed down sharply. This is exactly the case since 2014.

Figure 10: Tourist Numbers and Spending



Source: Hong Kong Tourism Board

Tourist Spending

Tourist spending experienced the same up and down trends as tourist numbers. From 2005 to 2014, total tourist spending in Hong Kong increased by four times, while Chinese tourist spending expanded by six times. Total tourist spending in 2014 was HK\$300 billion (13.3 percent of GDP), and Chinese tourists represented 80 percent of that amount. However, after peaking in 2014, total tourist spending dropped 21 percent between 2014 and 2016. Spending by Chinese tourists dropped by 23.5 percent over the period, while spending by other tourists dropped 9.2 percent. The decrease in spending was larger than the decrease in tourist numbers because per capita spending also declined, as is shown in the table below.

There are two different types of tourists in Hong Kong. The first is typical overnight tourists, who stay in Hong Kong for several days. The other is day-trippers. Day-tripping is big in Hong Kong, because of the shopping considerations mentioned above. Hong Kong is only two hours by train from the Guangzhou-Shenzhen metropolitan area, which has more than 50 million people. Many visitors from that area visit and return the same day. Currently, day-trippers represent about 60 percent of total tourists, while overnight tourists represent about 40 percent.

The two types of Chinese tourists behave differently. As Table 7 shows, for day-trippers the main purpose is shopping. For them, if the RMB depreciated, Hong Kong products would become more expensive, demand for Hong Kong goods would be lower, and thus there would be fewer day-trippers. If they continued to shop in Hong Kong, though, it probably would mean that they really want to buy certain goods, so the per capita spending would not be much lower. Another important point regarding day-trippers is that compared to other shopping destinations, like South Korea, Japan and Europe, Hong Kong has a great

locational advantage. In contrast, most overnight tourists are from regions comparatively far from Hong Kong. Typically, shopping is not their only purpose; they also want to go sightseeing, eat good food, etc. Such tourist numbers would not decline as much as those of the day-trippers. However, they tend to save money by spending less on shopping, and changing their shopping destinations to other regions in the world, when prices in Hong Kong become unattractive. Thus they are likely to have lower per capita spending.

Table 6: Tourist numbers and per capita spending, changes

Year	Change in RMB	Change in tourist numbers		Change in per capita spending	
		Sameday	Overnight	Sameday	Overnight
2014	-2.43%	19.09%	11.63%	-0.74%	-2.62%
2015	-4.22%	-1.15%	-5.66%	-0.19%	-8.95%
2016* ¹³	-6.7%	-8.74%	-3.51%	-6.27%	-10.40%

Source: Hong Kong Tourism Board

Table 7: Tourist spending based by category in 2016 (January-June)

Category	Same-day tourists		Overnight tourists	
	Value (mn HK\$)	%	Value (mn HK\$)	%
Shopping	27,996.53	85.1	37,433.15	65.9
Hotel	244.57	0.7	7,373.46	13.0
Meals outside hotels	1,374.55	4.2	6,865.90	12.1
Entertainment			1,566.90	2.8
Tours			79.56	0.1
Others	1,684.13	5.1	3,517.09	6.2

Source: Hong Kong Tourism Board

Literature on Exchange Rates and Tourism

Numerous studies on international tourism demand have been carried out since the late 1970s. They find that the exchange rate elasticity of tourist spending is significantly negative, but varies by tourist origins and destinations. Crouch (1993) summarizes over 300 studies prior to 1993 and finds that most use regression analysis to derive tourism demand elasticities. GDP growth and exchange rates, as proxies for income levels and tourism prices, respectively, are the typical explanatory variables; tourist numbers, tourist spending, and hotel rates are the typical response variables. Some studies build empirical models for a pair of origin and destination over a time span, while others research on various destinations at the same time point. According to Crouch, the exchange rate elasticity of tourism demand varies a lot across studies, with a mean of around -1, which implies that a 10 percent appreciation in prices at the destination would lead to a 10 percent decrease in tourism demand, and vice versa.

¹³ The latest data for tourist spending is Jan-Jun 2016, we generated spending data for the second half of the year based on the tourist number.

Recent literature employs more advanced econometric techniques and investigates more explanatory variables. Vogt (2008) and Cheng, Ming, Kim, Thompson (2013) stress the importance of real exchange rate and income for both U.S. inbound and outbound tourism. Yap (2011) finds that international tourists are sensitive to appreciation of the Australian dollar in the short run, but not in the long term. Wang, Chen, Lu and Hwang (2008) use a copula approach to examine the negative relationship between international tourist arrivals to Asia and exchange rate.

Some literature is particularly instructive for our study. Ruane (2014) investigates the relationship between Japan's exchange rate and tourism in Guam. When the study was carried out, Japan accounted for about 70 percent of tourist arrivals to Guam, and the yen was depreciating sharply against the U.S. dollar, which is very similar to our hypothesized China and Hong Kong situation, except that Hong Kong is not a completely tourism-dependent economy. Analyzing Scotland's tourism, Greenwood (2007) finds that the exchange rate has a much greater impact on short-haul visitors than long-haul visitors. As we have seen, day-trippers from areas adjacent to Hong Kong represent a large share of its tourist arrivals. Cheng (2012) adds dummy variables to regression models and concludes that the relaxation of visa requirement and the launch of the Individual Visit Scheme play a more important role than exchange rate for Chinese tourists to Hong Kong. Finally, instead of focusing on realized changes, some literature stresses the importance of expectations. For instance, Tse (2001) studies the impact of economic factors on tourism in Hong Kong and points out that "real tourist expenditure depends on expected income, expected exchange rate and price level."

Empirical Model

We will use a regression model to investigate Chinese tourism demand elasticities with respect to the exchange rate and income. Recent literature has been using increasingly sophisticated econometric models and has included variables in addition to the exchange rate and income; for example, relative inflation, tax and even events like relaxation of visa requirements. An entire paper would be required to build such models for Hong Kong's tourism. Instead, we will take a glimpse at the statistical relationships by using the old method and the most typical explanatory variables – the exchange rate and income. Our model can be expressed as follows.

$$V_t = \beta_0 + \beta_1 ER_t + \beta_2 Income_t + \varepsilon_t$$

where for each time t :

V_t : tourist number or tourist spending

ER_t : exchange rate

$Income_t$: Chinese GDP

ϵ_t : error term

$\beta_{1,2}$: elasticities to be estimated

All variables are yearly data transformed into year-on-year percentage changes. We not only investigate the impact on total Chinese tourist numbers, but also examine the two types of tourists we have described as well as the effect on the per capita spending of each type. For exchange rate, we will examine the bilateral exchange rate between the RMB and U.S. dollar (since the Hong Kong dollar is fixed to the U.S. dollar), the effective exchange rate of the Hong Kong dollar, and the effective exchange rate of RMB. We will also test the performance of the quadratic form of the exchange rate. For Chinese GDP growth, we use annual GDP growth data published by the World Bank.

The data can be found in an accompanying file, issued with this paper. The Python notebook (code) of the regression model is available from the author upon request.

Interpretation of Empirical Results

Regression models show a positive relationship between the RMB-U.S. dollar rate and Chinese tourism demand to Hong Kong, while the impact of income level is not significant in most specifications. We have examined the RMB-U.S. dollar rate, the Hong Kong dollar effective rate, and the RMB effective rate, but only report results for the RMB-U.S. dollar rate due to its better regression performance. We decided to include the quadratic form of the RMB-U.S. dollar rate based on the improvement in adjusted R-squared. We ran the regression model for both no lags and a lag of 1 (for a given year, the explanatory variables are growth rate of the year before). For most model specifications, the exchange rate, represented by the RMB-U.S. dollar rate, has a statistically significant impact on tourist numbers and spending. However, in contrast to previous literature, the Chinese income level is not significant in most of our models. The reason may be that correlation between the annual growth rates of the RMB-U.S. dollar rate and China's GDP is over 0.7, which may lead to multicollinearity in the linear regression. It also may be that since over our sample period (2005-2016), China's GDP growth was always positive, it failed to explain the fall in tourism since 2014 ("growth of GDP growth" may solve the problem). Finally, due to the quadratic form of the exchange rate term, the relationship between the exchange rate and tourism demand is not linear. However, as the squared power of a 10-30 percentage change is comparatively small and thus can be omitted in rough estimation, we can take the coefficient of exchange rate in the regression model as the exchange rate elasticity of tourism demand in Hong Kong. Our empirical results are summarized in Appendix 6.

RMB depreciation would deter Chinese tourism demand in Hong Kong, and day-trippers are more sensitive than overnight tourists. This is shown in three aspects of the model. First, with no lag in variables, the exchange rate is only significant for total Chinese tourists and day-trippers, though it is also significant for overnight tourists when there is a one-year

lag. Second, the exchange rate can explain about 65 percent of variations in day-tripper numbers (as measured by adjusted R-squared), while it accounts for about 50 percent of changes in overnight tourist numbers. Third, the coefficient of the RMB-U.S. dollar rate in the specification for day-trippers is twice as large as that for overnight tourists. This is consistent with the abovementioned fact that the major purpose of day-trippers visiting Hong Kong is shopping. If changes in exchange rate make goods in Hong Kong more expensive, day-trippers' demand for such shopping trips would decrease sharply. Another explanation can be derived from Greenwood's (2007) finding that the exchange rate has a greater impact on long-haul tourists (overnight tourists, in this case) than short-haul tourists (day-trippers to Hong Kong, mainly Chinese). Besides, in all specifications, the coefficients of exchange rate are larger when there is a one-year lag. This is intuitively reasonable, as normal people tend to plan their travel based on known information – realized exchange rate changes, instead of the ongoing fluctuations. To summarize, the exchange rate elasticity of Chinese tourism demand to Hong Kong is around -2 to -3, meaning that a 10 percent depreciation in RMB would lead to a 20-30 percent drop in Chinese tourist arrivals.

Aggregate Chinese tourist spending would be negatively impacted by RMB depreciation. However, the exchange rate effect is only significant for overnight per capita spending, not for day-tripper per capita spending. Generally speaking, regression models fit better for tourist spending than for tourist numbers, accounting for over 70 percent of variations in total Chinese tourist spending (with no lag). As Tables C and D in Appendix 6 show, the RMB-U.S. dollar rate is significant for total Chinese tourist spending, as well as for spending from Chinese day-trippers and overnight tourists separately. This is a natural result of the decrease in tourist numbers. However, the exchange rate is not significant for per capita spending, except in the specification for overnight tourists with a one-year lag. This implies that day-trippers would not cut their spending much as long as they do visit Hong Kong, while overnight tourists may reduce their spending with an exchange rate elasticity of -3, which means that a 10 percent RMB depreciation against the U.S. dollar would lead to about 30 percent decrease in per capita spending. As a result, though day-tripper numbers would drop more than overnight tourists, their aggregate spending would decrease by approximately the same percentage. To sum up, the exchange rate elasticity of aggregate Chinese tourist spending is around -3 to -4, meaning that a 10 percent depreciation in RMB would lead to a 30-40 percent drop in Chinese tourist spending.

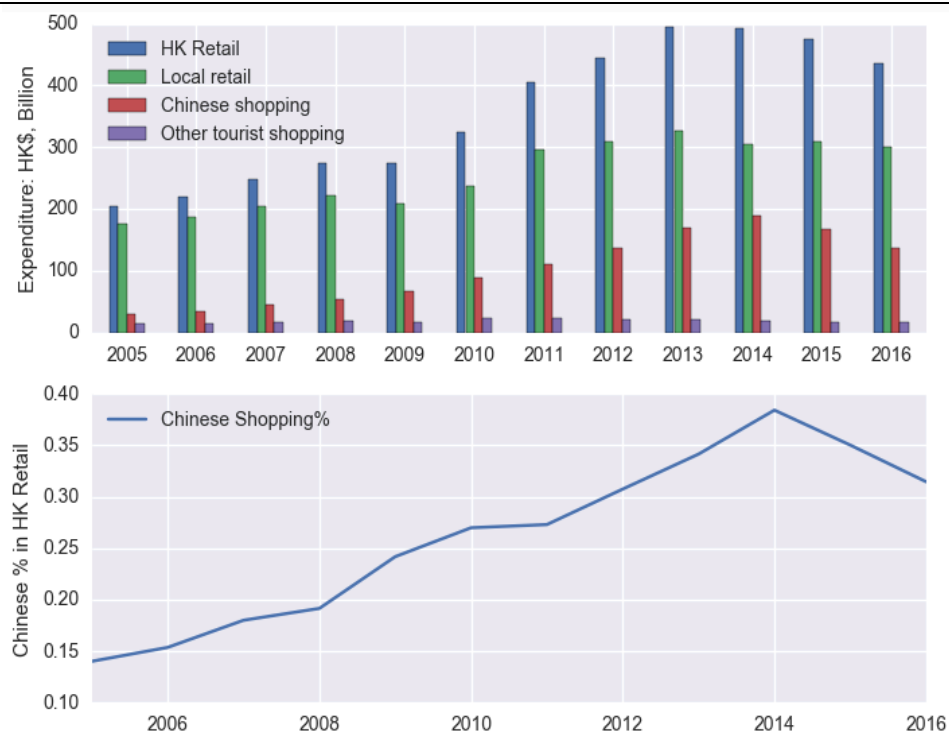
However, the exchange rate elasticity of tourism demand may not be as large as implied by the empirical results above. One reason may be that over the booming decade, the annual growth rate of tourism demand from China was much larger than the annual changes in exchange rate. As a result, the coefficients in the regression model will be large, thus leading to a large exchange rate elasticity of tourism demand. In fact, as pointed out by Cheng (2012), the main reason of the tourism boom was the launch of the Individual Visit Scheme, which had nothing to do with exchange rates. In this context, the effect of exchange rate implied by the empirical models is exaggerated. However, with the maturing

of Chinese tourism market, the exchange rate should in the future have the normal impact identified in the economic literature on tourism.

Retail Sales

The retail sales sector benefits the most from growth in tourism, as it attracts the largest share of tourist spending. Tourist spending runs through many channels, including retail sales, hotels, entertainment, catering etc., but for Hong Kong, retail sales is the most important one. Shopping typically accounts for 70 to 80 percent of Chinese tourist spending. Retail sales only covers consumer spending on goods and does not include spending on services such as entertainment and transport. In this regard, tourist spending on shopping is included in retail sales, but tourist spending on entertainment, tours and similar items is not. The share of Chinese tourist spending in Hong Kong's retail sales expanded over the boom period of 2005-2014, peaking at about 38 percent in 2014. After that, with the drop in both tourist numbers and per capita spending, tourists' expenditure on shopping declined along with their overall spending. Retail spending from local consumers did not change much,¹⁴ so the share also dropped.

Figure 11: Hong Kong Retail Sales and Chinese Tourists' Shopping Expenditure



Source: Hong Kong Tourism Board

¹⁴ The local retail consumption is calculated by subtracting the total tourist spending on shopping from the total HK retail sales, thus it may not be the accurate value.

According to our calculations below, falling Chinese tourist expenditure on shopping would definitely hurt retail sales in Hong Kong. If the RMB further depreciated by 10 percent, spending on shopping from Chinese tourists would shrink by 20-30 percent. If we assume that local retail consumption and shopping expenditure from other tourists do not change much, as shopping spending from Chinese tourists represents around 30 percent of the total Hong Kong retail sales, retail sales would drop by 6-10 percent.

Table 8: Tourist Spending

	2014	2015	2016*¹⁵
Retail Sales Value (1)	493.3	475.2	436.6
Overall Visitor Spending	300.8	271.5	238.3
- Same-Day Visitor Spending	79.7	78.5	69.1
- By Chinese Tourists	76.1	75.1	65.7
- On Shopping (2)	70.3	68.3	58.8
- Overnight Visitor Spending	221.0	193.0	169.3
- By Chinese Tourists	166.0	142.6	119.4
- On Shopping (3)	119.3	98.1	78.6
Chinese Tourists' Spending as Part of Retail Sales: (1)+(2)	189.6	166.4	137.4
- Share of (1)	38.4%	35.0%	31.5%

Source: Hong Kong Tourism Board

Summary

Hong Kong's tourism and retail sales industry would be negatively impacted by China's devaluation. RMB depreciation would deter tourism demand from China, but its impact is greater on day-trippers than overnight tourists, in terms of tourist numbers. On the other hand, however, per capita spending by overnight tourists is more sensitive to exchange rates than is spending by day-trippers. The overall effect would be a large decrease in aggregate tourist spending. Given that spending from Chinese tourists represents over 30 percent of Hong Kong's retail sales, devaluation of the RMB would lead to a contraction of Hong Kong's retail sector.

6. Conclusions

In this paper, we first reviewed Hong Kong's situation during the 1997-98 East Asian financial crisis, then investigated the impact of a hypothetical sudden RMB depreciation on Hong Kong by analyzing three key sectors: foreign direct investment, external trade and tourism.

RMB depreciation is likely to deter both China's inward and outward FDI, and thus also to

¹⁵ The latest data for tourist spending are for January-June 2016, so we generated projected spending data for the second half of the year based on the tourist numbers.

reduce Hong Kong's FDI as well as hurt related business sectors. Our analysis shows that China's inward FDI is gradually shifting from export-oriented to market-oriented, and the latter will be deterred by depreciation in RMB. On the other hand, as non-state-owned enterprises make up a larger share of China's outward FDI, China's FDI activities should become more sensitive to exchange rate changes. However, we also find that FDI is much more stable than other forms of foreign capital inflows during economic fluctuations. In addition, taking China's huge economic size into account, China's FDI is still expected to expand in the long run. As a service platform, Hong Kong may suffer from short-term stress, but is likely to participate in the long-run growth in China's FDI.

Hong Kong's trade sector is likely to benefit from RMB depreciation through its re-export channel for China. After breaking down Hong Kong's external trade statistics, we find that re-exports account for most exports and a large share of imports. To some extent, re-exports serve as a channel for China's external trade, and Hong Kong profits from re-export margins. A depreciation of the RMB would stimulate China's net exports, and therefore increase net re-exports generated from China. Since re-export business from China yields higher margins than re-exports from elsewhere, this would lead to more profits for Hong Kong's trade industry.

Tourism and retail sales will suffer greatly from depreciation in RMB. Our detailed analysis on tourist composition shows that tourists from China play a dominant role in Hong Kong's tourism sector. RMB depreciation will deter tourism demand from China, but its impact is greater on day-trippers than overnight tourists, in terms of tourist numbers. On the other hand, however, per capita spending by overnight tourists is more sensitive to exchange rates than is spending by day-trippers. The overall effect is a large decrease in aggregate tourist spending. Given that spending from Chinese tourists represents over 30 percent of Hong Kong's retail sales, devaluation of the RMB would lead to a contraction of Hong Kong's retail sector.

Looking beyond this paper, the next step would be to investigate more industries and find the most appropriate theories and models for Hong Kong. Aside from FDI, trade and tourism, the property market, securities market, and entertainment industry are very important to Hong Kong's economy as well. They deserve further and deeper analysis.

Hong Kong has been highly integrated with China economically and financially since 1997. However, it retains its special political system, currency and tax regime, etc. It is much more than a simple free port and international financial center. During our research, we found that little literature has been developed specifically about Hong Kong, or that it is too old to accommodate recent developments. Therefore, more efforts are required for updating economic theories and models for Hong Kong.

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Appendices

Appendix 1: Major Asian Currencies versus the US Dollar (July 1 to December 31, 1997)

Currencies	Depreciation
Chinese RMB	< 0.5%
Hong Kong dollar	< 0.5%
Indonesian rupiah	- 47.6%
Japanese yen	- 11.5%
Korean won	- 47.6%
Malaysian ringgit	- 35.2%
Philippine peso	- 34.1%
Singapore dollar	- 14.6%
New Taiwan dollar	- 14.8%
Thai baht	- 41.2%

Source: Calculations by Jao (2001); some currencies depreciated further in 1998

Appendix 2: Exports and Imports of Hong Kong, Year-on-Year Growth Rate (%)¹⁶

	Exports			Imports	
	Total Exports	Re-exports	Domestic Exports	Total Imports	Retained Imports
1997 Annual	6	7	2	7	8
Q1	4	5	- 4	6	8
Q2	6	7	*	7	6
Q3	4	4	6	7	14
Q4	10	10	5	8	3
1998 Annual	- 4	- 4	- 8	- 7	- 14
Q1	1	2	- 5	- 2	- 9
Q2	- 1	- 1	- 1	- 2	- 4
Q3	- 7	- 7	- 9	- 10	- 19
Q4	- 10	- 9	- 15	- 13	- 24
1999 Annual	4	5	- 7	*	- 12
Q1	- 5	- 4	- 9	- 10	- 23
Q2	- 2	*	- 13	- 8	- 23
Q3	8	11	- 8	7	- 2
Q4	12	14	1	12	6

Notes: * means change of less than 0.5%

Source: Calculations by Jao (2001)

¹⁶ The growth rates are in real terms, that is, the change in prices has been subtracted from the nominal values. According to Jao (2001), prices declined by 2-6% during the East Asian financial crisis.

Appendix 3: 2015 Hong Kong FDI by Home/Destination Economies (Billion Hong Kong Dollars)

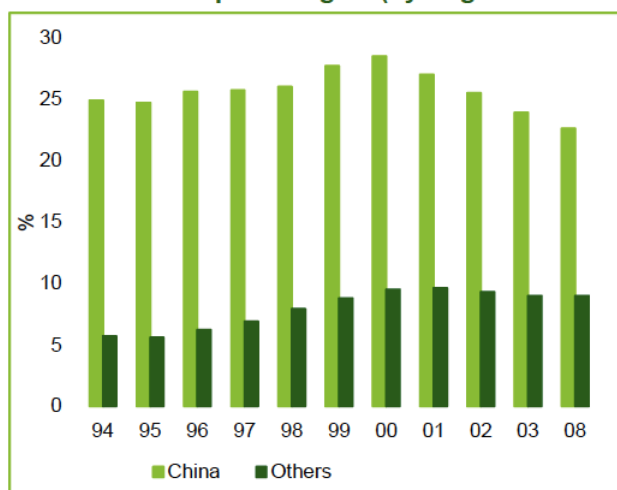
Economy	Inward				Outward			
	Inflows		Stock		Outflows		Stock	
BVI	437.5	32.4%	4,325.5	35.1%	-16.4	-2.9%	4,840.5	40.8%
China	200.8	14.9%	3,270.3	26.5%	306.6	55.1%	4,701.8	39.6%
CI	404.3	29.9%	861.7	7.0%	224.5	40.3%	455.2	3.8%
Netherlands	34.4	2.5%	778.7	6.3%				
Bermuda	59.4	4.4%	569.7	4.6%	24.0	4.3%	227.0	1.9%
Singapore	23.3	1.7%	343.1	2.8%	-8.2	-1.5%	71.4	0.6%
USA	3.0	0.2%	314.6	2.6%	-17.0	-3.1%	85.7	0.7%
Other	188.8	14.0%	1,872.3	15.2%	43.2	7.8%	1,487.8	12.5%
Total	1,351.5	100.0%	12,335.9	100.0%	556.7	100.0%	11,869.4	100.0%

Source: Hong Kong, Census and Statistics Department, *External Direct Investment Statistics of Hong Kong 2015*

Notes: BVI = British Virgin Islands; CI = Cayman Islands

Appendix 4: Re-export Margins by Origins

Exhibit 6: Re-export Margins (by origin of country)



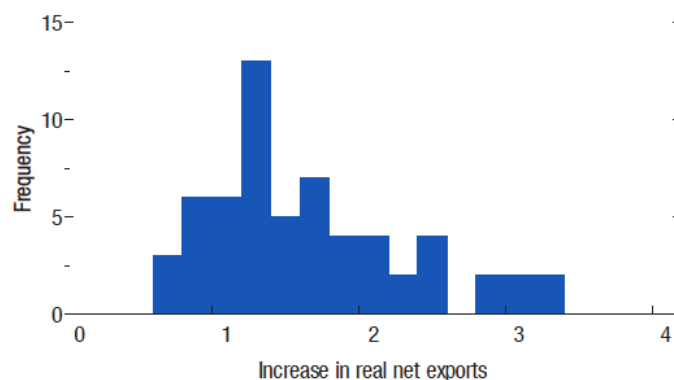
Source: Census & Stat. Dept., HKMA, Hang Seng Bank

Source: Hang Seng Bank

Appendix 5: Effect of a 10% Real Effective Depreciation on Real Net Exports

Figure 3.3. Effect of a 10 Percent Real Effective Depreciation on Real Net Exports
(Percent of GDP)

A 10 percent real effective depreciation in an economy's currency is associated with a rise in real net exports of, on average, 1.5 percent of GDP, with substantial cross-country variation around this average.



Source: IMF staff calculations.

Note: Figure shows long-term effect on level of real net exports in percent of GDP based on country-specific import- and export-to-GDP ratios and the average producer price index-based trade elasticities reported in Table 3.1 for the 60 economies in the sample.

Source: IMF; note that this is generalized, not specific to Hong Kong

Appendix 6: Empirical Results

Table A: Results for Chinese Tourist Numbers

Response Variable	Coefficients for Variables				Adjusted r-squared
	Constant	Chinese GDP	RMB-US\$	RMB-US\$ ²	
All Tourists	25.7249	-1.7800	2.1680		0.287
All Tourists	26.0926 *	-1.2158	2.1914 **	-0.2812 *	0.497
Day-Trippers	20.1648	0.3411	2.4903 *	-0.3926 *	0.617
Overnight Tourists	9.3923	0.2083	1.1756	-0.2364	0.354

Notes: ** means significance (p value < 0.05); * means (p value < 0.1)

Table B: Results for Chinese Tourist Numbers (with one-year lag)

Response Variable	Coefficients for Variables (with lag 1)				Adjusted r-squared
	Constant	Chinese GDP	RMB-US\$	RMB-US\$ ²	
All Tourists	12.7928	-0.4005	1.4742		-0.021
All Tourists	18.4448	-0.4421	3.2916 **	-0.5662 **	0.484
Day-Trippers	11.5427	1.1527	4.0543 **	-0.7754 **	0.645
Overnight Tourists	10.6412	0.1127	2.1727 *	-0.5025 **	0.489

Notes: ** means 5% significance level (p value < 0.05); * means 10% significance level (p value < 0.1)

Table C: Results for Chinese Tourist Spending

Response Variable	Coefficients for Variables				Adjusted r-squared
	Constant	Chinese GDP	RMB-US\$	RMB-US\$ ²	
All Tourists	20.6920	-1.0672	3.1995 **		0.561
All Tourists	21.1631	-0.3443	3.2294 **	-0.3603 **	0.748
Day-Trippers	14.7568	1.3334	3.5730 **	-0.2979 **	0.904
Overnight Tourists	17.4091	-0.1978	3.0721 **	-0.3777*	0.637
Same-Day per Capita	-13.7492	2.1511	0.6960	-0.0175	0.525
Overnight per Capita	0.8441	0.4869	1.4487 **	-0.1515	0.562

Notes: ** means 5% significance level (p value < 0.05); * means 10% significance level (p value < 0.1)

Table D: Results for Chinese Tourist Spending

Response Variable	Coefficients for Variables (with lag 1)				Adjusted r-squared
	Constant	Chinese GDP	RMB-US\$	RMB-US\$ ²	
All Tourists	1.1319	0.9266	2.2709		0.237
All Tourists	7.4123	0.8803	4.2903 **	-0.6291 **	0.519
Day-Trippers	-9.4751	4.0093 **	4.3830 **	-0.8004 **	0.894
Overnight Tourists	7.2177	0.5769	4.2135 *	-0.6071 *	0.383
Same-day per Capita	-21.7607 *	3.0482 **	0.5708	-0.1389	0.506
Overnight per Capita	-6.0592	0.8427	1.7980	-0.1115	0.433

Notes: ** means 5% significance level (p value < 0.05); * means 10% significance level (p value < 0.1)