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12

Capital Flows and Exchange Rate Volatility
Singapore's Experience

Basant K. Kapur

12.1 Introduction

Singapore's experience with international capital flows over the past two decades or so has been a rather—although not completely—benign one, owing to strong fundamentals and generally well-conceived macroeconomic policies. At the same time, useful lessons can be learned regarding issues such as exchange rate policy, the policy of noninternationalization of the Singapore dollar, and unavoidable fallout effects of capital flow volatility even in generally sound environments and how these may best be dealt with.

A feature of Singapore's economy that sets it apart from various other countries discussed in this volume is its well-developed banking system and equities market, and the fact that it is on a (modified) currency board (CB) system. Its bond market is, however, less developed, although in recent years measures have been taken to foster its growth, as discussed below. It may be useful, therefore, to begin by comparing Singapore's experience with that of another state with a well-developed financial system, namely Hong Kong: the latter, in addition, operates what may be termed a "pure" CB system. Notwithstanding their economic similarities, Singapore and Hong Kong have had rather different experiences with capital flows, and an examination of why this has been so turns out to be rather instructive. In section 12.2, therefore, we briefly examine Hong Kong's experience during the Asian crisis of 1997–98 and identify its areas of vulnerability. In section 12.3, we discuss Singapore's policy background and how it responded

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to a significant speculative attack in 1985, and draw lessons from this. Further lessons are drawn in section 12.4, in which we consider Singapore's experience during the Asian crisis. Section 12.5 discusses Singapore's debt markets, an interesting feature being that both Singapore and Hong Kong have in recent years encouraged foreign enterprises to *float* bond issues in Singapore dollars (S$) and Hong Kong dollars (HK$), respectively. Section 12.6 concludes. An appendix provides a chronology of the evolution of capital controls (specifically, the evolution of the noninternationalization policy) in Singapore.

12.2 Hong Kong: The 1997–98 Experience

As indicated above, our discussion here will be fairly brief, given that our main focus is on Singapore, and is designed primarily to provide a comparative perspective on Singapore's experience.[1] A minimalist definition of a pure CB system is that it is one in which domestic currency is issued or redeemed (a) only in exchange for foreign currency and (b) at a fixed exchange rate, usually vis-à-vis a single foreign currency, termed the reserve currency. A modified CB system, discussed further below, is then one in which criterion (a) holds, but not (b). A pure system aptly describes the Hong Kong situation, with the exchange rate fixed at HK$7.8 to the U.S. dollar (US$) since October 1983. Moreover, the monetary base in Hong Kong was rather small, given that it does not impose reserve requirements on banks and has an efficient, real-time interbank payment system so that "the aggregate balance that banks maintain in their clearing accounts held with the currency board" (Yam 1998a) is low. This rendered Hong Kong vulnerable to speculative capital outflows, of which there were a number in mid-1997 through mid-1998: these did not succeed, in part because the resulting high interest rates adversely affected the speculators too, who had borrowed Hong Kong dollars in the interbank market to launch their attacks. The high interest rates (the overnight interest rate actually rose to 280 percent on October 23, 1997) and their adverse effects on the stock market and economic activity in general were, however, a source of concern.[2]

The really major attack, however, occurred in August 1998, and Yam (1998a) describes the so-called double play thus:

1. Here we draw mainly on Rzepkowski (2000), Yam (1998a, 1998b), and Corsetti, Pesenti, and Roubini (2001).

2. The attacks reflected contagion from crises elsewhere in the region (Rzepkowski 2000; Hashimoto and Ito 2004) and uncertainties associated with Hong Kong's accession to China. While Yam (1998a) refers to the interest rate increases as an "autopilot mechanism"—an inevitable concomitant of the CB system—Rzepkowski contends (2000, p. 15) that they were partly induced, on occasion, by discretionary increases in the Hong Kong Monetary Authority's (HKMA's) discount rate.

> In August [after an announcement that first-quarter gross domestic product growth had been negative] the speculators adopted a more sophisticated ploy. They introduced a form of double play aimed at playing off the currency board system against the stock and futures markets. First, to avoid being squeezed by high interest rates, they prefunded themselves in Hong Kong dollars in the debt market, swapping US dollars for Hong Kong dollars with multilateral institutions that have raised Hong Kong dollars through the issue of debt. At the same time, they accumulated large short positions in the stock index futures market. They then sought to engineer extreme conditions in the money market by dumping huge amounts of Hong Kong dollars. This sell-off was intended to cause [either a devaluation or] a sharp interest rate hike, which in turn would have sent the stock market plummeting. The collapse of the stock market would have enabled them to reap a handsome profit from the futures contracts they had taken out.

Presumably, a double play facilitates a stronger currency attack, since the higher interest cost resulting from an attack of a given size is at least partly offset by the possible gains from short selling in the stock index futures market. Rzepkowski (2000) points out that speculators also engaged in short selling of stocks, and that "the hedge funds involved in the speculation were identified as being the Quantum Fund of George Soros, the Tiger Fund, the Moore Global Investment, and the Long Term Capital Management" (p. 17). Their prefunding activities had driven the Hong Kong interest rate premium over the U.S. dollar to about 5 percentage points (Yam 1998b). It was estimated (Yam 1998a) that "the hedge funds involved had amassed in excess of HK$30 billion in currency borrowings, at an interest cost of around HK$4 million a day. They also held an estimated 80,000 short contracts, which translated into the following calculation: for every fall of 1,000 points in the Hang Seng index they stood to make a profit of HK$4 billion." Owing to the marking-to-market of their margin accounts with the Futures Exchange, they stood to gain daily from incremental falls in the Hang Seng Index (Rzepkowski 2000, pp. 17–18).

In the event, the attack proved unsuccessful. Like Singapore, Hong Kong has very substantial nonmonetary foreign reserves—reserves in excess of what is required to back the monetary base. At the time, it was unexpectedly confronted with a fiscal deficit, and had to convert part of these reserves into Hong Kong dollars to meet its fiscal obligations. "The immediate impact of this sale [of foreign currency], of an amount exceeding the HK$30 billion accumulated by the hedge funds, was the non-trigger of high interest rate" (Rzepkowski 2000, p. 19). In addition, and quite unconventionally,

> between the 14th and 28th August 1998, the HKMA intervened via the Exchange Fund on the stock and futures markets. It acquired a portfolio of equities and HSI [Hang Seng Index] futures for an amount of about

> US$15 billion, that is 7% of the capitalization and around 30% of the current [1998] Hang Seng Index value. . . . About 13% of its nonmonetary reserves . . . were allocated to these interventions, inducing an important injection of liquidity into the money market. (Rzepkowski 2000, p. 19)

By November, the portfolio had risen to US$19 billion in value, and during the interim speculators "were forced to close out their short positions, in many cases with heavy losses" (Yam 1998a). The portfolio was subsequently placed under the management of a separate company at arm's length from the HKMA, with the aim of divesting it gradually.

After August 1998, systemic improvements were introduced, with the intention of minimizing the occurrence of future attacks. The Exchange Fund, which manages Hong Kong's monetary and nonmonetary reserves, had since 1990 issued bills to promote the development of the local bond market, and in September 1998 virtually unrestricted discounting of Exchange Fund bills by commercial banks at the discount window of the HKMA, at nonpenal rates, was introduced. Effectively, this almost doubled the size of the monetary base, and it served to significantly reduce the interest rate response to a capital outflow of a given magnitude (Rzepkowski 2000, pp. 18–20). In addition, the government

> brought in a 30-Point package tightening the regulation of the securities and future markets. Measures in the package include the strict enforcement of the T+2 settlement process, imposing a super margin on brokers with highly concentrated positions, introducing the client identity rule, increasing the penalty for naked short selling, creating a new offence for unreported short sales, and introducing new requirements for stock lenders to keep proper records of their lending activities. In parallel, SEHK [the Stock Exchange of Hong Kong] re-introduced the up-tick rule (no short selling below the current best ask price) for covered short selling and HKFE [the Hong Kong Futures Exchange] tightened the large open position reporting requirements and imposed position limits for HSI 33 Futures and Option Contracts. (Dickens 2002, p. 3).[3]

Subsequently, "relaxation measures applicable to certain market neutral transactions [were] introduced" (Dickens 2002, p. 3).

While the Hong Kong authorities have taken the view that the hedge funds were engaged in predatory market manipulation, Corsetti, Pesenti,

3. Prior to launching their attack in August, the hedge funds had borrowed Hong Kong stocks, to a large extent in the more efficient offshore market, from international fund managers and custodians (Rzepkowski 2000, n. 20). In addition, owing to "lax settlement requirements" (Yam 1998b, quoted in Rzepkowski 2000, n. 22), naked short selling was also practiced, even though it was against the law. Corsetti, Pesenti, and Roubini (2001, p. 43) also quote a study by the Financial Stability Forum (2000): "Aggressive trading practices by HLIs [highly leveraged institutions] reportedly included concentrated selling intended to move market prices, large sales in illiquid offshore trading hours, and spoofing of the electronic brokering services to give the impression that the exchange rate had moved beyond the HKMA's intervention level. There were frequent market rumours, often in offshore Friday trading, that a devaluation of the Hong Kong dollar or Chinese renminbi would occur over the weekend."

and Roubini (2001) adopt a more agnostic position, stating that "the hypothesis of rational investors taking short positions in two markets (based on an assessment of economic fundamentals) and the hypothesis of a double play (suggesting market manipulation) are observationally equivalent" (p. 44). One could hypothesize, alternatively, that the weakening fundamentals, due to both domestic and regional developments, had pushed the economy into a zone in which multiple equilibria (discussed further below) existed. Speculators then endeavored to drive the economy to the unfavorable equilibrium (possibly hoping that their actions would serve as a signal to others), seeking to reap large profits in the process, and were not averse to resorting to questionable means (such as naked short selling) to do so. One would then interpret the HKMA's actions as seeking to maintain the economy at the favorable equilibrium—successfully, as it turned out. In this framework, the equilibria themselves—in particular the equilibrium level of stock prices—depend inter alia on the extent of policy intervention by the authorities.[4]

The foregoing account permits (preliminary) identification of areas of vulnerability to speculative attack, or fault lines, in the Hong Kong environment of 1997–98. The first is the commitment to a fixed exchange rate. The Hong Kong authorities probably felt that they had no alternative in the matter, since any devaluation so soon after the accession to China could, it was felt, trigger a massive loss of confidence—a multiple-equilibria scenario analogous to Diamond-Dybvig-style bank panics, but affecting asset (including stock) prices in Hong Kong's case.[5] (Instead, real

4. In their theoretical discussion, Corsetti, Pesenti, and Roubini (2001) recognize that large players can influence market outcomes, but the authors appear reluctant to hypothesize that this occurred in Hong Kong's case. Their formal analyses deal with speculative attacks in a single market, and they then informally extrapolate their results to the Hong Kong case. However, in a double-play situation, if a devaluation does not occur, speculators can either lose or gain (Corsetti and his coauthors simply assume that they will lose), depending on the actions of other speculators and of the authorities, which affect interest rates and present and future stock prices. It is also entirely conceivable that in the Hong Kong case speculators failed to fully anticipate the extent and nature of the authorities' reaction. Rzepkowski (2000, p. 28) adopts a view of the underlying process somewhat similar to ours, arguing that "the logic underlying the several attacks against the HK dollar rests essentially on self-fulfilling expectations and on a pure contagion." Next, Chakravorti and Lall (2000) formally model a speculative double play and conclude that "government intervention in the equity market may either reduce interest rate or reduce the downward price pressure in equity markets but not both" (p. 23), owing to countervailing actions by speculators. They very peculiarly assume, however, that such intervention has no monetary effects, contrary to Rzepkowski's observation earlier, and they also overlook the fact that in Hong Kong, as indicated above, a fairly large sum of nonmonetary reserves was converted into Hong Kong dollars to meet fiscal obligations. A useful policy lesson here is that, if intervention is to be undertaken in response to a double play, it should also be targeted at both equities and money markets.

5. This is a possibility that Devereux (2003) does not address in his comparison of the implications of the differing exchange rate regimes of Hong Kong and Singapore for longer-run trends in inflation and real exchange rates, and for short-run macroeconomic and real exchange rate volatility. It is also not clear whether his short-run simulation analysis imposes expectational rationality with regard to changes in the exchange rate (equal, in his model, to the expected rate of inflation of traded-goods prices) and the price of land.

gross domestic product [GDP] grew by 3 percent in 1999 and 10.2 percent in 2000.) In more normal situations, however, an adjustable peg (a) provides, as is well known, speculators with a one-way bet (especially if the band around the peg is fairly narrow), and (b) does not permit gradual exchange rate adjustments in the light of slowly changing fundamentals. The second vulnerable area is the ease with which speculators could borrow Hong Kong dollars, either in the interbank market or from multilateral institutions. The third is the unrestricted ease of short selling, in stock spot and index futures markets, and the laxity in enforcement of settlement requirements. Last is the initial small size of the monetary base, coupled with reliance on the autopilot mechanism of the CB system.[6] We turn now to a discussion of some of Singapore's experiences with capital flow volatility, and we should also recognize that not infrequently a tension exists between the desire for short-run stability and the desire to foster deeper and more open financial and capital markets for purposes of long-run growth and development of the economy.

12.3 Singapore: Policy Background and Early Experience

Any discussion of Singapore's experience must assign a prominent place to a major, long-standing (but recently relaxed, as discussed below) cornerstone of its monetary policy: the policy of noninternationalization of the Singapore dollar.[7] In Notice 621 of November 1, 1983, the Monetary Authority of Singapore (MAS) stated:

> Banks should observe the Authority's policy of discouraging the internationalization of the Singapore dollar. Specifically, banks should consult with the Authority before considering Singapore dollar credit facilities exceeding S$5 million (per entity) to nonresidents, or to residents where the Singapore dollars are to be used outside Singapore. Banks managing syndicated loans, bond issues, or other financial papers exceeding S$5 million should do likewise. The terms "residents" or "non-

6. In his empirical work, Rzepkowski utilizes the information in currency option prices to infer the expected intensity of a Hong Kong dollar devaluation, and then, in a vector autoregression framework, demonstrates the existence of a speculative double play: "A circular scheme characterized the formation of self-fulfilling expectations. The [expected] intensity of a HK dollar devaluation induced a sharp decrease in the index futures prices, which contributed to make the volatility of the HSI soar, in turn exacerbating the speculative pressures against the HK dollar" (p. 27). However, he then argues that the HKMA's stock market interventions in August 1998 were ineffective, since they "achieved to push up temporarily the index futures price, but induced a significant rise in the market volatility." Instead, it was the technical measures introduced in September 1998 to strengthen the CB system (see p. 578, this volume) that, he claims, dampened the pressures against the currency. Rzepkowski acknowledges that his options analysis abstracts from the possibility of a time-varying risk premium and imposes "strong assumptions on the underlying dynamics" (p. 29), and so the robustness of his findings remains an open issue.

7. We draw here mainly on Chan and Ngiam (1996, 1998), but we critique their formal analysis below; we draw as well on Lee (2001).

residents" include bank and nonbank customers (quoted in Chan and Ngiam 1996, p. 5).[8]

Chan and Ngiam (1996, p. 6) point out that "To ensure that its regulations are not being circumvented through financial derivatives, the MAS has defined Singapore dollar credit facilities to cover a wide range of financial instruments, including loans, foreign exchange swaps, currency swaps, interest rate swaps, facilities incorporating options, and forward rate agreements in Singapore dollars."[9] Subsequently, on July 18, 1992, the MAS issued a circular amending the policy. Consultation with the MAS was not required for credit facilities extended in Singapore dollars, in any amount, to residents or nonresidents to facilitate direct exports from and imports to Singapore, and for payment bonds in favor of Singapore parties, or payment guarantees, in respect of "economic activities" in Singapore, where the latter specifically excluded financial and portfolio investments. Forward sales of Singapore dollars earned from exports to Singapore were also permitted.

At the same time, banks were told that they should not finance in Singapore dollars "activities which have no bearing on Singapore" (Chan and Ngiam 1996, p. 5), including direct or portfolio investments outside Singapore by nonresidents, third-country trade by nonresident-controlled companies, and nonresident subscription to equity in a Singapore company where the proceeds are used for takeovers or financial investments. Moreover, note Chan and Ngiam (1996), banks were "advised against granting Singapore-dollar credit facilities to nonresidents for speculating in the local financial and property markets." For all other activities—which are quite wide ranging, and include third-country trade as well as direct and portfolio investments overseas by residents, and direct investment and housing development in Singapore by nonresidents—the 1983 ruling calling for consultation with the MAS continued to apply.

It perhaps bears noting that there are no restrictions against nonresidents' building up Singapore dollar holdings by converting their own foreign currency resources (or resources borrowed abroad) into Singapore dollars and placing them with the domestic banking units (DBUs). Moreover, by 1994 "the ACUs and the banks outside Singapore [had] amassed some S$51.6 billion worth of Singapore-dollar deposits (or 25 percent of

8. Singapore also has a very active offshore Asian currency market (in non-Singapore currencies), and banks are required to maintain separate accounts for Asian currency units (ACUs; Chan and Ngiam 1996, p. 4). "Nonresidents include Singapore-incorporated companies, which are majority-owned or otherwise controlled by nonresidents" (Lee 2001, p. 34).

9. Chan and Ngiam (1996) state, "Without any restrictions, a firm or individual can borrow Singapore dollars indirectly by first borrowing U.S. dollars and then doing a foreign exchange swap (which involves the buying of the Singapore dollar spot with the simultaneous selling of the Singapore dollar forward). This effectively replicates, or synthesizes, a Singapore dollar money market loan with a 'lock-in' Singapore dollar interest rate" (p. 6).

total liabilities) in the DBUs" (Chan and Ngiam 1996, p. 7). Such holdings could be converted into foreign currencies if sentiment regarding the Singapore dollar turned adverse; however, any *further* pressure through nonresidents' borrowing domestic currency and converting it, as occurred in Hong Kong, was obviated.[10] "Further pressure" here refers not to any increased likelihood of the country's reserves being unable to support capital outflows—which obviously cannot occur under a CB system—but to heightened short-term interest rates and their effects on the economy, as well as the enhanced complexity of monetary management.

Commencing in August 1998, a series of steps was undertaken to gradually liberalize the noninternationalization policy, in conjunction with moves to promote the development of the Singapore dollar bond market. These are discussed in greater detail in section 12.5. Throughout, however, the MAS made it clear that "banks shall not extend S$ credit facilities [exceeding S$5 million] to non-resident financial institutions if there is reason to believe that the S$ proceeds may be used for S$ currency speculation" (MAS Notice 757 of May 28, 2004). In the "frequently asked questions" document accompanying this notice, it was stated that banks were "expected to institute appropriate internal controls and processes to comply with this restriction"; these could include "written confirmation from the non-resident financial institution specifying the purpose of funding" and a "formal evaluation process of the client profile, which provides a clear basis for assessing that the client is unlikely to use the S$ proceeds for currency speculation." Banks were also required to report to MAS monthly their aggregate outstanding Singapore dollar lending to nonresident financial institutions. Clearly, there is an element of judgment involved in assessing that a client is unlikely to engage in speculation, but to date this does not appear to have created difficulties for banks.

The noninternationalization policy thus rather effectively blocked one of the channels of vulnerability that existed in Hong Kong. What about another channel, that of short selling of shares?[11] This, too, was circumscribed in Singapore: Poitras (2002, p. 147) points out that "sales for same day delivery" are permitted, and in its *Report on Transparency of Short Selling* the Technical Committee of the International Organization of Securities Commissions (IOSCO; 2003, p. 10) states that the Stock Exchange

10. Chan and Ngiam (1996, p. 8) also suggest that "as the forward market involving the Singapore dollar is rather thin, it cannot provide an effective vehicle for speculation"; moreover, the MAS monitors forward transactions with a view to ensuring that these are used for hedging and not for speculation. Chan and Ngiam further suggest that borrowing by residents for speculative purposes does "not seem to be a major concern as the Government can bring them to task if they bring down the Singapore dollar" (n. 27); the point being made here probably relates to the greater ease of monitoring, and if necessary regulating, the activities of residents, and perhaps also the greater sophistication and speed of action of foreign hedge funds and the like.

11. As discussed below, stock index futures were only introduced in 1998.

of Singapore (SES) "may suspend individual securities if speculative activity is excessive or abuse is suspected."[12] We thus observe a role being assigned to discretion in decision making, and both this and the same-day covering rule are in all likelihood reflective of the literature's ambiguity regarding the net benefit of short selling, especially in the presence of large players.

Discussion of the other two channels of vulnerability—the fixity of the exchange rate and the narrowness of the monetary base—is best carried out in the context of Singapore's exchange rate experience in the 1980s. As Teh (1988) points out,

> The Singapore dollar exchange rate is managed and set against a trade-weighted basket of currencies of its major trading partners. The trade-weighted Singapore dollar is allowed to float within a target band. The MAS keeps the trade-weighted dollar within the band through foreign exchange interventions [in U.S. dollars]. . . . The level at which the trade-weighted dollar is set is determined by what world inflation and domestic inflation are expected to be. Generally, the aim is to reduce imported inflation in domestic prices by appreciating the trade-weighted dollar.[13]

Departures from the foregoing general objective have occurred under recessionary conditions, during which the Singapore dollar has been permitted to depreciate to a certain extent. The first post-1965 recession in Singapore occurred in 1985, when real GDP fell by 1.6 percent, followed by slow growth of 2.3 percent in 1986 (Peebles and Wilson 2002). In response, as figure 12.1 shows, the dollar depreciated gradually from 1985 to the beginning of 1987. The depreciation was not an entirely smooth affair, however, as we now discuss.

It appears that speculators overestimated the extent to which the authorities were prepared to permit the exchange rate to depreciate. By August 1985, the currency had depreciated to about S$2.20:US$1 (from about S$2.10:US$1 earlier), and it then came under speculative pressure, primarily through spot conversions of Singapore dollars into foreign currencies (Chan and Ngiam 1996, pp. 7–8). By Thursday, September 12, it had fallen

12. There appears to be some confusion of interpretation about the issue. Bris, Goetzmann, and Zhu (2003, p. 33) say that in Singapore short selling is "not allowed" but is "practiced," while Morgan Stanley (2003) says, "There are no by-laws under the SGX [Singapore Exchange Ltd.] that forbid short-selling[;] however the present CDP [Central Depository] system actively works against it. This is because short sellers must cover their positions within the same day or face a buy-in by the SGX" (p. 4). Poitras (2002) says that "Except in very restrictive circumstances, short selling of stock on the SES is prohibited," while the technical committee of IOSCO (2003) states that short selling is "unrestricted," except for the caveat mentioned above. Market practitioners confirm, however, that short sellers are expected to cover their positions by the end of the same day, after which a buy-in by the SGX can occur; as mentioned, suspension of individual securities can also be instituted.

13. As the MAS (2000b) points out, under a pure CB system the rate used by the CB determines the market exchange rate, whereas in Singapore the exchange rates used by the CB "depend on the current rates in the foreign exchange market" (p. 24).

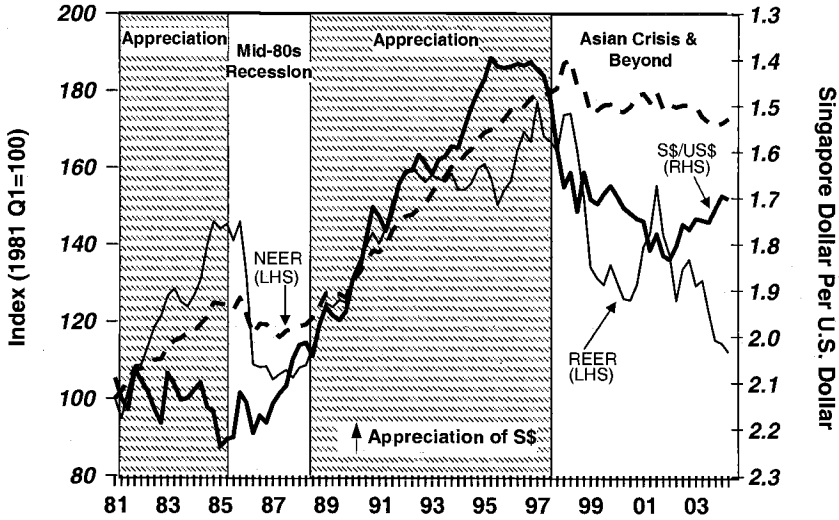

Fig. 12.1 Singapore's exchange rates

Source: MAS (2001), kindly updated by the MAS.

Note: REER uses export competitiveness weights and is deflated by relative unit labor costs.

to almost S$2.31:US$1 (Starr 1985). The following Monday, the MAS intervened, by spending US$100 million (amounting to less than 0.1 percent of its foreign reserves, according to Chan and Ngiam) to purchase Singapore dollars. The consequence was an immediate rise in the overnight interbank rate, which reached 120 percent on September 18, and the currency strengthened to S$2.20:US$1—an appreciation of about 5 percent in just four days. A news source noted that "substantial losses have almost certainly been incurred by foreign banks as a result of speculating against the Singapore dollar" (Textline 1985). Thereafter, liquidity was gradually restored to the money market, but it was also made clear that the MAS would not hesitate to act again if necessary.

Clearly, in addition to the noninternationalization policy and the discouragement of speculative short selling of shares, the exchange rate policy played a significant role in defusing the speculative attack. Initially permitting the exchange rate to depreciate to S$2.20:US$1, in line with weakening fundamentals, took some of the edge off speculative pressure. It would appear that the authorities then permitted, for some time, a further depreciation owing to uncertainty regarding the path of fundamentals. When it was determined that this depreciation was excessive, they were in a position to inflict substantial losses on speculators. As in the case of Hong Kong, Singapore's very healthy reserve position was a valuable asset in this regard. Unlike the case of Hong Kong, however, nonadherence

to a fixed peg implied that speculators faced a "two-way bet": this may have constrained the intensity of the attack then, and, by strengthening the MAS's reputation for toughness, reduced speculators' willingness to attack in the future as well. Finally, the flexibility with which the MAS generally permits short-term uncollateralized borrowing by banks, in support of its exchange rate policy (MAS, n.d., p. 6), meant that the speculative pressure prior to the MAS intervention did not appreciably raise short-term interest rates (Textline 1985). We proceed next to examine lessons learned during the Asian crisis of 1997–98.[14]

12.4 Singapore: The 1997 Experience

We begin with a succinct statement by Chan and Ngiam (1998, p. 259):

> During the recent Asian currency crisis, which began when Thailand allowed its baht to float on July 2, 1997, the Singapore dollar, along with all the regional currencies, showed a significant fall against the US dollar for six months. From a high of $1.43 per US dollar on the day before the float of the baht, the Singapore dollar went all the way down to S$1.75 per US dollar on January 7, 1998, a decline of 18.3 percent over the period. . . . Although the Singapore dollar depreciated against the US dollar, it appreciated sharply against the regional currencies. Hence, on a trade-weighted basis, the Singapore dollar actually showed a slight appreciation since July 1, 1997. The Singapore dollar has withstood the currency storm lashing the region because of its extremely strong economic fundamentals . . . [including] low foreign debt, huge foreign exchange reserves, large current account surpluses, substantial budget surpluses, high savings rates, strong inflow of foreign direct investment, a sound financial system and prudent government policies.

We thus observe a significant difference between Singapore's exchange rate experience in 1997 and its experience in 1985. The greater depreciation in 1997, compared to the initial depreciation of only about 5 percent from S$2.10 to S$2.20 per U.S. dollar in 1985, might have reflected a judgment that the economic situation was more serious in 1997; at the same time, a larger depreciation might have been more in line with speculators' priors,

14. Chan and Ngiam's (1998) formal analysis of the 1985 episode appears, however, to be flawed. They erroneously assume that the exchange rate appreciated from a preexisting disequilibrium level but that interest rates nonetheless fell because, by underscoring the authorities' determination not to allow the currency to weaken, the appreciation reduced the perceived probability of a devaluation. In fact, however, interest rates did (as indicated above) rise after the appreciation, owing to the liquidity squeeze, and only fell subsequently. The key element of losses imposed on speculators by the appreciation is not included in the Chan and Ngiam analysis; nor do they recognize that the appreciation was intended to bring the exchange rate to an (equilibrium?) level that was lower than the original S$2.10 level. Indeed, it is difficult to imagine the perceived devaluation probability, and the interest rate, falling for good if the exchange rate did indeed remain overvalued.

and the latter might also still have had memories of the 1985 experience.[15] In both years, the noninternationalization policy and the short-sale restrictions would also have helped. Singapore's experience also exemplifies the point made in section 12.2 regarding the merits of gradual rather than discrete adjustments in situations that are not too extreme.

Notwithstanding the fairly smooth exchange rate adjustment, Singapore was not spared from volatility in other asset markets, particularly equities and property. From a high of 2055.44 in January 1997, the Straits Times index of stock prices dropped by 60 percent to 856.43 in September 1998 before recovering (Ngiam 2000, p. 6 and fig. 2). The private property price index dropped monotonically by about 40 percent from 270.0 in the first quarter of 1997 to 163.7 in the fourth quarter of 1998 (Ngiam 2000, p. 6 and fig. 3). Real GDP in fact declined by 0.9 percent in 1998 (table 12.1). It would not be correct to ascribe these developments solely to contagion effects, and trade and banking exposure to the region. Other factors, such as the global electronics slowdown, the downturn in the domestic real estate cycle, and (over time) the gradually increasing competition from China and India, also played a significant part. However, Singapore's experience in 1997–98 underscores the fact that countries that plug into the global economic grid will tend to experience not only higher mean growth rates but also greater variability of those growth rates. As has often been noted, capital can flow out of a country as well as into it. Selective measures aimed at particular sectors can mitigate the degree of volatility, but are unlikely to be capable of effectively eliminating it. Of course, economic agents will in due course learn to make improved risk-return calculations, and at the same time governments would be well advised to develop various coping mechanisms, such as a reasonable degree of social insurance and provision of skill upgrading and retraining facilities to help those who are severely affected by shorter-term cyclical changes as well as longer-term structural ones.

12.5 Debt Markets in Singapore

We begin with some figures for the 1990s. Table 12.2, from Ong (1998), provides information on the debt-asset ratio (DAR) of nonfinancial corporations in Singapore, Canada, and the United States. The ratio in Singapore declined somewhat in the 1990s, being fairly modest at 0.31, of which 0.21

15. Hashimoto (2003, p. 256) obtains "puzzling" results in seeking to identify speculative pressure against the Singapore dollar in 1997, including the fact that a large depreciation occurred when her estimated depreciation likelihood was lowest. Methodologically, her assumption that speculators condition only on the M2–foreign exchange reserves ratio in deciding when to launch an attack appears rather restrictive, and it is also not clear what her estimated critical level of 0.25 for this ratio for Singapore signifies, since the actual ratio was above this throughout her sample period (1986–97).

Table 12.1 **Key national income statistics, Singapore**

Year	GNI (in S$ millions)	Per capita GNI (in S$)	Gross national saving (in S$ millions)	Gross capital formation (in S$ millions)	Gross domestic product (in S$ millions)	Gross fixed capital formation (in S$ millions)
1993	94,604.0	28,535	42,062.4	35,258.2	98,838.2	32,439.3
1998	141,068.3	35,968	75,416.8	44,316.0	138,345.0	51,253.3
1999	142,617.3	36,097	70,644.6	44,739.5	147,834.4	48,717.8
2000	159,097.0	39,599	73,984.6	51,150.6	162,162.3	52,933.8
2001	155,472.3	37,634	67,150.2	38,296.3	159,073.0	50,549.3
2002	157,818.5	37,834	67,238.5	33,444.1	162,493.2	45,530.6
2003	157,173.9	37,555	70,351.3	21,245.0	164,265.9	43,779.4
			Percentage change over previous year			
1993	13.0	10.1	8.7	21.3	12.3	10.3
1998	–4.3	–7.4	–3.0	–20.3	–0.9	–6.0
1999	1.1	0.4	–6.3	1.0	6.9	–4.9
2000	11.6	9.7	4.7	14.3	9.7	8.7
2001	–2.3	–5.0	–9.2	–25.1	–1.9	–4.5
2002	1.5	0.5	0.1	–12.7	2.2	–9.9
2003	–0.4	–0.7	4.6	–36.5	1.1	–3.8

Source: Singapore Department of Statistics 2004 *Yearbook of Statistics.*

Notes: GNI = gross national income. All dollar amounts in Singapore dollars, and all are shown at current market prices except for the final two, "Gross domestic product" and "Gross fixed capital formation," which are at 1995 market prices.

Table 12.2 **Average leverage ratio during the 1970s, 1980s, and 1990s**

	1970s	1980s	1990s
Singapore			
DAR	0.33	0.36	0.31
Short-term DAR	0.24	0.24	0.21
Long-term DAR	0.09	0.12	0.10
Short- to long-term debt ratio	2.55	1.97	1.98
Canada			
DAR	0.24	0.28	0.30
Short-term DAR	0.11	0.17	0.15
Long-term DAR	0.13	0.11	0.15
Short- to long-term debt ratio	0.86	1.53	1.04
United States			
DAR	0.30	0.33	0.37
Short-term DAR	0.11	0.15	0.17
Long-term DAR	0.19	0.18	0.21
Short- to long-term debt ratio	0.59	0.85	0.80

Source: Ong (1998).

Notes: DAR = debt-asset ratio. For Singapore, data refer to period 1990–97. For Canada, data refer to period 1990–96. For the United States, data refer to period 1990–94.

was due to short-term debt (defined by Ong 1998, p. 9, as "the sum of bank loans and overdrafts, short-term commercial papers and other short-term loans"), and 0.10 to long-term debt ("the sum of preference shares, bonds and debentures, and other long-term loans," as defined by Ong).

With regard to external debt, the Singapore Department of Statistics (SDOS) distinguished between external debt per se—defined as "all overseas loans drawn by our corporate, government and household sectors, but exclud[ing] our banks' overseas inter-bank loans" (SDOS 2000, p. 1; we discuss bank borrowing below)—and "secondary forms of external debt," comprising negotiable debt securities (SDOS 1998, p. 2) such as bonds, debentures, treasury bills, and trade credits (defined by SDOS 1998 as "direct extension of credit by suppliers and buyers for goods and services transactions and advance payments for work that is in progress"). Tables 12.3–12.8 provide information on these forms of debt during the 1990s. According to the SDOS (1998, p. 2), "Singapore has had no public external debt since 1995," owing to its regular budget surpluses. Its debt sustainability ratios were much more favorable than those of other countries in the region. About three-quarters of the external corporate debt was contracted by foreign-owned companies.[16]

16. The figure for nonbank loans at end 97, $4.518 billion, is the same in tables 12.3 and 12.6, but the figure for bank loans is larger in the former, since it includes loans to households as well; nonbank lending to households is not significant.

Table 12.3 **Singapore's external debt, end 1995 to end 1998 (in S$ millions)**

	End 1995	End 1996	End 1997	End 1998
Private sector	9,801	12,341	16,490	14,734
Loans				
BIS banks	6,921	7,390	11,161	9,274
Non-BIS banks	434	1,053	811	808
Other nonresidents	2,446	3,898	4,518	4,652
Public sector	0	0	0	0
Total	9,801	12,341	16,490	14,734
Previous estimates	9,801	10,927	15,631	

Source: SDOS (2000).
Notes: Data for 1998 are preliminary. BIS = Bank for International Settlements.

Table 12.4 **Singapore debt sustainability ratios, end 1995 to end 1998 (%)**

	End 1995	End 1996	End 1997	End 1998
Debt to GNP	8.1	9.3	11.2	10.0
Debt to (domestic) exports	10.0	11.9	15.3	13.9

Source: SDOS (2000).
Note: Data for 1998 are preliminary.

Table 12.5 **External debt sustainability ratios of selected countries (%)**

	End 1993	End 1994	End 1995	End 1996
External debt to GNP				
Indonesia	58.9	57.4	56.9	59.9
Malaysia	38.7	36.9	42.6	42.1
The Philippines	64.1	59.3	51.5	47.3
Thailand	37.1	43.1	34.9	50.3
External debt to exports				
Indonesia	211.9	195.8	202.9	222.2
Malaysia	43.5	37.7	40.8	42.4
The Philippines	187.0	160.6	121.8	97.6
Thailand	93.0	103.1	76.6	120.5

Source: World Bank, *World Debt Tables,* reproduced from SDOS (1998).

Turning to secondary forms of external debt, the SDOS (2000) observes, in regard to table 12.7, that "Singapore's external liability in debt securities nearly doubled from $2.0 billion at end-95 to $3.7 billion at end-98. . . . It was dominated by 4 foreign (3 Japanese and 1 U.S.) companies. The debt securities are mostly short and medium term notes issued to provide additional funds for the companies' operation." Regarding foreign direct investment (FDI) nonequity liabilities, and excluding debt securities, a

Table 12.6 **Overseas loans of local and foreign-owned companies, end 1997**

	Identified bank loans		Nonbank loans		Total	
	Value (US$ millions)	Share (%)	Value (US$ millions)	Share (%)	Value (US$ millions)	Share (%)
Local-owned	1,258	21	1,445	32	2,703	26
Foreign-owned	4,754	79	3,073	68	7,827	74
Total	6,01		4,518		10,530	

Source: SDOS (2000).
Note: "Identified bank loans" refers to bank loans that are identified in SDOS surveys.

Table 12.7 **Secondary forms of external debt, end 1995 to end 1998 (in US$ millions)**

	End 1995	End 1996	End 1997	End 1998
Debt securities	1,952	2,419	3,585	3,662
FDI nonequity capital: Net liability	5,194	5,687	7,808	7,792
Loans		4,074	5,437	5,752
Trade credits: Liabilities	9,852	6,830	7,431	6,825
Trade credits: Assets	4,658	5,217	5,050	4,785
Non-FDI trade credits: Net asset	3,267	6,238	8,092	7,072
Assets	16,662	17,632	21,148	19,639
Liabilities	13,395	11,394	13,056	12,567

Source: SDOS (2000).
Note: Data for 1995 have been revised. Data for 1998 are preliminary.

Table 12.8 **Net external position: Loans and debt securities, end 1996 to end 1997 (in US$ millions)**

	End 1996	End 1997
Debt securities	6,303	7,454
Assets	8,722	11,039
Liabilities	2,419	3,585
Loans: Other nonresidents	4,804	6,846
Assets	8,702	11,364
Liabilities	3,898	4,518
Loans: FDI	3,518	3,944
Assets (outward FDI)	7,592	9,381
Liabilities (inward FDI)	4,074	5,437

Source: SDOS (2000).

significant portion comprised loans from parent companies. After 1995, Singapore was a net creditor in all trade credit transactions (FDI and non-FDI). As table 12.8 shows, it was also a net creditor in all the other categories covered in the preceding tables, namely debt securities, FDI-related loans, and loans to other nonresidents, with the exception of borrowing from external banks (table 12.3): the figure of almost S$12 billion here is modest relative to other figures below, and it has not been netted against lending by Singapore banks to external nonbank entities, on which data are not provided.

The overall picture that emerges is that of a comfortable external debt position, as far as nonbank entities are concerned. Turning to banks, as of December 1997 the DBUs owed S$94.7 billion to banks outside Singapore (including to the head offices of foreign-owned banks); however, they had also lent S$69.7 billion to banks outside Singapore (both figures are inclusive of DBU transactions with ACUs, and all figures are from the *Monthly Digest of Statistics, Singapore,* July 1998).[17] The total asset base of DBUs at that time (after deducting interbank lending between DBUs, but inclusive of dealings with ACUs and other foreign banks) was S$163.7 billion, and their total deposits from nonbank customers amounted to S$124.1 billion, with a further S$25.8 billion of deposits with the Post Office Savings Bank. Also by way of comparison, Singapore's stock market capitalization was about S$180 billion in 1997 (Thiam 2002, table 1), notwithstanding the depressed state of security prices at the time. Finally, with regard to bond issuance specifically, total outstanding corporate bonds at that time, sold to both domestic and foreign asset holders, amounted to S$8.4 billion (S$6.7 billion being Singapore dollar issuance, and S$1.7 billion being non–Singapore dollar issuance), and total outstanding governmental debt (secondary debt according to the SDOS classification) comprised S$15.0 billion worth of bonds and S$6.9 billion worth of treasury bills (all figures from the MAS web site's sections on Singapore's bond markets).

Given Singapore's modest overall external debt position, its large foreign exchange reserves (amounting to about six times the size of the monetary base[18]), and its small exchange rate depreciation relative to that of

17. We focus here on DBUs, since the offshore market or the ACUs transact virtually entirely in foreign currencies.

18. These very large reserves are to a not insignificant degree a reflection of Singapore's fairly low domestic absorption capacity (given its small size), juxtaposed against its large savings rate over many years. Nor does it appear that such large reserve holdings impose a significant opportunity cost on the economy: a *Straits Times* (Singapore) report of July 22, 2004, by Audrey Tan quotes the assistant managing director of the MAS, Ong Chong Tee, as saying, "we are invested across a diversified range of markets and currencies" and that owing to "the better performance of global equity markets," the MAS's profits in the year ending March 31, 2004, jumped to S$4.99 billion (from just S$623 million the previous year). The bulk of these profits arose from investing its foreign reserves, which totaled US$96.3 billion at the beginning of the year. The report adds that the MAS "does not disclose the rate of return on its investments" but that, according to Ong, "on average, MAS' performance would

other countries in the region, it is not surprising that its external indebtedness was not a noticeable aggravating factor in the 1997–98 downturn. It is, however, of interest to examine the reasons for the historical underdevelopment of Singapore's bond markets (as seen above, its banking system and equities market are much more developed) and to review the measures taken since 1998 to foster their growth, with particular reference to their implications for the noninternationalization policy.[19]

We may divide the reasons for the historical underdevelopment into supply and demand factors, while recognizing that there is some interaction between the two. Perhaps the most important supply factor has been the healthy fiscal position of the government, which has resulted in a limited need for it to issue bonds. Moreover, the bonds that were issued were of low maturity (not more than seven years, prior to 1998), and the bulk of them, and of treasury bills, were held by banks and finance companies (to a significant extent to meet minimum liquidity requirements), as well as insurance companies, resulting in a very limited secondary bond market. It should, however, be noted that we exclude here "specially-issued, non-tradable, long-term government bonds which are held by the CPF [Central Provident Fund] until maturity" (Ngiam and Loh 2002, p. 6). The CPF is Singapore's compulsory saving scheme, and its holdings of these special bonds substantially exceed the outstanding amount of other, tradable government securities. Ngiam and Loh add, "Most of the proceeds from such [CPF-purchased] bonds are probably channeled to the Government of Singapore Investment Corporation (GSIC) for investment in foreign assets" (p. 6).

An important consequence of the underdevelopment of the governmental bond market, particularly the secondary market, was the absence of a benchmark yield curve to facilitate corporate issuance, and active trading, of bonds. At the same time, it may be hypothesized that Singaporeans' appetite for a secure, long-term asset has to a large extent been met, albeit compulsorily, by their CPF savings, notwithstanding the somewhat low return on such savings (Asher 2004). They may thus wish to channel most if not all of their remaining discretionary savings (beyond that used to finance home ownership) to more liquid bank deposits and to higher-yielding but risky equity investments, an explanation that would help account for the more advanced state of development of Singapore's banking system and equities market—which in turn makes it easier for Singapore corporations to raise funds from these sources.

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place it in the top 25th percentile of its peer group of fund managers." Substantial sums are also invested by the Government of Singapore Investment Corporation (in financial and real assets abroad) and Temasek Holdings (until recently, mostly in government-linked-companies domestically), but the precise amounts are not known, and neither is the former's rate of return on its investments.

19. Valuable references here are Ngiam and Loh (2002), Lee (2001), and U.S. Embassy (2001).

With a largely captive market for government securities, the government could afford to pay low yields on these. Moreover, until recently, "Singapore investors [had] to pay tax on interest income whereas they [did] not have to pay tax on capital gains obtained from investing in equities and properties" (Ngiam and Loh 2002, p. 11). Lastly, much of Singapore's economic growth has historically been driven by large inflows of FDI, with foreign-owned companies receiving major infusions of equity and loans from their parent companies.

The Asian crisis of 1997–98 provided a major impetus to a shift in policy thinking regarding bond market development in Singapore. The crisis highlighted the dangers of currency and maturity mismatches in corporate borrowing, and Singapore banks also suffered losses due to exposure to the region, although none was in danger of collapsing. It therefore appeared prudent to diversify the sources of borrowing on the part of Singapore corporations, particularly long-term borrowing, and encourage them to borrow in Singapore dollars. Also, with economic growth the pool of discretionary saving was growing substantially, notwithstanding the high CPF contribution rate, and fund management companies had become increasingly active in the economy. One may surmise that concomitantly the demand for market determination of bond yields, and of greater market liquidity, was also growing. This was underscored by the severe fall in equity and property prices during the crisis. From a longer-term, developmental perspective, fostering of a further pillar of Singapore's dynamic financial sector was also deemed desirable. The intention was to encourage not only Singaporean but also foreign corporations, and multilateral institutions, to float bond issues in Singapore.

Accordingly, since 1999 the MAS has issued, on a regular basis, more Singapore government securities (SGSs), with larger issuances and longer maturities (up to fifteen years). The healthy fiscal position of the government has enabled it to offer lower yields on such securities and yet ensure their acceptance by investors.[20] Statutory boards and government-linked corporations (GLCs) have also become active in bond issuance, relying less on bank borrowing: for example, the Jurong Town Corporation launched a S$200 million twelve-year issue in 2000, and Singapore

20. See figures 12.2 and 12.3 (from Wong 2004) in respect of Singapore and U.S. government ten-year bond yields in the recent past. The former yield has almost invariably been below the latter, while tracking its movement fairly closely, except in recent months, which Wong attributes to expectations of continued weakening of the U.S. dollar. The IMF Country Report of October 2001 on Singapore (Kochhar et al. 2001) also points out that SGSs offer lower yields than U.S. Treasury bonds but have nonetheless been included in JPMorgan's Government Bond Index (GBI) Broad since April 2001 (with a weight of one-third percent) because of their low cross-correlations with returns from most other government bonds and their very low volatility of returns, "which help to expand the efficient portfolio frontier for bonds" (p. 24). McCauley and Jiang (2004) provide a detailed analysis of the diversification benefits from holding a range of Asian currency bonds in addition to those from other areas.

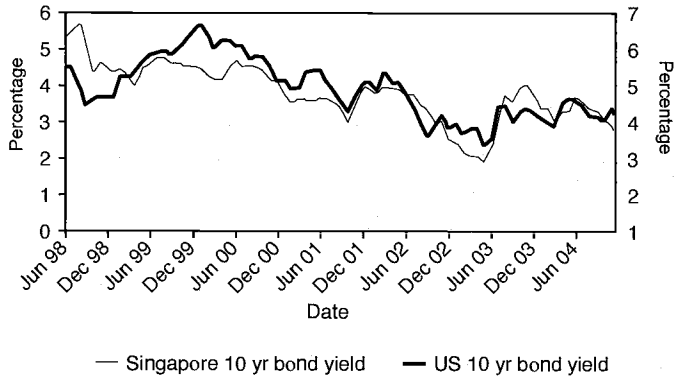

Fig. 12.2 Singapore dollar and U.S. dollar bond yields
Source: Wong (2004).
Note: The left column measures the Singapore bond yield.

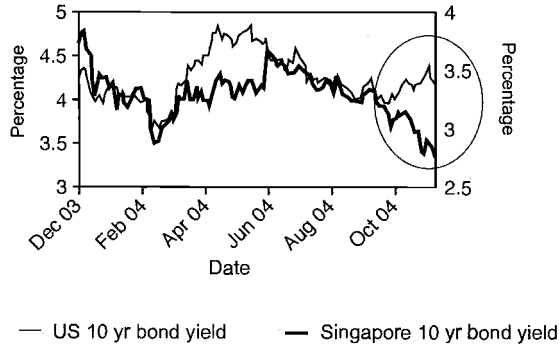

Fig. 12.3 U.S. dollar and Singapore dollar bond yields
Source: Wong (2004).
Note: The left column measures the U.S. bond yield.

Telecommunications launched a S$1 billion five-year issue in February 2001. The intention has been "to stimulate the emergence of a debt market, and to establish benchmark rates" (U.S. Embassy 2001, p. 2). Secondary markets are still fairly small (Ngiam and Loh 2002), although growing. Tax exemption for fee income earned by financial institutions arranging debt securities in Singapore (in Singapore dollars as well as foreign currencies) was also granted, interest income earned by nonresidents was exempted from withholding tax, and a concessionary tax rate of 10 percent was introduced on interest income earned by financial institutions and corporations from holding debt securities. Interest rate futures

contracts were introduced, and restrictions on Singapore dollar over-the-counter (OTC) interest rate derivatives such as interest rate swaps, forward rate agreements, and interest rate and swap options were lifted (Ngiam and Loh 2002, p. 13).[21] The authorities have also attempted to foster primary and secondary market liquidity through measures such as the introduction of an SGS repurchase facility for primary dealers and a five-year SGS bond futures contract.

Of particular interest for our purpose is "the opening up of the S$ bond market to foreign issuers . . . accomplished through MAS Notice 757, introduced in August 1998 and amended in November 1999" (Ngiam and Loh 2002, p. 8).[22] The proceeds from such issues could be retained in the form of domestic currency deposits with banks in Singapore pending use; however, if and when the proceeds were to be used outside Singapore, they had to be converted or swapped into foreign currency before remitting abroad (Ngiam and Loh 2002). Funds raised for use in Singapore by nonbank nonresidents for designated economic activities—excluding, for example, "speculating in the S$ currency and interest rate markets" (Lee 2001, p. 36)—did not require prior MAS approval. Prior approval was also not required for transacting in several derivative products (fuller details are provided in the appendix). Lee (2001) also points out that Notice 757 (of August 1998) "fully liberalized the extension of S$ credit facilities to residents" (p. 35). Interestingly, in the revised Notice 757 of May 28, 2004, the MAS has stated that, effective from that date, nonresident nonfinancial issuers of Singapore dollar bonds and equities were no longer required to swap or convert their proceeds into foreign currencies before remitting abroad, adding that this revision "would allow the issuers greater flexibility in managing their S$ funds." For nonresident financial institutions, however, the requirement was retained.

A short time after the policy of August 1998 was announced, according to the U.S. Embassy (2001),

> the International Finance Corporation became the first foreign entity to issue S$ bonds, with a S$300 million three-year issue. GE Capital followed in Q1 1999 as the first foreign private issuer, with a S$300 million issue, followed by the Nordic Investment Bank and the European Bank for Reconstruction and Development. A wide range of foreign financial institutions and other corporates have launched issues since early 1999

21. "However," Ngiam and Loh add, "banks are required to submit monthly reports on details of interest rate derivative transactions exceeding S$5 million with counter-parties outside Singapore" (p. 13).

22. Foreign entities have also been permitted to list Singapore dollar–denominated shares since late 1998, but similar restrictions to those discussed immediately below on the use of the proceeds outside Singapore have applied (Shook Lin and Bok 2001).

(including US issuers such as Ford Motor Credit, JPMorgan, UPS, Morgan Stanley, John Hancock, General Motors Acceptance, and Goldman Sachs, as well as a wide range of European entities and some Asian entities).

By the first quarter of 2002, total Singapore dollar bond issue by foreign entities amounted to S$7.2 billion (Ngiam and Loh 2002, p. 8), and the market continues to grow, thereby helping to meet the demand of both domestic and foreign investors (including fund managers) for such instruments.

Ngiam and Loh (2002, p. 20) further mention that "from December 2000 onward, non-residents have been allowed to borrow Singapore dollars [from banks] to buy SGS and SDCB [Singapore dollar corporate bonds]," as well as Singapore dollar equities and real estate (U.S. Embassy 2001). Banks were also permitted to "extend S$ credit facilities exceeding S$5 million to nonresidents to fund offshore activities, as long as the S$ proceeds are swapped into foreign currency" (Lee 2001, p. 37), to transact in Singapore dollars currency options with other banks and financial institutions in Singapore, and to transact with nonresidents in a broad range of derivative products (Lee 2001, p. 37; the appendix provides further details). Foreign securities intermediaries were permitted to freely obtain Singapore dollar financing domestically, and, effective March 1, 2001, offshore banks were permitted to freely engage in Singapore dollar swap activity with nonbanks (U.S. Embassy 2001). In March 2002, Singapore dollar credit facilities to nonresident nonfinancial entities (such as corporate treasury centers) were liberalized, so that only credit in excess of S$5 million to nonresident financial entities for speculating against the Singapore dollar was prohibited, and even these entities were permitted to engage in a wider range of derivative transactions (such as Singapore dollar currency options) with financial institutions. The intention was to promote the deepening of such markets. We discuss the overall implications of measures to promote financial market development in the conclusion.

12.6 Conclusion

Singapore clearly has strong defenses against what it deems excessive exchange rate volatility triggered by destabilizing capital flows. These include its strong fundamentals (discussed in the Chan and Ngiam quotation at the beginning of section 12.4), the adoption of a CB system, and the nonadherence to a fixed currency peg when the economic situation changes. (Indeed, an important lesson is that it is the *package* of policies in totality that can meaningfully be evaluated, rather than individual policies in isolation from the overall policy context.) Under the imperative of promoting the continued growth and diversification of its financial sector—an impor-

tant pillar of the economy, accounting for about 12 percent of its GDP—quite a number of administrative restrictions have been relaxed since 1997. This was heralded in a key address on November 4, 1997, by then Deputy Prime Minister Lee Hsien Loong:

> In order to meet the upcoming challenges, DPM Lee proposed a fundamental change in Singapore's attitude towards risk management. . . . In contrast to Hong Kong, "where anything not expressly forbidden is permitted," Lee noted that in Singapore "anything not expressly permitted is forbidden." At this stage, however, the government needed to regulate the financial sector "with a lighter touch, accept more calculated risks, and give the industry more room to innovate and stretch the envelope" in order to promote a more competitive, dynamic and innovative environment. Lee argued for a disclosure-based regulatory system to protect investors, rather than . . . extensive regulations. (U.S. Embassy 1999)

The progressive relaxations of the Singapore dollar noninternationalization policy, which in any event was a rather limited form of capital control, may be viewed in this light.[23] Such relaxations, including those on a wide variety of derivative transactions, were necessary to foster bond market development in Singapore, and the evidence provided in this chapter indicates that this objective (including the attraction of foreign bond-issuers) is well on the way to being achieved. Since May 2004, the only remaining restriction of any significance is the onus placed on banks to determine, as far as possible, that the Singapore dollar credit facilities they extend to nonresident financial institutions will not be used for currency speculation. This would appear to be a reasonable restriction, especially in light of the very high interest rate volatility experienced by Hong Kong (which did not impose such a restriction) during speculative periods (see the beginning of section 12.2). Given the MAS's reputation for toughness, one would expect that banks will err on the side of caution in implementing this policy. Financial market development is thereby facilitated, and at the same time the risk of heightened currency speculation during turbulent periods is reduced, along with the associated macroeconomic instability. It is also quite conceivable that restrictions—for example, on swap transactions—would be reintroduced if it was felt that the situation so warranted.

A similar policy orientation may be seen in the securities market. In 1998, Morgan Stanley launched the Morgan Stanley Capital International (MSCI) Singapore stock index futures contract, and in 2000 the *Straits Times* Singapore stock index futures contract was launched, both on Singapore International Monetary Exchange (SIMEX). However, SIMEX is

23. A study by the MAS (2000a) found that during the 1990s, and prior to the Asian crisis, covered and uncovered interest parity tended to hold between Singapore and U.S. one- and three-month interbank rates respectively, indicating, as one might expect, a high degree of financial integration.

authorized by the MAS to "establish position and trading limits to diminish or prevent excessive speculation" (Lawton 1999, section 3) and also maintains a large trader reporting system. Somewhat ironically, in the light of (now) Prime Minister Lee's observations, while Singapore has moved to a more relaxed regulatory regime, Hong Kong has tightened up somewhat, and the two systems are closer than they previously were. This perhaps is where the golden mean lies—a fairly, although not completely, unrestrictive, rule-based system in general, but with provision for discretionary intervention when the situation warrants. Do such discretionary provisions create uncertainty for business, and can they be abused? If they are intelligently employed, they can be very valuable in times of stress, and perhaps the best safeguard against abuse is public analysis and discussion whenever they are employed.

Appendix

Chronology of Capital Controls in Singapore

June 1, 1978

Exchange controls are completely liberalized, in line with efforts to develop Singapore as a banking and financial center (including offshore banking). From then on, "residents are allowed to borrow, lend and invest freely in foreign currencies. Banks in Singapore that are licensed to deal in Asian Currency Units can freely accept deposits in foreign currencies. Residents may deal freely in spot and forward foreign exchange transactions. Nonresidents are freely allowed to make direct and portfolio investments in the country" (MAS 1999, p. 2).

November 1, 1983

MAS Notice 621, setting out the policy of noninternationalization of the Singapore dollar, is issued (see section 12.3).

July 18, 1992

The MAS amends the policy by distinguishing three categories of activities:

1. *The approved category:* Consultation with the MAS is not required for credit facilities extended in Singapore dollars, in any amount, to residents or nonresidents to facilitate direct exports from and imports to Singapore, and for payment bonds in favor of Singapore parties, or payment guarantees (including guarantees for tax payments), in respect of "economic activities" in Singapore, where the latter specifically excludes finan-

cial and portfolio investments. Forward sales of Singapore dollars earned from exports to Singapore are also permitted.

2. *The banned category:* Banks are not to finance in Singapore dollars "activities which have no bearing on Singapore," including direct or portfolio investments outside Singapore by nonresidents, third-country trade by nonresident-controlled companies, and nonresident subscription to equity in a Singapore company where the proceeds are used for takeovers or financial investments. Banks are also not to extend Singapore dollar credit facilities, in any amount, to nonresidents for speculating in the local financial and property markets.

3. *The unlisted category:* The 1983 ruling calling for consultation with the MAS continues to apply for all other activities, which are quite wide ranging; these include third-country trade as well as direct and portfolio investments overseas by residents, and direct investment and housing development in Singapore by nonresidents.

August 1998

In conjunction with an "extensive program of financial sector liberalization" (Lee 2001, p. 35), the MAS issues the first version of Notice 757, which replaces Notice 621; this and subsequent versions seek to successively relax restrictions against various financial transactions. While concluding that "the basic policy remains sound," the MAS states that "some judicious relaxation of specific restrictions would foster the development of capital markets with minimal incremental risks" (quoted in Lee 2001, p. 35).

The notice fully liberalizes the extension of Singapore dollar credit facilities to residents. In addition, banks can now engage in the following activities without prior consultation with the MAS (Lee 2001):

1. Extension of Singapore dollar credit facilities to, and arranging Singapore dollar equity listings or bond issues for, nonbank nonresidents if the Singapore dollar proceeds are used for designated economic activities in Singapore.
2. Extension of Singapore dollar credit facilities to nonbank nonresidents for financial investments—shares, bonds, deposits, and commercial properties in Singapore—up to S$5 million.
3. Extension of Singapore dollar credit facilities up to S$20 million to nonresidents, via repurchase agreements of SGSs.
4. A limited list of derivative transactions, including hedging of currency or interest rates from the activities listed in item 1 above, and transacting in Singapore dollar interest rate futures with nonresidents.

For other activities, consultation with the MAS continues to be required, and in addition the Singapore dollar proceeds from credit facilities and bond and equity listings arranged for nonbank nonresidents have to be converted or swapped into foreign currency if they are to be used outside

Singapore. Also, the extension of Singapore dollar credit facilities to nonresidents for certain purposes—including speculating in the Singapore dollar currency and interest rate markets, financing third-country trades, and financing acquisition of shares of companies not listed on the stock exchange or Central Limit Order Book—is explicitly prohibited.

November 1999

Banks are permitted to engage in an expanded range of activities without prior consultation with the MAS, including extension of Singapore dollar credit facilities to, and transacting in Singapore dollar interest rate products with, other banks, merchant banks, finance companies, and insurance companies in Singapore; extension of Singapore dollar credit facilities of any amount to nonresidents via repurchases of SGSs or other Singapore dollar bonds; arranging Singapore dollar equity listings for nonresident companies as long as the Singapore dollar proceeds are converted into foreign currency before being used outside Singapore; and all Singapore dollar derivative transactions with residents, as well as an expanded range of derivative transactions with nonresidents, including option-related products with nonfinancial counterparts. However, banks are still required to consult with the MAS before transacting in Singapore dollars currency options or option-related products with nonbank financial institutions, and before extending Singapore dollar credit facilities exceeding S$5 million to banks and other financial institutions outside Singapore, and they are not permitted to transact in Singapore dollars currency options or option-related products with other banks.

December 2000

Nonresidents are permitted to borrow Singapore dollars (from banks) to buy SGSs and SDCBs, as well as Singapore dollar equities and real estate. Banks are also permitted to extend Singapore dollar credit facilities exceeding S$5 million to nonresidents to fund offshore activities, as long as the proceeds are swapped into foreign currency; to transact in Singapore dollars currency options with other banks and financial institutions in Singapore; and to transact with nonresidents in a broad range of derivative products, including cross-currency swaps and currency options for hedging purposes, Singapore dollar interest rate derivatives, and equity derivatives. Foreign securities intermediaries are permitted to freely obtain Singapore dollar financing domestically, and, effective March 1, 2001, offshore banks are permitted to engage freely in Singapore dollar swap activity with nonbanks.

March 2002

Singapore dollar credit facilities to nonresident nonfinancial entities (such as corporate treasury centers) are liberalized, so that only credit in excess

of S$5 million to nonresident financial entities—including banks, finance companies, insurance companies, hedge funds, and securities dealers and brokers—for speculating against the Singapore dollar is prohibited. Even the latter entities are permitted to engage in a wider range of derivative transactions (such as Singapore dollar currency options) with financial institutions, except that foreign exchange swaps involving a spot sale of Singapore dollars to the nonresident in the first leg remain under the rubric of Singapore dollar credit facilities. Apart from this, transactions involving asset swaps, cross-currency swaps, and cross-currency repurchases are fully liberalized. The intention is to promote the deepening of such markets and make it easier for Singapore dollar equities and debts to be swapped into foreign currencies for overseas use. Financial institutions are also no longer required to ensure that Singapore dollar credit facilities extended to finance investments be withdrawn when the investments are liquidated, thereby lessening the burden of tracking fund use.

May 28, 2004

Nonresident nonfinancial issuers of Singapore dollar bonds and equities are no longer required to swap or convert their Singapore dollar proceeds into foreign currencies before remitting abroad, so as to "allow the issuers greater flexibility in managing their S$ funds" (MAS Notice 757). For nonresident financial institutions, however, the requirement is retained for Singapore dollar proceeds from equity and bond listings and from borrowing from banks. Banks are also required to report to the MAS monthly their aggregate outstanding Singapore dollar lending to nonresident financial institutions. It is reiterated in Notice 757 that "banks shall not extend S$ credit facilities [exceeding S$5 million] to non-resident financial institutions if there is reason to believe that the S$ proceeds may be used for S$ currency speculation."

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Comment

Anusha Chari

Introduction

Singapore's macroeconomic history sets it apart from the other countries discussed in this volume. A number of developing countries have lurched from crisis to crisis, plagued by a variety of economic ills such as unsustainable fiscal positions, current account deficits, lax monetary poli-

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cies, rampant inflation, high unemployment rates, and weak corporate governance mechanisms. In contrast, Singapore's economic good fortune is one of budget and current account surpluses, a high savings rate, low inflation, good institutions, a sound financial system, and—last but not least—a stable currency.

Closer examination reveals that a cornerstone of Singapore's policy on capital account openness is the noninternationalization of the Singapore dollar. Banks are required to follow a policy of noninternationalization in large part because the government is concerned about the buildup of offshore deposits of the Singapore dollar that could be used by speculators to destabilize the currency. The policy is applied to a broad range of financial instruments including bond issues and derivative products.

The policy is in part also designed to help Singapore maintain the "soft peg" that has been crucial for its export-led strategy of development. Singapore's successful maintenance of its soft peg defies the conventional wisdom that soft pegs are not viable (Eichengreen 1999).

It is worth noting that, following revisions in March 2002, only two core requirements of the policy on capital controls remain. First, financial institutions are not allowed to extend Singapore dollar credit facilities in excess of S$5 million to nonresident financial entities, if they have reason to believe that the proceeds may be used for speculation against the Singapore dollar. Second, for a Singapore dollar loan to a nonresident financial entity exceeding S$5 million, or for a Singapore dollar equity or bond issue by a nonresident entity that is used to fund overseas activities, the Singapore dollar proceeds must be swapped or converted into foreign currency before use outside Singapore. According to the Monetary Authority of Singapore (2002), the policy continues to be necessary to prevent offshore speculators from accessing the liquidity in Singapore's onshore foreign exchange swaps and money markets.

In these comments I will argue that the policy of noninternationalization has perhaps outlived its use and may in fact be a factor that hinders the development of an active bond market in Singapore.

Destabilizing Speculation versus Deteriorating Fundamentals

Basant Kapur argues that Singapore has adopted a policy of noninternationalization to ward off financial instability of the sort experienced by Hong Kong in 1998. Hong Kong and Singapore are often thought of as being very similar. Indeed, both are city-states with a British colonial heritage, and both have been in the set of "Asian tigers" that achieved extremely rapid economic growth from the 1960s until very recently. Kapur contends that the "double play" by foreign speculators—simultaneously shorting the Hong Kong stock index futures and selling the Hong Kong dollar forward—was the root cause of the crisis in 1998.

There has been a long-standing academic and policy debate about the

factors that drive currency crises. In this context, the role of large players has been particularly important. On the one hand, large traders and arbitrageurs may improve the efficiency of the price mechanism because they are well suited to collecting and processing information. Alternatively, following crisis episodes, the machinations of large players have been blamed as catalysts of market panic and short-termism (Corsetti, Pesenti, and Roubini 2002). The literature provides many an example in which market efficiency is jeopardized by the behavior of large traders as destabilizing speculators (Krugman 2000).

According to Kapur, Hong Kong in 1998 provides an important example of an economy that came close to the collapse of its currency board regime as a result of aggressive speculation against its foreign exchange and stock markets. In this example, only direct intervention by the authorities in the stock market prevented the collapse of the currency peg and a further meltdown of its stock market. However, the effects of defending the peg, which probably exacerbated the recessionary effects of the Asian crisis on the domestic economy, were quite costly (Corsetti, Pesenti, and Roubini 2002).

In fact, it is rather hard to prove that speculation by large traders alone caused a currency or stock market crisis episode. Crisis episodes generally take place against a backdrop of deteriorating macro fundamentals, policy uncertainties, and structural weaknesses (Corsetti, Pesenti, and Roubini 2002). In other words, was the double play in Hong Kong a rational response to deteriorating fundamentals?

Kapur concedes that the empirical findings do not provide evidence of market manipulation per se. Indeed, Hong Kong experienced a sharp recession in 1998, and GDP growth in the first quarter was negative. Coupled with worsening macroeconomic conditions in East Asia, a falling yen, and the threat of Chinese devaluation, this may have led to a loss of confidence in the Hong Kong stock market and the survival of the currency peg.

Shorting both the Hong Kong stock market and its currency at that time could therefore be interpreted as a rational strategy for all investors, domestic and foreign, highly leveraged or not (Corsetti, Pesenti, and Roubini 2002). In other words, the hypothesis of rational investors taking short positions in two markets (based on an assessment of economic fundamentals) and the hypothesis of a double play (suggesting market manipulation) are observationally equivalent. Kapur acknowledges this point. The rationale for the continued maintenance of the policy of noninternationalization in Singapore is therefore not apparent.

Developing a Viable Bond Market

The second issue that Kapur focuses on is the concerted effort being made by Singapore to develop its bond market. It is interesting to note the unique factors separate from the policy of noninternationalization that

hinder the development of the bond market in Singapore. In many countries, the need to develop active bond markets stems from a public finance motive—namely, to finance government deficits. In contrast, Singapore has consistently run budget surpluses since the 1980s. Therefore, the government's borrowing needs have not spawned a domestic bond market. Many large companies in Singapore also do not require bond financing, as they tend to be cash rich.

Moreover, Singapore has a sophisticated bank lending network and equity capital market, which provide viable financing alternatives in the absence of bond markets. Hence, the need to develop the debt markets in Singapore must be governed by other imperatives.

One imperative may be the desire on the part of the government to develop the island state as a financial services hub for the region. In the longer term, Singapore may aspire to become a center for the issuing and trading of regional currency bonds. Like Switzerland, Singapore has all the necessary ingredients of an active corporate bond market—low borrowing costs, political stability, sound fundamentals, a stable currency, and a AAA sovereign rating.

Despite these attractive features, Singapore has been characterized by a historic underdevelopment of its bond market or suffers from original sin on the supply side. It is important to note that the greater part of international bond issuance takes place in relatively few currencies. For example, international bonds and notes denominated in the U.S. dollar, the euro, and the British pound account for approximately 88 percent of the total amounts outstanding for these instruments (*BIS Quarterly Review* 2005). This may prove to be an obstacle for a small country like Singapore as it tries to develop as a regional hub for international bond issuance in its own currency.

Interestingly, despite the fact that the government has run budget surpluses since the 1980s and maintains huge reserves, the government has actively promoted the development of a government bond market. In fact, the government securities market remains the biggest segment of the debt markets in Singapore. In part, developing the government bond market may fulfill the important purpose of providing a benchmark yield curve as a reference for the term structure of corporate issues.

The second measure that Singapore has undertaken to develop its bond market has been the opening up of the Singapore dollar bond market to foreign issuers. Foreign issuers may be attracted to the Singapore market because of low borrowing costs and a large pool of Singapore dollar funds. However, the policy of noninternationalization continues to apply to Singapore dollar bond issuance by foreigners. If Singapore dollar proceeds from the bond issuance are not used for economic activity in Singapore, they must be swapped into a foreign currency before being remitted abroad.

Note that a Singapore dollar loan combined with a currency swap results in a "synthetic" foreign currency loan. Also note that the swap market involving the Singapore dollar is illiquid and has wide bid-ask spreads. It is therefore not evident why foreign issuers would prefer to issue Singapore dollar bonds and incur the heavy costs of swapping rather than directly issuing foreign currency bonds in the Eurodollar bond market. By imposing swapping costs on foreign issuers, Singapore may in fact deter potential foreign issuers from the Singapore dollar bond market.

However, there is another point worth noting in the context of the currency denomination of international bond issuance: This context further highlights the idea that the policy of noninternationalization may have outlived its purpose. Corporate risk management strategies require companies to swap foreign currency–denominated loans (here, the Singapore dollar) into their domestic currency (say, the U.S. dollar) so as to avoid a currency mismatch between domestic assets and liabilities. The rationale for the government maintaining the noninternationalization "requirement" is therefore unclear.

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