A MONETARY CONDITIONS INDEX FOR HONG KONG

Monetary conditions indexes (MCIs) have been increasingly used for macroeconomic and policy analysis in recent years. An MCI is computed as a weighted sum of the real interest rate and the real effective exchange rate (REER), with weights reflecting the relative effects of the two variables on aggregate demand. This paper presents an estimate of the MCI for Hong Kong that integrates previous work on the REER and the real interest rate. By including equity prices, the MCI has also been extended to derive a financial conditions index (FCI).

Our estimates suggest that the swings in the REER resulting from the Asian financial crisis have led to tighter, and subsequently easier, financial conditions than indicated by changes in the real interest rate alone. Changes in financial conditions owing to swings in equity prices have also reinforced underlying cyclical conditions in the past few years.

Financial conditions have eased significantly since the third quarter of 1998. The MCI has declined by 8½ percentage points (real interest rate equivalent) during 1998Q4—2000Q2, which is double the drop in the real expected interest rate. The composition of the changes in the MCI and FCI suggests that improved competitiveness—resulting from the large decline in the REER—has been the largest contributor to the easing of financial conditions.

Caution is required when using the MCI as a macroeconomic analysis tool. Despite their theoretical appeal, MCIs are subject to a number of caveats. Considerable margins of error exist in their calculation, which are model based. They also ignore other variables that may have important influences on economic activity. Furthermore, by construction, an MCI complicates identification of the sources of its changes—including the nature of the shock—which may have different implications in terms of the impact on economic activity.

I. Introduction: What is an MCI?

Monetary conditions indexes (MCIs) are typically derived from standard open-economy macro models in which the aggregate demand side of the economy is a function of, among other things, the real exchange rate and real interest rates. The MCI uses a weighted combination of movements in the interest rate and exchange rate as an indicator of financial conditions, with the weights reflecting the relative influences of these two key variables on aggregate demand. MCIs have

been used in a number of inflation-targeting countries since the early 1990s as an indicator of the policy stance, or even as an operational target for monetary policy. However, problems with the use of the MCI for these purposes has been increasingly recognised, primarily because exchange rates are affected by a variety of factors in addition to monetary policy actions. As a result, emphasis is now placed on using the MCI as an indicator of financial conditions.[1]

In more recent years, some private investment houses have started to construct and monitor MCIs for Asian economies, including Hong Kong. In Hong Kong, because of the linked exchange rate system, interest rates tend to follow their counterparts in the United States. Furthermore, movements in the effective exchange rate are also exogenous, being determined by changes in third-country exchange rates vis-à-vis the US dollar. As a result, an MCI for Hong Kong should be viewed exclusively as an indicator of financial conditions rather than a measure of the stance of monetary policy. This paper presents such an estimate and examines its usefulness as an indicator of financial conditions.

The paper is organised as follows. The next section discusses the usefulness of the MCI in Hong Kong's context, taking into account the structural characteristics of the Hong Kong economy, including the fixed exchange rate system. Section III covers some analytical and empirical issues in constructing an MCI for Hong Kong. Section IV presents an estimate of MCI and discusses the implications of its movements in recent years. In Section V, the MCI is extended by including equity prices, and a financial conditions index (FCI) is derived. The final section provides concluding remarks, and discusses caveats and pitfalls of the MCI.

II. Why an MCI Can be Useful for Hong Kong?

In general terms, the appeal of the MCI can be seen from two perspectives. First, the MCI offers a useful way of aggregating information to obtain a clearer signal of the combined impact of interest rates and the exchange rate on aggregate demand. While information about conditions in individual markets may be lost in the process of aggregating the two prices, the primary benefit of such a composite index is that the signal provided by the underlying variables is made clearer and more accessible. Secondly, the MCI provides us with a concept that incorporates the exchange rate in our thinking about interest rates, and highlights the importance of viewing changes in financial variables in an integrated way. To shed light on the usefulness of the MCI in Hong Kong's context, this section recaps briefly the main channels through which the real interest rate and exchange rate affect aggregate demand. This will be followed by a discussion of the relevance of the MCI as a composite indicator of financial conditions in a small open economy with a fixed exchange rate.

Real interest rates influence spending through a number of channels, including a cost of capital effect—on business fixed capital investment, investment in housing, and purchases of durable goods; a wealth effect through changes in asset prices on household spending; an intertemporal substitution effect on consumer spending; and a cash (or liquidity constraint) effect. As discussed in our earlier work on real interest rates, private sector spending in Hong Kong depends importantly upon asset prices and the user cost of capital for business investment, for both of which the relevant concept of real interest rate is the long-term expected real interest rate.[2] The other channels are not expected to be significant. Specifically, intertemporal substitution in spending is primarily

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[1] Research on the MCI has been largely limited within the central banks circle. For a discussion on its use in Canada, please refer to "The Role of Monetary Conditions and the Monetary Conditions Index in the Conduct of Monetary Policy," *Bank of Canada Review, Autumn 1995*. For a recent review of MCIs for the UK, please refer to "Monetary Conditions Indices for the UK: A Survey," *External MPC Unit Discussion Paper no. 1, Bank of England, September 2000*.

[2] The article "Real Interest Rates in Hong Kong," in *Hong Kong Monetary Authority Quarterly Bulletin, August 1999* presents a detailed discussion of this issue.

relevant for durable goods, of which Hong Kong produces little. Changes in cash flow (income) due to—say—a rise in interest rate is generally expected to have an income redistribution effect only, as the positive effect on the income of lenders is offset by a negative effect on the income of borrowers.[3]

Real exchange rate movements influence economic activity primarily through their effect on the international competitiveness of domestic production. A drop in the (trade-weighted) real effective real exchange rate (REER) would shift demand toward domestic goods from foreign products.[4] On the supply side, competitive pressures would lead to relative price changes between the traded and non-traded good sectors, and a consequent reallocation of factors of production. Being an international business service and financial centre, competitiveness considerations would also bear importantly on decisions by multinational corporations on whether to locate investment in Hong Kong. Offsetting the competitiveness effects are possible income effects associated with a change in the real exchange rate. An appreciation of the real exchange rate would have a positive income effect if it raises the economy's terms of trade, for example. Over time, however, the substitution effect due to reduced competitiveness should dominate, according to standard empirical estimates. In addition, an appreciation of the domestic currency would reduce the wealth and income measured in domestic currency of an economy—like Hong Kong—that has a positive net foreign currency asset position.

The MCI was first developed as a composite measure of financial conditions for small open economies with a *flexible* exchange rate regime.

Under a flexible exchange rate regime with capital mobility, monetary policy works through both the interest rate and exchange rate channels. Therefore, it could be misleading to assess monetary conditions by looking at interest rates alone. Furthermore, it might be desirable to use interest rates to offset changes in the exchange rate arising from international portfolio shocks.[5] In Hong Kong, because of the linked exchange rate system, domestic interest rates tend to follow those in the United States. Shocks to the exchange rate are mostly reflected in changes in risk premium of domestic interest rates. Thus, on the face of it, there is a question whether interest rates already embody information about the exchange rate. However, the MCI is still a useful indicator for Hong Kong for the following reasons:

- First, while the Hong Kong dollar is linked to the US dollar at a fixed exchange rate, its exchange rates vis-à-vis other trading partners' currencies change along with the US dollar's exchange rate. In the wake of the Asian financial crisis, for example, the nominal effective exchange rate (NEER) of the Hong Kong dollar appreciated as a result of the devaluation of some other Asian currencies.

- Second, the REER of the Hong Kong dollar could also change as a result of an inflation differential between Hong Kong and its main trading partners.

In sum, notwithstanding the fixed exchange rate system, the REER provides additional information that is not reflected in the real interest rate. Thus, a weighted sum of the two could be

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3   In an open economy like Hong Kong, a net income effect might arise from a redistribution of income between residents and non-residents. While data are not available on the non-bank private sector's net foreign asset position, statistics on official reserves and the banking sector's net foreign currency asset position (about HK$733 billion and HK$803 billion, respectively, at end-1999) imply that Hong Kong is a net creditor vis-à-vis the rest of the world. Thus, a rise in interest rates would likely have a net positive income effect. Nevertheless, the magnitude should be much less significant than the channels discussed above.

4   Note that the REER-rather than the bilateral real exchange rate—is the appropriate measure of competitiveness since it captures the movement in the Hong Kong dollar versus the currencies of Hong Kong's major trading partners, appropriately weighted for their importance in Hong Kong external trade.

5   However, complications arise if the monetary authority attempts to use the MCI as an indicator of policy stance or an operational target, as the exchange rate may also respond to output and inflation developments in a way that complicates the signal provided by the MCI.

a useful composite indicator. A number of examples below illustrate possible interpretations of the MCI for Hong Kong:

- *Shock to risk premium in exchange markets.* Because of the linked exchange rate, an increase in risk premium on the HK dollar would be reflected in an increase in interest rates. The resulting increase in the MCI would indicate a tightening in financial conditions.

- *Change in monetary policy in the United States.* An increase in the U.S. interest rates—aimed at reducing aggregate demand, for example—would likely lead to an increase in interest rates in Hong Kong and possibly also an appreciation of the HK dollar's nominal effective exchange rate (due to US dollar appreciation against other currencies). Both would lead to an increase in the MCI indicating a tightening of financial conditions, assuming that the price level remains broadly stable.

- *Autonomous demand shocks.* Suppose that demand falls autonomously—for instance, because firms decide that their existing capital stock is too high at current levels of interest rates—activity would fall and there would be deflationary pressures. Real interest rates could increase but the real effective exchange rate would depreciate. The change in the MCI, if any, would measure the net effect on financial conditions.

III. Constructing an MCI: Some Analytical and Empirical Issues

The MCI is defined as a weighted sum of some measures of the real interest rate and the REER, with the weights reflecting their relative effects on aggregate demand. In most formulations, the coefficients on the interest rate and REER terms in an aggregate demand function determine the weights in the MCI. Such an equation, in its simplest form, might be:

$$y = -\alpha r - \beta reer + \textit{other variables}$$

where y is output, r and $reer$ are the real interest rate and REER respectively. The parameters α and β determine the weights in the MCI, which can be defined as

$$MCI = r + \beta/\alpha \, reer$$

where r is measured in percentage points, and $reer$ is in logarithms. This particular formulation is scaled such that a 1 point change in the MCI is equivalent in its effect on aggregate demand to a 1 percentage point change in the real interest rate. *Note that the absolute level of the MCI has no meaning—there is no absolute sense of 'tightness' or 'looseness', only relative to other points in time.*

To construct an MCI would thus require a measure of the real interest rate, a measure of the REER, and determination of the relative weights of the two. Previous in-house research has dealt with issues in measuring and assessing the REER and the real interest rate. The remainder of this section provides a summary of the main points that are relevant for the present purpose, followed by discussions on defining relative weights for the two variables.

Real Effective Exchange Rate

The REER is measured as a trade-weighted average of bilateral exchange rates deflated by domestic and foreign consumer price indices. A change in the REER can be decomposed into changes in the NEER and inflation differential respectively. In terms of using the REER as an indicator of Hong Kong's competitiveness, two measurement issues arise.

First, movements in the exchange rate between the Hong Kong dollar and the renminbi (RMB) have different implications for Hong Kong's competitiveness than do those in the Hong Kong dollar's exchange rates vis-à-vis other trading partners. With the surge in Mainland re-export activities since the early 1980s, the margins earned on such exports are now larger than all other components of Hong Kong's trade with the Mainland combined. Thus, RMB depreciation—which could boost Hong Kong's trade balance after the indirect effects are taken into account—may not represent a loss of competitiveness for Hong Kong. To reflect

Hong Kong's increasing role as a major entrepôt for the Mainland, a measure of the REER of the Hong Kong dollar that has a declining weight on the RMB was used in computing the MCI.[6] The resulting series shows less appreciation from the base year than the one with the fixed RMB weight, reflecting depreciation of the RMB in the 1980s and the early part of the 1990s (Chart 1).[7]

Second, the REER exhibits a clear upward trend from the latter part of the 1980s. The secular trend is often attributed to faster productivity growth in Hong Kong's traded goods sector relative to non-traded sector (the Balassa-Samuelson effect).[8] As a result, an increase in the REER does not necessarily indicate a loss of competitiveness and a tightening of financial conditions. For the purpose of computing the MCI, the relevant measure of the REER should be deviations from equilibrium or trend. Two approaches have been utilised in estimating the equilibrium level of the REER. The first was the so-called macroeconomic balance approach, which defines the equilibrium exchange rate as the rate that is consistent with internal and external balance over the medium term. Internal balance refers to the achievement of the level of output at potential, whereas external balance is defined as a current account position that is sustainable over the medium term.[9] Secondly, in view of the visible upward trend in the series, a simple log-linear trend fitted to the REER was taken as equilibrium.

Chart 1
Real Effective Exchange Rates (Seasonally Adjusted)

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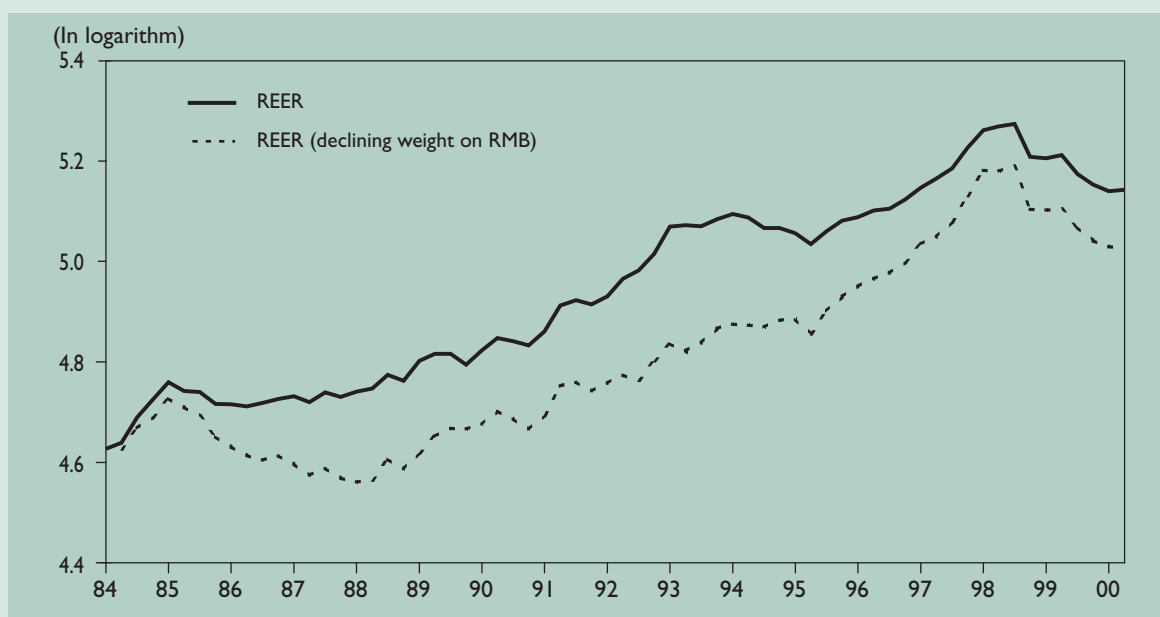
6   Specifically, based on the share of Hong Kong's re-exports (both from and to the Mainland) in its total trade with the Mainland, the weight on the RMB was reduced from 8 1/2% in the early 1980s to zero in the early 1990s. The declining weight on the RMB and rising weights on other currencies were applied to log-changes in bilateral real exchange rates to derive log-changes in the REER which, based on a base year number, give rise to the REER index numbers.

7   A gap started to develop between the two REERs from the mid-1980s but narrowed somewhat in the latter part of the 1990s, in part reflecting broad stability in the Hong Kong dollar/RMB exchange rate following the unification of the RMB exchange rate in early 1994.

8   Faster growth of productivity in the traded goods sector would lead to higher wages in both sectors. As a result, prices of non-traded goods rise relative to traded goods, leading to an real exchange rate appreciation. In Hong Kong, the rapid productivity growth in the traded sector is often attributed to the opening-up of the Mainland and the transformation of Hong Kong into an international trade and financial centre.

9   Empirically, this involves (1) an estimated relationship between the trade balance of goods and services and the REER and other determinants like domestic demand and foreign demand; (2) an estimated underlying trade balance based on this relationship and estimated potential levels of domestic and foreign demand; and (3) an assessment or judgement on the equilibrium level of the trade balance. The REER that brings the underlying trade balance into equality with the equilibrium trade balance is determined as equilibrium. Note that ideally the current account balance rather than the trade balance should be used. However, statistics on the former are available only from the mid-1990s. The overall trade balance of goods and services are thus used as an approximation.

Estimates derived from the above two approaches are very close for the period since the mid-1990s (Chart 2a and b).[10] They indicate large swings in the REER relative to equilibrium in the wake of Asian financial crisis. Specifically, the REER rose sharply to be substantially above equilibrium (or trend) in mid-1998, mainly as a result of the strengthening of the US dollar against other Asian currencies. Subsequently, the REER has recorded a large decline of 15% to a level that was significantly below equilibrium in the second quarter of 2000. Initially, the decline reflected mainly a rebound of other Asian currencies against the US dollar as the financial market situation stabilised. The subsequent drop of the REER was in large part a result of downward adjustments in domestic prices. In sum,

the decline in the REER relative to equilibrium indicates a significant improvement in Hong Kong's competitiveness in the past two years.

Long-term Expected Real Interest Rate

Our previous research highlights a number of problems with conventional—short-term and backward-looking—measures of real interest rates, and suggests the use of a longer-term expected real interest rate. The latter was computed as the difference between the 5-year Exchange Fund note yield and a measure of inflationary expectations. To derive an estimate of long-term inflation expectations, a model-based approach was used that features the adjustment process under the

Chart 2a

REER and Equilibrium, Estimates of the Macroeconomic Balance Approach
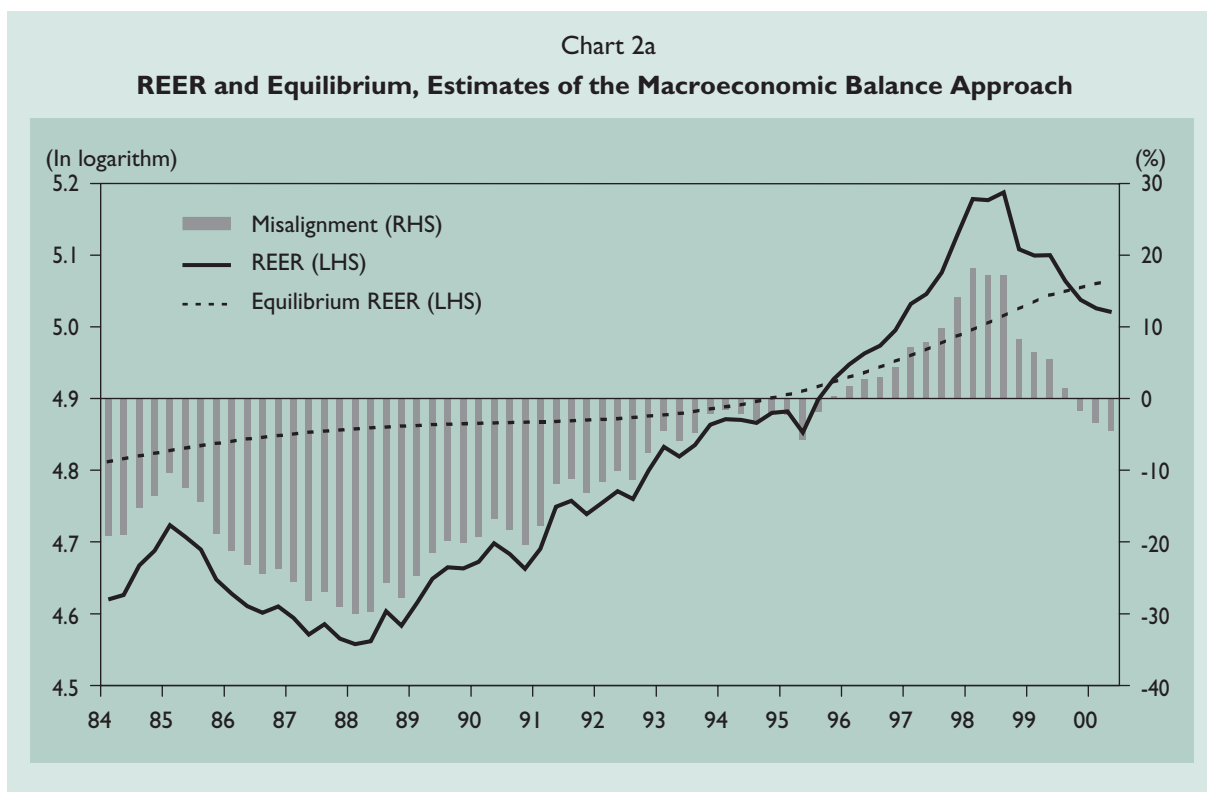
10 The estimates for the 1980s were quite different between the two approaches, with the macroeconomic balance approach giving rise to sustained under-valuation. The latter was related to the assumption on the equilibrium trade account position, which was set at 1% of GDP for the whole sample period. This looks reasonable for the 1990s, when the trade balance of goods and services was on average about 1³/₄% of GDP. It appears on the low side for the 1980s, however, considering the average trade balance-to-GDP ratio of 9% in the period. The estimated persistent under-valuation of the REER for the 1980s would be reduced if a larger positive equilibrium trade position were assumed. Thus, ideally a varying equilibrium trade balance position should be assumed. However, this would introduce a break in the time series of estimated deviations. The specific year in which it is introduced would be rather arbitrary and the break in the time series would cause problems to econometric work for determining the relative weights for the real interest rate and the REER. Because of this consideration, the estimates from the log-linear trend approach were used in the ensuing econometric exercises.

Chart 2b

REER and Equilibrium, Estimates of the Log-linear Trend Approach

(In logarithm)   (%)

Legend:
- Misalignment (RHS)
- REER (LHS)
- Equilibrium REER (LHS)
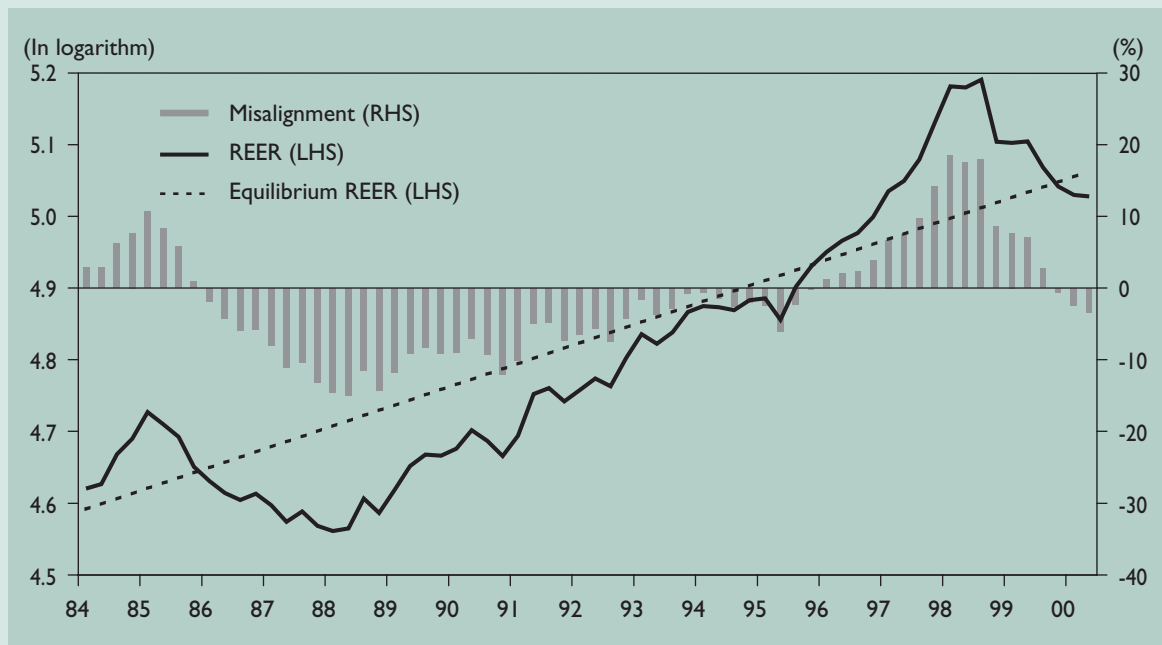
linked exchange rate system.[11] Specifically, with the nominal HK$/US$ exchange rate fixed, competitiveness considerations will tie the price level in Hong Kong to that in the US over the longer term. That is, prices in Hong Kong will adjust such that the real exchange rate remains consistent with an underlying equilibrium. The model allows for some secular drift between the Hong Kong and US price levels that represent trend changes in the equilibrium REER due to—say—the Balassa-Samuelson effect discussed above. An over-valuation in the REER—for example—would imply, other things being equal, low domestic inflation relative to foreign inflation in the future that will help eliminate the misalignment.

Based on the model and applying the equilibrium REER estimated above, long-term inflationary expectations were computed. The estimated long-term real interest rate exhibits a quite different pattern than the conventional measure of short-term real interest rate (Chart 3).[12] The conventional measure of the real interest rate reached its peak in the early part of 1999 and has since stayed at a high level of about 14%. In contrast, after peaking at $7\frac{1}{4}$% in the third quarter of 1998, the long-term real expected interest rate has declined significantly to about 3% in the second quarter of 2000. Nevertheless, it should be noted that its current level was still somewhat higher than the pre-crisis levels.
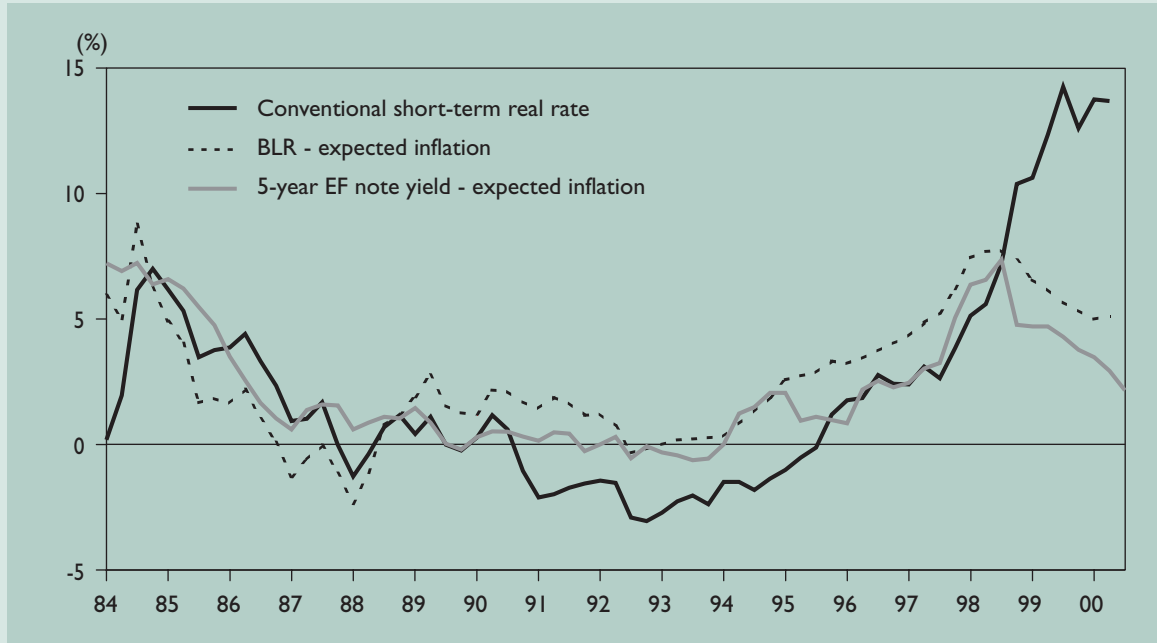
Relative Weights of the REER and Real Interest Rate

To select the weights for the real interest rate and the REER, a reduced-form equation approach was used. Specifically, we employed an empirical equation for the output gap, with once-

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11 The model-based approach was used in part because of the absence of long-term inflation surveys and indexed bonds in Hong Kong. The difference between yields on indexed bonds and those on unindexed bonds is often used a measure of the break-even inflation rate as perceived by markets in other economies.

12 The latter was computed as the difference between the best lending rate and CPI inflation in the past 12 months. The year-on-year change in the CPI turned negative from the first quarter of 1999 and has remained significantly negative. In contrast, the estimated long-term inflationary expectations never turned negative—notwithstanding some significant declines in the wake of the financial turmoil—and started to trend up from the third quarter of 1999.

Chart 3
Long-term Real Expected Interest Rate

(%)

Legend:
- Conventional short-term real rate
- BLR - expected inflation
- 5-year EF note yield - expected inflation

lagged real interest rate, the deviation of the REER from equilibrium and the Hang Seng Index (as a ratio to GDP times 100) as the explanatory variables (Table 1).[13] The form and lag structure of the equation were selected using a general-to-specific approach, with 4 lags included for each of the explanatory variables, including a variable for growth in foreign demand in the first step. By dropping insignificant terms one by one, the final

form was derived. The significance of the once-lagged real interest rate in the final form is in line with the expectation that changes in interest rates affect economic activity more slowly than the exchange rate. The regression was computed using quarterly data for the period of 1984–99.

The estimated coefficients imply that a one percentage point increase in the long-term real

Table 1
An Empirical Model of Output Gap and Financial Variables

$$GAP = 0.745 \ GAP_{-1} - 0.068 \ REERD - 0.358 \ INTR_{-1} + 0.257 \ HSIY$$
$$(12.9) \qquad (2.25) \qquad (3.11) \qquad (2.28)$$

Adj R^2 = 0.87   DW = 1.97

Where: GAP, output gap measured as a log ratio of actual to potential GDP
REERD, deviation of the REER from equilibrium
INTR, long-term real interest rate
HSIY, the ratio of the Hang Seng Index to nominal GDP times 100

13 An alternative approach for selecting the weights is to rely on simulations of a macroeconomic model. Such a model is not ready yet for our purpose.

interest rate would reduce real GDP (relative to potential) by about $3/4$% within a year (Table 2). A ten percentage points increase in the REER relative to equilibrium would reduce real GDP by about $1 3/4$% for the same time horizon. Thus, about $4 1/4$ percentage points change in the REER relative to equilibrium is equivalent to 1 percentage point change in the real interest rate in terms of the effect on output growth.

The estimated weights are similar to those reported by some private analysts for Hong Kong. However, estimates for other small open Asian economies indicate generally smaller ratios of real interest rate against real exchange rate.[14] The difference could be explained by two factors. First, in Hong Kong, because of the linked exchange rate system, shocks to the Hong Kong dollar exchange rate tend to be reflected in changes in risk premium of interest rates through which economic activity is affected. Secondly, Hong Kong has a smaller manufacturing sector which tends to be more elastic with respect to exchange rate changes than do service sectors. Thus changes in the REER

	Within 1 Year
One percentage point increase in the real interest rate	$-3/4$
10% increase in the REER's deviation from equilibrium	$-1 3/4$
10% increase in equity prices	$1/2$

Table 2
Effects on Real GDP of Changes in Financial Variables (percent deviation from potential)

should have a smaller effect on output growth in Hong Kong than in the other economies.

IV. An MCI For Hong Kong

Based on the estimates presented above, an MCI is computed as a weighted sum of the real interest rate and the deviation of the REER from equilibrium in percentage points (Chart 4). The

Chart 4
Monetary Conditions Index
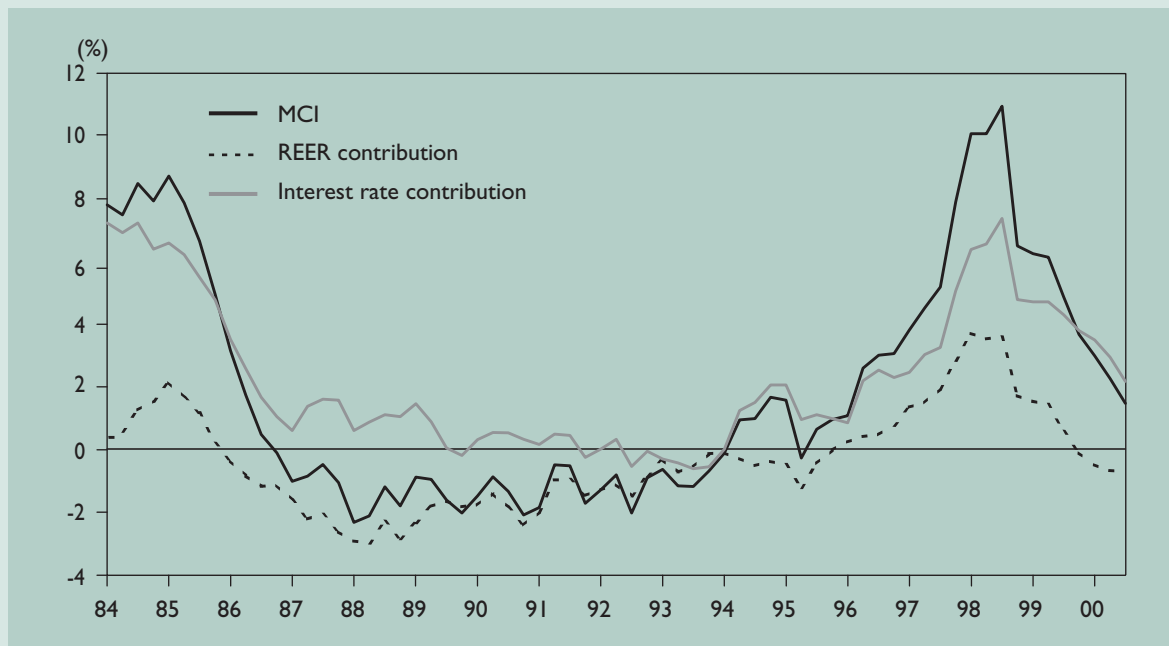
14 Estimates by a private investment house suggest the following ratios of real interest rate against real exchange rate: Hong Kong, 1 to 5; Korea, 1 to $2 1/2$; Malaysia, 1 to 4; Singapore, 1 to $1/4$; and Thailand, 1 to $2 1/2$.

following are some observations on the movements in the MCI in recent years:

- The MCI started to pick up strongly from the third quarter of 1997 until reaching its peak in the third quarter of 1998, indicating a tightening of financial conditions during this period. The increase of about 6 percentage points was a result of rises in both the real interest rate and the REER relative to equilibrium. It is interesting to note that the change in the MCI indicates a stronger tightening during the period than suggested by the increase in the real interest rate alone. The latter rose by about 4 percentage points during the period.

- The MCI has dropped since the last quarter of 1998, indicating a significant easing of financial conditions. It has recorded a cumulative decline of $8^1/_2$ percentage points during 1998Q4-2000Q2, and is currently about

2 percentage points lower than the level in the second quarter of 1997. The decline in the MCI was about 4 percentage points greater than that in the real interest rate.

- In terms of the composition of the change in the MCI, the drop in the last quarter of 1998 was contributed in large part by the decline in the real interest rate. The subsequent decline was mostly a result of the large drop in the REER relative to equilibrium—notwithstanding its much smaller weight.

The significant easing of financial conditions since the last quarter of 1998 is in line with the recovery in economic activity. Real GDP rebounded from the second quarter of 1999, accelerating to a year-on-year increase of $14^1/_4$% and $10^3/_4$% in the first and second quarter of 2000 respectively (Chart 5). The estimated output gap has also narrowed significantly in recent quarters (Chart 6). The MCI seems also to be a reasonably good measure of demand conditions for the
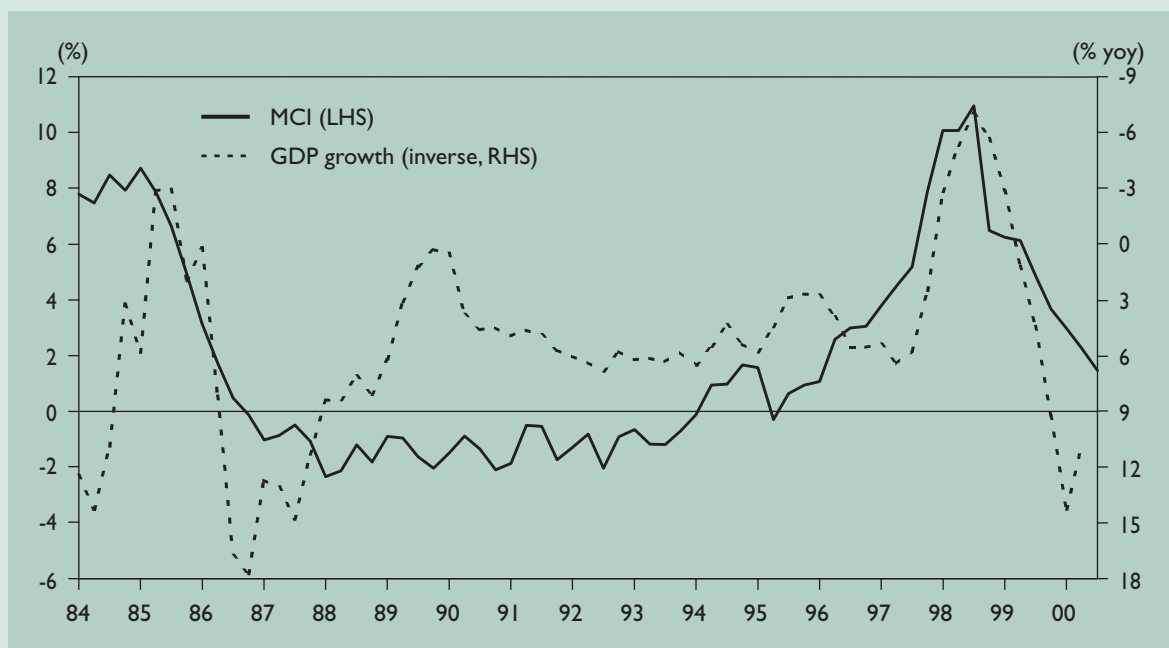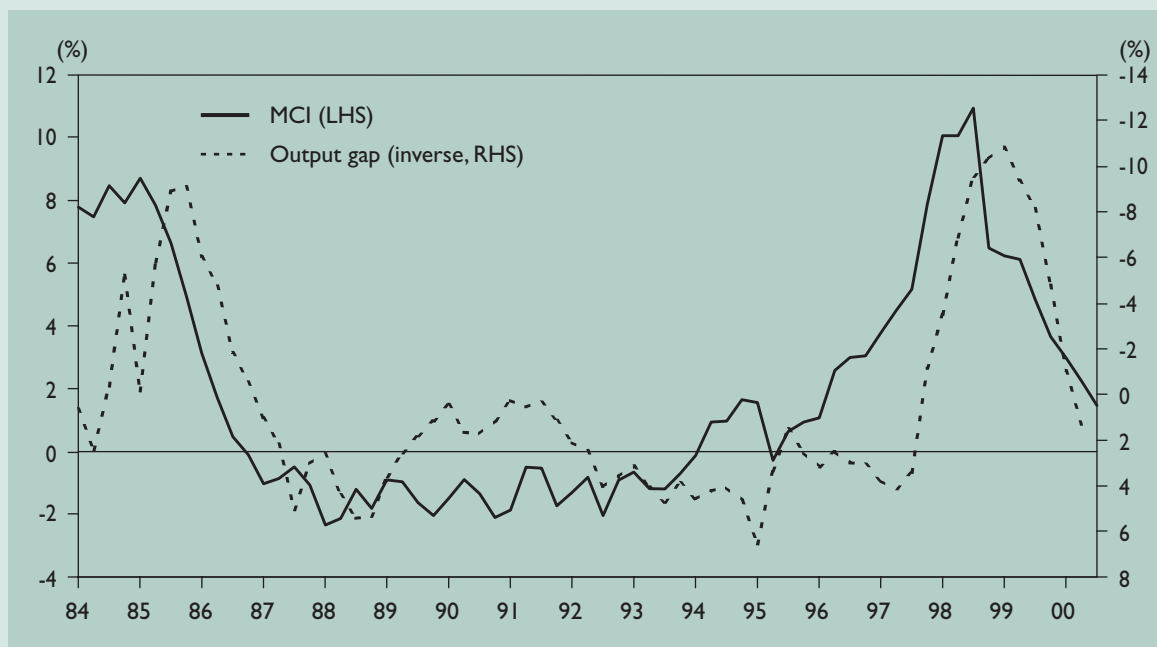

Chart 5
MCI and GDP Growth

Chart 6
MCI and Output Gap

economic cycle in the early 1980s. However, for the earlier part of the 1990s and the latter part of the 1980s, the correlation between the MCI and the output gap was much less significant, in part reflecting broad stability in the latter during the period.
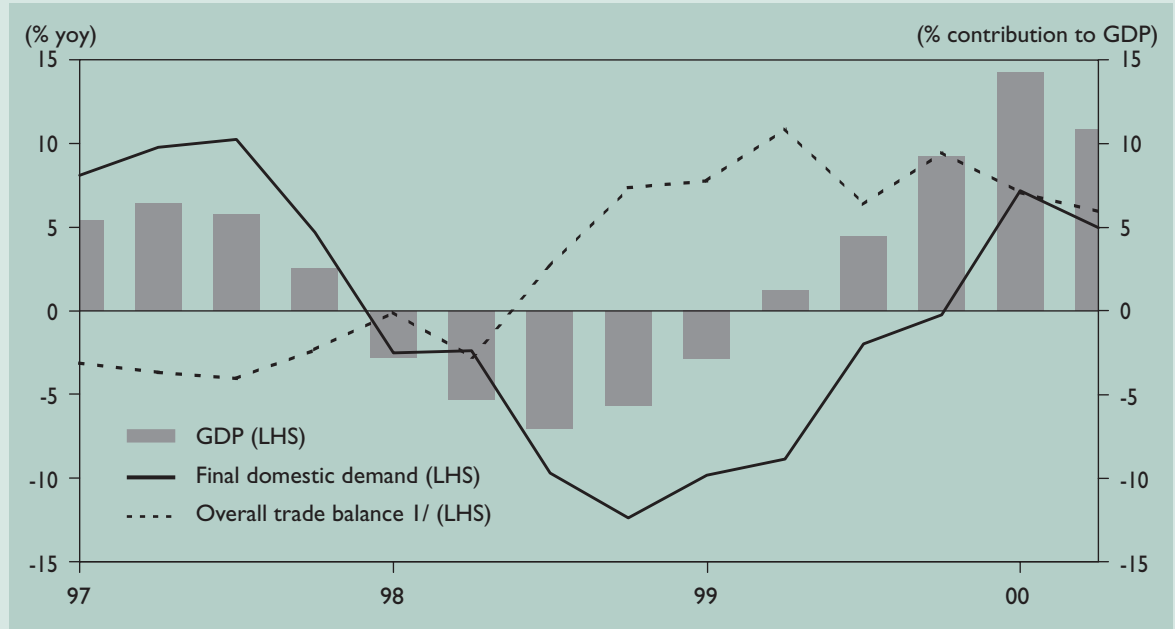
The composition of changes in the MCI—in terms of contribution from the real interest rate and the REER—will have implications for the sources of GDP growth. This is because—as noted earlier in the paper—the real interest rate and the REER affect economic activity through different channels. At the risk of oversimplification, the real interest rate generally affects GDP growth through its influences on domestic demand—private consumption and investment, whereas the REER works through net exports of goods and services. The composition of the decline in the MCI during the past year or so was in line with growth in the GDP components. Specifically, the large decline in the REER relative to equilibrium—accounting for about two-thirds of the decline in the MCI since the first quarter of 1999—has provided a boost to net exports of goods and services. The latter

contributed the bulk of GDP growth in 1999, and remained robust in the first half of 2000 (Chart 7).

V.   FCI: An Extension to the MCI

As an indicator of financial conditions, the MCI is often criticised for not incorporating a sufficiently broad range of financial variables. In particular, it omits the effects of changes in equity prices on aggregate demand. Our regression results suggest that increases in equity prices would have significant positive effects on GDP growth. Specifically, a 10 percent increase in the Hang Seng Index would raise GDP (relative to potential) by about $1/2$% within a year. Admittedly, the effect of changes in equity prices is in part captured by changes in the real interest rate, which is one of the factors that determine equity prices. Nevertheless, because equity prices are also affected by other factors including expected earnings growth and market risk considerations, it is appealing to include a measure of equity price in the MCI. The resulting measure is often termed the Financial Conditions Index (FCI).

Chart 7
GDP Growth

(% yoy)

(% contribution to GDP)

GDP (LHS)

Final domestic demand (LHS)

Overall trade balance 1/ (LHS)

1/ Excluding imports for inventory building.

In Hong Kong, equity prices have experienced large fluctuations in recent years, as indicated by the movements in the Hang Seng Index (Chart 8).

Following a significant consolidation in 1994-95, equity prices started to pick up strongly from 1996 and reached a historical high in the third quarter

Chart 8
Hang Seng Index

(as a ratio to GDP)
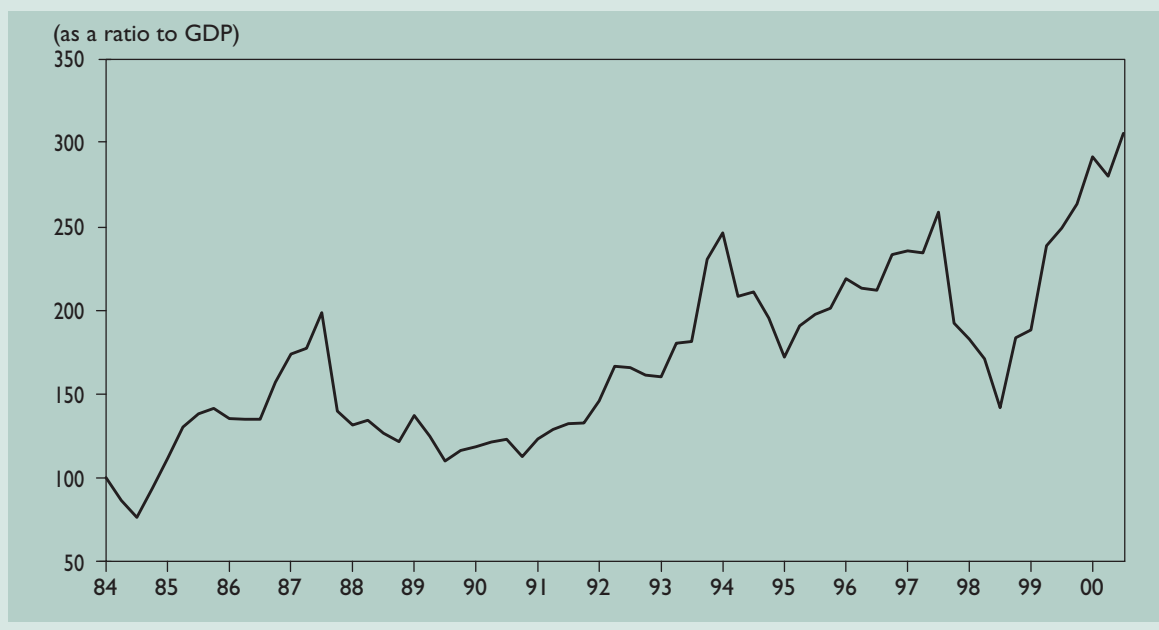
of 1997. These sharp gains were followed by the dramatic collapse of equity prices that started from the last quarter of 1997 through to the third quarter of 1998. Equity prices rebounded in the last quarter of 1998, and continued to recover in 1999. Stock prices then rose sharply in the first quarter of 2000 to new records, before some consolidation in the second quarter. These large fluctuations are likely to have had an important direct impact on aggregate demand, both through the wealth effect on consumption and through changes in capital costs on investment.

Based on the relative weights implied by the regression estimates, the FCI was computed by including the ratio of the HSI to nominal GDP (times 100) as the third component. As can be expected, the FCI experienced a larger swing than the MCI in the past few years, because of the large fluctuations in equity prices (Chart 9). Thus, by excluding equity prices, the MCI could underestimate the tightening of financial conditions during the financial market turmoil period, and the easing of financial conditions subsequently. Specifically,

- The FCI increased by about 8 percentage points (real interest rate equivalent) from the third quarter of 1997 through to the third quarter of 1998, compared with a rise of 6 percentage point in the MCI during the same period.

- In the subsequent period through to the second quarter of 2000, the FCI had recorded a decline of over 10 percentage points, 2 percentage points higher than that in the MCI.

- In terms of composition of change in the FCI, the real interest rate contributed the bulk of the decline in the last quarter of 1998 (Chart 10). In the subsequent period, the drop in the REER relative equilibrium accounted for over 40% of the total decline in the FCI, while changes in the real interest rate and equity prices contributed about one third and one quarter respectively.
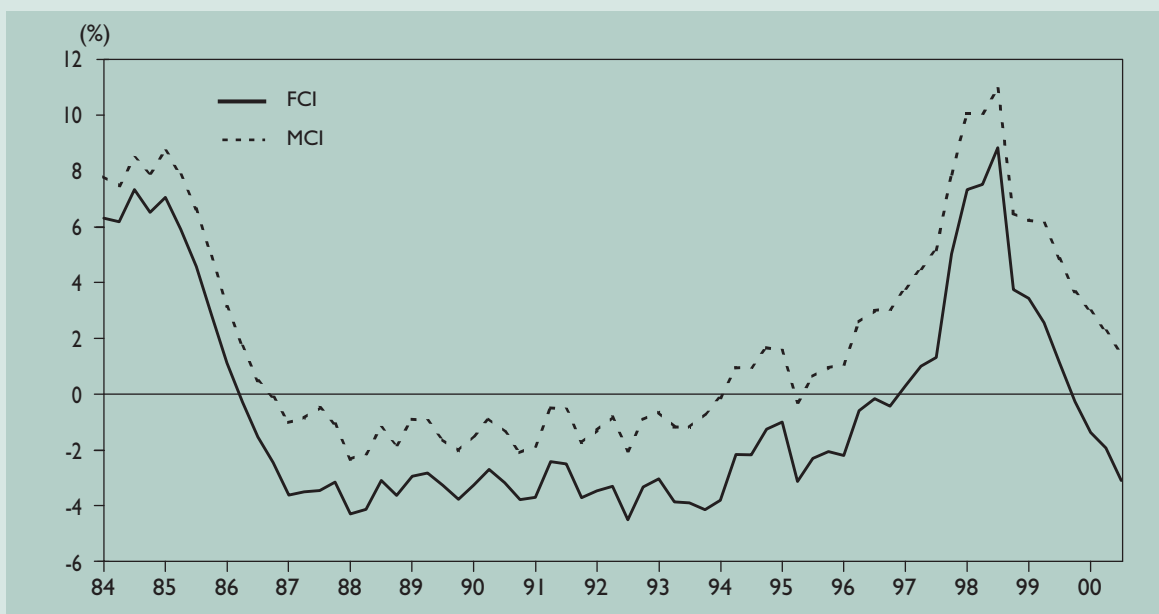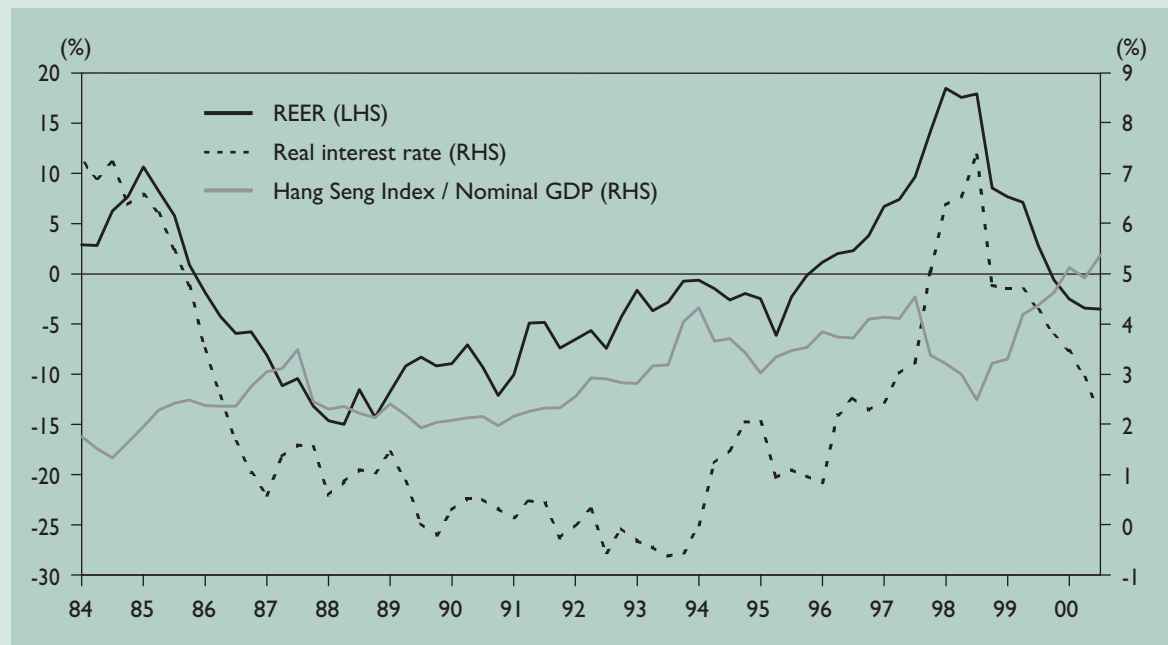

Chart 9
FCI and MCI

Chart 10
FCI Components

(legend)
REER (LHS)
Real interest rate (RHS)
Hang Seng Index / Nominal GDP (RHS)

VI. Caveats and Concluding Remarks

In this paper, we have discussed the usefulness of a monetary/financial conditions index in Hong Kong. Analytical and empirical issues in constructing such an index were examined, and estimates of the MCI and FCI were derived. A number of tentative conclusions can be drawn:

•   The movements in the REER relative to equilibrium in the wake of the Asian financial crisis have led to tighter and subsequently easier financial conditions than suggested by changes in the real interest rate alone. Changes in financial conditions owing to swings in equity prices have also reinforced underlying cyclical conditions in the past few years.

•   Since the third quarter of 1998, financial conditions have eased significantly. Notwithstanding a real interest rate that is still somewhat higher than the pre-crisis levels, financial conditions are estimated to be currently easier than those prevailing in the period before the onset of the Asian financial crisis. The

composition of the change in the MCI and FCI suggests that improved competitiveness has been the largest contributor to the easing of financial conditions.

•   The easing of financial conditions is in line with the economic recovery in recent quarters. The improvement in competitiveness, as indicated by the decline in the REER to below equilibrium, has provided a boost to net exports of goods and services.

Finally, a few words on pitfalls and caveats of the MCI/FCI are warranted. While the concept of a financial conditions index is appealing theoretically, the empirical implementation and interpretation involve considerable uncertainties and margins of error. The main caveats include:

•   *Shock identification.* Different types of shocks have different implications for financial conditions. By construction, MCIs complicate the identification of exchange rate shocks because they aggregate movements in the exchange

rate and interest rates together, rather than focusing on these variables separately. This caveat is particularly worrisome when MCIs serve as operating targets or indicators of policy stance. An exchange rate depreciation due to a negative supply shock should not be interpreted as an loosening of monetary policy stance, for example. Nevertheless, it is a lesser concern for Hong Kong, because the MCI can be useful only as an indicator of financial conditions, and movements in the effective exchange rate are exogenous.

- *Model dependence*. MCIs are model based. Errors and uncertainties arise from measuring the real interest rate, the REER and its equilibrium, as well as estimating the relative weights for the component variables. The MCI and FCI computed in this paper will only be as good as the underlying models from which the equilibrium REER, inflationary expectations and the weights for the components were derived.[15]

- *Dynamics*. The MCI is an average of the REER and real interest rate, which may affect economic activity at different speeds. Thus, the response of economic activity to changes in the MCI will differ according to which component has changed. Even if medium-term multipliers are used to derive the MCI weights—i.e. even if account is taken of the existence of lags in the estimated reduced form model, as in our case— the MCI may give a misleading picture in the short run.

- *Omission of other variables*. While the three financial variables included in the FCI represent important determinants of economic activity, other variables may

have additional information. In Hong Kong, because of the limited scope for independent monetary policy, fiscal measures have particular significance in macroeconomic management. Our previous research suggests that expansionary fiscal measures have provided a significant boost to aggregate demand in the recent economic downturn.[16] It is thus appropriate to expand the indicator of financial conditions to include an estimate of fiscal stance. However, because quarterly—let alone monthly—data on revenue are not readily available, a financial conditions index that includes fiscal stance could be computed only at annual frequencies, reducing its usefulness for timely analysis.

In sum, while the MCI offers a useful tool for macroeconomic analysis, it should not be used in a mechanical way. Considerable margins of errors exist in the empirical estimation. Also, sources of changes in the MCI should be taken into account when interpreting movements in the MCI. ✿

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15 It should be noted that empirical estimates of other analytical concepts that economists and policy makers routinely use—from output gaps to fiscal stance to the shape of short-run Phillips curves, for example—face the same problem. All these concepts are useful, and are at the heart of macroeconomic analysis. Yet, we should keep in mind the problems with over-reliance on claims to empirical precision.

16 "Hong Kong: Macroeconomic Impact of Recent Fiscal Measures" in *Hong Kong Monetary Authority Quarterly Bulletin, February 2000*.