FISHER EFFECT AND REAL INTEREST RATE EQUALIZATION IN SELECTED ASIAN COUNTRIES

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ABSTRACT

FISHER EFFECT AND REAL INTEREST RATE EQUALIZATION IN ASIAN COUNTRIES

This study investigated the validity of the Fisher effect and real interest rate parity with respect to China in the context of Asian countries (China, Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Thailand, India and Taiwan) by using long-term and short-term interest rates for the period spanning from quarter one of 2001 to quarter three of 2006. Univariate unit root tests and ARDL bounds test for cointegration were used in this study to examine both Fisher effect and real interest rate parity. All in all, this study showed that there was no cointegration relationship between short-term nominal interest rate and expected inflation for the case of Indonesia, Malaysia, the Philippines and China. It is shown that only Hong Kong and China exhibited evidence of cointegration relationship between long-term interest rates and expected inflation rates. In other words, Fisher effect holds for Hong Kong and China. Meanwhile, Indonesia, South Korea, Malaysia, the Philippines, Thailand and Taiwan did not exhibited evidence of cointegration relationship between long-term interest rates and expected inflation rates. This implied that Fisher effect did not hold for these countries. This study showed that there was no long-run relationship between the real interest rates for the case of Indonesia and Malaysia with respect to China real interest rate using short-term interest rates. So, real interest rate parity did not hold. It was shown that more evidence of long-run relationship between the real interest rates of Asian countries with respect to China can be observed for the long-term interest rates. The real interest rates for Indonesia and Taiwan exhibited evidence of long-run relationship with respect to China real interest rate. In other words, real interest rate parity holds for Indonesia and Taiwan. Meanwhile, Hong Kong, Malaysia, the Philippines and Thailand did not exhibited evidence of cointegration relationship. The real interest rate parity did not hold for these countries. Finally, a few policy implications have been highlighted in response to these findings. This information was useful for the central bank to adopt an appropriate monetary policy to control economic behavior. Besides, the banks should set efficient investment strategy in order to prevent unnecessary losses in capital investment. These findings will also benefited to the global investors who intend to do investment in the Asian region.

Keywords: Fisher effect, Financial integration, Real interest rate equalization, real interest rates, Panel unit root tests, ARDL bound tests for cointegration

v

ABSTRAK

Kajian ini adalah untuk menyelidik Kesan Fisher dan penyamaan kadar faedah yang benar dengan berdasarkan kepada Negara China. Kajian ini merangkumi Negara Asia seperti China, Hong Kong, Indonesia, Malaysia, Filipina, Singapura, Korea Selatan, Thailand, India dan Taiwan dengan menggunakan kadar faedah secara jangka masa pendek and panjang. Sampel data yang digunakan dalam pengujian ini ialah dari suku pertama tahun 2001 hingga suku ketiga 2006. Ujian unit root dan Ujian ARDL bounds telah digunakan untuk mengkaji kesan Fisher dan penyamaan kadar faedah yang benar. Secara keseluruhannya, kajian ini menunjukkan bahawa negara Indonesia, Malaysia, Filipina dan China tidak mempunyai hubungan antara kadar faedah jangka pendek dan jangkaan inflasi. Akan tetapi, negara Hong Kong and China telah dibuktikan terdapat hubungan antara kadar faedah jangka panjang dan jangkaan inflasi. Dalam perkataan lain, kesan Fisher wujud di negara Hong Kong dan China sahaja. Manakala, hubungan antara kadar faedah jangka panjang dan jangkaan inflasi tidak wujud di negara Indonesia, Korea Selatan, Malaysia, Filipina, Thailand dan Taiwan. Ini menunjukkan bahawa kesan Fisher tidak berlaku di negara tersebut. Selain itu, kajian ini juga menunjukkan bahawa tiada hubungan dikesan antara kaedah faedah benar jangka pendek untuk Indonesia dan Malaysia terhadap kaedah faedah benar jangka pendek China. Kajian telah menunjukkan bahawa penyamaan kadar faedah yang benar jangka pendek tidak berlaku antara negara Asia dan China Manakala, hubungan penyamaan kadar faedah benar wujud dalam jangka panjang. Dalam kes ini, negara Indonesia dan Taiwan telah membuktikan wujudnya penyamaan kadar faedah yang benar terhadap China. Manakala, penyamaan kadar feadah yang benar tidak wujud bagi negara Hong Kong, Malaysia, Filipina dan Thailand. Akhirnya, beberapa kesan-kesan polisi telah diutarakan sejajar dengan keputusan ini. Informasi ini berguna kepada bank pusat supaya mengunakkan polisi kewangan yang berkesan untuk mengawal keadaan ekonomi. Selain itu, bank-bank juga perlu megaturkan strategi pelaburan yang berkesan supaya tidak mengalami kerugian dalam pelaburan kapita. Keputusan ini amat berguna kepada para pelabur sedunia yang ingin membuat pelaburan di Asia.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Economists have all the time been looking for a better understanding of the dynamic behavior of the real interest rate[1] and real interest rate parity. As a result, these two hypotheses were popularly studied in the past literature. The major reason was that these two propositions were the important variables in modeling fruitful investment, shaping the financial assets valuations and influencing macroeconomic dynamics for country output decisions. According to Fisher (1930), who suggested that nominal interest rates should adjust one-for-one relationship to the changes in predicted inflation rate. The validity of Fisher effect is verified if real difference between the nominal interest rates and the predicted inflation rate exhibits long-run mean reversion behavior. However, the hypothesized Fisher effect had been a subject of discussion ever since the non-stationary finding documented in the existing financial literature. The real interest rate parity (RIP) was a building block of the exchange rate models and it implied that both uncovered interest rate parity (UIRP) and purchasing power parity (PPP) hold simultaneously. Most of the previous studies focused on the short-term maturities but reported no supportive evidence for the Fisher effect and RIP. Recently, numerous studies have been carried out to investigate the long-term interest rates due to the limitations and failures of the short-term interest rates to support the Fisher theory and RIP. An empirical question that was unanswered from the previous literature was that whether Fisher effect and RIP holds better either for long-term interest rates or short-term interest rates? The failure of the consensus and consistent idea, provided by empirical literature on the validity of Fisher effect and RIP put into research that kept on

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[1] 'The rate of interest plays a central role in two branches of economic science, - the theory of prices, and the theory of distribution. The role of the rate of interest in the theory of prices applies to the determination of the prices of wealth, property, and services.' Irving Fisher (1907, p. 225).

going in finding the real solution. Several studies have been done corresponding to the factors leading to the failure of these two propositions to hold since several decades ago.

The study on the Fisher effect had important policy implications towards researchers and policy makers who were interested to know whether the Fisher effect was valid or not that may influence the effectiveness of their suggested strategy. First, the long-run relationship between nominal interest rate and expected inflation rate allowed central banks to control a yield curve through interest rate based on the expected inflation rate (Granville and Mallick, 2004). Secondly, the existence of a long-run relationship between nominal interest rate and expected inflation rate will be a good opportunity for the investors to borrow money and make productive investment to promote a country's economy growth and develop a better and reliable banking system (see Pill & Pradhan, 1997). Third, as pointed out by Garcia and Perron (1996) that the application of the Lucas type of consumption capital asset pricing model will be rejected if there was no long-run relationship between nominal interest rates and expected inflation rate. Lastly, as stated by Garcia and Perron (1996) that the usefulness of the Black-Scholes pricing options theory was solely dependent on the existence of long-run relationship between nominal interest rate and expected inflation rate.

This study also investigates the validity of the RIP in Asian countries and a few important policy implications can be recommended to investors, businessmen and central banks who may be interested to know the validity of the RIP towards the Asian region. First, the RIP is a long-run relationship of real interest rate cross countries to measure the financial market integration. Validity of RIP implies a long-run relationship of real interest rate cross countries. As suggested by Anoruo *et al.* (2002), the highly integrated financial market will have a strong impact on the financial institution operating systems. Adverse economic situations will be transferred from one financial market to other financial market and lastly frighten away investors. Thus, investors may not gain any benefit through well designed portfolio diversification strategy in highly integrated financial markets. Secondly, the effectiveness and efficiency of government monetary authorities' policies will be severely affected if the RIP holds (Mancuso *et al.*,

2003). In this respect, the government could not control the movement of the interest rate, which was influenced by other countries. Third, as the financial market of the country is highly correlated to others, the monetary and fiscal authorities of the countries should work together to stay away from any potential macroeconomic instability in this region. Good cooperation and coordination in monetary policies in regional economics are very important to prevent regional economic instabilities while attracting more investors' investment to contribute to the country's economic growth.

A substantial number of empirical techniques and tests have been employed to the research problems but mixed results of favoring and against the Fisher effect and RIP were reported. Perhaps, most of the economists perceived that the economic system strictly follows conventional linear framework, to bring order, predictability and control. Particularly, the econometrics methodology and models used may provide misleading inferences or unable to provide the supportive evidence of the Fisher effect and RIP. Although this conclusion was not universal, it seems to be the case that the results were relatively robust with respect to the particular markets considered and the empirical tests applied in the evaluation. Moreover, it is interesting to note that the recent studies consider the autoregressive distributed lag (ARDL) bounds test for cointegration. This method is applicable to examine the variables that found either integrated at order $I(0)$ or order $I(1)$. Therefore, this paper is purposely designed to re-examine the validity of the Fisher effect and RIP by applying ARDL bounds testing for cointegration.

In addition, this study attempts to explain the inter-relationship between Fisher effect and real interest rate parity (Taylor, 1999). It is expected that if real interest rate parity holds between Asian countries and China, the domestic real interest rates have to follow the real interest rate of China. As such, the Asian countries may loose the independence in controlling the movement of the nominal interest rates. On the other hand, the domestic governments expected to have flexibility to adjust the movement of the interest rates independently in accord to the expected inflation if real interest rate parity does not hold. As such, this study contributed to the literature by showing

3

whether the adjustment of nominal interest rate to the expected inflation in Asian countries were affected by the monetary policy in China.

The rest of this chapter is structured as follow: section 1.1 provides the background of study. Section 1.2 discusses the motivation of this study. Section 1.3 describes the problem statements in this study. Section 1.4 provides the objectives to be fulfilled. Section 1.5 reports the importance of the study. Section 1.6 outlines the organization of this study briefly.

1.1 BACKGROUND OF STUDY

The emergence of China was having a strong influence on Asian economies, see, Lim (2006, p.1). China started to adopt open door policy since 1970s by strengthening linkages with global economies through trade and direct investment. Gaining from the labour-intensive products comparative advantage, China was able to transform into a newly industrialized country. China's entry into the World Trade Organization on December 11, 2001 symbolized moving forward pace towards global economy integration.

China had grown at an average of 9 percent a year for the last 25 years. In 2005 China recorded a GDP growth rate of 10 percent (World Bank, 2006). Rapid growth in China had been accompanied with fast and continuous strong expansion in overseas trade. From the statistical perspectives as provided in the Table 1.1, China was the leading exporter and importer in Asian merchandise trade which accounted US$ 762 billion in export and US$ 660 billion in import during 2004. China surpassed Japan which make up the biggest share in leading exporter in Asian's merchandise trade from 15 percent in 2000 to 27.4 percent in 2005 as compared to Japan from 28.9 percent in 2000 declining to 21.4 percent in 2005. China was accounting 25.4 percent share as the leading importer in the Asian merchandise trade due to the government policies in emphasizing the importance of export led to the economic growth. Meanwhile, Japan recorded second place dropping drastically from the first ranking in 2000, accounted 25.3 percent to 19.8 percent in 2005. Hong Kong ranked third position of both exporter

4

and importer in the Asian merchandise trade in 2005 where US$ 292.1 billion were recorded in exports and US$ 300.2 billion in imports.

Speedy growth in South Korea has gained the fourth position relatively important in contributing to the Asian merchandise trade. However, as compared to China, China remained the most important and influential country as a source of supply and market. Exports to South Korea, Taipei, Thailand, Australia, Indonesia and Philippines were felt slightly due to, among others; the US economy slowing down. Meanwhile, exports grew significantly in 2005 to markets such as Malaysia, India and Pakistan. India archived the US$ 95.1 billion contributed up to 3.4 percent in 2005 compared to 2.6 percent in 2000. But China had made up of 27.4 percent valued US$ 762 billion in contributing to the overall Asian merchandise trade in 2005.

Asian imports from Australia, Thailand, Vietnam, New Zealand and Pakistan economies have maintained at moderately medium level. Nevertheless, China turned to be the main source of market and demand since China was the largest population in the world. Internationally, China's economic growth will continue to affect relative prices and production structures in the world level. Therefore, China economic growth will induce countries in Asian to promote economic growth at fairly high and consistent because two-thirds of China's imports originated from Asian. Meanwhile, the percentage share of Asian merchandise trade particularly in imports from the South Korea, Taipei, Singapore, Malaysia, Indonesia and Philippines had dropped fairly high.

There were bigger changes and evolution in the global trading pattern for the past few decades. The Table 1.2 showed that China played an important role in the Asian region. China had become the focus market and main supplier source. Strong trading relationship between China and Asian countries had proven that this region was gradually becoming more integrated in terms of financial markets and goods and services markets. From the statistical overview provided in the Table 1.2, the total export of 12 Asian countries to other countries in Asian had elevated from 46 percent in 1995 to 50.5 percent in 2005. However, if China was excluded from the trading with

Asian, the statistics fell down from 29.5 percent in 1995 to 25.5 percent in 2005. For evidence, the dollar value of Asian trade excluding China had increased to 87% from 1995 through 2005. However, the statistic figures also showed that exports from these 11 countries' to China had increased more than tripled times during this 10 years interval but non-China inter-Asian trade had not been so striking and encouraging.

Table 1.1: Leading Exporters and Importers in Asian Merchandise Trade, 2005

		Exports					Imports		
		US$ bn	Share, %				US$ bn	Share, %	
		2005	2000	2005			2005	2000	2005
1	China	762.0	15.0	27.4	1	China	660.0	15.0	25.4
2	Japan	594.9	28.9	21.4	2	Japan	514.9	25.3	19.8
3	Hong Kong	292.1	-	-	3	Hong Kong	300.2	-	-
	domestic exports	20.1	1.4	0.7					
	re-exports	272.1	-	-		retained imports	28.1	2.3	1.1
4	South Korea	284.4	10.4	10.2	4	South Korea	261.2	10.7	10.1
5	Singapore	229.6	8.3	8.3	5	Singapore	200.0	9.0	7.7
	domestic exports	124.5	4.7	4.5		Retained imports	94.9	5.0	3.7
	re-exports	105.1	3.6	3.8					
5	Taipei, Chinese	197.8	9.1	7.1	6	Taipei, Chinese	182.6	9.4	7.0
7	Malaysia	140.9	5.9	7.1	7	India	134.8	3.4	5.2
8	Thailand	110.1	4.2	4.0	8	Australia	125.3	4.8	4.8
9	Australia	105.8	3.9	3.8	9	Thailand	118.2	4.1	4.5
10	India	95.1	2.6	3.4	10	Malaysia	114.6	5.5	4.4
11	Indonesia	86.2	3.9	3.1	11	Indonesia	69.5	2.9	2.7
12	Philippines	41.3	2.4	1.5	12	Philippines	47.4	2.5	1.8
13	Vietnam	31.6	0.9	1.1	13	Vietnam	36.5	1.0	1.4
14	New Zealand	21.7	0.8	0.8	14	New Zealand	26.2	0.9	1.0
15	Pakistan	15.9	0.5	0.6	15	Pakistan	25.3	0.7	1.0
	Asian	2778.8	100.0	100.0		Asian	2598.9	100.0	100.0

Source: WTO , http://www.wto.org (13 November 2007).

6

China's major trading partners in Asian included Hong Kong, Indonesia, Malaysia, Philippines, Singapore, South Korea, Thailand, India and Taiwan (see, Table 1.3, Table 1.4 and Table 1.5). As can be seen in the Table 1.1, China had surpassed Japan to be the main driving force for the exports and imports in Asian countries. It was undeniable that Japan was still the major Asian source of foreign direct investment for most Asian countries. Japan used to be the main exporter in Asian countries but China played a greater role in Asian and even overtook the US in some cases.

Table 1.2: Changing Patterns of Merchandise Trade in Asian

	% Growth in total exports between 1995 & 2005	% Growth In exports to China between 1995 & 2005	% Growth in exports to Asian minus China Between 1995 & 2005	% Growth in exports to non-Asian between 1995 & 2005	% of Total Exports Going to China		% of Total Exports Going to Asian minus China		% of Exports Going to non-Asian	
					1995	2005	1995	2005	1995	2005
China	411.8	N/A	237.8	734.9	N/A	N/A	65	42.9	35.0	57.1
Hong Kong	66.8	125.2	140.9	18.0	33.3	45.0	10.7	15.4	56.0	39.6
India	226.7	3042.6	262.6	183.5	0.9	8.9	21.1	23.4	78.0	67.7
Indonesia	104.4	340.0	74.5	129.4	3.8	8.2	60.2	51.4	36.0	40.4
Japan	37.8	273.7	25.0	25.9	5.0	13.5	38.6	35.0	56.5	51.6
Malaysia	119.0	867.7	74.6	132.1	2.6	11.3	55.4	44.2	42.0	44.5
Philippines	201.7	4795.8	265.0	81.0	1.2	19.5	34.8	42.1	64.0	38.4
Singapore	75.4	615.9	86.2	41.7	2.3	9.5	45.7	48.5	52.0	42.0
South Korea	116.3	664.3	91.4	68.0	7.0	24.6	29.0	25.7	64.0	49.7
Taiwan	77.7	30.4	373.1	14.3	23.4	17.2	16.6	44.2	60.0	38.6
Thailand	87.6	455.4	138.9	40.2	2.8	8.3	36.2	46.1	61.0	45.6
Vietnam	447.9	540.4	446.5	438.9	6.4	7.5	33.1	33.0	60.5	59.5

Sources: The ADB's Key Economic Indicators of Developing Asian and Pacific Countries (2006)
The Japanese Ministry of Finance
IMF, Direction of Trade Statistics

China's imports from the rest of Asian were essentially taken in three different forms (political & economic risk consultancy, 2006). One of them was the transfer of export-oriented manufacturing from developed economies like South Korea, Taiwan and

Japan. Secondly, it was in the category of the goods and equipment (again mainly from Asian's developed economies) to satisfy Chinese domestic demand. The third type would be foodstuffs, timber, oil and other raw materials needed to satisfy China's domestic demand and industrial growth. As we can see the trading was drawing the countries of Asian closer to China.

Table 1.3: China's Trade by Export Destinations Sources, 2001 – 2005 (%)

Year	Exports Share (Trade partner)										
	HK	ID	MA	PH	SG	KR	TH	IN	TW	Others	Total
2001	17.44	1.07	1.21	0.61	2.17	4.70	0.94	1.07	2.21	68.58	100
2002	17.95	1.05	1.53	0.63	2.14	4.76	0.91	1.05	2.44	67.54	100
2003	17.40	1.02	1.40	0.71	2.02	4.58	0.87	1.02	2.50	68.48	100
2004	17.00	1.05	1.36	0.72	2.14	4.69	0.98	1.05	2.81	68.20	100
2005	16.33	1.10	1.39	0.62	2.19	4.61	1.03	1.10	2.61	69.02	100

Source: IMF, *Direction of Trade Statistics CD-ROM*, accessed on 13 November 2007.

Note: HK=Hong Kong, ID=Indonesia, MA=Malaysia, PH=Philippines, SG=Singapore, KR=South South Korea, TH=Thailand, IN=India, TW=Taiwan.

Export share is the percentage of exports going to a partner to total exports of a China. A higher share indicates a higher degree of integration between China and trading partner countries.

Table 1.4: China's Trade by Import Destinations Sources, 2001 – 2005 (%)

Year	Imports Share (Trade partner)										
	HK	ID	MA	PH	SG	KR	TH	IN	TW	Others	Total
2001	3.87	1.60	2.55	0.80	2.11	9.61	1.93	1.60	1.95	73.98	100
2002	3.65	1.52	3.15	1.09	2.39	9.67	1.89	1.52	3.37	71.75	100
2003	2.69	1.39	3.39	1.53	2.54	10.45	2.14	1.39	5.19	69.29	100
2004	2.10	1.29	3.24	1.61	2.49	11.09	2.06	1.29	6.06	68.77	100
2005	1.85	1.28	3.05	1.95	2.50	11.64	2.12	1.28	6.19	68.14	100

Source: IMF, *Direction of Trade Statistics CD-ROM*, accessed on 13 November 2007.

Note: HK=Hong Kong, ID=Indonesia, MA=Malaysia, PH=Philippines, SG=Singapore, KR=South South Korea, TH=Thailand, IN=India, TW=Taiwan.

Import share is the percentage of imports from a partner to total imports of a China. A higher share indicates a higher degree of integration between China and trading partner countries.

Table 1.5: China's Trade by Total Trade Destinations sources, 2001 – 2005 (%)

Year	Total Trade Share (Trade partner)										
	HK	ID	MA	PH	SG	KR	TH	IN	TW	Others	Total
2001	10.96	1.32	1.85	0.70	2.14	7.04	1.41	0.71	2.09	71.78	100
2002	11.15	1.28	2.30	0.85	2.26	7.10	1.38	0.80	2.88	70.00	100
2003	10.27	1.20	2.36	1.10	2.27	7.43	1.49	0.89	3.80	69.19	100
2004	9.76	1.17	2.27	1.15	2.31	7.80	1.50	1.18	4.39	68.47	100
2005	9.61	1.18	2.16	1.23	2.34	7.87	1.53	1.32	4.27	68.49	100

Source: IMF, *Direction of Trade Statistics CD-ROM*, accessed on 13 November 2007.

Note: HK=Hong Kong, ID=Indonesia, MA=Malaysia, PH=Philippines, SG=Singapore, KR=South South Korea, TH=Thailand, IN=India, TW=Taiwan.

Trade share is the percentage of trade with a partner to total trade of a China. A higher share indicates a higher degree of integration between China and trading partner countries.

China had become a favorite trading partner in the global arena and as an alternative to the United States. Consequently, it was making extremely rapid strides in signing official pacts that interlink China economy with other economies. Hence, the trading relationship had made China's influence on the world stage become greater.

From the statistical overview above, this study attempts to use China as the base country to examine the degree of integration within Asian with respect to China. This study aims to fill the gaps in the literature instead of using Japan and United States as a benchmark for the financial markets integration measurement.

1.2 MOTIVATION OF STUDY: FAILURE OF FISHER AND REAL INTEREST HYPOTHESIS

There were substantial empirical findings with respect to validity of the Fisher hypothesis, beginning with Fama (1975) who, utilized regressions and found evidence that the Fisher hypothesis holds for the United States. However, Fama's results are then refuted by Garbade and Wachtel (1978), Nelson and Schwert (1977), Fama and Gibbons (1982), Shiller (1980) and Mishkin (1981). Shiller (1980) and Mishkin (1981) argued that Fama's chosen sample period was unrepresentative of twentieth century experience. Investigations were carried out and their findings once again were against the earliest Fama's outcome. There were several findings which showed the ex ante real interest rate exhibited non-stationarity or less supportive for the Fisher effect (see, for instance, Antoncic, 1986; Rose, 1988; King and Watson, 1992; Choi, 1994; Mishkin, (1992, 1995); Evans and Lewis, 1995; Crowder and Hoffman, 1996; Daniels *et al.*,1996; Lee *et al.*, 1998; Koustas and Serletis, 1999; Coppock and Poitras 2000; Lanne, 2001; and Atkins and Coe, 2002). This was not surprising to learn that their studies were unable to detect the Fisher effect because they were mainly focused on the short-term interest rates. However, recently, numerous studies carried out investigation on the long-term interest rates and found supportive evidence for a full Fisher effect (see, Duck, 1993; Crowder and Hoffman, 1996; and Fahmy and Kandil, 2003). Inspired by the stationary findings on the long-term interest rates data, several empirical studies such as Evans and Lewis (1995), Coppock and Poitras (2000) attempted to re-examine but decisively rejected the

previous findings. Motivated by the previous empirical findings, it is interesting to know whether Fisher effect holds better at long-term interest rates as compared to the short-term interest rates.

The RIP measured the financial markets integration which was derived from the assumption of both international capital markets and the goods market should be integrated. However, empirical studies provided mixed results regarding to equality of the short-term real interest rates[2]. Frankel (1979) argued that the long-term real interest rates should be equalised cross countries. Since then, numerous studies were looked at the long-term real interest rates to shed light of an arising puzzle, which was unable to provide consistent findings to the theoretical framework. These included Goodwin and Grennes (1994), Johnson (1992), Al-Awad and Goodwin (1998), Mancuso *et al.*, (2003) who offered more favorable results to the real interest rate equalisation. However, Gagnon and Unferth (1995), Jorion (1996), and Fujii and Chinn (2001) found that there were no tendency for the real interest rates to be equalised for long-term interest rates. Inspired by the empirical studies, it is interesting to know whether RIP holds better at long-term interest rates as compared to the short-term interest rates.

The emergence of China's economy especially following entrance of China into the World Trade Organization in 2001 had attracted few of the researchers to investigate the regional financial integration with respect to China. As for the empirical findings, Cheung *et al.* (2003 and 2006) examined the uncovered interest rate parity for Hong Kong and Taiwan with respect to China. They showed that Hong Kong is highly cointegrated with China but Taiwan exhibited stronger linkages with respect to Japan and US as compared to China. In addition, Cheung *et al.* (2005) also examined the uncovered interest rate parity for Hong Kong, Japan and Singapore relative to China.

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[2] See for instance, (Kaen and Hachey, 1983; Cumby and Obstfeld, 1984; Mishkin, 1984; Hartman, 1984; Mark, 1985; Cumby and Mishkin, 1986; Merrick and Saunders, 1986; Kirchgassner and Wolters, 1987; Swanson, 1987; Modjtahedi, 1988; Fratianni and Hagen, 1990; Karfakis and Moschos, 1990; Biltoft and Boersch, 1992; Katsimbris and Miller, 1993; Goodwin and Grenne, 1994; Caporale and Pettis, 1995; Chinn and Frankel, 1995; Byun and Chen, 1996; Jorion, 1996; Alexakis *et al.*,1997; Hutchison and Singh, 1997; Moosa and Bhatti, 1997; Al-Awad and Goodwin, 1998; Siklos and Wohar, 1997; Hassapis *et al.*, 1999; Fujii and Chinn, 2001; Anoruo *et al.*, 2002; Laureceson, 2003; Zhou, 2003; Ma and Park, 2004; Baharumshah *et al.*, 2005 and Jayaraman *et al.*, 2006).