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Forward currency markets in Asia: lessons from the Australian experience[1]

Capital controls have resulted in the creation of numerous offshore non-deliverable forward (NDF) markets for Asian currencies. The Australian experience in the 1970s and early 1980s indicates that an NDF market may facilitate a smooth transition to a fully convertible currency.

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In recent years, non-deliverable forward (NDF) markets have become increasingly important for a number of currencies in the Asia-Pacific region. NDF contracts differ from ordinary forward currency contracts in that they are generally settled entirely in a foreign currency, that is, without the delivery of the local currency. These markets have evolved for currencies with foreign exchange convertibility restrictions, and trading has generally taken place in offshore financial centres. The availability of NDFs has allowed some hedging of exchange rate risks, even in the presence of currency restrictions.

Some Asian authorities are now contemplating the liberalisation of their currency markets. An important question they face is how to facilitate the transition from offshore NDF markets to regular onshore or deliverable forward markets.

Australia also had an NDF market that evolved in the early 1970s in the presence of currency restrictions. These restrictions were removed by the authorities around the time the Australian dollar was floated in 1983. In this paper, we draw lessons from the Australian transition from an NDF market to a deliverable market following the float of the Australian dollar, taking into account the current structures of Asian NDF markets.

In the next section, we provide an overview of the exchange controls in place in Australia in the 1970s and the development of the Australian NDF market, typically referred to as the "hedge" market. We next look at current Asian NDF markets, comparing these with the Australian NDF market. We then

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characterise the Australian transition from NDF to deliverable forward markets, from which we draw lessons for the Asian forward markets. The final section concludes.

The Australian experience

Australia had a fixed or managed exchange rate until 1983

Prior to the floating of the Australian dollar in December 1983, exchange rate policy in Australia moved through a number of fixed or managed exchange rate regimes.[2] These arrangements were underpinned by a comprehensive system of exchange controls, with all foreign currency transactions requiring approval from the Reserve Bank of Australia (RBA). As a general rule, certain types of transactions were freely approved, such as those relating to trade and private capital inflows. However, to minimise the opportunity for speculation, restrictions were placed on the timing of such transactions in terms of leads and lags between accessing the funds and completing the transaction. For example, between 1972 and 1974, Australian residents were not granted approval for overseas borrowings (other than trade finance) that were repayable in less than two years. In addition, severe restrictions were placed on investment abroad by Australians and on borrowing in Australia by foreigners.

Little demand for hedging prior to the 1970s

During the 1950s and 1960s, there was little demand for hedging of exchange rate risk in Australia. Interest rate volatility was low and exchange rates were generally stable, with the Australian dollar pegged to the pound sterling. Forward markets were only available for trade-related transactions, with the additional requirement that the future payment have a maturity of six months at most. Forwards were not available for capital transactions, thereby exposing these transactions to movements in the exchange rate. Under these arrangements, which had been in place since 1939, the RBA provided cover to banks for the risks arising from their forward transactions with eligible customers, thereby transferring risk from private companies to the central bank. Commercial banks were required to buy from (sell to) the RBA each month the sterling equivalent of their excess foreign currency payments (receipts), at a cost defined as a fixed percentage of the notional forward amount.[3] Banks were required to charge this cost to their customers and transfer it to the RBA as compensation for accepting the foreign exchange risk; thus, banks simply acted as agents for the central bank.[4]

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[2] See Debelle and Plumb (2006) for a more detailed discussion.

[3] For the most part, the cost was the equivalent of 25 cents per £100, although it was reduced to 10 cents per £100 between November 1967 and September 1971.

[4] From 1948, for contracts expressed in US and Canadian dollars, there was no charge. Banks dealt forward with customers in these currencies on their own account at rates based on the London foreign exchange market. Banks were required to cover forward risks (beyond a small limit) each day in these currencies with the central bank, between themselves or in overseas trading centres.

Evolution of the hedge market

Interest rate volatility and the floating of major currencies created demand for hedging

As interest rate volatility increased and a number of major currencies were floated in the early 1970s, managing exchange risk became increasingly important. With the deliverable market in Australia providing very limited forward exchange facilities, market participants developed a non-deliverable forward market as a means of providing exchange risk protection for transactions where hedging was not otherwise available. This became known as the foreign currency hedge market.

Hedge market was encouraged by changes in capital controls …

Changes in foreign exchange market controls, particularly on forward transactions, in the first half of the 1970s facilitated the development of the hedge market. For example, in late 1971 banks were granted the authority to handle all foreign exchange transactions (both spot and forward) with customers as principals, rather than as agents of the RBA. Australian banks were able to trade between themselves and with offshore banks to cover their positions by the end of each day, although the RBA continued to provide facilities for banks to clear both spot and forward book positions. Also, restrictions were placed on the timing of eligible forward exchange transactions, such that those seeking cover for eligible transactions were required to enter into the forward agreement within seven days of assuming the exchange rate risk. This "seven day rule" was introduced in May 1974, following a number of costly episodes where importers bombarded the RBA with applications for forward cover just prior to a devaluation of the Australian dollar.

The mechanics of NDF markets are explained in Box 1. In the Australian case, contracts were based on settlement in Australian dollars, with no exchange of foreign currency, so hedging of exchange rate risk was achieved without violation of exchange controls.[5] The first currency hedge contract in Australia was formalised in 1973, and with only minor modifications the structure of that contract was maintained throughout the life of the hedge market (Carew (1985, p 164)).

… developed onshore by the private sector and condoned by the authorities

The Australian hedge market was noteworthy in that it was developed onshore, whereas most NDF markets are developed offshore. It was developed within the private sector by local banks and non-bank institutions. The authorities were aware of its emergence and monitored its development, but chose to condone rather than discourage it. It was argued that transactions in the hedge market would not exert pressure on the spot exchange rate, because there was no direct connection between flows in the hedge and spot markets. Shifts in sentiment in one market, however, could affect trading in the other. For example, if NDF market participants anticipated a revaluation, thereby pushing the NDF exchange rate higher, it was likely that exporters and borrowers would hedge eligible payments in the spot market early, thereby placing upward pressure on the exchange rate.

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[5] Generally, contracts longer than 12 months were not readily available. Spreads between buy and sell quotes on short-term contracts were comparable with spreads quoted at the time on Reuters in European forward markets.

Box 1: How NDF contracts work

A forward foreign exchange contract is an obligation to trade one currency for another on a future date (settlement date) at an exchange rate that is set on the date of the contract (trade date). A typical foreign exchange NDF contract is similar to a regular forward foreign exchange contract, except that at maturity the NDF is settled in another currency, typically the US dollar, because the domestic currency is subject to capital controls, and is therefore "non-deliverable". If, on the settlement date, the prevailing spot exchange rate has changed from the previously agreed forward exchange rate, the holder of the contract who has benefited from the exchange rate movement must compensate the other for the difference between the contracted forward price and the spot market rate. The contract is net-settled in US dollars based on the notional amount. The fixing rate is generally based on the prevailing rate in the domestic or onshore spot market for the non-deliverable currency.

Note that, in an *onshore* NDF market, circumventing exchange controls usually requires settling contracts in the local currency. That is, restrictions are imposed on the foreign exchange dealings of the local market participants, which can be avoided by dealing in the local currency. In contrast, in an *offshore* NDF market, restrictions on currency convertibility prevent settlement taking place in the local currency. Therefore settlement must take place in another currency, such as the US dollar.

Consider the following example for an offshore NDF market for the Australian dollar (A$). Assume that Party A is due to pay A$ 1,000 in one year. Concerned about appreciation of the Australian dollar before the payment, Party A enters into an NDF contract with Party B to purchase the contract equivalent of A$ versus US$. Assume that Party A buys the required A$ 1,000 at a forward exchange rate of US$ 0.7 per A$, the equivalent of US$ 700 at the forward rate. If at the time of settlement the spot rate is 0.6, ie the A$ has depreciated relative to the forward rate, Party A pays an amount of US$ 100 to Party B as compensation for the reduced US$ cost of purchasing the required A$ 1,000. Alternatively, if the settlement rate was 0.8, then Party A would receive US$ 100 as compensation from Party B, because the value of the A$ 1,000 Party B is selling has increased. The calculation is based on the following formula:

US$ settlement amount = (forward rate – settlement rate) x A$ notional amount

Note that Party A still needs to purchase the required amount of A$. This trade needs to be executed in the spot market and is separate from the NDF. Typically, Party A will carefully consider the timing and execution of the spot trade to ensure that the rate achieved is as close to the settlement rate of the NDF hedge as possible. The risk of having a difference between these two rates is referred to as basis risk.

There are several advantages of NDFs, due to the absence of any requirement to undertake cash transfers in the local market. First, an NDF enables participants with exposures not eligible for hedging under controlled capital regimes to hedge their price exposures. One aspect of this is that the structure can be designed to be undertaken between two offshore counterparties and can therefore be used to avoid currency controls or restrictions. Second, because an NDF, in contrast to a deliverable forward contract, settles only marginal amounts, counterparty risk is lower. Finally, it allows parties to avoid potentially high transaction costs of trading in local currencies.

Hedge market grew rapidly in the late 1970s …

There was significant development in the hedge market in the late 1970s and early 1980s. At the end of 1979, hedge contracts outstanding were estimated to be around A$ 3 billion. This represented less than half of outstanding forward contracts of around A$ 7 billion in the deliverable market at the time. However, the RBA estimated that, out of total forward and hedging business written, the contribution of the deliverable market fell over time, from 60% at December 1980 to around 20% by late 1983. Banks were heavily involved, with around 40% of their forward contracts written in hedge markets.

While the hedge market was primarily developed onshore, because regulations prevented non-residents from taking out cover in Australian hedge

… and overseas interbank NDF markets were created …

markets, interbank hedge markets in Australian dollars were established in overseas financial centres. However, Australian trading banks still played a prominent role. These offshore markets were smaller than onshore hedge markets, with estimated turnover in North American markets of around A$2–3 billion each year. An important distinction between onshore and offshore Australian dollar hedge markets relates to the currency of settlement. In the onshore market, settlement of hedge contracts was in Australian dollars. This circumvented restrictions on foreign currency transactions (eg no forward cover for foreign capital transactions). In contrast, in offshore markets settlement could not take place in Australian dollars, due to the prevailing exchange controls (eg restrictions on foreigners borrowing Australian dollars). Therefore settlement in offshore markets was in US dollars.

… but markets were still not adequate

Despite the development of the onshore hedge market, it was argued that the forward markets during this time were still inadequate: capital investors did not have direct access to deliverable markets, and NDF markets lacked depth and range, at times showing poor ability to handle moderate- to large-sized transactions. Restrictions on non-resident participation in the NDF market and on banks' ability to hold balances abroad were two factors contributing to this.

Asian NDF markets

Asian NDF markets are similar to the Australian hedge market

Notwithstanding a gap of around 30 years, there are a number of similarities between the Asian NDF markets of today and the Australian hedge market of the 1970s and early 1980s. As in Australia, NDF markets in Asia have developed to provide an alternative hedging tool. In Asia, such hedging has been desired by foreign investors with local currency exposure and has arisen when convertibility of a currency is restricted or the domestic market in the currency is illiquid. NDF markets also allow investors to take investment positions in non-convertible currencies. The use of NDF markets by residents typically reflects the desire of resident exporting and importing companies to hedge their international trade-related currency exposures for those transactions subject to capital controls.

Similar capital controls

The foreign exchange restrictions and capital controls currently in place in selected Asian markets are very similar in nature to those formerly imposed in the Australian market.[6] As was the case in Australia, the restrictions in today's Asian forward currency markets are designed to limit short-term capital flows not related to trade and direct investment and to discourage foreign market participants from holding short or long positions of a size that might exert pressure on the spot exchange rate. These restrictions take a number of forms. First, some Asian countries rely on formal approval processes or qualified investor schemes for foreign participants in onshore currency markets. Second, most countries only permit hedging for transactions relating to trade and

[6] See Giacomelli et al (2006) and Citigroup (2006) for overviews of restrictions in Asian currency markets.

foreign direct investment, often referred to as real transactions.[7] Third, non-residents are not allowed to borrow or fund themselves in the onshore market, except for clearly trade-related purposes. Finally, some countries, in contrast to Australia, also restrict the counterparties with which foreign market participants can interact in the onshore currency market.

Similar structure

Ma et al (2004) analyse prices in these markets to measure the impact of capital controls. Similar to the Australian hedge market in the early 1980s, Asian markets have well established trading and pricing practices and well organised market-making arrangements (Box 2). This is in part due to collaborative efforts by both market participants and policymakers in the country hosting these offshore markets.

Trading patterns in Asian NDF markets are comparable to those seen in the Australian hedge market, in that a large share of overall trading is between dealers. In both Asian NDF markets and the hedge market, the share of inter-dealer trading was more than three quarters of all trading.[8]

Extensive use of brokers

Although Asian NDF markets have matured in recent years, similar to the Australian hedge market, there is extensive use of third-party specialised voice brokers in these markets. In most NDF markets, the majority of, and in some cases virtually all of, the market-makers' non-client NDF trades are mediated by brokers rather than directly bank-to-bank. Although less efficient than electronic brokerage, voice brokers have probably helped the major NDF markets evolve to have sufficient depth and liquidity to enable market-makers to quickly offset their positions incurred through market-making activities.

Key differences between Asian and Australian NDF markets ...

There are, however, differences between the Asian NDF markets and the Australian hedge market. First, Asian NDF contracts are settled entirely in a foreign currency, specifically the US dollar, while the Australian hedge contracts were settled in the local currency, namely the Australian dollar. Second, the Asian NDF markets are located offshore, while the Australian market was an onshore market. Third, in contrast to the Australian case, where the hedge market was more influenced by local participants, global banks play a more important role in current Asian NDF markets.

... reflect a number of factors

The differences between today's Asian NDF markets and the Australian hedge market reflect a number of factors. Discussions with market-makers in Asia suggest that one important reason for the offshore location and the settlement in US dollars is that a lack of access to the domestic money markets limits market-makers' ability to hedge onshore, even when a local forward market exists. This was not the case in Australia, where the participants were local institutions which had access to the domestic money market. Second, market-makers have taken advantage of economies of scope by concentrating NDF trading in different currencies in a single location, predominantly Singapore.

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[7] Until it started deregulation in 1984, Japan had in place similar restrictions on capital flows. See Osugi (1990).

[8] This is in contrast to the markets for major currencies. In 1995, nearly two thirds of all foreign exchange transactions were carried out directly between dealers. By 2004, only about every second trade took place in the interbank market. For a discussion of this, see Galati (2001) and BIS (2005).

Box 2: Size and structure of Asian NDF markets

Asian NDF contracts are traded over the counter (OTC) and offshore, with trading predominantly taking place in Singapore, followed by Hong Kong and, to a lesser extent, London and Tokyo. As NDF markets are OTC, it is difficult to gauge the volume of contracts traded and who trades. However, discussions with market participants suggest that liquidity has improved as turnover in Asian NDF markets has grown significantly in recent years (see Ma et al (2004) for data on size and liquidity in 2003/04). In addition, an NDF market for the Malaysian ringgit has developed in recent years.

Turnover and liquidity of Asian NDF markets

	Contract tenures	Asian inter-dealer market daily trading volume, US$ millions	Trade size, US$ millions[1]	Bid-ask spread, basis points
China	Liquid to 12 months, limited liquidity 3–5 years	700	10	3–5
India	Liquid to 12 months, limited liquidity up to 5 years	500	5–10	3–5
Indonesia	Moderate liquidity up to 12 months, illiquid beyond	250	3–5	10–20
Korea	Liquid to 2 years, limited liquidity to 5 years	2,000	10	2
Malaysia	Moderate liquidity up to 12 months, illiquid beyond	450	5	10–12
Philippines	Moderate liquidity to 12 months, limited liquidity 3–5 years	250	3–5	7–9
Taiwan (China)	Liquid to 12 months, limited liquidity up to 5 years	1,000	5–10	2–4

[1] Trade size possible without moving prices on "normal" days.

Source: BIS estimates, 2006 Q2, based on discussions with Citigroup, Deutsche Bank and JPMorgan Chase.

In general, pricing is based on the interest rate parity formula, which determines equivalent returns over a set time period based on two currencies' interest rates and the current spot exchange rate. When international investors have little access to a country's onshore interest rate markets or deposits in the local currency, NDF prices are based primarily on the expected future level of the spot exchange rate.

Also, major financial institutions are involved in NDF markets through their market-making activities. Market-makers typically offset NDF positions incurred through market-making activities with other major banks through the inter-dealer market. These positions can be shifted between banks until a corporate customer is willing to take an opposing position. For NDF currencies where there are relatively well developed onshore currency, bond and interest rate markets, international banks are, to a limited extent, also used to offset risks onshore.

This dominance of a single location may also in part explain the more prominent role of global and large regional players in the Asian markets, as these are more capable of taking on a market-making role in a range of regional currencies. Finally, the concentration in a single offshore location also reflects the fact that the global financial system today is more integrated than it was in the 1970s and 1980s, as well as the significant advances in the use of IT in the financial industry.

Transition to a deliverable forward market in Australia

Australian hedge market was replaced by deliverable markets in the early 1980s

When restrictions on forward transactions in the deliverable market were removed in Australia in 1983, the hedge market faded out over several years and was replaced by the deliverable forward market which exists today. Several developments contributed to the emergence of this market. First, over time, the variation in forward margins became larger, reflecting larger variations in interest rates and speculation surrounding future exchange rate movements. For example, the announcement in February 1983 of Australian federal elections in early March saw heightened nervousness and volatility in financial markets. Substantial outflows of short-term capital and a significant premium on the US dollar (well in excess of interest differentials) were observed, reflecting expectations of an imminent and sizeable devaluation of the Australian dollar. This eventually occurred in the form of a 10% devaluation of the trade-weighted effective exchange rate shortly after the change of government at the elections.

Financial integration eroded capital controls

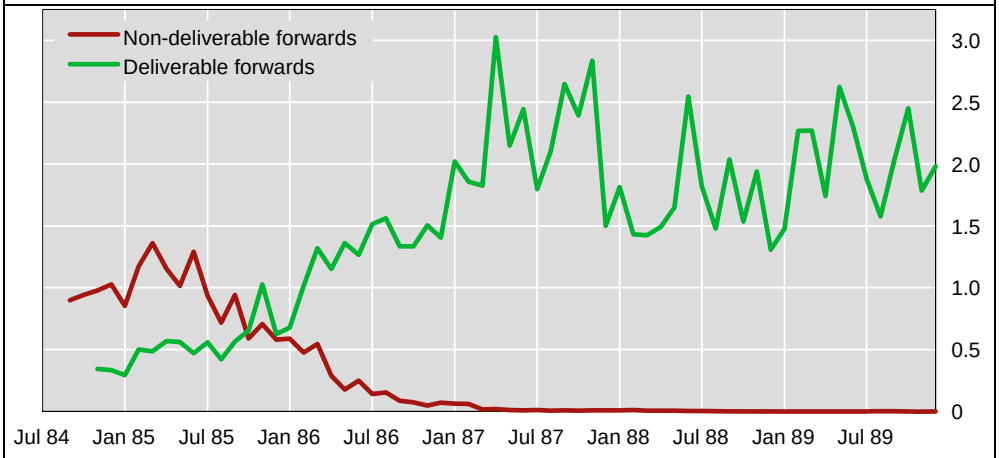
Second, in the early 1980s, alongside the increased integration with overseas financial markets, the growth of the currency hedge and futures markets themselves contributed to the erosion of the effectiveness of exchange controls.[9] Eventually, in late October 1983, a significant change was made to forward foreign exchange arrangements, with the RBA withdrawing from day-to-day operations and removing outer limits on banks' dealings with customers. Forward rates were then allowed to respond directly to the forces of supply and demand, and banks could deal in forward exchange with customers at mutually agreed rates. Banks were no longer required to clear their net forward positions with the RBA, and could now offset forward positions, within limits, using spot positions. The "seven day rule" was also abolished, although non-trade-related transactions remained ineligible for forward cover until June 1984. Shortly after the float of the spot exchange rate in December 1983, the RBA also closed its net forward position. The forward rate had been floated in October, allowing banks to take spot against forward positions. By the time of the float of the spot exchange rate in December, the spot spread in the hedge market was equivalent to that in the deliverable market, as banks could arbitrage between markets.

By mid-1987, turnover in the hedge market was negligible, while turnover in the deliverable forward market rose steadily in substitution (Graph 1). The increase in turnover in the deliverable forward market reflects in part an increase in the number of market participants. During 1984, foreign exchange dealing authority was given to 39 non-banks, a number of which were important participants in the hedge market. By the end of 1987, 59 non-banks were authorised foreign exchange dealers. Another reason for the increase in

[9] Laker (1988).

Turnover in Australian dollar forward markets, 1984–89

Average daily volumes, in billions of Australian dollars



Source: Reserve Bank of Australia. Graph 1

turnover is that commercial banks, rather than policymakers, encouraged non-financial corporations to participate in the deliverable forward market.[10]

Hedge market improved trading skills

In terms of the broader development of the Australian financial system, the foreign currency hedge market, together with trading in third currencies (such as the US dollar against the Deutsche mark), yielded an important benefit, namely that the hedge market had enabled market participants to develop their trading skills. This facilitated the functioning of the foreign exchange market when the exchange rate was floated. The skills that had been developed by market players to participate in the hedge market were easily transferable to the deliverable forward market and the deregulated foreign exchange market more generally once the Australian dollar was floated and capital controls were removed in the first half of the 1980s. This undoubtedly eased the transition from the managed regime to the floating regime.

Lessons for the Asian markets

Australian experience holds lessons for Asia

There are three lessons that can be drawn from the Australian experience for today's Asian NDF markets. First, today's Asian NDF markets may facilitate a transition to fully convertible currencies by providing an interim hedging opportunity. Second, the market infrastructure developed for NDF markets can be adapted to the deliverable market. Finally, NDF markets allow for the development of trading experience and skills that are transferable to the deliverable forward market, provided that local market participants have access. The differences between the Australian hedge market and current Asian NDF markets do, however, add some nuance to these lessons.

Limited hedging possibilities in NDF markets

Despite the benefits of NDF markets for hedging purposes in Asia, particularly for currencies of countries attracting significant foreign investment,

[10] Australian dollar futures continue to be traded on the Sydney Futures Exchange, although activity is smaller than in the deliverable forward market. The largest amount of activity in Australian dollar futures is on the Chicago Mercantile Exchange.

market participants cite a variety of limitations which are likely to be relevant in a period of transition. The first and most important limitation in Asia is that only global institutions and a restricted number of domestic institutions are able to use these instruments. Second, for most markets there is limited liquidity in contracts with a maturity over one year. Third, there is no guarantee that the holder of the contract will actually be able to trade foreign exchange at the fixing rate. An implication of this is that when a change in exchange rate regime is anticipated, there is a greater likelihood that the validity of the fixing rate as an indication of where a trade can be transacted is significantly diminished. Finally, the usefulness of NDF markets for hedging purposes in periods of market stress may be limited.[11]

Asian NDF markets are offshore …

Asian NDF markets are located offshore, which might reduce their importance in a transition to a fully convertible currency. In particular, with NDF trading taking place offshore, local market participants may not have the same opportunities to develop their trading skills as they would have with an onshore market. However, there are reasons to believe that participants in Asian markets are already developing transferable trading skills. First, the significant presence of both global and regional players in Asian NDF markets suggests that some locally active market participants are already endowed with sophisticated trading skills. Second, in some Asian markets, onshore participants have at least limited access to offshore NDF markets. For example, Korean banks have had access to the Korean won NDF market since 1999, and daily transaction volumes are significant (Bank of Korea (2006)). Also, onshore banks can sometimes gain indirect access to NDF markets via offshore subsidiaries, such as a subsidiary of a Chinese bank located in Hong Kong trading in the renminbi NDF market. Third, in some countries (eg China) local market participants have greater access to deliverable forward markets than was the case in Australia prior to 1983.[12] In this respect, access to forward markets, either deliverable or non-deliverable, may be the key element in developing skills and experience, rather than the actual location of the market.

… but local players do participate

Concluding thoughts

NDF markets may facilitate transition to a deliverable forward market

The Australian experience suggests that the transition to a deliverable forward market benefits from the fact that NDF market participants' skills and experience are transferable. Thus, in addition to providing a tool to manage exchange risk, the presence of an NDF market can facilitate a transition to a deregulated foreign exchange market. That is, NDF markets can be seen as an intermediate tool in the progress of market development from limited to fuller

[11] Following the end of the Argentine peso's peg against the US dollar in late 2001, Argentine authorities called an unscheduled market holiday for three weeks. This led to a disruption in determining the settlement rate of outstanding peso NDF contracts. As a result, even after foreign exchange trading resumed, the NDF market in pesos was stymied by continued uncertainty over fixing rates to be used for settlement. See Lipscomb (2005).

[12] In August 2005, new regulations enabled licensed banks operating in China to trade renminbi forwards and to enter into renminbi swaps. See People's Bank of China (2005).

currency convertibility. As illustrated by the Australian experience, once a currency becomes fully convertible, NDF markets tend to disappear.

While risks from NDF markets exist …

There are, admittedly, risks to condoning NDF markets for countries seeking to keep short-term capital movements under control as financial markets develop. One risk is that pressures for appreciation or depreciation may flow from the NDF market to the spot market by making capital flows larger and more volatile. A second risk is that NDF markets may make it easier for sizeable speculative positions to build up. This may affect not just the currency in question, but also other "proxy" hedging currencies.

… policymakers could consider condoning NDF markets

Nevertheless, for policymakers interested in facilitating a transition from a non-deliverable to a deliverable forward market, the comparison between the Australian hedge market and current Asian NDF markets suggests that policymakers do have a role to play. First, condoning rather than discouraging NDF markets may be desirable, because an NDF market may provide a "training ground" for both domestic and foreign market participants that allows them to improve both analytical and trading skills. Second, policymakers may consider the potential benefits of having large global players commit to taking an active role in organising markets, similar to the one they are given in some countries as primary dealers for government bonds. Finally, whether the market is onshore or offshore can influence the process of evolution, but at least as important is whether policymakers allow local institutions to participate in the NDF market, regardless of its location.

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