

Exploring the Case for Monetary Integration between Mainland China and Hong Kong

Tony Cavoli, Ramkishen S. Rajan *

Abstract

This paper presents an empirical investigation on an important policy issue; namely, whether there is any evidence supporting monetary integration between mainland China and Hong Kong. We follow two lines of inquiry. First, we present a series of simple tests to find the extent to which trade and/or financial linkages exist between the two regions. Second, we use simple inflation and output differentials and structural VAR techniques to test for the degree of business cycle synchronization between the two regions. The results indicate that there is evidence supporting the existence of trade linkages and that there is also support for the possible synchronization of business cycles. We discuss the implications of this for monetary integration between Hong Kong and the mainland.

Key words: Hong Kong, mainland China, monetary integration, optimum currency area, renminbi

JEL codes: F31, F41

I. Introduction

When one thinks about the relationship between mainland China and Hong Kong, the phrase “one country, two systems” is invariably the first thing that comes to mind (Takeuchi, 2006). It is well known that this principle, which has been enshrined under the territory’s Basic Law, refers to the fact that although Hong Kong is part of China (i.e. no political independence), it has complete autonomy in terms of economic policy-making. For instance, in the case of monetary and financial policies, the Hong Kong Monetary Authority (HKMA) is independent of the People’s Bank of China and Hong Kong can maintain its own system of currency issuance and management, and operate its own financial and monetary policies.

Although this economic autonomy has been cherished by much of Hong Kong, particularly in the early stages of handover, there is a growing body of opinion questioning the value of such a system to the Hong Kong economy. In particular, it has been suggested that as mainland China continues to liberalize its economy and grow rapidly, and as Hong Kong integrates more intensively with mainland China, it might be in Hong Kong’s best interest to remove other policy barriers that have prevented Hong Kong’s full integration with mainland China. Leung (2003, p.3) points out:

Hong Kong needs to reposition itself, because after the sovereignty handover, its integration with China has been severely constrained by the strict regulations on mainland visitors, in addition to the totally independent and different legal, currency, and tariff systems. Meanwhile, Hong Kong’s role as the bridge and window to China is under severe competition due to the

* Tony Cavoli, Lecturer, School of Economics and Finance, Queensland University of Technology, Australia. Email: t.cavoli@qut.edu.au; Ramkishen S. Rajan, Associate Professor, School of Public Policy, George Mason University, Arlington, VA, USA. Email: rrajan1@gmu.edu. Research assistance by Surabhi Jain is gratefully acknowledged.

rapid development of China's economic reform and opening up policy, making Hong Kong face the situation of being marginalized.

In terms of trade, mainland China and Hong Kong recently signed a Free Trade Agreement (FTA), called the Closer Economic Partnership Arrangement (CEPA), which came into force on 1 January 2004. The CEPA offers zero tariffs on goods from both parties, preferential access in a number of service areas and takes other steps to facilitate cross-border trade (see Table 1). Therefore, although China is liberalizing its economy under the aegis of the WTO, the CEPA can provide preferential access and first mover advantage to Hong Kong firms, especially service-oriented ones.¹

Table 1. The Closer Economic Partnership between Hong Kong and Mainland China

The closer economic partnership arrangement (CEPA) that was signed in June 2003 and became effective 1 January 2004 presents significant opportunities for Hong Kong. The second phase of CEPA was signed in August 2004.

CEPA gives Hong Kong substantial long-term advantages compared to the mainland's commitments to other countries under the WTO. Specifically:

- On 1 January 2004, goods from Hong Kong that fell under 273 mainland product codes (equivalent to 90 percent of Hong Kong's direct exports to the mainland, and which excludes re-exports) became eligible for a zero-tariff treatment under CEPA.
- On 1 January 2006, the remaining products will also be given a zero-tariff treatment.
- Market access under CEPA is wider than under the mainland's WTO commitments and includes several sectors (e.g. trade in goods, services and investment promotion).
- Many of the trading quotas imposed on Hong Kong firms by the mainland would also be lifted under CEPA.

The service sector in Hong Kong stands to benefit the most from CEPA, including through the lowering of entry barriers.

- 18 service sectors are eligible for favorable treatment under CEPA (including telecommunications, banking, insurance and management consultancy and other sectors that were not included in the mainland's WTO commitments); additional service sectors were added to the CEPA list in August 2004.
- CEPA lowers the minimum assets requirement for banks planning to open branches in the mainland from US\$20bn to US\$6bn, thus making most local banks eligible for it.
- It relaxes equity share restrictions for foreign investors in the service sectors.

CEPA's rules of origin are less stringent than those set under similar free trade agreements.

Manufacturing firms are required to have only 30 percent of their value added in Hong Kong to qualify for CEPA's benefits. Although labor costs are relatively high it might be profitable to carry out high value added processes—especially those with intellectual property content, given the zero tariff, and low tax rates in Hong Kong.

CEPA also includes a liberalization of the mainland tourist visa scheme (allowing individual, rather than just group visits), which resulted in an immediate surge in tourist arrivals from the Mainland to Hong Kong.

Source: Reproduced from IMF (2005a, p. 11).

¹For a summary of the CEPA, see IMF (2005a), www.tdctrade.com/econforum/tdc/tdc060701.htm and www.tdctrade.com/econforum/tdc/tdc051101.htm.

In the monetary realm, there have been some suggestions that there could be a common currency between Hong Kong and mainland China, or at least full convertibility between the two currencies, similar to the convertibility agreement between Singapore and Brunei in which the latter pegs to the former. Given the relative economic sizes between mainland China and Hong Kong, any sort of union effectively implies Hong Kong forsaking its own autonomy and delegating economic decision-making to the mainland. Would this be in Hong Kong's best interest?

From an economic perspective, monetary integration requires the satisfaction of certain preconditions. First, there needs to be a high and growing level of economic integration between the two parties. However, this is only a necessary condition for a common currency. It is also important that there exist a high degree of business cycle synchronization between the two entities. The basic argument here is that if you are sacrificing monetary policy autonomy it is important that you share a common business cycle with the other party so that that country's monetary policy would be the appropriate stance for you as well. For instance, if mainland China was overheating while Hong Kong was facing a recession, this means that no business cycle synchronization, a tight monetary policy in the case of mainland China, would not be appropriate for Hong Kong.² Of course, because Hong Kong already operates a currency board arrangement (so-called Linked Exchange Rate System or LERS), the issue of loss of monetary policy independence not a major issue. We return to this point later.

This rest of paper is organized as follows. Section II provides some general empirical observations about the extent of trade and financial integration between Hong Kong and mainland China. Section III undertakes more rigorous testing of the extent to which the mainland and Hong Kong share synchronous business cycles. Section IV discusses possible future directions for and the likelihood of monetary integration between mainland China and Hong Kong.

II. Trade and Financial Linkages between Hong Kong and China

1. Trade Linkage

To obtain a sense of the extent of Hong Kong's trade with mainland China, this section presents some broad trends in Hong Kong's imports from and exports to mainland China since 1972. The data is sourced from the Hong Kong Census Department. Table 2 highlights some raw trade figures for exports, imports, re-exports to and re-exports from China. The table offers an indication of the rise in Hong Kong's trade flows with China.

²Two other ways of overcoming the lack of business cycle synchronization would be through greater labor mobility or through provision of fiscal subsidies. We do not discuss these issues further in the present paper.

Table 2. Hong Kong's Trade with China, 1972–2004

(Unit: millions of Hong Kong

dollars)

	Hong Kong exports to mainland China		Hong Kong imports from mainland China		Hong Kong re-exports to mainland China		Hong Kong re-exports from mainland China	
	Value	Percent change	Value	Percent change	Value	Percent change	Value	Percent change
1972	21	0	3847	0	82	0	NA	NA
1973	49	133	5634	46	222	171	NA	NA
1974	99	102	5991	6	197	-11	NA	NA
1975	28	-72	6805	14	137	-30	NA	NA
1976	24	-14	7761	14	123	-10	NA	NA
1977	31	29	8082	4	175	42	NA	NA
1978	81	161	10 550	31	214	22	NA	NA
1979	603	644	15 130	43	1315	514	NA	NA
1980	1605	166	21 948	45	4642	253	NA	NA
1981	2924	82	29 510	34	8044	73	NA	NA
1982	3806	30	32 935	1	7992	-1	NA	NA
1983	6223	64	42 821	30	12 183	52	NA	NA
1984	11 283	81	55 753	30	28 064	130	NA	NA
1985	15 189	35	58 963	6	46 023	64	NA	NA
1986	18 022	19	81 633	38	40 894	-11	NA	NA
1987	27 871	55	117 357	44	60 170	47	NA	NA
1988	38 043	36	155 634	33	94 895	58	NA	NA
1989	43 272	14	196 676	26	103 492	9	NA	NA
1990	47 470	10	236 134	20	110 908	7	NA	NA
1991	54 404	15	293 356	24	153 318	38	NA	NA
1992	61 959	14	354 348	21	212 105	38	403 782	0
1993	63 367	2	402 161	13	274 561	29	474 007	17
1994	61 009	-4	470 876	17	322 835	18	545 831	15
1995	63 555	4	539 480	15	384 043	19	636 392	17
1996	61 620	-3	570 442	6	417 752	9	683 514	7
1997	63 867	4	608 372	7	443 878	6	723 416	6
1998	56 066	-12	580 614	-5	407 366	-8	691 219	-4
1999	50 414	-10	607 546	5	399 188	-2	720 126	4
2000	54 158	7	714 987	18	488 823	22	849 517	18
2001	49 547	-9	681 980	-5	496 574	2	808 370	-5
2002	41 374	-16	717 074	5	571 870	15	863 967	7
2003	36 757	-11	785 625	10	705 787	23	967 104	12
2004	37 898	3	918 275	17	850 645	21	1 135 469	17

Source: Hong Kong Census Bureau (2005).

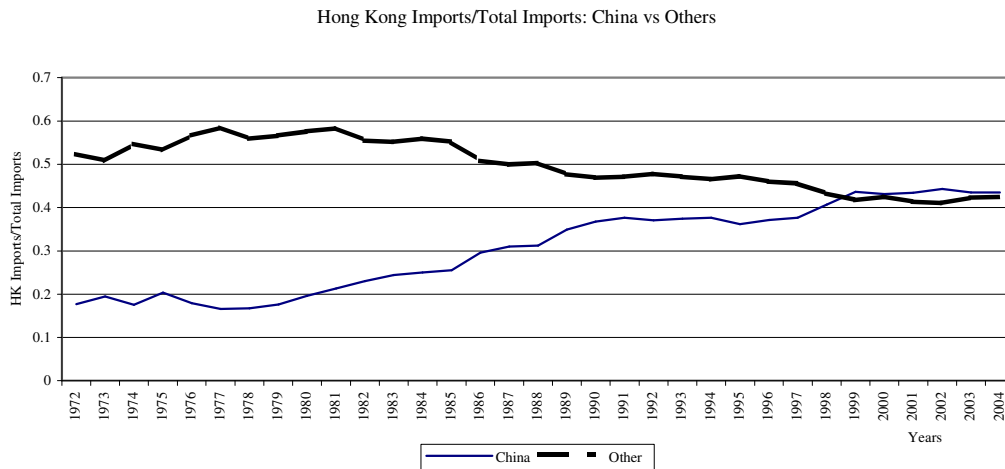
Notes: NA, not applicable

Figure 1(a) presents a comparison of Hong Kong's imports from mainland China (measured by the proportion of its imports with China to its total imports) and

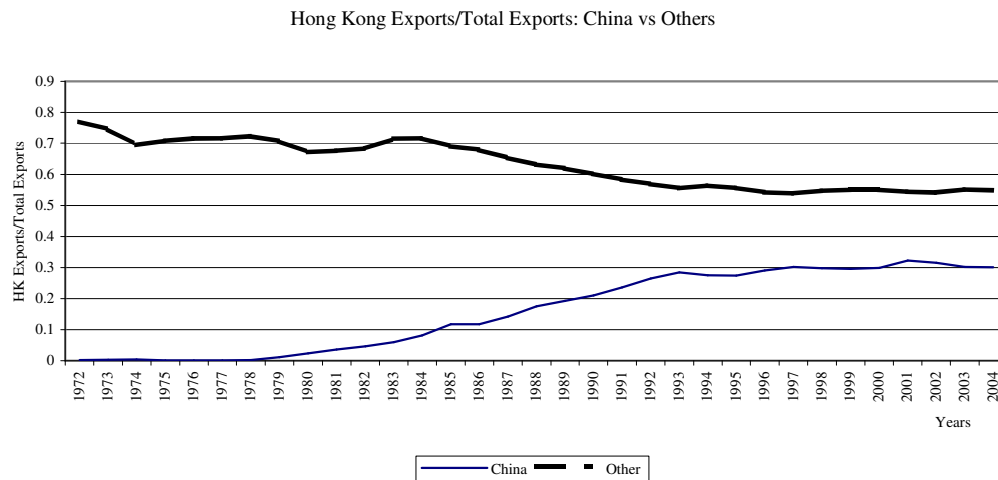
Hong Kong's imports from the remaining nine of its top ten trading partners (measured in the same way).³ Figure 1(b) provides the same information for Hong Kong's domestic exports. Essentially, these figures provide information about the importance of Hong Kong's trade with mainland China and whether and how this has moved over time.⁴

Figure 1. Trade Patterns: Hong Kong's Exports to and Imports from Mainland China, 1972–2004. (a) Hong Kong Imports/Total Imports: China Versus Others; and (b) Hong Kong Exports/Total Exports: China Versus Others.

(a)



(b)



Source: Hong Kong Census Bureau (2005).

Note: “Others” refers to the other nine of Hong Kong’s top ten trading partners.

³Apart from mainland China, the economies specified by the Hong Kong Census Bureau are Japan, Chinese Taiwan, USA, Singapore, Korea, Malaysia, Germany, Thailand and the Philippines.

⁴Re-exports are not included in these figures.

Referring to Figure 1(a), note that the line has increased over time from 18 percent at the start of the sample in 1972 to approximately 44 percent of total imports in 2004. Note also that the (dotted) line representing Hong Kong's imports from other nine countries has decreased from approximately 52 to 42 percent since the late 1990s. This is an indication of the growing significance of mainland China as a source of imports for Hong Kong. Interestingly, the lines cross in 1998, implying that mainland China became a larger trading partner than the rest of Hong Kong's top ten trading partners combined, including the USA. Figure 1(b) presents a similar story, although not quite so marked, for Hong Kong's exports. Exports to mainland China were negligible for approximately 6 years at the start of the sample period (1972), but grew to 30 percent of total exports by the early 1990s and remained constant since then. Exports to the other nine of the top ten were very high, over 75 percent of total exports in 1972 and declined to approximately 55 percent by the early 1990s and have remained constant since then. Inclusion of re-exports will show an even more marked rise in mainland China's importance to Hong Kong as an export market.

Although much more detailed and sophisticated analysis of bilateral trade flows could be undertaken (e.g. intensity indices, gravity models), the general conclusion noted above remains unaltered. Mainland China, especially the region around the Pearl Delta River is rapidly growing in importance as a trade partner to Hong Kong, particularly as a source of imports and in terms of re-exports.⁵ It is important to keep in mind that entrepot is just one area of services trade. Given the importance of the service sector in Hong Kong, it would also be important to examine bilateral trade in other areas of services as well. However, data limitations preclude such an analysis. Suffice it to note that the CEPA should be helpful in further integrating Hong Kong's service sector with enterprises in mainland China.⁶

2. Financial Linkage: Focus on Interest Rates

The high level of Hong Kong's trade linkages with mainland China is well-recognized (as is integration through foreign direct investment (FDI)), but what about the degree of financial integration? In this section we present some stylized facts about the recent trends in financial linkages by focusing mainly on the deposit rate differential and the lending rate differential between Hong Kong and mainland China.⁷

Figure 2(a) presents a time series of the deposit rate for both Hong Kong and mainland China (IMF, 2005a).⁸ Although not entirely conclusive, the figure seems to indicate some convergence in the two series between 1997 and 2001. From 2002 to the end of the sample in 2004, a fairly constant differential of some -2 percent (from the perspective of Hong Kong) has been maintained. Further information can be obtained from Figure 2(b). Here, the differential is plotted (Hong Kong minus mainland China) against its Hodrick- Prescott filtered trend (Hodrick and Prescott, 1997).⁹ The actual differential shows convergence from 1994 to 1999 where it overshoots before settling on the -2-percent deviation mentioned above. The series indicates a pattern of convergence until 1999 and a degree of divergence thereafter.

⁵In addition, the Pan-Pearl River Delta initiative has been put in place to further intensify Hong Kong and Macau's integration with mainland Chinese provinces around the Pearl Delta River.

⁶See <http://www.tdctrade.com/econforum/tdc/tdc041205.htm>.

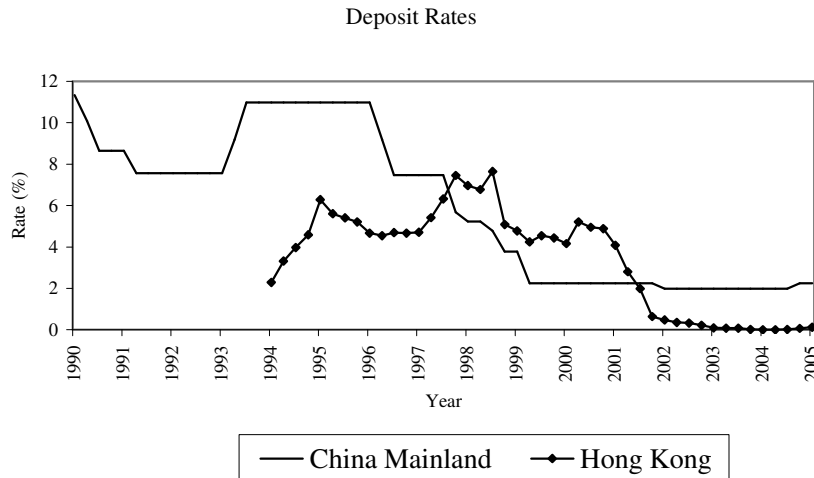
⁷The data series for both economies, especially China, does not exhibit the amounts of volatility necessary for rigorous testing. As such, we present some casual empirical evidence with a view to gaining some basic trends or patterns in the data and to gain some basic insights into the possibility of deeper financial links between the two economies.

⁸Line 60L from the IMF (2005b).

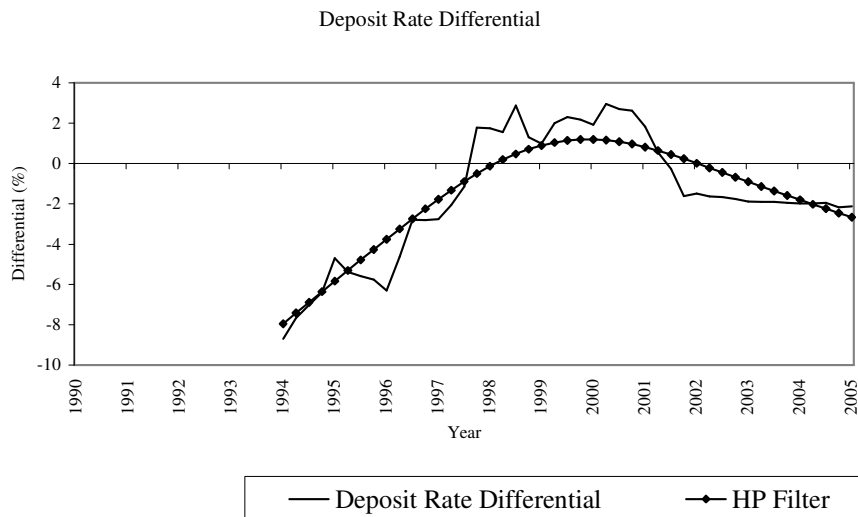
⁹This is done to remove cyclical movements.

Figure 2. (a) Deposit Rates and (b) Differentials between Hong Kong and Mainland China, 1990–2004 (%)

(a)



(b)



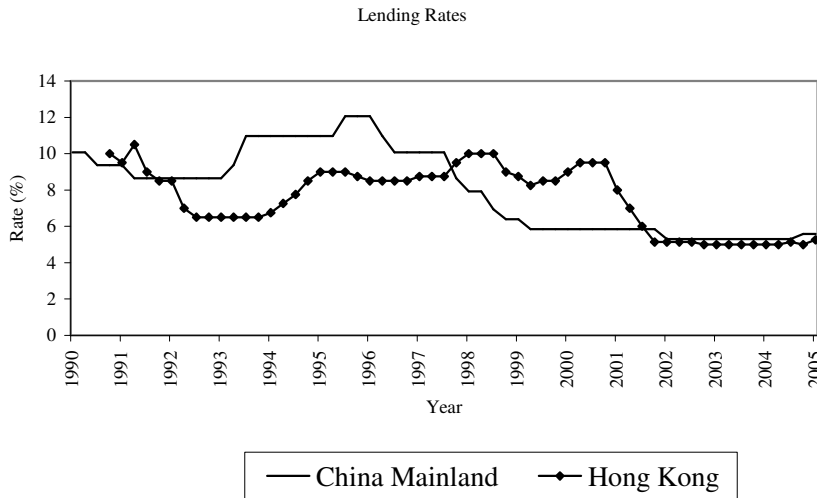
Sources: Lending rates and differentials (IMF, 2005b); Hodrick–Prescott (HP) filtered data are calculated by authors.

We repeat the analysis using lending rates (IMF, 2005b). Figure 3(a) presents the time series for lending rates. The pattern for convergence appears to be much stronger than for deposit rates with the differential being quite small and stable for the period 2002–2004. Figure 3(b) presents the differential (Hong Kong minus mainland China) plotted against the Hodrick–Prescott trend. The oscillating pattern seen in the deposit rates also appears for the lending rates, but the magnitude of the deviation appears lower over the sample. In the latter part of the sample the differential is much closer to zero in the case of lending rates compared to deposit rates.

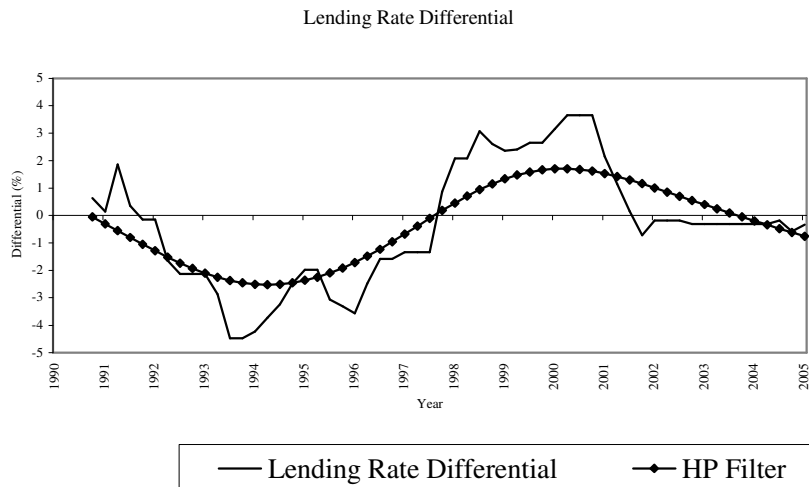
Cheung *et al* (2006, 2007) undertake a different but complementary set of tests of financial integration between mainland China and Hong Kong. They examine whether various goods and asset arbitrage conditions, namely, the uncovered interest parity (UIP), real interest parity (RIP) and the relative purchasing power parity (PPP), hold.¹⁰ They find that over the long run, these parity conditions hold quite well for Hong Kong and for mainland China, suggesting a high degree of integration, particularly in the case of the UIP.

Figure 3. (a) Lending Rates and (b) Differentials between Hong Kong and Mainland China, 1990–2004 (%)

(a)



(b)



¹⁰A sufficient condition for RIP to hold is that UIP and PPP must simultaneously hold. Because PPP assumes goods price arbitrage, it is a measure of real sector integration. The UIP is a measure of financial integration. The RIP is a measure of both.

Sources: Lending rates and differentials (IMF, 2005b); Hodrick–Prescott (HP) filtered data are calculated by authors.

3. Summary

In addition to the empirics above, one could consider other dimensions of economic integration in terms of equity flows or FDI.¹¹ However, there are two problems with using any such measures of de facto economic integration to draw policy conclusions. First, different measures and types of economic integration could lead to somewhat divergent conclusions depending on what is being measured and how it is being measured. For instance, based on the empirical investigation above, trade flows appear to indicate significant degrees of integration of Hong Kong with mainland China, whereas the evidence from the interest rate differentials provides slightly weaker evidence of closer integration. Second, it is not always clear that closer integration makes a region more suitable for a common currency and a common set of monetary policies. For instance, as is well known, if trade integration is based on factor price differentials, enhanced integration could lead to more supply-side dissimilarities between the two parties, making them less of an optimum currency area (OCA) (Krugman, 1993).¹² In view of this, the next section provides more formal tests of integration based on the extent of business cycle synchronization.

III. Tests of Business Cycle Synchronization

A significant determinant of the degree of integration in the OCA literature is the extent of business cycle synchronization. The intuition behind this is that if two economies share largely similar economic cycles and respond the same way to economic shocks, they need not persist with independent monetary policies and, as such, would be net beneficiaries from a monetary union because a common currency lowers transactions costs and facilitates price convergence.

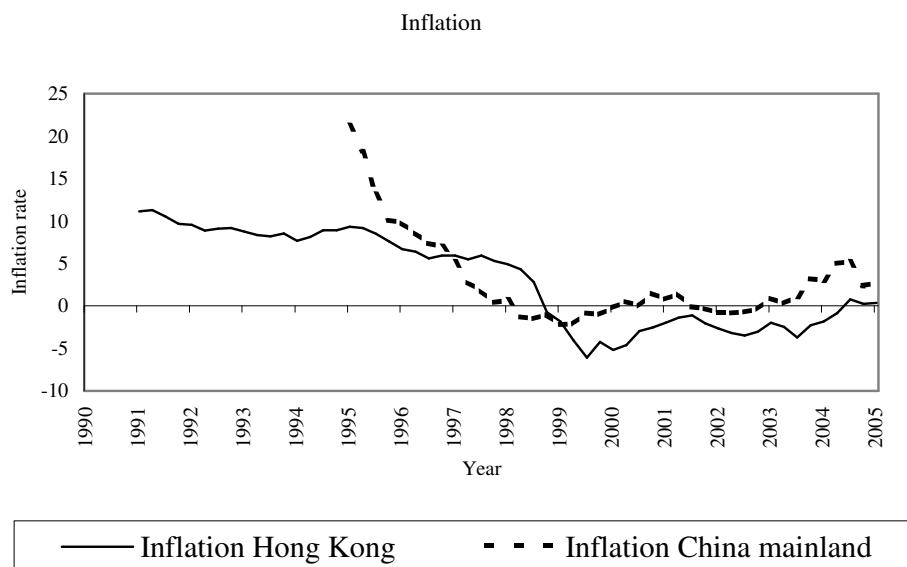
The analysis below examines the degree of business cycle synchronization by testing the short-run and long-run relationships between incomes in Hong Kong and mainland China and inflations between the two economies. Before undertaking the tests and discussing the results, consider Figure 4(a) and (b), which chart inflation and output growth. The data suggests that the series move significantly closer together in the latter part of the sample, perhaps indicating intensified macroeconomic synchronization.

¹¹Although it might be premature to analyze equity market integration between Hong Kong and the mainland in view of the controls on outflows imposed by mainland China (though the mainland is progressively liberalizing via the Qualified Domestic Institutional Investor or QDII Scheme), data limitations preclude consideration of FDI integration. Suffice it to note that Hong Kong accounts for approximately 40 percent of the mainland's realized FDI, with the bulk of these investments in the Guangdong Province. Conversely, Hong Kong is the largest destination of FDI from the mainland.

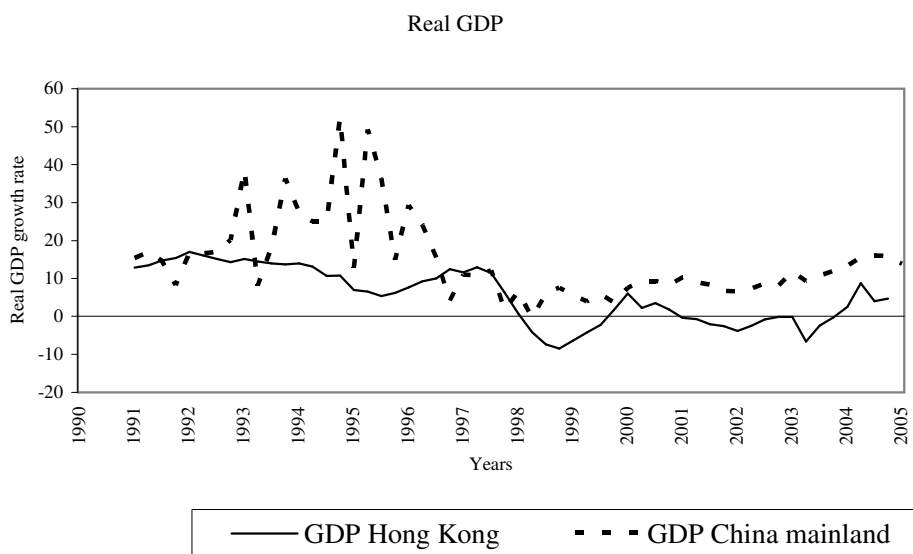
¹²The relationship between trade and financial integration, and optimum currency areas, are explored in Rajan (2005).

Figure 4. (a) Inflation and (b) Output Differences between Hong Kong and Mainland China, 1990–2004

(a)



(b)



Sources: GDP (Datastream); inflation (IMF, 2005b).

Note: Figures are expressed as year-on-year growth rates using quarterly data: see main text.

1. Testing for Convergence of Inflation and Output

We first conduct simple Augmented Dickey–Fuller (ADF) tests for a unit root in the (Hong Kong minus mainland China) income and inflation differentials. Essentially, this is a test for mean-reversion in each series. If the series is stationary (does not contain a unit root), it can be interpreted as mean reverting. This suggests a tendency for the series to converge. Inflation is measured as $100 * [(CPI_t - CPI_{t-4}) / CPI_{t-4}]$ using quarterly data from IMF(2005b). Output is taken from Datastream and is measured as $100 * [\ln(GDP_t) - \ln(GDP_{t-4})]$ The period under consideration is the first quarter of 1991 to the fourth quarter of 2004.

The results are presented in Table 3. The null hypothesis for the test is that the inflation (output) differential contains a unit root. A rejection implies stationarity. The lag lengths for the ADF tests are selected using the Schwartz criteria. The first result presented is for the inflation differential. The null hypothesis is rejected at 10 percent and very nearly at 5 percent (the actual probability is 5.56 percent). Therefore, we can conclude that there is some evidence of mean reversion in the inflation differentials. The second result is for the output differential. As with the inflation differences, the lag length is determined by the Schwartz criteria, but we include an intercept in the test. Here, the result appears stronger than in the case of inflation as the null hypothesis of a unit root is rejected at the 1-percent level of significance. The implication appears to be that there is reasonable evidence of convergence in output growth rates over time.

Table 3. Augmented Dickey–Fuller Test Results: Inflation and Output Differentials

Null hypothesis	<i>t</i> -statistic	Probability
Inflation differential has a unit root	-1.9008	0.0556
Output differential has a unit root	-3.7829	0.0055

Note: The lag length for the Augmented Dickey–Fuller tests are selected using the Schwartz criteria. An intercept term is included for the output tests but not for the inflation tests.

2. Tests of Short Run Dynamics of Inflation and Output

The second set of empirical tests requires the employment of a structural vector autoregression (SVAR) and is specified as follows:

$$AX_t = C + B(L)X_{t-1} + \zeta_t, \quad (1)$$

where X_t is a vector comprised of Hong Kong income, China income, Hong Kong inflation, China inflation, measured as discussed previously. A is a matrix of contemporaneous parameters, L is the lag operator over the parameter matrix B , ζ_t is a vector of innovations and C is a vector of constant terms.

The first test is the Granger causality test, which examines the causal relationship between lagged values of one variable in the model on contemporaneous values of the other. As with the ADF tests, the lag lengths are selected using the Schwartz criteria. It turns out that only one lag is optimal under the criteria and, as such, the results presented are the model with only one lag. We are testing here for the

effect of lagged China inflation/output on current Hong Kong inflation/output and vice versa.¹³

The results are given in Table 4. The Granger causality results for inflation show a solid two-way relationship. The lagged values of China's inflation affect Hong Kong's current inflation with a high level of significance of 5.2 percent. The lagged values of Hong Kong's inflation also strongly influence mainland China's inflation at 1.8 percent. The results for output are mixed and somewhat counterintuitive. The lagged values of Hong Kong's output affect mainland China's output, with 4.4 percent significance: this is a strong result. Quite surprisingly, the lagged values of mainland China's output do not significantly affect Hong Kong's output. The results also show quite strong relationships between inflation in one region and output in the other. For example, mainland China's output is strongly influenced by lagged Hong Kong inflation and Hong Kong output is strongly influenced by lagged mainland China's inflation, at 9.5 percent.

Table 4. Granger Causality Test Results: Inflation and Output Differentials

Null hypothesis	χ^2 -statistic	Probability
Mainland China's inflation does not Granger-Cause its output	90.46	0.000
Hong Kong's output does not Granger-Cause mainland China's output	4.05	0.044
Hong Kong's inflation does not Granger-Cause mainland China's output	7.22	0.007
Mainland China's output does not Granger-Cause its inflation	1.35	0.245
Hong Kong's output does not Granger-Cause mainland China's inflation	0.30	0.581
Hong Kong's inflation does not Granger-Cause mainland China's inflation	5.62	0.018
Mainland China's output does not Granger-Cause Hong Kong's output	0.02	0.892
Mainland China's inflation does not Granger-Cause Hong Kong's output	2.78	0.095
Hong Kong's inflation does not Granger-Cause its output	3.80	0.051
Mainland China's output does not Granger-Cause Hong Kong's inflation	0.05	0.831
Mainland China's inflation does not Granger-Cause Hong Kong's inflation	3.76	0.052
Hong Kong's output does not Granger-Cause its inflation	25.87	0.000

Notes: These tests are based on the simple vector autoregressive model given by Equation 1 and footnote 13. Lag length is selected using the Schwartz criteria. It turns out that only one lag is optimal under the criteria and, as such, the results presented are for the model with one lag.

The second series of tests are impulse response functions (IRF) and variance decompositions (VD) using the SVAR model in Equation 1. To provide these tests, the error terms need to be orthogonalized by way of identification restrictions. There are many methods that can be used to identify the model. In this case, we chose to use short-term coefficient restrictions on the A matrix on the basis of economic intuition.¹⁴

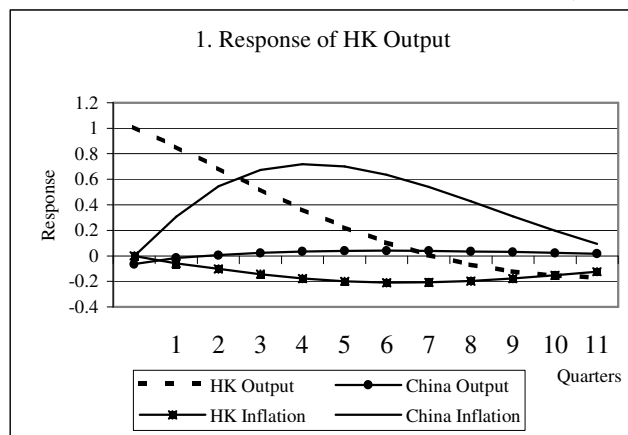
¹³In other words, we are testing for the significance of the off-diagonal terms in B . For the Granger Causality tests, the SVAR in equation is presented as $X_t = A^{-1}B(L)X_{t-1} + A^{-1}\zeta_t$.

¹⁴We tried several methods as part of robustness testing. The Blanchard and Quah (1989) (also see Xu, 2006) method was ruled out because a large number of observations are needed to provide effective results. Several Cholesky orderings were tested, as was identification based on the correlations of the

The identification restrictions involve setting to zero the coefficients representing the following contemporaneous relationships: The relationship between inflation and output in Hong Kong, the relationship between inflation in China and inflation in Hong Kong, the relationship between Hong Kong inflation and China output (both directions), the relationship between China inflation and China output and the relationship between Hong Kong output and China inflation. The economic interpretations of these coefficients reflect the idea behind the Phillips curve; inflation does not influence output contemporaneously and within each region but output can influence inflation. Also, we have allowed output/inflation in one region to contemporaneously determine the other. These restrictions leave the model over-identified.

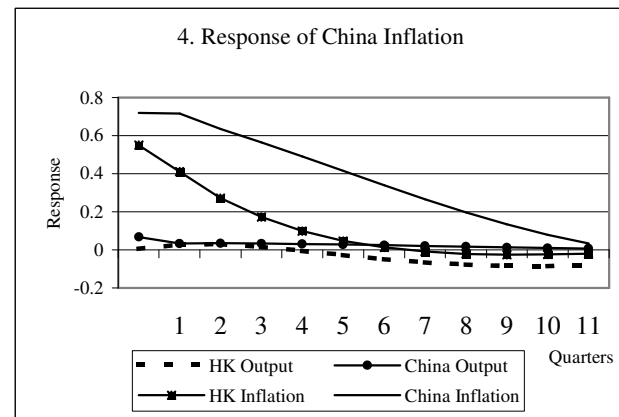
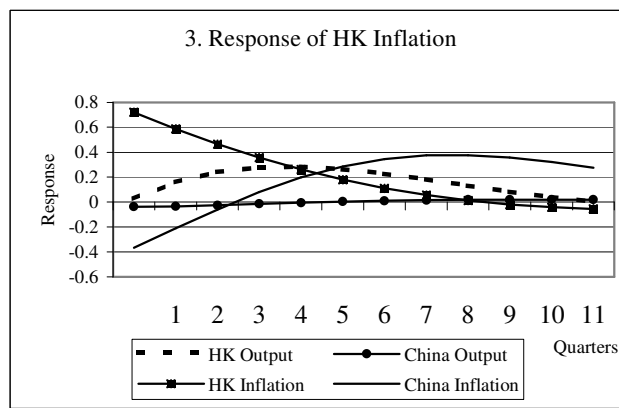
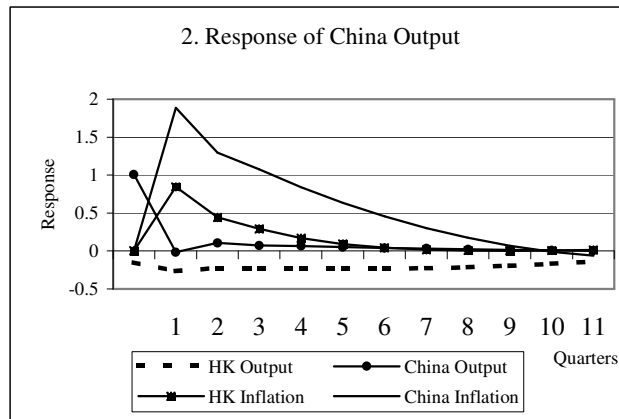
Figure 5 presents the IRF. Each panel represents the response of a particular variable to a one standard deviation shock in all of the variables over 12 periods. The first panel presents the responses of Hong Kong's output. As expected, the biggest influence is its own innovation. Interestingly, a shock to mainland China's inflation also strongly determines Hong Kong's output. Mainland China's output innovation does not influence Hong Kong's output in any meaningful way. In Figure 5(b), mainland China's inflation shock also influences its output, but Hong Kong's output shock does not. The IRF for Hong Kong and mainland China's inflation are much more supportive of the hypothesis of synchronization. An innovation to Hong Kong's inflation is heavily influenced by mainland China's inflation in Figure 5(c) and the reverse is true for Figure 5(d).

Figure 5. Impulse Response Functions, Mainland China and Hong Kong. (a) Response of Hong Kong Output; (b) Response of China Output; (c) Response of Hong Kong Inflation; and (d) Response of China Inflation.



Comment: Zhinan: Please remove part labels from parts (a)–(d) (and relabel as (a)–(d)). Change hyphens (-) to en-dashes (–) for minus signs down y axis. Remove gridlines and borders. Change font in key to sentence case (i.e. ‘China Output’ to ‘China output’), spell out Hong Kong in full and change the font sizing in the figure so that numerals along x and y axes are the same.

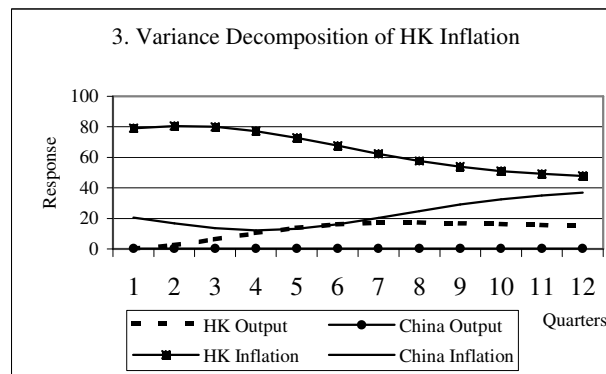
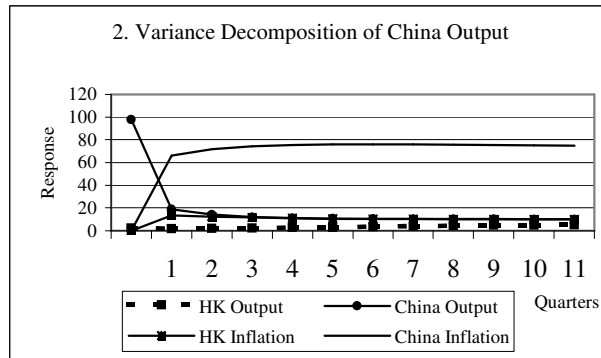
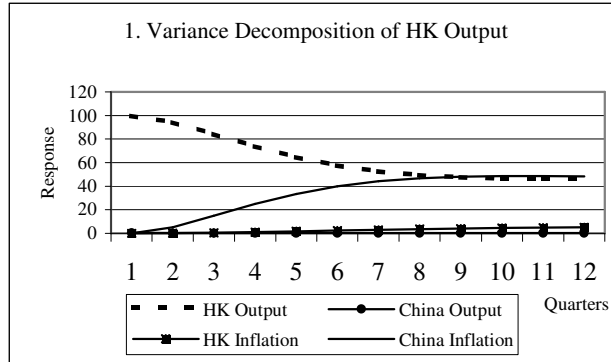
error terms of the unrestricted VAR. It turns out that, although subtle differences exist, the identification method that was finally decided upon yielded quite similar results to several Cholesky orderings and very similar results to the identification based on error correlations.

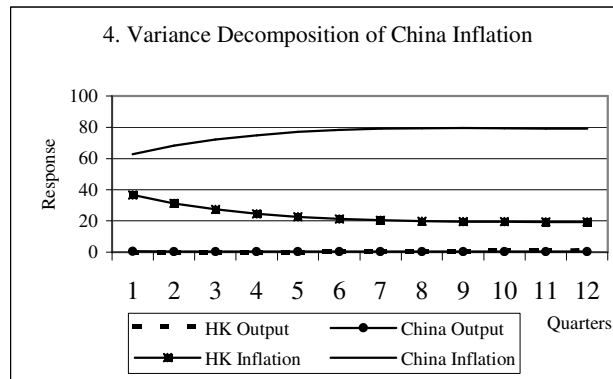


Source: Authors' calculations.

Figure 6 presents the VD. Each panel shows the proportion of the variance of each variable being explained by all variables. The results are very similar to the ones given by the IRF. The variances of each variable are explained significantly by their own innovations. Additionally, the innovation of mainland China's output does not explain the variance of Hong Kong's output in Figure 6(a). From Figure 6(b), the innovation of Hong Kong's output does not explain mainland China's output variance. From Figures (c) and (d), we can see that a shock to mainland China/Hong Kong's inflation contributes significantly to the variance of Hong Kong/mainland China's inflation. This is supportive of the synchronization story.

Figure 6. Variance Decompositions, Mainland China and Hong Kong. (a) Variance Decomposition of Hong Kong Output; (b) Variance Decomposition of China Output; (c) Variance Decomposition of Hong Kong inflation; and (d) Variance Decomposition of China inflation.





Source: Authors' calculations.

3. Summary

The formal tests of business cycle synchronization are generally supportive of integration in inflation and output for both parts. However, the result is stronger for inflation than for output. This is also consistent with the fact that although Hong Kong was struggling with sluggish growth until around 2002, mainland China's economy has been booming over the past 15 years. Both economies were, therefore, at different stages of the business cycle from 1998 to 2001. Of course, there are several other ways to measure the degree of business cycle synchronization. For instance, Zhang and Sato (2005) find that the pattern of demand and supply (output) shocks between Hong Kong and the mainland have become more similar over time, suggesting greater business cycle convergence. Similarly Kristen-Gerlach (2004) finds that macroeconomic cycles between mainland China and Hong Kong were converging between 1962 and 2003. A recent IMF (2005a, p.5) report concludes as follows:

The correlation between the two economies' output as well as the components of output ... have increased since the mid-1990s, which suggest that integration has advanced in many sectors of the two economies. Although consumption and investment correlations have increased, they are lower than output correlations. Real exchange rate changes for the two economies also exhibit significantly high correlation. Forward exchange rates have become highly correlated and equity market developments in the two economies have generally followed each other.

IV. Can Currency Relations between Hong Kong and Mainland China Go Forward?

The foregoing empirical analysis and existing studies suggest a high and rapidly growing level of economic integration of Hong Kong with the mainland, and a gradual synchronization of business cycles between the two economies. There is growing evidence that the mainland's macroeconomic situation directly affects Hong Kong in several ways, including pressure on interest rates, the banking sector and property prices.¹⁵ This said, Genberg et al. (2006) have made the point that while Hong Kong's business cycle is fairly synchronized with the mainland, it is relatively more synchronised with the US. They go on to argue that the correlations

¹⁵ An interesting article by the HKMA (2002) discusses external claims and liabilities of Hong Kong's banking system vis-à-vis the mainland. Also see IMF (2005a).

between the business cycles in the mainland and Hong Kong are largely because of the common US influences on both economies.

This caveat notwithstanding, it is inevitable that over time: (i) the Chinese renminbi (RMB) will continue to become more flexible vis-à-vis all major currencies, including the US dollar; (ii) Hong Kong will continue to integrate more intensively with the mainland; and (iii) the RMB will become even more accepted and traded in Hong Kong. In fact, the RMB is being increasingly accepted in Hong Kong with the sharp rise in tourists from the mainland,¹⁶ and Hong Kong banks have been accepting RMB deposits and issuing RMB debit and credit cards since 2004 (Fung, 2006). As these trends intensify, there might be a time when Hong Kong might find it economically sensible to either adopt the RMB, or at least peg to the RMB while maintaining some sort of convertibility agreement with the mainland similar to Singapore and Brunei, or between Hong Kong and Macau for that matter.¹⁷ In addition to this de facto market integration, because Hong Kong has already forsaken its monetary policy autonomy by having maintained a currency board regime since 1983, the anticipated cost of moving to a monetary union (with mainland China) ought to be fairly low. This a priori expectation has been confirmed by an empirical analysis by Cheung and Yuen (2004).

When can we expect such a currency regime switch in Hong Kong? According to Kwan (2006, p.1):

Ultimately, the “One Country, Two Currencies” relationship between the Hong Kong dollar and the yuan is only a transitional measure, and there will be no point in making a distinction between the two currencies as convergence progresses in the development stages of the political and economic systems of mainland China and Hong Kong. When drawing up the Sino–British Joint Declaration and the Hong Kong Basic Law that set the framework for Hong Kong’s return, authorities seem to have presumed that it would take approximately 50 years for this convergence to take place. However, if the Chinese economy continues to grow at the pace that it has over the past quarter century, the unification of the two currencies may be realized sooner.

As long as the mainland’s financial sector remains weak and its capital account is not fully convertible and the RMB is not an internationally accepted currency, it is unlikely that the HKMA will be tempted to switch its peg to the RMB, let alone completely adopt the RMB. However, as the RMB becomes more flexible relative to the US dollar and, therefore, also relative to the Hong Kong dollar, Hong Kong will be faced with much more challenging decisions and tradeoffs in regards to whether to persist with its US dollar currency board arrangement or to opt for some other type of currency regime that takes into account fluctuations in the RMB (Tsang, 2002). Indeed, the introduction of the “convertibility zone” on the Hong Kong dollar in May 2005 to provide more flexibility to the currency was done in anticipation of greater flexibility being introduced to the RMB regime. One might expect further such piecemeal modifications by the HKMA in the future in keeping with the observation by Yam (1996) of there being “one country, two currencies, two monetary systems and two monetary authorities which are mutually independent”.

¹⁶ Conversely, there is a high degree of currency substitution between the Hong Kong dollar and the RMB in southern China.

¹⁷ Apart from pegging to the RMB or fully adopting the RMB, other options could be pegging to a basket of currencies (including the RMB and the US Dollar) or independent or managed floating (which would almost inevitably mean that over time the market would move the Hong Kong dollar with the RMB).

References

- Blanchard, Olivier Jean and Danny Quah, 1989, "The dynamic effects of aggregate demand and supply disturbances," *American Economic Review*, Vol. 79, No. 4, pp. 655–73.
- Cheung, Yin-Wong, Menzie D. Chinn and Eiji Fujii, 2006, "The Chinese economies in global context: The integration process and its determination," *Journal of Japanese and International Economies*, Vol. 20, No. 1, pp. 128–53.
- Cheung, Yin-Wong, Menzie D. Chinn and Eiji Fujii, 2007, *The Economic Integration of Greater China: Real and Financial Linkages and the Prospects for Currency Union*, Hong Kong: Hong University Press.
- Cheung, Yin-Wong and Jude Yuen, 2004, "The suitability of a greater China currency union," *Hong Kong Institute for Monetary Research Working Paper No. 12/2004*, Hong Kong Institute for Monetary Research, Hong Kong.
- Fung, Enoch, 2006, "Can Hong Kong afford to keep the peg?" *Global Economics Paper No.140*, Goldman Sachs, 27 April.
- Genberg, H., L.G. Liu and X. Jin (2006). "Hong Kong's business cycle synchronisation with mainland China and the US," *HKMA Quarterly Bulletin*, September, pp.5–12.
- HKMA (Hong Kong Monetary Authority), 2002, "Hong Kong's external claims and liabilities vis-à-vis mainland China," *HKMA Quarterly Bulletin*, February, pp.15–26.
- Hodrick, Robert J. and Edward C Prescott, 1997. "Postwar U.S. business cycles: An empirical investigation," *Journal of Money, Credit and Banking*, Vol. 29, No. 1, pp. 1–16.
- Hong Kong Census Bureau, 2005, "Trade with ten major countries/territories, [online; cited 27 June 2005]. Available from: <http://www.censtatd.gov.hk>
- IMF (International Monetary Fund), 2005a, "People's Republic of China – Hong Kong Special Administrative Region: Selected issues," *Country Report 05/62*, IMF, Washington DC.
- IMF (International Monetary Fund), 2005b, *International Financial Statistics*, Washington, DC: IMF.
- Kristen-Gerlach, Petra, 2004, "Business cycle and inflation synchronization in mainland China and Hong Kong," *University of Hong Working Paper*, University of Hong Kong, Hong Kong.
- Krugman, Paul, 1993, "Lessons of Massachusetts for EMU," in Francesco Giavazzi and Francisco Torres, eds, *The Transition to Economic and Monetary Union in Europe*, New York: Cambridge University Press.
- Kwan, Chi Hung, 2006, "The Hong Kong dollar is not following the yuan's rising trend - It is too early to shift to a yuan peg," *China in Transition*, Research Institute of Economy, Trade and Industry (REITI) [online: cited 28 June, 2006]. Available from: <http://www.rieti.go.jp/en/china/06062803.html>
- Leung, Tse Kwok, 2003, "Hong Kong and the mainland: Economic integration prospects under the CEPA framework," [online: cited November 2003] Hong Kong Trade Development Council. Available from: <http://www.tdctrade.com/econforum/boc/boc031101.htm>
- Rajan, Ramkishan, 2005, "Asian economic cooperation and integration: Sequencing of financial, trade and monetary regionalism," in *Asian Economic Cooperation and Integration: Progress, Prospects and Challenges*, Manila: Asian Development Bank, pp. 77–92.

- Takeuchi, Takayuki, 2006, "Integration under 'one country, two systems': The case of mainland China and Hong Kong," *Institute of Developing Economies Discussion Paper* No.70, Institute of Developing Economies, Japan.
- Tsang, Shu-ki., 2002, "From 'one country, two system' to monetary integration?" *Working Paper* No. 15/2002, Hong Kong Institute for Monetary Research, Hong Kong.
- Yam, Joseph, 1996, "Hong Kong's monetary scene: Myths and realities," speech at Bank of England seminar on Hong Kong Monetary Arrangements through 1997, London, 17 September.
- Xu, Xinpeng, 2006, "A currency union for Hong Kong and mainland China," *Journal of International Money and Finance*, Vol. 25, No. 6, pp. 894–911.
- Zhang, Zhaoyong and Kiyotaka Sato, 2005, "Whither currency union in Greater China," *Yokohama National University Working Paper* No. 2005–01, Yokohama National University, Yokohama, Japan.