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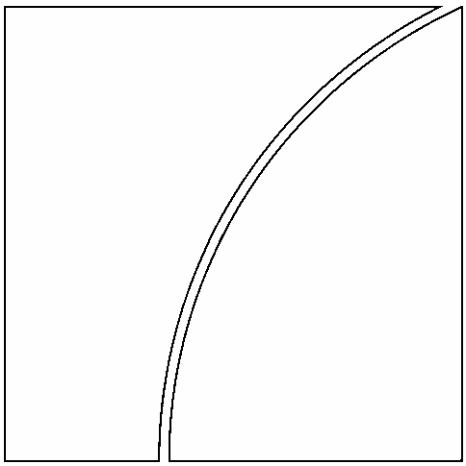

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Transparency versus constructive ambiguity in foreign exchange intervention

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Abstract

Based on a survey of 10 central banks and a review of existing literature, this paper examines the choice between transparency versus ambiguity in central banks' foreign exchange intervention. Three case studies – Canada, Hong Kong SAR and Japan – are presented to highlight the problems facing central banks in this choice, and the changes that have been made to cope with those challenges.

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1. Introduction[1]

Notwithstanding the trend towards increased transparency and accountability of central banks' operations, foreign exchange intervention has been conducted in a rather discreet manner in a number of economies. This is a puzzling phenomenon, particularly when we take into account the body of academic literature and empirical evidence that suggests sterilised foreign exchange intervention works mainly through the signalling effect. Without full disclosure, the market keeps guessing when and how the central bank will intervene. Will such market guesses add to market volatility, or will some degree of uncertainty be helpful in deterring destabilising speculation?[2] Furthermore, while central banks may prefer to retain surprises in their foreign exchange operations, what are the problems with ex-post disclosure?

This paper examines various dimensions of the choice between transparency versus ambiguity in central banks' foreign exchange intervention. In addition to reviewing existing literature, a survey has been conducted on 10 central banks regarding their disclosure practice. Out of these 10 cases, which cover a variety of exchange rate regimes, a more indepth examination is made into Canada, Japan and Hong Kong SAR, with a view to highlighting the factors that have led to changes in their disclosure practice.

Foreign exchange intervention is defined here as those operations conducted with the objective of influencing the exchange rate of the domestic currency. They are to be distinguished from operations that central banks carry out in the foreign exchange market for the purposes of managing official reserves, meeting transaction needs of their governments, or as agents of other central banks. It is nevertheless noted that central banks may have some scope in timing the latter types of operations with a view to influencing the exchange rate of the domestic currency. As another point of clarification, the term "constructive ambiguity" is used to denote a situation where ambiguity is created intentionally, rather than inadvertently caused by conflicting signals. Furthermore, it is useful to note that in a number of economies, foreign exchange intervention is a shared responsibility between the central bank and the treasury. In some cases, the disclosure policy falls under the ambit of the latter.

The rest of this paper is structured as follows: the next section reviews the literature on foreign exchange intervention and the transparency issue, with particular emphasis on studies that compare the effectiveness of discreet versus publicly announced intervention. Section 3 summarises the findings of a survey on 10 central banks regarding their disclosure practice. This is followed by three case studies – Canada, Japan and Hong Kong – in Section 4. Drawing upon the survey findings and the case studies, Section 5 discusses the benefits and risks of transparency, and the last section concludes.

2. Literature review

Transmission channels and their implications for the transparency issue

The literature on foreign exchange intervention suggests four main channels through which such operations may influence the exchange rate. The first and probably the most potent one is the **monetary/interest rate channel**. When foreign exchange intervention is left unsterilised, it affects the

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[2] In some cases, the purpose of intervention might be to increase volatility.

monetary base, and hence the interest rate and money supply, which will in turn have an impact on the exchange rate (see, for example, Edison (1993)). The currency board system, which forges a mechanical link between foreign exchange transactions conducted by the central bank (or the currency board) and the monetary base, relies primarily on this mechanism to maintain exchange rate stability. Whether foreign exchange operations are transparent or not does not affect the way in which this channel works. Nevertheless, because of its effects on money market conditions, unsterilised intervention tends to be, but is not necessarily, more visible.

While there is broad agreement on the effectiveness of unsterilised intervention in influencing the exchange rate, that of sterilised intervention has been subject to much debate. In analysing the effects of sterilised intervention, one strand of literature focuses on the supply-demand factors. On the assumption that assets denominated in domestic and foreign currencies are imperfect substitutes, it is postulated that central banks may affect the exchange rate by changing the relative demand and supply of those assets. According to the **portfolio balance** theory, economic agents compare the expected nominal return (determined by interest earnings, the expected movement in the exchange rate, and the risk premium) on a domestic currency denominated asset with that on a foreign currency denominated asset. When the central bank sells foreign currency assets for domestic currency assets, other things being equal, this creates an excess supply of foreign currency assets, and an excess demand for domestic currency assets. To re-establish equilibrium, economic agents need to be compensated by a higher expected return on foreign currency assets. This may take the form of a widening interest rate differential, or an appreciation of the domestic currency to change the spread between the expected future exchange rate and the current spot exchange rate (see Tryon (1984) and Edison (1993)).

Empirical support for the portfolio balance channel has been rather limited. This is hardly surprising, considering that the size of central bank intervention is minuscule when set against the size of the foreign exchange market.[3] Focusing on the flow concept and the liquidity issue, some recent studies suggest that, over short-term horizons, the exchange rate is determined by marginal demand and supply. Thus, even though official reserves are small, central banks, like other big players, may be able to influence the exchange rate (see, for example, Evan and Lyons (2001), who develop a micro portfolio balance model and use private sector transactions as a proxy for secret central bank intervention). However, it remains doubtful how durable the impact can be. Returning to the transparency issue, regardless of whether the transmission mechanism works through the portfolio balance channel or market liquidity, visibility of foreign exchange operations does not appear to be a relevant concern in this line of thinking.

By contrast, the **signalling** theory holds that sterilised foreign exchange intervention has to be publicly known to be effective. Mussa (1981) argues that foreign exchange intervention may influence market expectations on exchange rate movements as it conveys new information about future changes in monetary or exchange rate policy. A corollary of this argument is that if the central bank does not follow up the intervention with credible policy adjustment, the effectiveness of the signal will be undermined. Among the various transmission mechanisms that have been suggested, there is relatively more empirical support for the signalling channel.[4] However, the findings are inconclusive as to whether foreign exchange intervention is indeed a precursor of monetary or exchange rate policy changes (see, for example, Fatum and Hutchison (1999)). Interpreted in a broader sense, foreign exchange intervention is a costly signalling by the central bank of its views on the exchange rate. It is "putting money where its mouth is". To the extent that market participants believe the central bank has superior information on economic fundamentals, or that it has the ability to adjust monetary policy to change conditions in the foreign exchange market, such intervention may have an impact on market perception of future exchange rate movements.

The implication for disclosure is markedly different under the **noise trading** channel. Hung (1997) argues that a considerable proportion of market participants are chartists or momentum traders, who

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[3] According to a global survey on foreign exchange turnover conducted by the Bank for International Settlements, the average daily turnover in the global foreign exchange market amounted to USD 1,200 billion in April 2001, compared with combined official reserves of USD 1,520 billion (see BIS, 2002).

[4] One caveat is that one of the advantages of the signaling approach is that it compresses the time period over which exchange rates are expected to react, making it easier for empirical studies to capture the effects of intervention. This could lead to a certain bias in the reported results.

follow certain trading rules based on past movements of the exchange rate rather than analyses of economic fundamentals. When liquidity is thin, and the market is overbought or oversold, a surprise intervention by the central bank may move the exchange rate. Momentum traders may jump on the bandwagon in the belief that there will be more movement in the same direction, prolonging the initial impact due to the intervention. Depending on market conditions, central banks may wish to intervene on an anonymous basis. For instance, where the underlying momentum is strong, and the central bank wants to create a sense of two-way risks, it will probably conceal its identity such that traders will interpret the trades as stemming from genuine commercial interests.

In short, different theories on the transmission mechanism lead to rather different conclusions on the need for transparency of foreign exchange intervention: the signalling channel relies primarily on the announcement effect; the noise trading channel suggests that central banks should operate in a secretive manner in certain circumstances; under the monetary and portfolio balance channels, transparency does not matter much.

Explanations for ambiguity in foreign exchange intervention

In the context of the price-output trade-off, Cukierman and Meltzer (1986) postulate that a central bank is likely to choose more ambiguous control procedures if it is uncertain of its objectives. Extending this to foreign exchange operations, it may be argued that as most central banks operating under an independently floating exchange rate system are more concerned with discouraging destabilising speculation than maintaining a certain exchange rate level, they can be more ambiguous about their intervention policy. On the other hand, central banks operating under a fixed exchange rate system need to be much more transparent in order to encourage market participants to behave in a way consistent with their objectives. An alternative explanation provided by Almekinders (1995) is that central banks may wish to conceal their operations, or make them unpredictable, with a view to retaining private information about their own preferences so as to create surprises.

Dominguez and Frankel (1993) summarise three sets of reasons why many central banks are reluctant to disclose their foreign exchange operations. The first set of reasons relates to central banks' convictions regarding the efficacy of the intervention. In circumstances when the decision to intervene comes from the outside (say, due to political factors), and when the intervention policy is regarded as inconsistent with the prevailing monetary and fiscal policies, central banks may be inclined to remain silent. The second set of reasons revolves around central banks' assessment of the depth and underlying volatility of the foreign exchange market. Uncertain of whether their operations would be swamped by market forces, central banks may choose to operate on an anonymous basis to avoid undermining their credibility. There may also be occasions when central banks disguise their identities, as they wish to create a sense of two-way trades in a market dominated by one-direction bets. The third set of reasons is concerned with the need to avoid sending confusing signals. Central banks operate in the foreign exchange market for reserve management and other purposes, in addition to influencing the exchange rate. Since those operations may not be easily distinguished by market participants, central banks may feel more comfortable in keeping their operations discreet.[5]

Enoch (1998) adds a few other practical considerations. For countries that manage their exchange rates within a predetermined band, central banks may see advantages in conducting undisclosed intramarginal intervention to prevent the exchange rate from getting near to the edges, where speculative pressure may quickly build up. Furthermore, central banks, like other typical big players, do not wish to be perceived as engaging in "distress buying", which would jeopardise their chance of getting the best rate.

In a survey of foreign exchange intervention conducted by Neely (2000), central banks are asked, among other things, why intervention transactions are conducted secretly. The responses are very mixed: some central banks hold that discreet intervention maximises market impact, while others report that intervention is conducted in a secretive manner to minimise market impact.

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[5] Some central banks avoid this problem by informing their counterparties that the deals are unrelated to intervention. Furthermore, they may choose to conduct reserve management and treasury-related operations through other central banks, or through the Bank for International Settlements.

Different facets of transparency

On the general issue of transparency of central banks' operations, some literature questions the implicit assumption of transparency as a free good – ie, the more the better. Winkler (1999) argues that even in the absence of a credibility problem, central banks face many challenges in their communication strategies. He postulates a transparency triangle to illustrate the possible trade-offs between information efficiency, openness and clarity. In the process of policy formulation, central banks would want to make use of as much relevant information as possible (information efficiency). Very often, even policymakers themselves have difficulty in articulating the precise process of how a decision is arrived at. It is therefore important to make a judgment on the appropriate degree to which the mode and extent of details in external communication should correspond to those in internal communication (openness). A further complication is the cost of processing information, which suggests a need to balance the different requirements of heterogeneous receiver groups with different information processing capabilities (clarity). It follows from the above argument that central banks' disclosure policy goes beyond how much to disclose. It also involves complex issues of how the information is structured, and the context in which the signals are picked up. In the context of foreign exchange operations, this set of problems will need to be handled with particular care. As evidenced by occasionally large exchange rate movements in response to market news and rumours, this market tends to be very sensitive to information.

IMF Code of Good Practices on Transparency in Monetary and Financial Policies

The Code of Good Practices on Transparency in Monetary and Financial Policies, developed by the International Monetary Fund, bases its arguments for transparency of monetary and financial policies on two main premises. First, policy effectiveness can be strengthened if the goals and instruments of policy are known to the public and if the authorities can make a credible commitment to meeting them. Second, good governance calls for central banks and financial agencies to be accountable. In cases when conflicts might arise between or within government units, transparency in the mandate and clear rules and procedures in the operations of the agencies can help in their resolution, strengthen governance, and facilitate policy consistency.

However, the Code recognizes that there may be justifications for limiting certain disclosure practices in situations "where increased transparency could endanger the effectiveness of policies, or be potentially harmful to market stability" (IMF, 1999). In relation to exchange rate policy considerations, the Code states that "extensive disclosure requirements about internal policy discussion on money and exchange market operations might disrupt markets, constrain the free flow of discussion by policymakers, or prevent the adoption of contingency plans. Thus, it might be inappropriate for central banks to disclose internal deliberations and documentation, and there are circumstances in which it would not be appropriate for central banks to disclose their near-term monetary and exchange rate policy implementation tactics and provide detailed information on foreign exchange operations".

While embracing a generally transparent environment, the Code contains few specific recommendations on disclosure regarding foreign exchange operations, other than the suggestion that "institutional responsibility for foreign exchange policy should be publicly disclosed" (clause 1.1.4). This is probably a recognition of the complex market dynamics and expectation formation in foreign exchange trading, which underline the difficulties of formulating the "best" disclosure practice with general applicability across different economies.

Empirical studies

Whether discreet or open intervention is more effective is also an empirical question. On the broad question of the effectiveness of sterilised intervention, empirical studies have yielded inconclusive results, however. Having conducted a comprehensive survey of the relevant literature in the 1980s and early 1990s, Edison (1993) concludes that "both the existing empirical methods and the quality of the existing data are not sophisticated enough to enable researchers to properly resolve questions regarding the effect of intervention".

Specifically relating to the effectiveness of discreet versus open intervention, the data problem is even more daunting. In the early 1990s, when the US Treasury and the Deutsche Bundesbank first agreed to provide daily intervention data to analysts, this spurred some empirical work on this area. In recent years, however, US intervention has largely been conducted in an open manner, with the Treasury

confirming most of the intervention episodes at the time they were launched. In other words, the sample of discreet intervention is almost non-existent. In 2000, the Japanese authorities made a significant turn in their disclosure policy, publishing a historical series of foreign exchange intervention dating back to the early 1990s and providing updates on such operations on a quarterly basis. Since the previous episodes were conducted in mixed manners – some discreet and some visible – this is potentially a useful data set for empirical studies on the transparency versus ambiguity issue.

Distinguishing between "discreet" and "open" intervention is not a straightforward task, however. Although central banks may not formally announce or confirm their intervention, they may deliberately conduct them in a visible manner, or the intervention may be somehow leaked to the market. Such information may already have an impact on the exchange rate. Most empirical studies rely on reports in the financial press to identify episodes that were perceived by market participants, and those that were not known (see, for example, Dominguez and Frankel (1993) and Humpage (1999)). However, because of different sources, the constructed series often vary considerably among themselves.

Turning to the empirical studies that have tested the signalling hypothesis, Dominguez and Frankel (1993) compare daily changes in the US dollar/mark exchange rate following reported and secret intervention over the period from 1985 to 1990.[6] The coefficients of both variables are found to be incorrectly signed in the regression, probably due to the problem of simultaneous bias, ie the regression results show the central banks' response to a prevailing exchange rate trend (leaning against the wind in this case), rather than the effects of the intervention on the exchange rate. The authors do, however, find evidence of a strong positive relationship between reported intervention and expectation measured by survey data. However, using a logit model to estimate how various aspects of intervention affect the probability of success, Humpage (1999) does not observe any connection between news reports of intervention and the chance of success.[7] This has led him to raise doubts on the accuracy of news accounts, and on the assumption that key market participants are not aware of unreported intervention.

In another test of the signalling hypothesis, Fischer and Zurlinden (1998) assess the differential effects of intervention and customer transactions conducted by the Swiss National Bank on the US dollar/Swiss franc exchange rate.[8] The former was taken as reported intervention, in view of the Swiss National Bank's practice to make known its intervention operations immediately after they are conducted. Customer transactions, on the other hand, are carried out in a discreet manner, and hence have no signalling effects. Using data for the period from 1986 to 1994, the authors find that only the initial round of operations in an intervention episode matters. Subsequent intervention operations and customer transactions have little influence on the exchange rate. They believe that their results lend support to the signalling theory. Nevertheless, a problem in interpreting the findings is that intervention and customer transactions are often conducted under different market conditions, which may partly account for the differential impacts of the two types of operations.

Some empirical works have also examined the effect of open and discreet intervention on exchange rate volatility, as one of the often-quoted objectives of foreign exchange operations is to ensure orderly markets. Using a GARCH model and data from 1985 to 1991, Dominguez (1993) finds that publicly known Federal Reserve and Bundesbank intervention appears to have decreased daily volatility in the post-Louvre Accord period, while secret intervention generally increases exchange rate volatility.

As an alternative explanation using the noise trading approach, Hung (1997) argues that central banks may deliberately resort to volatility-enhancing intervention to reverse a strong exchange rate trend. Such operations are often kept secret with a view to creating a sense of two-way trades. The study finds that US intervention decreased the volatility of both US dollar/yen and US dollar/mark rates in the

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[6] The empirical studies discussed in this section are confined to sterilised intervention.

[7] Success is measured in terms of the central bank's ability to move the spot exchange rate in the intended direction, or to moderate exchange rate movement in an unintended direction.

[8] Customer transactions refer to US dollar purchases triggered by the Swiss government's request for foreign currencies. The intervention episodes captured in the study were coordinated intervention operations carried out jointly with the US Federal Reserve and the Deutsche Bundesbank. Intervention operations conducted by the Swiss National Bank on its own are excluded as they might not have been sterilised immediately, and the resultant liquidity effects are difficult to control for.

1985–1986 post-Plaza Accord period, but increased the volatility of both rates in the 1987-1989 post-Louvre period. This seemingly puzzling phenomenon is attributed to a change in intervention objectives. In the post-Plaza period, the intervention was aimed at ensuring a continuation of the downward adjustment of the US dollar exchange rate, and "leaning against the wind" operations were carried out when the US dollar experienced occasional upward pressures in a downward trend. By contrast, in the post-Louvre period, the objective of the intervention was to maintain the exchange rate within an implicit target band. Volatility-enhancing intervention was warranted to change market attitude when the US dollar showed signs of breaching the limits of the implicit band.

In short, empirical studies that have been conducted so far have not produced results that are sufficiently robust across different models, currencies or sample periods. As another angle to look at the transparency issue, this study surveys the disclosure practice of 10 central banks, in an attempt to identify some patterns that may have influenced the choice between transparency and ambiguity.

3. Survey of central banks' disclosure practice

Background

The survey covers central banks in Australia, Canada, Hong Kong, Japan, Korea, Singapore, Switzerland, the UK and the US, together with the European Central Bank. With the exception of Hong Kong (which operates a currency board regime) and Singapore (which adopts managed floating), the central banks surveyed are currently operating under an independently floating exchange rate system, according to the classification of exchange rate arrangements in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (IMF, 2001).[9] The survey was conducted through interviews with senior officials in charge of foreign exchange operations, and the discussions centred on the following four areas:

(a) Basic framework for the conduct of foreign exchange intervention – this includes, for example, the objectives of such operations, the relationship between the central banks and the treasuries, whether intervention is sterilised or not, and how frequently the central banks intervene in the foreign exchange market.

(b) Visibility of intervention – this delves into the way in which intervention is conducted, as this will affect its chance of being perceived by the market, regardless of whether there is any official announcement.

(c) Disclosure practice – this covers the channels, if any, through which foreign exchange intervention is disclosed, the details of the disclosure, and the time lag involved.

(d) Interaction with market players – this is mainly concerned with the flow of information between the central banks and market players. Issues discussed include the tapping of market intelligence from the market, and concerns, if any, about possible information advantage to certain market participants.

The survey findings in respect of individual central banks are set out in Tables 1–5. Major observations are discussed below.

[9] The classification in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* is largely based on the reporting of individual economies. Some academic literature has come up with different results based on the behaviour of the exchange rate. For instance, Reinhart and Rogoff (2002) label the Canadian regime as a "de facto moving band around the US dollar"; that of Switzerland as a "de facto moving band around the Deutsche mark"; and the United Kingdom as "managed floating".

Main observations

Frequency of intervention

Most of the central banks surveyed have intervened less frequently in the foreign exchange market in recent years. In some cases, this has been due to a change in the exchange rate regime. For instance, the introduction of the euro in January 1999 to replace 11 European currencies has obviated the need for central banks to intervene to maintain the exchange rates within the predetermined bands under the ERM. Thus far, the European Central Bank has intervened on two occasions, both in 2000. In respect of the United Kingdom, no foreign exchange intervention has been undertaken since the pound sterling exited from the ERM in 1992, except on the occasion of joining the concerted intervention to support the euro in September 2000. Both the European Central Bank and the Bank of England have focused their attention on domestic monetary and price developments, rather than exchange rate movements per se. That said, for open economies, the exchange rate is of course an important determinant of the domestic price level. In the United Kingdom, for instance, the Bank of England has the ability to intervene in the foreign exchange market in support of its monetary policy objective, though this has not been invoked so far. In Canada, the central bank's presence in the foreign exchange market has been substantially reduced under a new approach that has abandoned mechanical, symmetric intervention (see Section 4 for details). Other than the participation in concerted intervention, the Swiss National Bank has not intervened since 1991.

In Asia, following considerable intervention to defend their exchange rates amid the Asian financial turmoil, most central banks appear to have scaled down their operations, along with the break from the informal pegs with the US dollar, as well as improved stability in the financial environment.[10] However, partly reflecting the high degree of external orientation of these economies, and partly reflecting the legacy of the previous regimes, exchange rate management has continued to be an important part of their monetary policy.

Among other independently floating exchange rate regimes, the Bank of Japan, and to a lesser extent the Reserve Bank of Australia, are seen occasionally in the foreign exchange market. US intervention has become rather infrequent in recent years, but it is uncertain whether this signifies a new trend, or a continuation of the past alternations between brisk and quiet periods.

Transparency of foreign exchange intervention

Transparency can be assessed in terms of the objectives of foreign exchange intervention, the intervention tactics, and the visibility and disclosure of such operations. Regarding **the objectives of foreign exchange intervention**, obviously economies practising a fixed exchange rate system have a clearly defined exchange rate objective. Of those floating exchange rate regimes covered in the survey, the objectives of foreign exchange intervention are more explicitly spelt out in Canada and Singapore. Canada defines its main objective as preventing a loss of confidence in the Canadian dollar that may threaten the implementation of monetary policy. The Monetary Authority of Singapore has stated that foreign exchange intervention is carried out to maintain the trade-weighted exchange rate of the Singapore dollar broadly within an undisclosed target band. In most other cases, the objectives have not been explicitly defined, or have been couched in rather general terms, such as the prevention of excessive exchange rate fluctuations that are judged to be out of line with economic fundamentals, however defined. Under those broad terms, central banks may have different operational objectives under different market circumstances. They may sometimes informally target certain exchange rate levels, or operate in the market to reduce volatility, or increase volatility deliberately to create a sense of two-way risk. These operational objectives are seldom made known to the market.

Disclosure of the **mechanism or circumstances for invoking intervention** is invariably very limited among the central banks surveyed, with the exception of Hong Kong, which operates an inherently transparent currency board system. With reference to Winkler's argument discussed above, this is

[10] Note, however, a study by McKinnon (2000), which uses high frequency data, and finds that the exchange rates of the local currencies against the US dollar have become as stable as they were before the crisis, except for Indonesia. He attributes this to the "fear of floating" à la Calvo and Reinhart (2000).

probably an area where judgment is made from a "big black box of decision making", and even decision-makers themselves have difficulties in articulating the precise manner in which decisions are made. A number of central banks surveyed indicate that they operate with the presumption of "no intervention", and will only intervene in the foreign exchange market under exceptional market conditions. While what is regarded as exceptional varies considerably among central banks, present day concerns seem to focus more on the formation of speculative bubbles and extrapolative expectations. This is particularly evidenced in the case of Canada, which is discussed in Section 4.

There is greater diversity among the central banks surveyed as regards the **visibility and disclosure of foreign exchange intervention operations**. Canada and Hong Kong have a high level of transparency, committing to disclosure of intervention on a real-time basis. Likewise, in the two intervention episodes conducted by the ECB since its inception, there were immediate press announcements on the operations.

While the US authorities have retained discretion on whether or not to make an official statement on intervention, operations undertaken in recent years have been conducted in a very visible manner. In most cases, the intervention operations were shortly followed by an official confirmation by the US Treasury. This contrasts with the situation before the early 1990s, when a considerable proportion of the operations were carried out discreetly through one or two dealers.[11]

In Japan, there does not seem to be a consistent practice in disclosing foreign exchange intervention operations. Before 2000, transparency of the operations was considered on a case by case basis. During a period from 2000 to the summer of 2002, transparency was greater, with the Ministry of Finance disclosing the intervention immediately as it occurred. However, more discreet interventions were conducted in the first half of 2003.

The contents of the announcements vary somewhat among central banks/treasuries. The Hong Kong Monetary Authority discloses also the amounts involved in the operations, whereas the Bank of Canada, the ECB, and the US Treasury only confirm that intervention has taken place. However, they provide more details after a certain time lag. For instance, the US Federal Reserve publishes, on a quarterly basis, a report on Treasury and Federal Reserve foreign exchange operations, which contains a description of the intervention episodes, with details on currency pairs, intervention amounts and dates. If no intervention has been carried out, this will be stated. Japan's Ministry of Finance started to provide similar information, also on a quarterly basis, from 2000. In addition, Japan's Ministry has begun to disclose monthly aggregate figures from June 2003. The United Kingdom has established a policy of disclosing the operations in the monthly press release on official holdings of foreign currency and gold, which is issued on or before the third working day in the following month. Details of the amount and date of intervention, and an explanation of why it is undertaken, are provided. Separately, any intervention in support of the Monetary Policy Committee's objective would very likely be discussed in the minutes of the meetings, which are disclosed. The ECB *Monthly Bulletin* mentions intervention operations, but gives no details on the amounts and the currency pairs.

On the other hand, Australia, Korea and Singapore have no regular channels to disclose their foreign exchange intervention.[12] The Bank of Korea and the Monetary Authority of Singapore have adopted a practice of not commenting on intervention episodes. In Australia, disclosure is determined on a case by case basis. Most of these central banks rely on informal gentlemen's agreements with agent banks to maintain the confidentiality of the operations. Privy information and other business relations with the central bank provide strong incentives for commercial banks to cooperate, though news of intervention may still leak out through market talk.

There is no simple explanation for the differences in the disclosure practice among central banks. The following examine some factors that may be relevant.

(a) **Exchange rate regime** – An important consideration in formulating the disclosure policy is how this will affect the functioning of the exchange rate system. Operating under the currency board

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[11] Hung (1997) finds that approximately 40% of US intervention operations over the 1985-1989 period were kept secret when they were conducted.

[12] The Reserve Bank of Australia discloses its foreign exchange transactions in its Monthly Bulletin. But in addition to intervention, the figures also capture the Bank's transactions with its customers, including the Commonwealth Government.

system, Hong Kong has been very transparent in its exchange rate objective, the mechanism for ensuring exchange rate stability, and the operations that are undertaken under the currency board account. Such transparency is regarded as an important underpinning of public confidence in the system. Singapore, which practises managed floating, is very transparent in explaining the objectives of its foreign exchange intervention, but the operations are kept discreet. A major concern that has been expressed is that if the intervention tactics are known, and the limits for non-intervention are identified, speculators may "gang up", and take one-sided bets to challenge "the line in the sand".

(b) **Independence of central banks** – Whether central banks are independent from the treasury in foreign exchange intervention does not appear to have affected the choice of transparency versus ambiguity, as there is a mix of "independent" and "non-independent" central banks in both camps. An interesting observation is that the disclosure practice has sometimes influenced the interaction between the central banks and the treasuries. In the United States, the Treasury and the Federal Reserve each contributes 50% of the resources for intervention by convention, and this funding ratio is usually made known in the quarterly report. Even though in principle the Treasury can intervene without the Federal Reserve's agreement, a breach of the 50-50 formula would risk creating the impression of a rift between the two authorities. In practice, therefore, the Treasury and the Federal Reserve generally make their decisions based on consensus.

(c) **Frequency of intervention** – Among the central banks surveyed, those that are more active in foreign exchange intervention tend to be less forthcoming in disclosing the details of such operations. There are two possible explanations. First, as suggested by Almekinders (1995), central banks may wish to retain private information about their preference for creating surprises. To achieve this, they either make their operations unpredictable (say, by having a very occasional presence), or by concealing their identity. A central bank that is both active and transparent in its foreign exchange operations runs the risk of revealing its tactics, and may feel compelled to act in a certain way, be it to satisfy, or to counter, market expectations. An alternative explanation is related to central banks' perception of the foreign exchange market. Those that believe that the market should be very much left to its own devices would tend to intervene less, and would be more relaxed towards disclosing their occasional operations. Those that believe that the market is afflicted by distortions may be inclined to intervene more frequently, and see their interactions with market players as involving a guessing game.

(d) **Likely success of the intervention** – For those central banks that determine the visibility of the foreign exchange intervention on a case by case basis, the decision is often based on an assessment of the likely success of the operations. When the momentum is already shifting towards the intended direction, central banks may make the intervention more visible with a view to enhancing the announcement effect. Conversely speaking, if market sentiment remains bearish, and the effectiveness of the operations is highly uncertain, a central bank is likely to keep a low profile to protect its credibility.[13]

(e) **Sterilised versus unsterilised intervention** – Whether the foreign exchange intervention is sterilised or not does not seem to have affected the choice of disclosure practice. Singapore has left some of its foreign exchange operations unsterilised, but its operations can be kept discreet, as it would be difficult to distinguish the liquidity effects of intervention from other domestic money market operations.

(f) **Concerted versus unilateral intervention** – A major reason for conducting concerted intervention is to boost the signalling effect. Hence such operations tend to be highly visible, and are often confirmed by the authorities of the lead partners. Junior partners in concerted intervention may, or may not, disclose their participation, depending on their own disclosure policy.

(g) **Transparency of monetary policy** – Intuitively, central banks with a more transparent monetary policy framework would probably be more open in the conduct of foreign exchange operations. A study by Fry et al (1999) compiles transparency scores for central banks based on

[13] In most of those cases, the operations are launched to test the market, taking the opportunities presented by some short-term chart movements.

a host of criteria such as explanation of policy decisions, publication of the minutes of monetary policy meetings, and release of forecasts and forward-looking analyses. The study assigns high scores to the United Kingdom, the United States and Korea, followed by Switzerland, Canada, Australia and Japan.[14] Those scores need to be interpreted with great caution, as there is little objective basis to compare transparency in a quantitative sense. Nevertheless, to the extent that they provide some useful indications on the transparency of the monetary policy framework, one can probably conclude that the relationship between transparency in monetary policy and that in foreign exchange intervention is by no means straightforward. For instance, the Bank of Korea has a high score on transparency in explaining its monetary policy, but its foreign exchange operations are kept very secretive. Canada, on the other hand, adopts a very open approach in its foreign exchange intervention, but its transparency score is lower than that of the United Kingdom and the United States.

Interaction with market participants

There is a concern that transparency in foreign exchange intervention may put central banks in an unfair game, to the extent that private sector players are not subject to similar disclosure requirements. A relevant question is how information is obtained from market participants. Most of the central banks surveyed have imposed some forms of reporting requirements on large players. In some cases, daily reports on their foreign exchange positions or buy/sell activities are required. Nevertheless, most central bank officials interviewed in this survey indicate that they rely more on informal liaison to tap market intelligence rather than an elaborate analysis of the data collected from the returns.

4. Case studies

Of the ten central banks covered in the survey, Canada, Hong Kong SAR and Japan have been chosen for more in-depth case studies. In analysing these cases, the emphasis is put on the problems facing the central banks in the choice between transparency and ambiguity, and the changes that have been made to cope with those challenges.

Canada

Canada presents an interesting case study because there have been significant changes in its intervention approach in the past few years. Notwithstanding a return to the floating exchange rate system in 1970, the Bank of Canada continued to intervene actively in the foreign exchange market. Unlike some of its counterparts elsewhere, which acted to influence the exchange rate level, or to reverse an exchange rate trend, the Bank intervened for the purpose of smoothing exchange rate movements, so as to prevent excessive one-way movement from triggering a bandwagon effect. Despite this rather modest objective, the Bank found itself intervening in the foreign exchange market on as many as 50 to 60% of business days under a symmetric, "leaning against the wind" intervention mechanism. Specifically, this mechanism used a 100-point non-intervention band to determine the timing of intervention. When the exchange rate hit the limit, intervention would be conducted at a predetermined pace. But instead of being stationary, the non-intervention band was constantly rebased, taking into account the previous intervention levels.[15]

Increasing doubts were cast on the regime as from the early 1990s, mainly on two fronts. In the first place, questions were raised about the effectiveness of the operations. While the specifics of the intervention mechanism were not disclosed to the market, market participants derived a good sense of the central bank's tactics by observing its consistent pattern of operations. As such, the operations contained little information content, and hence, had weak signalling effect. An empirical study by Murray et al (1996) shows that during the period from January 1992 to April 1995, intervention was

[14] The score for Hong Kong falls behind those economies listed here. But it is acknowledged in the study that the framework for assessing transparency may not be appropriate for fixed exchange rate systems.

[15] As an illustration, suppose the non-intervention band was 1.1900 – 1.2000 on Day One, and during the trading session on Day Two, the Canadian dollar traded between 1.1975 and 1.2050. As the upper level depreciated beyond the non-intervention band, the Bank would sell US dollars for Canadian dollars, in an amount set by a formula. Subsequent to the intervention, the non-intervention band would be reset, to 1.1950 – 1.2050 in our example.

found to be largely ineffective in dampening exchange rate volatility. Another area of debate related to the objective of intervention. Comparisons of exchange rate volatility among major currencies did not put the Canadian dollar in an unfavourable light. Furthermore, some empirical studies (for example, Côté (1994)) suggest that the perceived effects of exchange rate volatility on trade and direct investment have probably been exaggerated.

In some respects, the Bank's role was akin to that of a market-maker. At times when the market was dominated by one-sided bets, it helped provide some liquidity, preventing a sharp widening of the buy-sell spread. It is, however, debatable whether there is a need for a central bank to take on such a role on a regular basis under a floating exchange rate regime, particularly as the foreign exchange market is one of the most liquid among various asset markets.

As a response to the above concerns, the intervention regime was revamped in April 1995. Important changes include a widening of the non-intervention band and a daily resetting of the band with reference to the previous day's market close. These two measures reduced the frequency of intervention. To improve the effectiveness of the intervention, the intervention intensity was raised. More significantly, a discretionary component was introduced to enable the Bank to enter the market earlier and with greater intensity when there was a perceived risk that the exchange rate movement would develop into a speculative bubble that might destabilise domestic financial markets.

Under the revamped regime, intervention was reduced to around 10% of business days. However, the blending of symmetric and discretionary intervention had a major drawback of sending confusing signals to the market. At times market players were puzzled as to why the Bank abstained from intervening even though it had been seen in the market under similar conditions before. Furthermore, some studies find that of the intervention episodes conducted under this revamped regime, only the unexpected and unusually heavy operations had some effects in dampening exchange rate volatility (see Murray et al (1996)). The last major intervention episode under this regime took place in August 1998. The Canadian dollar had been depreciating sharply on the back of the Asian crisis. The purpose of the operations was to avoid erosion of confidence that would raise the risk premium on the Canadian dollar and dampen speculative activity. In the event, the intervention was not very effective in halting the slide, as it was immediately followed by the Russian crisis, which resulted in further drains on reserves to provide liquidity. The Bank finally raised interest rates by 100 basis points at the end of the month to support the exchange rate.

In September 1998, the Bank decided to abandon automatic, symmetric intervention, and retain only discretionary intervention. Efforts have also been made to clarify the objective of intervention. It has been explained to the market that intervention might be contemplated "when a loss of confidence in the Canadian dollar was occurring or there was considerable risk of it occurring, potentially leading to extrapolative expectations and a prolonged and sharp drop in the value of the currency" (Freedman (2000)). Market participants have also been advised to take the intervention as a signal that the Bank is concerned about developments and is acting to stabilise the situation. If the intervention is unsuccessful, the Bank would very likely follow this up with interest rate action.

To enhance the signalling effect, the Bank has committed to broadcast its intervention through Reuters, Telerate and the Bank's website. The statement "Bank of Canada intervenes in the foreign exchange market mm/dd/yr" will be made coincident with the first transaction on any given business day. Details on the exchange rate level and the amount of intervention will not be disclosed at that time, however.

Canada has taken a number of steps since 1999 to increase the transparency of its monetary policy. They include such things (i) as moving to a system of fixed action dates for monetary policy decisions, beginning in late 2000, (ii) issuing a press statement after each decision, (iii) refining its Monetary Policy Reports, and (iv) increasing the frequency of its speaking engagements.

In summary, the reforms in Canada's intervention regime represent a move from a mechanical, predictable system to a discretionary, less predictable system. In this regard, transparency in terms of the decision rules for conducting intervention is reduced. But transparency in terms of the objectives of the intervention and the actual operations has been increased. By making intervention less predictable, the Bank increases its ability to surprise the market, which may have some deterrent effects on destabilising speculation. On the other hand, by announcing the actual operations and conducting them in a highly visible manner through brokers, the Bank will give the market a clear signal that it is concerned about market developments. Its undertaking to change monetary policy if the operations fail to achieve the intended effects adds potency to its action. Timely announcement of the operations also provides a more level playing field among market participants. Moreover,

confusion between intervention and treasury operations can be minimised, as the latter are not disclosed on a deal by deal basis, and are carried out through dealers.

So far there has not been any intervention since September 1998, apart from the concerted intervention to support the euro in September 2000, which was initiated by the ECB. As global financial markets have largely stabilised after the Russian debacle, the new regime has not yet been tested under severe market conditions. It will probably take some time for the system to gain full credibility, after the market has watched how the central bank exercises its discretion, and how committed it is to interest rate action as a second line of defence.

Japan

Relative to many of its counterparts in the floating exchange rate league, Japan is more prepared to intervene in the foreign exchange market, both in words and deeds. But the dollar/yen exchange rate is also one of the most volatile among major currency pairs. A convenient starting point to examine Japan's intervention regime is to briefly review the major intervention episodes in the past few years.

Having strengthened to a record level, the yen started to weaken in the latter half of 1995, leading to growing concerns about the impact of a weak yen on investors' confidence generally, and on the stock market in particular. A string of verbal interventions by the Ministry of Finance and the Bank of Japan preceded actual intervention in 1997 and the early part of 1998, but neither was effective in arresting the decline of the yen. Partly undermining the operations was a perceived divergence of views between Japan and the United States on the need for concerted intervention.[16] As the Asian financial crisis deepened, the Asian economies, particularly those whose currencies were formally or informally linked to the US dollar, expressed strong concerns over the impact of a weak yen on their external competitiveness. In June 1998, a joint US-Japan intervention was conducted to support the yen. Although the scale was believed to be much smaller than the earlier unilateral intervention, it gave a significant boost to the yen. Nevertheless, a reversal in the exchange rate trend occurred only in August/September, as a result of the unwinding of the yen carry trades by highly leveraged funds after the Russian crisis and the LTCM incident.[17]

Concerns about the impact of yen strength on the weak economy emerged following the subsequent upswing of the currency. Occasionally intervention has been conducted in an attempt to restrain the appreciation trend.

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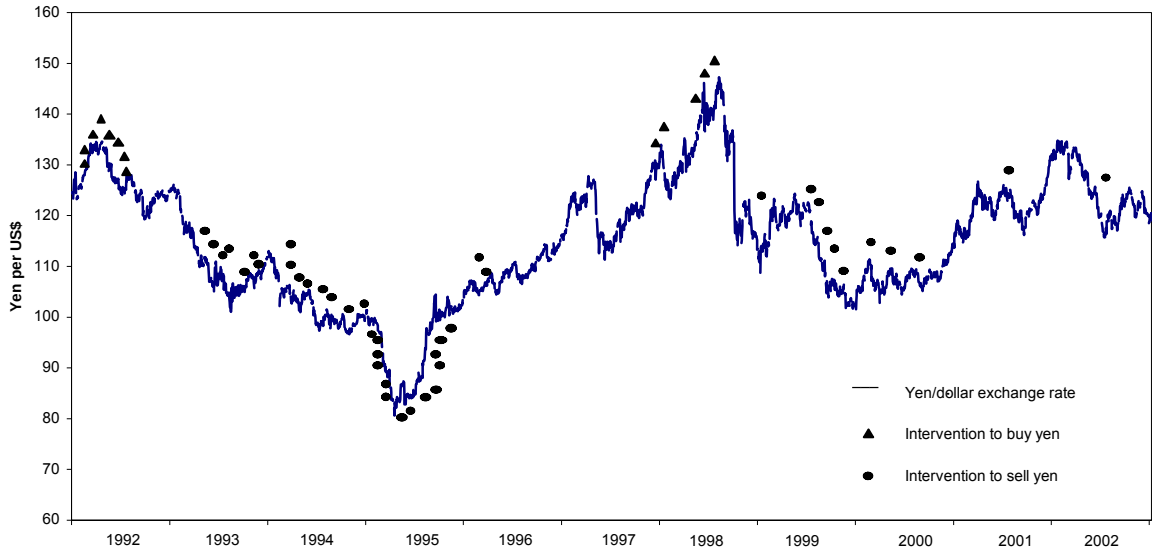
[16] Following the G7 meeting held in April 1998, a statement was issued, which stated, among other things, that "We discussed developments in our exchange and financial markets. We reaffirmed our view that exchange rates should reflect economic fundamentals and that excess volatility and significant deviations from fundamentals are undesirable. We emphasised that it is important to avoid excessive depreciation where this could exacerbate large external imbalances. In light of this, we support appropriate steps by Japan aimed at stimulating domestic demand-led growth and reducing external imbalances, thus also correcting the excessive depreciation of the yen. We will continue to monitor developments in exchange markets and to co-operate as appropriate." Japan's Vice Finance Minister Eisuke Sakakibara told the press that the statement indicated the possibility of coordinated intervention. On the other hand, US Treasury Secretary Robert Rubin reiterated his support for a strong US dollar policy, and said the G7 did not discuss intervention.

[17] Yen carry trades involve the borrowing of low-interest yen and the placement of the proceeds in US dollar or dollar-related assets to earn the yield differentials. Some highly leveraged funds had reportedly taken up a sizeable position in such trades in 1996 and 1997.

Chart 1
Yen Exchange Rate and Foreign Exchange Intervention



A notable feature of Japan's intervention regime is the frequent use of verbal intervention. Remarks like "the Bank is prepared to take appropriate and timely action in the foreign exchange market" are often used. Occasionally senior officials indicate possible actions at certain exchange rate levels.[18] By contrast, the actual operations have been conducted in a rather discreet manner (with the exception of a period from 2000 to 2002). This is rather intriguing, as the signalling effect of the actual operations should be greater than that of verbal intervention. A possible explanation, combining the signalling theory and Winkler's arguments, is that the signalling effect depends critically on the interpretation of the signals. Anecdotal evidence suggests that the Bank of Japan's operations were sometimes perceived as last resort buying or selling in an otherwise one-sided market. Some market participants considered this as a good opportunity to place deals. Under those circumstances, the authorities might wish the market to perceive the foreign exchange transactions as genuine commercial trades, rather than distress buying or selling by the Bank. This may also explain why the Japanese authorities did not appear to be very concerned about the issue of information advantage to commercial banks involved in the intervention operations. To the extent that the "insider banks" jumped onto the bandwagon of the central bank, this reinforced the signal of genuine commercial interests, thus amplifying the impact of the intervention.

The active use of verbal intervention, the frequent presence in the foreign exchange market, and the ambiguity of the actual operations created a difficult set of problems, however. When verbal intervention becomes almost a daily routine, it carries little information content, and sometimes may even be counterproductive. This is evidenced in the attempts to talk up the yen by creating expectations of a concerted Japan-US intervention in early 1998. An inadvertent outcome was that the market discounted the effectiveness of unilateral intervention. More damaging was the inconsistency in the comments made by the Japanese and US authorities, which triggered a wave of yen selling that counteracted the massive intervention by the Bank of Japan. Due to the frequent presence of the Bank in the foreign exchange market, there seemed to be more market guesses and rumours on the yen compared with other major currencies. Even in periods when no intervention was launched, there were occasionally rumours that the Bank was setting up a bull or a bear trap.[19] Furthermore, in the absence

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[18] For example, Finance Minister Kiichi Miyazawa was quoted in the Reuters Report on 7 January 2000 as saying that a strengthening of the yen beyond 100 yen per dollar would be undesirable.

[19] A bull trap refers to a situation in which the price of a commodity suddenly reverses when the market has been very bullish. When this occurs, market players who have entered into a long position would find themselves incurring a loss. The reversal of the trend may be triggered by various reasons, including possibly central bank intervention.

of an established framework to deal with the disclosure of the foreign exchange operations, there was a market perception that the decision to disclose was sometimes driven by political considerations. For instance, there might be a greater inclination to make known intervention to restrain the strength of the yen to show the government's efforts in stimulating economic growth.

In recent years, the Japanese authorities appear to have been shifting back and forth in their disclosure policy. In 2000, the authorities made it a practice to confirm the operations soon after their launch. In addition, the Ministry of Finance started to publish on its website the details of its intervention operations, including the dates, amounts and currency pairs, on a quarterly basis. This significant stride towards greater transparency was concomitant with a scaling down of intervention activities. This lends some support to our earlier observation that there may be an inverse relationship between the frequency of intervention and the transparency of such operations. The authorities suspended immediate confirmation of intervention operations in early 2003.[20] Indeed, the deals were so discreet that, notwithstanding the substantial amount involved, the secret had been well kept until the end-month release of figures showing inflows and outflows of government funds through the accounts at the Bank of Japan. The apparent change in the disclosure techniques caught the market by surprise. The resultant increase in uncertainty might have served the purpose of restraining one-sided bets on the yen's strength. But inevitably, it has also landed Japan back to the old regime of market rumours.

Hong Kong SAR

If the case of Japan highlights the problems of ambiguity, that of Hong Kong shows that transparency and predictability may also create difficulties. Under the currency board system, foreign exchange transactions conducted by the Hong Kong Monetary Authority (HKMA) under the currency board account are left unsterilised. The resultant changes in the monetary base cause adjustments in interest rates to support the exchange rate. To enhance the transparency of the currency board operations, since 1998 the HKMA discloses, almost on a real-time basis, the forecast change in the aggregate clearing balance of the banking system (an important part of the monetary base through which the interest rate adjustment mechanism works) due to those foreign exchange transactions.

Amid the Asian financial turmoil in 1997 and 1998, some highly leveraged funds exploited the predictable relationship between fund flows and the movement in interest rates to launch speculative attacks across different financial markets. Those players prefunded themselves mostly through currency swaps, and at the same time went short in the stock and futures markets. They then waited for an opportunity to sell Hong Kong dollars when market sentiment was weakened by unfavourable external developments. In support of the exchange rate, the HKMA passively sold US dollars for Hong Kong dollars. The monetary base (to be more precise, the aggregate clearing balance of the banking system) contracted on the settlement of the deals.[21] The shrinkage of the aggregate clearing balance drove interest rates up, which in turn exerted downward pressure on stock prices, enabling the speculators to reap sizeable profits. To prevent further market dislocations with a deleterious impact on public confidence on the linked exchange rate system, the authorities undertook an unprecedented operation to purchase shares in the stock market in August 1998. This unpredictable move frustrated the cross-market plays of speculators and helped fend off the pressure on the Hong Kong dollar. Technical reforms to the currency board arrangements were also introduced in September to reduce the sensitivity of the interest rate response to movements in the aggregate clearing balance.[22]

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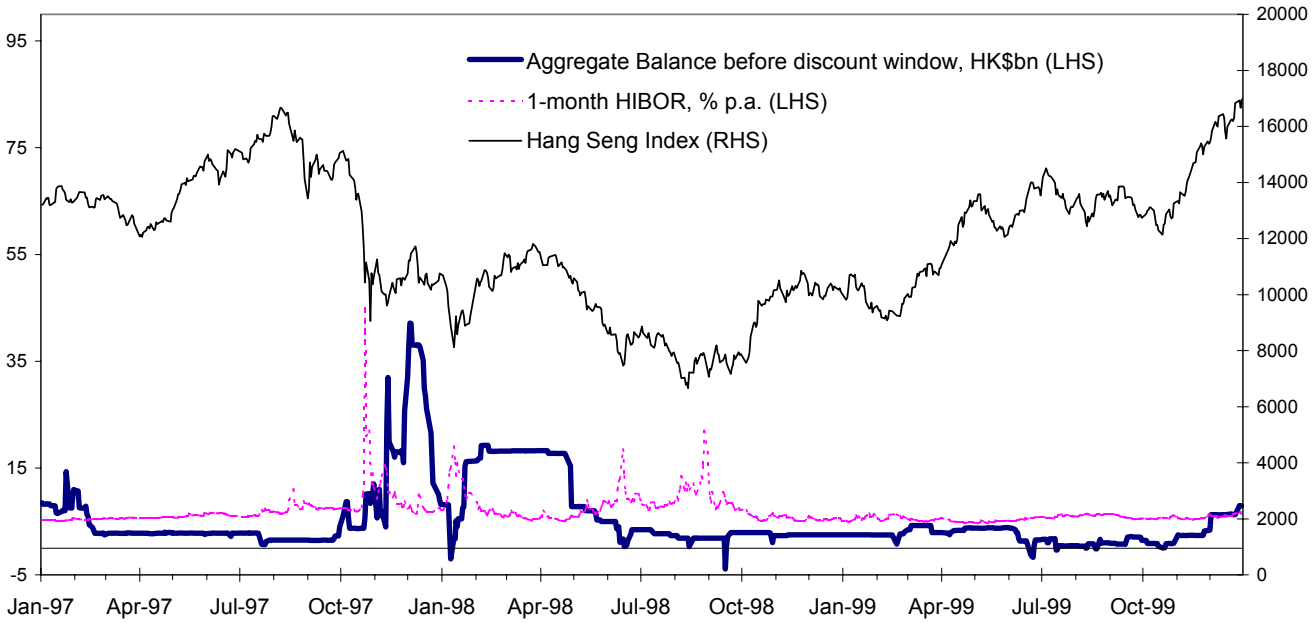
[20] The official comment accompanying the quarterly release states that the Ministry of Finance will issue confirmations only when conditions are right to do so.

[21] In the absence of a statutory reserve requirement, the aggregate clearing balance had always been small, and was easily wiped out by such foreign exchange transactions.

[22] The technical reforms to the currency board arrangements have two core elements. First, a discount window was introduced to replace the then Liquidity Adjustment Facility. Banks are allowed unrestricted access to the discount window using Exchange Fund Bills and Notes (which are issued by the HKMA and fully backed by US dollars) to obtain overnight liquidity. This helps to forestall an overshooting of the interest rate response to a shrinkage in the aggregate clearing balance. The second aspect of the reform deals with the undertaking to commercial banks to convert their Hong Kong dollar clearing balances into US dollars at a prescribed exchange rate, which is discussed in the next paragraph.

Chart 2

Aggregate Clearing Balance, Interbank Rate and Share Prices



Coupled with the improvement in the external environment, the financial markets stabilised in the latter part of 1998.

Another aspect relevant to the transparency versus ambiguity debate relates to the precise exchange rate at which the HKMA establishes itself in the market. While the linked rate has been fixed at 7.80 since its inception, this applies to the issue and redemption of banknotes.[23] The HKMA has retained a limited scope of discretion in deciding the precise level of exchange rate at which to buy or sell Hong Kong dollars in the foreign exchange market. This small degree of ambiguity was believed to be helpful in increasing the uncertainties faced by speculators. For a few years before the onset of the Asian financial crisis, the exchange rate settled around 7.75, and on occasions when the Hong Kong dollar was under pressure, the HKMA had defended it at this level. During the Asian crisis, selling pressures intensified. A retreat to another defence level would have risked undermining confidence in the link. The discretion and flexibility were in fact more limited than envisaged. On the other hand, against a turbulent external environment, the public at large needed more assurance on the link. Against this background, the HKMA made an explicit commitment in September to convert the Hong Kong dollar balances of commercial banks into US dollars at a prescribed exchange rate.[24] At the time of writing this paper, there is an ongoing discussion as to whether the convertibility undertaking should be extended to the strong side, ie the sale of Hong Kong dollars for US dollars by the HKMA. Among other things, the judgment has to be based on a careful balancing of the increased credibility due to the additional explicit commitment and the risk that greater certainty may aid speculators in calculating the cost of attacking the Hong Kong dollar.

The three case studies presented above illustrate the many facets of the transparency versus ambiguity issues. There is no easy solution on how much transparency is desirable. In the final

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[23] To be more precise, this applies to the Certificates of Indebtedness. Banknotes in Hong Kong are issued by three commercial banks, which are required by laws to hold the Certificates as cover for the banknote issue.

[24] Taking into account the then prevailing rate, the prescribed rate was initially set at 7.75. It gradually moved towards 7.80 by 1 pip per day during a 500-day period starting in April 1999, to converge with the convertibility rate for banknotes.

analysis, each central bank has to decide for itself what is appropriate, having regard to its exchange rate arrangements, as well as the structure of its foreign exchange and financial markets. But in coming up with this decision, there are some considerations relevant to most economies. At the risk of overgeneralisation, the next section will discuss the benefits and risks of transparency.

5. Benefits and risks of increased transparency

Benefits

As mentioned in section 2, the IMF Code of Good Practices on Transparency in Monetary and Financial Policies identifies two key benefits of a transparent policy framework, namely the enhancement of policy effectiveness through promoting public understanding of the goals and instruments of policy, and the strengthening of governance by promoting accountability. To a large extent, this applies also to foreign exchange operations conducted by central banks. By making its operations known, a central bank **signals its views to the market**. If the signal is perceived as credible, this will influence the expectations of market participants on exchange rate developments. Indeed, given the huge size of the foreign exchange markets, most of the central banks covered in the survey hold the view that sterilised intervention works primarily through the signalling channel. This leads to an interesting question of whether economies with smaller and less liquid currency markets can afford to be less visible in their foreign exchange intervention, to the extent that they can directly affect the exchange rate through changing the supply and demand conditions. There are few published studies on smaller markets to shed light on this question. But take the example of Singapore, where intervention operations are mostly carried out in a discreet manner. There are reasons to believe that apart from relying on the portfolio balance channel, the Monetary Authority of Singapore would, as and when necessary, leave the intervention unsterilised to reinforce its impact on the exchange rate (that is, making use of the monetary channel). In time to come, as emerging markets liberalise their controls, and as their financial markets expand in size, their central banks would inevitably find it more difficult to fine-tune the supply-demand balance, and due consideration has to be given to the use of the signalling channel in influencing market behaviour.

Greater transparency of intervention objectives and operations also **reduces speculation and rumours** about central banks' actions, which would be helpful when central banks try to reduce market volatility.[25] Furthermore, the commitment to give a broad explanation of their operations exerts discipline on central banks to develop a more structured approach in processing information relating to market developments.

In a number of economies, the responsibility of determining foreign exchange intervention is shared between the central banks and the treasuries. As the US example illustrates, the disclosure of the intervention operations, which provides, among other things, details on the relative contribution of resources for intervention from the two authorities, has helped **promote decision-making by consensus**. On the other hand, the lack of an established framework to announce foreign exchange operations has, in some cases, given rise to a market perception that disclosure is determined on the basis of political needs.

Real-time announcement of foreign exchange intervention operations also ensures **a more level playing field** for commercial banks. Some microstructure studies of the foreign exchange market (eg Peiers (1997)) find that certain commercial banks stand as market leaders during periods of central bank intervention. In a study on intervention in the G3 countries (the United States, Germany and Japan), Dominguez (1999) observes that some traders know about the intervention at least one hour prior to the release of the information in newswire reports. But she finds no evidence that banks actively used by central banks in intervention operations drive up volatility around intervention events. Another study, by Naranjo and Nimalendran (2000), finds that dealers increase their exchange rate spreads around intervention events to protect themselves from informational asymmetry. In short, the

[25] As noted above, at certain times the purpose of intervention might be to increase volatility.

problem of information advantage involves complex issues. While central banks may be able to guard against misuse of such advantage by vigilantly monitoring the foreign exchange market, increasing the visibility of the intervention operations and making timely disclosures are more straightforward solutions.

Two reasons have been suggested as to why central banks may deliberately allow some market participants to have privy information. The first reason is that, as a quid pro quo, market participants would have a greater incentive to provide central banks with information about market developments. Nevertheless, other than foreign exchange intervention, central banks have other dealings with commercial banks, such as those relating to the management of official reserves. They can select the service providers based on the total package they offer, which may include their willingness to provide market intelligence. Another reason that has been suggested is that market participants with the information advantage may propagate the effect of intervention to the extent that they side with the central bank. To evaluate this argument, the trading strategies of the privileged players will need to be carefully studied. If the participants engage mainly in short-term plays, this probably would not help much in sustaining the impact of the intervention. Moreover, the benefits, if any, from the propagation effect have to be carefully weighed against the perception of giving preferential treatment to certain participants.

Risks

Turning to the risks of increased transparency, a major worry is **possible erosion of credibility** if the foreign exchange intervention fails to achieve its objective. Compared with its activities in the money market (in which a central bank is the sole supplier of base money or the authority that determines certain benchmark interest rates), a central bank faces much greater uncertainty in operating in the foreign exchange market. There may be occasions when central banks want to test the market in a low-key manner. In the event that the operations are counteracted by market forces, the reputation of the central bank would not be harmed. While there are some justifications in this argument, a few other considerations should also be taken into account. First, although controls can be tightened to ensure the confidentiality of the operations, there is always a possibility that they might be leaked to the market. Market participants would, for instance, closely watch those banks that are believed to be actively involved in intervention operations for signs of central bank activities. A central bank perceived as concealing a failed intervention is likely to lose more credibility than one that openly explains the limitations of foreign exchange intervention. Second, there is a concern that the disclosure of operations carried out to defend the exchange rate of the domestic currency on the weak side may lead to worries about a dwindling of foreign exchange reserves, and market psychology may prompt more selling pressures. It is, however, noted that economies subscribing to the IMF's Special Data Dissemination Standard need to disclose detailed information on their international reserves and foreign currency liquidity under a new reporting requirement that covers both on- and off-balance sheet data. Thus, the additional risk of disclosing the operations should not be overstated. In the final analysis, if central banks are prepared to back the intervention by a change in policy if the operation is unsuccessful, the market is likely to interpret the intervention as a warning signal. Market participants would judge the credibility of the central bank not so much by the effectiveness of the operations, but more by its willingness to honour its commitment to change policy.

There is a concern that greater transparency may **reduce the ability of central banks to create surprises**. While clarity and consistency are more important than surprises for fixed exchange rate regimes, unanticipated intervention is more effective in conveying new information and as a deterrent for destabilising speculation for floating exchange rate regimes. Making the intervention tactics transparent risks creating targets for speculators to challenge. It may also exert pressure for central banks to react to market expectations, either to validate them or to counteract them. Based on these considerations, there appears to be a strong case for central banks to be somewhat ambiguous and unpredictable in terms of their intervention tactics. Having said this, the risk is much lower in respect of ex post disclosure, particularly when the data are released with a lag or at an appropriately aggregated level. One may argue that, if the central bank is rather consistent in its behaviour, ex post disclosure would enable market participants to guess how it would react in the future, and the surprise element would be much reduced. But this raises a more fundamental issue about the intervention tactics per se. It is doubtful whether predictable and consistent tactics work well for a floating exchange rate system. The mechanical intervention regime previously practised in Canada, which may perhaps be an extreme example, illustrates some of the problems of this approach.

A further argument in favour of ambiguity is that central banks may sometimes wish the market to perceive the trading activities as initiating from commercial interests. This may be related to reasons suggested by the noise trading theory, or to the fact that central banks may want to **avoid the impression of distress buying or selling**. While those may be valid reasons to disguise the identity of the central banks when the operations are launched, the concern should largely fall away if the operations are disclosed after a certain time lag, though any arrangements falling short of real-time disclosure will create the problem of information advantage, as discussed earlier.

Overall assessment

In conducting any market operations, a central bank has to make a difficult decision on the extent to which it should share its views with the market, and the extent to which it should keep the market in suspense. The dilemma comes to a forefront in foreign exchange intervention operations, as there are many more uncertainties on the effectiveness of central banks' actions. While variations across economies may warrant different disclosure practices, the balance between the benefits and the risks of transparency discussed above tends to favour ex post disclosure of the actual intervention operations, and greater clarity in terms of the objectives of foreign exchange intervention. On the other hand, the intervention tactics should perhaps be constructively kept obscure, particularly in a floating exchange rate regime.

6. Conclusion

The present study is a step removed from the mainstream literature that focuses on the transmission mechanism of foreign exchange intervention or the reaction functions of central banks. It looks into a specific question of whether such intervention should be made more transparent. There is no simple answer, as the survey on disclosure practice suggests that there are considerable differences in the disclosure policy even among economies practising the same exchange rate regime. Recognizing the multiple facets of the transparency versus ambiguity debate, the paper examines the implications of transparency in various dimensions, in terms of the objectives of foreign exchange intervention, the intervention tactics and the actual operations. At the risk of over-generalisation, the assessment suggests that benefits appear to outweigh risks in enhancing the transparency of the objectives and the actual operations. Even if, however, disclosure of all intervention operations on a real-time basis is considered somewhat risky, establishing a practice to disclose the operations after a certain time lag would still be useful in improving the accountability of central banks. In terms of the intervention tactics, there seems to be strong justification for retaining a degree of constructive ambiguity, especially for floating exchange rate regimes.

As a suggestion for further research on this topic, the survey on disclosure practice could be conducted on a larger scale to make the findings more representative, and to ensure more detailed comparison across economies practising similar exchange rate systems. While the present survey covers major currencies traded in the international foreign exchange market, there is an underrepresentation of emerging markets. Indeed, studies on smaller and less liquid markets have been scanty in the existing literature, probably due to a lack of data. It will, however, be of considerable interest to see how the transmission mechanism of foreign exchange intervention works in those markets, and the implications for their disclosure practice.

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Table 1

Exchange rate regime and objectives of foreign exchange intervention

	Exchange rate regime	Objectives of foreign exchange intervention
Australia	Independently floating	Intervention may be carried out to prevent a sharp overshooting of exchange rate from its fundamental value.
Canada	Independently floating	Mainly to prevent a loss of confidence in the Canadian dollar which may potentially lead to extrapolative expectations and a prolonged and sharp drop in the value of the currency, threatening the implementation of monetary policy.
European Central Bank	Independently floating vis-à-vis non-euro currencies	Intervention may be carried out if severe under- or overvaluation of the currency causes concern about repercussions of the exchange rate, in particular its impact on price stability.
Hong Kong SAR	Currency board system	To maintain the exchange value of the Hong Kong dollar close to the linked rate of USD 1: HKD 7.80.
Japan	Independently floating	To smooth excessive exchange rate fluctuations that are judged to be clearly out of line with economic fundamentals.
Korea	Independently floating	Following the shift from managed floating to free floating in December 1997, intervention is conducted mainly to smooth excessive exchange rate fluctuations that are judged to be out of line with economic fundamentals (assessed by factors such as trade balance, price movements, or the movements of the currencies of major trading partners, notably the yen).
Singapore	Managed floating with no preannounced path for the exchange rate	Foreign exchange intervention is conducted with the aim of maintaining the trade-weighted exchange rate of the Singapore dollar broadly within an undisclosed target band.
Switzerland	Independently floating	The Swiss National Bank has rarely carried out foreign exchange intervention since 1991. Monetary policy tools will be used instead if currency movements cause concerns. In the past, the Bank had intervened when there were sharp fluctuations in the exchange rate that were judged to be inconsistent with market fundamentals.
United Kingdom	Independently floating	Intervention may be carried out to check undue fluctuations in the exchange value of the pound sterling, or in support of the monetary policy objective (which is characterised by inflation targeting).
United States	Independently floating	Intervention by the U.S. has become increasingly rare. When it does occur it is aimed at "countering disorderly markets," which are generally interpreted as situations where the exchange rate is thought to be clearly out of line with the economic fundamentals and typically where markets do not reflect the perception of two-way risks in the exchange rate.

Table 2

Institutional framework for the conduct of foreign exchange intervention

	Institutional framework	Sterilised versus non-sterilised intervention
Australia	The Reserve Bank of Australia (RBA) decides and carries out the operations in the foreign exchange markets independently.	Intervention is sterilised.
Canada	The Bank of Canada (BoC) intervenes as an agent on behalf of the government. The broad framework of the intervention policy has to be agreed with the Department of Finance. The day-to-day operation is, however, the responsibility of the Bank.	Intervention is sterilised.
European Central Bank	Decisions on foreign exchange intervention are made by the European Central Bank (ECB). Foreign exchange operations of individual national central banks in relation to reserve management and transaction needs are subject, above a certain limit, to the approval of the ECB.	Intervention is sterilised.
Hong Kong SAR	The Hong Kong Monetary Authority (HKMA) is responsible for the conduct of exchange rate policy, and is independent from the Treasury in discharging this function.	Operations under the Currency Board Account are not sterilised.
Japan	The Ministry of Finance (MoF) makes decisions and provide resources for foreign exchange intervention. The Bank of Japan acts as an adviser and agent in implementing the foreign exchange operations.	Intervention is mostly sterilised.
Korea	By law, the Ministry of Finance (MoF) is directly responsible for exchange rate policy. However, given the close links between foreign exchange operations and monetary policy, the MoF and the Bank of Korea (BoK) have been cooperating closely in deciding when and how to intervene in the foreign exchange market, and the BoK is responsible for carrying out the intervention.	Intervention is sterilised.
Singapore	The Monetary Authority of Singapore (MAS) formulates and implements exchange rate policy independently.	Determined on a case by case basis.
Switzerland	The Swiss National Bank formulates and carries out the exchange rate policy independently.	In the last intervention episode, the operations were initially sterilised. As the currency continued to weaken, monetary policy was also tightened to support the exchange rate.
United Kingdom	The Treasury decides on intervention using the Exchange Equalization Account, and the Bank of England (BoE) acts as an agent. The BoE has a separate pool of foreign exchange reserves which it may use at its own discretion to intervene in support of its monetary policy objective.	Intervention by the BoE on behalf of the Treasury is sterilised. There are no precedent cases to assess whether intervention in support of the monetary policy objective would be sterilised or not.
United States	The Secretary of the Treasury is, by statute, responsible for foreign exchange policy and is the sole spokesman for the U.S. dollar. The Treasury Department funds its interventions through the Exchange Stabilization Fund (ESF). Separately the Federal Reserve System owns its own foreign currency reserves in the System Open Market Account (SOMA). By convention interventions are funded by the two monetary authorities on an equal basis. The Federal Reserve Bank of New York executes interventions, acting as agent in the market for both monetary authorities.	Intervention is sterilised.

Table 3

Frequency and visibility of foreign exchange intervention

	Frequency of intervention	Visibility of intervention
Australia	Varies with market conditions. In relative terms, the frequency of intervention probably ranks somewhere in the middle among the central banks surveyed.	Determined on a case by case basis. If there are signs that market conditions are turning round in the direction of the central bank's operations, intervention may be carried out in a more visible way to achieve the announcement effect. On the other hand, if the effectiveness of intervention is less assured, eg testing the market when the underlying sentiment remains bearish, the operations may be conducted in a more discreet manner through, eg using an agent bank.
Canada	The BoC intervened frequently under the previous regime, which comprised an automatic, symmetric component as well as a discretionary, asymmetric component. As from September 1998, the Bank would only engage in asymmetric intervention. There has been no intervention under this new approach, with the exception of the concerted intervention to support the euro in September 2000.	The Bank has stated that intervention under the new approach will be conducted in a very open and visible manner through the broker system.
European Central Bank	Intervention is infrequent. There have only been four intervention episodes since the ECB was established. On 22 September and 3 November 2000, the interventions were confirmed with immediate press releases. On the other two occasions, 6 and 9 November 2000, no press releases were issued but the interventions were confirmed by the ECB to wire services and banks who approached it with questions.	Though intervention is conducted directly with banks in the euro area, it is highly visible, as the operations are confirmed through press release.
Hong Kong SAR	The HKMA provides an undertaking to banks to convert their Hong Kong dollar balances into US dollars at a prescribed convertibility rate. Its operations in this regard are largely passive. In respect of the sale of Hong Kong dollars, it would respond to bank offers subject to market conditions.	Banks can approach the HKMA direct for the foreign exchange transactions. After the deal is done, its effects on interbank liquidity will be announced almost on a real-time basis.
Japan	In relative terms, intervention is fairly frequent among the central banks surveyed.	Except for a period from 2000 to 2002, intervention is conducted mostly in a manner not immediately visible to the market.
Korea	Frequency of intervention has reduced since the changeover to the free-floating exchange rate regime, but is probably still on the high side among the central banks surveyed.	Intervention is carried out on an anonymous basis through agent banks. It has been observed that the activities of agent banks have sometimes been monitored by market players to obtain some hints on whether the Bank of Korea is in the market.
Singapore	Intervention is conducted, when necessary, to maintain the trade-weighted exchange rate within the target band.	Intervention is carried out on an anonymous basis through agent banks. But on occasions when the MAS wishes to achieve a signalling effect, it may make the operations more visible.
Switzerland	Intervention has rarely been conducted since 1991.	If intervention is to be carried out, it is expected to be conducted in a relatively open and visible manner.
United Kingdom	No intervention since the pound sterling exited from the ERM in 1992, with the exception of the concerted intervention to support the euro in September 2000.	In the author's opinion, consistent with the transparent monetary framework, intervention in support of the monetary policy objective, if carried out, is generally expected to be carried out in an open and visible manner.

United States	Intervention has been relatively infrequent in recent years.	Intervention tactics have varied over the past several decades depending on market conditions and objectives of the operations. In the past decade interventions by the U.S. have had a high degree of visibility and typically have been confirmed by a public statement from the Treasury.

Table 4

Current disclosure practice

	Immediate disclosure	Other disclosure channels, and time lags involved
Australia	The RBA has discretion in deciding whether or not to announce the intervention.	The RBA's foreign exchange transactions are published in its *Monthly Bulletin*. As well as intervention, the figures also capture the Bank's transactions with its customers, including the Commonwealth Government. (Note: As part of its intervention technique, the RBA purchased some call options in 1999. This was disclosed in its 1999 *Annual Report*.)
Canada	The BoC has undertaken to announce its intervention in the foreign exchange market when the operations are launched.	
European Central Bank	The ECB informs the market of its intervention through press releases and answering questions from wire agencies.	The ECB *Monthly Bulletin* reports the intervention episodes, and a weekly balance sheet reports the foreign exchange reserves of the Eurosystem. But the intervention amounts are not disclosed.
Hong Kong SAR	Foreign exchange transactions under the Currency Board Account are known to the market almost on a real-time basis through the disclosure of the changes and forecast changes of interbank liquidity due to such operations.	Foreign exchange operations under the Currency Board Account are also disclosed in the *Monthly Report on the Operations of the Currency Board Arrangements*, published with a time lag of not more than six weeks.
Japan	Disclosure is considered on a case by case basis. (For a period from 2000 to 2002, the MoF adopted a practice of disclosing the operations immediately after their launch.)	Details of intervention, including the amounts and the currency pairs, are published on the MoF's website on a quarterly basis, with a time lag of about five weeks. Monthly aggregates are published on the same website at the end of the month (since June 2003).
Korea	It is an established practice not to comment on foreign exchange intervention.	No regular channels. Figures on foreign exchange reserves are published twice a month, but their movements are affected by a number of other factors in addition to foreign exchange intervention.
Singapore	It is an established practice not to comment on foreign exchange intervention.	No regular channels. Figures on foreign exchange reserves are published monthly, but their movements are affected by a number of other factors in addition to foreign exchange intervention.
Switzerland	No recent case to assess.	In the previous episodes, details of intervention were disclosed in the quarterly bulletins.
United Kingdom	No precedent so far. (The intervention to support the euro in September 2000 was initiated and announced by the ECB.)	The monthly press release on official holdings of foreign currency and gold, which is issued on or before the third working day of the following month, provides details of the amount and date of intervention, and an explanation of why it was undertaken. If there is no intervention, the monthly press release states so. Any intervention in support of the MPC's monetary policy objective would very likely be discussed in the minutes of the MPC meetings, which are disclosed.
United States	The are no firm rules about immediate disclosure. Before the 1990s typically there were no contemporaneous disclosures about interventions. In the last decade the Treasury has typically issued statements confirming an intervention on the same day as the intervention.	The Federal Reserve Bank of New York publishes a quarterly report, available on its public website, on the foreign exchange operations of the U.S. monetary authorities. The report details the amounts, dates, and currencies of any operations in that period. If there are no operations, this is stated as well. The report is typically published one month after each quarter end.

Table 5

Interaction with market players

	Tapping information from market players	Possible concerns regarding information advantage to certain market participants
Australia	Largely through informal liaison.	Not considered as a serious concern. Commercial banks are expected to observe confidentiality. The RBA monitors possible exploitation of information advantage through maintaining close contacts with market players.
Canada	Largely through informal liaison.	The highly visible nature of intervention, and the commitment to immediate disclosure of intervention, largely remove the concern of information advantage.
European Central Bank	Largely through informal liaison.	Immediate disclosure helps minimise concerns about information advantage.
Hong Kong SAR	Largely through informal liaison. Active players are required to submit a weekly report on their foreign exchange position.	The almost real-time disclosure of foreign exchange operations helps minimise the problem of information advantage.
Japan	Largely through informal liaison.	Appropriate measures to mitigate concerns will be implemented on an as necessary basis..
Korea	Banks are required to report their foreign exchange position on a daily basis. On an informal basis, they provide information on non-deliverable forward activities and major transactions with customers.	This is considered to be an issue of concern. The Bank of Korea closely monitors banks' foreign exchange position to ensure that agent banks are not exploiting their information advantage and, where necessary, moral suasion will be used.
Singapore	Banks are required to provide daily reports on net sell/buy of the local currency, and they will inform the MAS the broad categories of players in the market.	It is believed that close monitoring of the market and feedback from other market players will prevent agent banks from abusing the information advantage.
Switzerland	Largely through informal liaison with market participants.	No recent case to assess.
United Kingdom	Through informal liaison with market participants. The information obtained is provided to the Monetary Policy Committee for the purpose of assessing the impact of likely currency movements on the inflation outlook.	No recent case to assess.
United States	Largely through informal conversations with market participants. There is a formal weekly report that some large market participants file; this report is not useful for intervention planning and is not used for the purpose.	It is believed that the transparent and visible approach helps minimise the problem of information advantage.

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