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Foreign Exchange Auctions and Fixings: A Review of Performance

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Abstract

Flexible exchange rates regimes have become more apparent in developing countries during the 1980s, and a number of developing countries have adopted floating exchange rates within the context of interbank markets, but occasionally auction markets have been used. This study concentrates on developing countries where floating exchange rate regimes have been implemented in the form of auction markets. Its purpose is to assess how these arrangements have performed and whether they have provided a useful means of facilitating further development of foreign exchange markets. We also review the official fixing systems used by some countries with floating exchange rates.

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Summary

Recent developments in developing countries' foreign exchange markets suggest that the need for more flexible exchange rates became apparent during the 1980s, evidenced by shifts in the exchange rate regimes toward more flexible arrangements, including floating exchange rates. A number of developing countries have adopted floating exchange rates within the context of interbank markets, but sometimes auction market arrangements have also been used.

This study provides an analysis of the group of developing countries that have adopted floating in the context of foreign exchange auctions. Its surveys the major issues relating to foreign exchange auction arrangements, both in theory and in practice, and attempts to identify potential advantages and disadvantages of auction mechanisms. The study provides a guide to the actual operations of an auction market, and reviews the official fixing arrangements used by some developing countries with floating exchange rates.

The study accepts that auction markets in principle are likely to improve the allocation of foreign exchange while providing a transparent way of determining the price of foreign exchange. But the paper says the practical efficiency of auction markets is often undermined by government interference and manipulation of the auction-based exchange rate as well as the allocation of foreign exchange, which has led to situations where the credibility of the auction market is lost and the transparency of the auction system becomes doubtful. Sometimes market efficiency has been undermined because foreign exchange has been concentrated in the hands of a few influential buyers or sellers who were able to manipulate the market-based arrangement. Further, auction market arrangements have not generally succeeded in unifying official and parallel exchange rates.

Because of inconsistencies between macroeconomic policies and the desire to maintain a strong official presence in the foreign exchange market, auction market arrangements have rarely been sustainable in the long run. In fact, some developing countries that have introduced auctions have eventually terminated them and returned to a fixed exchange rate regime. Other countries that have continued to maintain an auction arrangement have combined it with an interbank market, but this raises questions about the degree of transparency and the transitional contribution that the auctions may have made to the efficiency of foreign exchange allocation.

Some developing countries use official fixing arrangements, either to fix the rate for the interbank market or to establish a rate to effect official transactions. Although such arrangements may, in the interim, be justified on the basis of lack of an efficient interbank market, in the longer run it is clear that direct interbank transactions should be encouraged. Since the fixing arrangements often underscore the centralized allocation by forcing most transactions through the fixing system, thus limiting the scope of the interbank trading, they are likely to slow down the development of a genuine interbank market.

I. Introduction

In the post-war period prior to the 1980s, most developing countries pegged their currencies to a single foreign currency, in most cases the U.S. dollar, but the French franc was also utilized occasionally. More flexible exchange rate regimes were used by some countries, but they were rare. 1/ 2/ Mounting difficulties due to higher domestic demand pressures, evident in the more rapid inflation rates relative to the partner countries and poor external performance, and uncertainty associated with fluctuations in the exchange rates of industrial countries, quickly eroded the usefulness of a fixed exchange rate arrangement and prompted movement toward more flexible exchange rate regimes. There is a wide body of literature that analyzes the relative merits of fixed and flexible rate regimes, 3/ but no uniform answer exists to the question of whether a fixed exchange rate is more appropriate for a small country than a flexible rate. Notwithstanding, the relative share of developing countries that have moved to a flexible exchange rate regime, either in the context of an interbank system or an auction market arrangement, has increased rapidly, exceeding 40 percent at the end of 1993, while the share of those developing countries that continue to peg their currencies to a single foreign currency has fallen to about 40 percent.

There are differences in the institutional arrangements relating to the establishment of auction and interbank markets. 4/ For instance, the institutional capacity of the financial sector to carry out intermediation and the competitiveness of the foreign exchange sector are raised as issues, but also the authorities' desire to have closer control over the foreign exchange flows has influenced the choice of arrangement. When the interbank

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1/ For the purpose of this study more flexible exchange rate regimes include managed floats and independently floating exchange rates. In 1982, when the auction market was implemented in Uganda, only 14 percent of developing countries utilized floating exchange rates, while 60 percent of developing countries pegged their exchange rates either to a single currency or to a composite of currencies (IMF, 1983).

2/ In 1953, Brazil instituted a system of auctions for the allocation of the available foreign exchange. The monetary authority sold certificates at auction which provided the right to obtain an import license and to purchase the amount mentioned in the certificate of foreign exchange at par (plus the remittance tax). The auctions represented an improvement in the allocation of foreign exchange over the previous system, but also created new problems. For instance, the auction premia tended to fluctuate frequently, while the system generated multiple exchange rates. The Brazilian auction system has been analyzed by Alexander Kafka (1956).

3/ Some recent studies include Svensson (1993), Corden (1993), Edwards (1992), and Honkapohja and Pikkarainen (1992).

4/ These two market types may be distinguished on the basis of the degree of centralization of foreign exchange allocation, treatment of the supply of foreign exchange to market, and the frequency of exchange rate adjustments.

markets have been adopted by the developing countries, their financial systems have been relatively well developed and a sufficient number of foreign exchange banks has existed, together with other nonbank dealers, to ensure the competitiveness of the market at the outset of floating. In those developing countries where the national authorities thought that the financial system lacked sufficient depth, auction markets have been seen as an alternative means of establishing market-based exchange rates.

The size of the foreign exchange market, measured either in terms of volume or the number of transactors, is likely to influence the efficiency of allocation associated with centralized and decentralized market structures. When the foreign exchange flows are limited in scope, an auction market may provide a more efficient means of allocating the foreign exchange resources than an interbank market, because the centrally organized system consolidates the buying and selling orders into a single market. As the size of the market increases, a centralized market is likely to become inefficient compared to decentralized allocation of foreign exchange. By end-1982, 21 developing countries classified their exchange rates as either managed or independently floating regimes, but only Uganda and Sierra Leone implemented the floating exchange rates within the context of an auction market. 1/ The number of developing countries with floating exchange rate regimes had risen to 75 by end-1993, but only 12 of them are using auction markets in any way for exchange rate determination (Table 1 provides a summary of the features of the auction arrangements). 2/

The aim of this study is to provide an analysis of a sample of developing countries that have adopted floating in the context of foreign exchange auction markets. The paper surveys the major issues related to foreign exchange auctions, both in theory and in practice, and attempts to identify the potential advantages and disadvantages of auction mechanisms. The study also provides a guide to the operations of auctions in the foreign exchange markets for those unfamiliar with such arrangements. Some guidance is provided by several earlier studies that have analyzed the workings of foreign exchange markets in the developing countries, including Krumm (1986), Quirk et al. (1987), and Kimaro (1988); however, most of these studies cover a relatively short time period of the experience with auction arrangements among the African and Latin American countries, as the studies were conducted soon after floating was introduced in these countries. Also, several formerly centrally-planned economies of Central and Eastern Europe

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1/ The auction arrangements in Sierra Leone and Uganda were short-lived and they were terminated soon after their inception: Sierra Leone in 1983 and Uganda in 1985 (both countries moved back to a pegged regime).

2/ Auction markets, or fixing systems, are presently used in Bolivia, Ethiopia, Guatemala, Guinea, Romania, and Viet Nam. Uganda used to have an auction market, introduced in 1988, but this was terminated in 1993 when the country moved to a unified interbank system. Russia and some countries of the former Soviet Union use auction markets.

Table 1: Summary of Auction Arrangements

Country	Auction facility introduced	Terminated	Bidding Technique	Organizer	Frequency of Auctions	Access to Auctions	Surrender	Interbank Market	Other Information
Bolivia	1985	No.	Discriminative auction.	Central Bank	Daily	Unrestricted	All visible receipts	Yes	
Ethiopia	1993	No.	discriminative auction.	Central Bank	Fortnightly	Final users (imports on a positive list)	All receipts	No	
Ghana	1986	Yes, 1992.	Uniform-price auction in the first tender session, then discriminative auction.	Central Bank	Weekly	Final users (imports on a positive list)	Partial	Yes	Wholesale auction introduced in 1990, access to authorized dealers
Guatemala	1990	No.	Uniform-price auction in the beginning, then discriminative.	Central Bank	Daily	Authorized dealers	All visible receipts	Yes	
Guinea	1986	No.	Uniform-price auction.	Central Bank	Weekly	Final users	Partial	Yes	
Jamaica	1983	Yes, 1988.	Uniform-price auction.	Central Bank	Four time/week; then twice/week	Authorized time/week, then twice/week	Partial	Yes	
Kazakhstan	1992	No.	Uniform-price auction.	Central Bank	Weekly	Final users	Partial	Yes	
Lithuania	1992	Yes, 1993.	English auction.	Central Bank	Fortnightly	Unrestricted	No surrender	Yes	Nonresidents may only sell foreign exchange in auctions
Moldova	1992	Yes, 1993.	Uniform-price auction.	Central Bank	Weekly	Final users	Partial	Yes	
Nigeria	1986	Yes, 1988. Was reintroduced in 1990, and terminated again in 1992.	Uniform-price auction in the beginning, then discriminative auction.	Central Bank	Weekly, but later daily	Authorized dealers	Partial	Yes	Surrender only for hydrocarbon receipts
Sierra Leone	1982	Yes, 1983.	Uniform-price auction.	Central Bank	Fortnightly, but later monthly	Final users (imports on a positive list)	Partial	No	
Uganda	1982	Yes, 1985.	Uniform-price auction.	Central Bank	Weekly	Final users, and banks on their own account	Full	No	
Ukraine	1992	No.	Uniform-price auction.	Central Bank	Weekly	Final users	Partial	Yes	
Zambia	1985	Yes, 1987.	Uniform-price auction in the beginning, then discriminative auction.	Central Bank	Weekly	Final users	Partial	Yes	

have adopted floating rate regimes in the context of auction mechanisms. In these countries, auction markets have often been preferred over an interbank market to address problems associated with a weak institutional structure, highly segmented banking sector, and the weakness of the payments system.

This study finds that the auction market arrangements implemented in the foreign exchange markets have rarely been sustainable, reflecting the failures of fiscal and monetary policies, as the countries terminated their arrangements and returned to fixed exchange rate regimes. Some countries have continued to maintain foreign exchange auctions despite functioning interbank markets, which raises questions about their transparency and the contribution to the efficiency of foreign exchange allocation. Where the authorities of developing countries have introduced auction arrangements in order to established market-based exchange rate regimes, these markets have suffered from lack of transparency and efficiency, interference by the local government, as well as manipulation by influential buyers and sellers of the foreign exchange. Further, foreign exchange auctions have rarely succeeded in unifying the official and parallel exchange rates, while the scope of the permissible foreign exchange transactions channeled through auction markets has remained limited in most cases. Auction fixings are sometimes used by some developing countries to supplement interbank trading; however, these fixing systems have often slowed down the development of genuine interbank markets, and significant limitations are usually imposed on the transactions allowed through the interbank market or the interbank exchange rate is only allowed to fluctuate within limits of the fixing rate. 1/

The paper has been organized as follows. Section II discusses briefly the underlying reasons why some developing countries have moved to auctions or interbank markets. A review of the earlier empirical studies on foreign exchange auctions is provided in Section III. The theoretical and practical issues related to the operations of auction markets are analyzed in Section IV, while Sections V and VI provide assessments of the performance of the auction and fixing arrangements in few developing countries. Section VII concludes the paper.

II. Why Have Auctions or Interbank Foreign Exchange Markets?

The experience with fixed exchange rate arrangements among developing countries suggests that nominal exchange rate stability has in many instances been entertained at the expense of the loss of external competition, balance of payments problems, distortions in relative prices and the allocation of foreign exchange, and the emergence of parallel markets for foreign exchange. Thus, fixed rate regimes have not ensured credibility or generally helped to solve external sector imbalances. In

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1/ In a fixing session, both the supply and demand are determined on the basis of the bids and offers, while the rate moves up and down in response to live quotations.

order to cope with these problems, several developing countries have introduced sizeable devaluations to correct the distortions associated with overvalued currencies and to reduce the size of the parallel market, but due to continued inconsistency between the fixed rate regime and the underlying macroeconomic policy, only in a few cases have these discrete devaluations achieved permanent improvements in the economy, or presented a viable option for policy makers over the long run. Also political pressures associated with frequent and large exchange rate changes have been substantial.

Lack of internal and external stability has been a major problem for many developing countries and a low level of official external reserves has made it difficult to maintain a credible commitment to the fixed exchange rate regime. The external reserve position has been further aggravated by a chronic balance of payments crisis, resulting from an overvalued exchange rate and lack of competitiveness. These developing countries often financed their balance of payments deficits by accumulating external payments arrears and relied heavily on exchange restrictions on international transactions (for both current and capital) in order to control their foreign exchange flows, including foreign exchange budgets and quantitative restrictions on imports and exports. These controls created additional incentives for the public to bypass the official exchange system through parallel markets and aggravated the foreign exchange shortage situation further.

During the 1980s many of these countries adopted auction and interbank market arrangements to implement a floating exchange rate regime, therefore shifting emphasis toward a market-based method of determining the exchange rate. This also released the government from political consequences related to the frequent exchange rate changes. These auction and interbank markets were often adopted within the context of stabilization programs in order to emphasize the need to achieve a sustainable external competitiveness through tight fiscal and monetary policies, ensure a low inflation rate and a stable exchange rate development.

The desire for exchange rate flexibility has been an important part of the design of stabilization programs for the developing countries, where the main concern has been the achievement of a sustainable balance of payments position and a current account deficit that could be financed with capital inflows. Over the years, the emphasis of these programs has shifted on the exchange rate adjustment as an instrument to correct the overvaluation of a currency, evident in the share of adjustment programs which have included exchange rate action as a program objective. In fact, during 1963-70, one-third of Fund-supported programs included a prior exchange rate action, while during the 1980s the majority of programs included exchange rate adjustment as one of the objectives of the programs. Almost 70 percent of the Fund-supported stand-by, extended, or SAF/ESAF arrangements adopted during 1985-92 included a floating exchange rate regime as a performance criteria or as a measure (these were reviewed by Quirk (1992)). Out of these 22 countries included in the study, only 4 implemented independent floating in the context of an auction market.

III. Empirical Studies of Foreign Exchange Auction Markets

Several studies have analyzed the functioning of the foreign exchange auction markets in developing countries. The study by Krumm (1986) covers experiences with auction markets in Africa and Western Hemisphere countries and provides an early overview of these experiences. The paper concludes that foreign exchange auctions have improved the efficiency of foreign exchange allocation relative to the administrative allocation. However, in order to ensure that the auction markets promote competition and improve the efficiency of foreign exchange allocation in these countries, a broad-based access to the tender sessions is needed, together with transparency of the arrangement and an easy access to foreign exchange.

The studies by Quirk et al. (1987) and Kimaro (1988) have taken a broad approach to covering the experiences of developing countries with interbank and auction markets. Quirk et al. (1987) conclude that auction arrangements have not been without problems. In some cases, for instance, the demand for foreign exchange by the public sector enterprises was satisfied outside the auction market, and retention privileges were granted to many private sector enterprises. As a result, the portion of foreign exchange channeled through the auction market declined substantially, in some cases to about 25 percent of the total exports receipts, which clearly undermined the efficiency of an auction market and the provision of foreign exchange for other import needs.

Kimaro (1988) examines floating regimes in African countries and notes that in this group of countries the auction market was often the only officially recognized market, whereas commercial banks acted merely as the intermediaries to organize and submit bids on behalf of the importers, rather than to facilitate direct sales or purchases of foreign exchange on their own account. One clear benefit associated with the auction-based exchange rates was that they encouraged surrender of foreign exchange to the official market, as the overvaluation of the exchange rate dissipated and confidence toward the market-based arrangement improved. However, the failure to enforce official surrender remained a problem in many developing countries.

Bolivia's experience with a foreign exchange auction market was recently reviewed by Dominguez (1991). Although in Bolivia the auctions have resulted in a de facto crawling peg, Dominguez argues that the arrangement has improved exchange rate stability in the highly indexed Bolivian economy. There, the instrument of exchange rate policy has been a reserve price established on the basis of an annual real exchange rate target. The frequency of reserve price changes declined over the years, which improved the information content of the reserve price and the transparency of the auction market, and made the reserve price easier to predict by reducing exchange rate fluctuations as evidenced by the lower standard deviation. However, the transparency of auctions in determining the spot exchange rate has been undermined since the number of sessions with the maximum bid price equal to the reserve price has been high, rising from 2 percent during the period 1985-86 to 65 percent in 1990.

Tenorio (1993) examines the auction arrangement of Zambia and provides an interesting evaluation of the bidding techniques used in these auctions. The study concludes that a significant revenue disparity emerged due to the change in the bidding technique from uniform to discriminative. The market-clearing exchange rate was less depreciated when the bidding was conducted using the discriminative technique than in the uniform-price bidding where bidding was more aggressive, but the use of the discriminative technique had a negative effect on the participation rate and exchange rate spread between the highest bid and the market-clearing bid price. Hence, revenues averaged higher in the uniform-price auction than in the discriminative auction due to higher participation rate and more aggressive bidding, which then pushed the market-clearing exchange rate up.

Wulf (1989) studies the underlying reasons for the apparent failure of the Zambia's auction experiment. 1/ He argues that widespread uncertainty associated with the future economic policies of the government and relative prices, large and persistent budget deficits, the perceived loss of exchange controls as policy instrument, and substantial rigidities in the economy in general were instrumental factors for the failure. Further, the supply of foreign exchange provided to each tender session was often erratic and less than what was anticipated by the public, while the central bank modified the auction rules frequently and intervened in order to slow down depreciation of the rate.

Aron and Elbadawi (1993a and 1993b) study the implications of foreign exchange auctions in Sub-Saharan Africa. Among other things, the paper argues that a reserve price rule facilitated stability of the exchange rate in some developing countries with auctions while consistent macroeconomic policies remained crucial for the success of the reserve price policy. The use of a legalized bureaux market deepened the foreign exchange markets and eliminated the premium associated with illegal trading. The parallel market exchange rate provided an indicator for the macroeconomic policy, as well as for the credibility of an exchange system. The depreciation of the auction-based exchange rate has been consistent with increased market liberalization and enhanced competition, and as such stabilized these auctions and fostered long-term unification. On the other hand, in cases where entry restrictions have been used to deter depreciation, such policies have back-fired and only accelerated speculative behavior. Finally, the authors argue that a gradual liberalization provides time for institution-building and learning by the economic agents, and an auction market could be useful where the market is operated in conjunction with special funds, such as stabilization funds, or the allocation of foreign exchange may not be competitive and efficient due to state-owned banks or highly concentrated commercial banking sector.

1/ In Zambia, the auction market was introduced in 1985, but was later terminated when the authorities moved to U.S. dollar peg in 1987.

Feldman and Mehra (1993) discusses more generally applications of auction markets, including the auctions of U.S. government securities, central bank credit, foreign exchange, and property in transition economies. The market for U.S. government securities is a primary market, participated in by a group of primary dealers who submit their multiple bids with different price-quantity combinations in each tender session, while noncompetitive bids are also allowed from individual investors. The authors argue that the uniform price auction would seem appropriate if an active market exists since this would minimize the likelihood of collusion and reduce costs of information collection, while a discriminatory auction would be more appropriate where the market is thin since the benefits from information gathering encouraged by the bidding process would outweigh the dead-weight loss associated with less than optimal information collection. Auction markets have been used by central banks to disburse refinanced credits to the financial market, or to allocate foreign exchange. Relative to the administrative allocation of credit or foreign exchange, the auction arrangement facilitates transparency and therefore improves the efficiency of allocation. Auctioning is thus seen as offering the advantage of simplicity in determining market-based prices when markets are thin or nonexisting.

IV. The Characteristics of Auction Systems

1. Theoretical considerations

The theory of auctions provides one way of approaching the question of price formation in the market place. In order to illustrate the issues at hand, let us consider a standard competitive model where a large number of potential buyers and sellers transact with one another. It is assumed that the market is competitive and buyers and sellers are unable to influence the equilibrium price or quantity, and consequently behave as price takers, but the model is not informative about the mechanism that generates the market-clearing prices. This is where the auction theory becomes useful since we may approach the problem of price determination by assuming that the market-clearing price is determined by a Walrasian auctioneer. The theory provides an explicit, though limited, mechanism of price formation, but its relevancy in practice is substantial because auctions are used in many markets and the value of commodities exchanged is considerable. 1/

In general, an auction market is a well-defined institution which can be characterized with a set of regulations governing the exchange of goods. These regulations are very important for the exchange process because they have a direct impact on the allocation of resources, prices charged from a successful bidder, participation in a tender session and the incentive to

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1/ Items sold through auctioning include works of art, books, antiques, agricultural products, mineral rights, treasury bills, and other financial instruments, including foreign exchange.

bid. Auctions may be organized for a single unit of good, such as a piece of artwork, or for multiple units, such as foreign exchange where the units are usually homogeneous.

Auctions are usually organized by a single subject, such as the central bank or the government of a country. It is important that the organizer has the ability to commit himself, in advance, to a set of rules governing the auction process which are then revealed to the participants. The organizer should possess the credibility to assure the participants that certain rules would be followed and not changed during the bidding process, although this might be in the interest of the organizer. Such advance commitment is the feature that significantly affects the bidding and allows the organizer to maximize his monopoly gains from the exchange. It would also influence the transparency of the arrangement. Once the organizer has made a commitment to a set of rules, reneging on them usually becomes very costly and it may result in an inability to make a credible commitment in the future.

An essential element of an auction market is asymmetric information and lack of information on the private valuations of bidders is crucial to the auction outcome. If the organizer is able to collect information concerning the private valuations in advance, an auction becomes unnecessary since the organizer may as well sell the item to the individual with highest private valuation of the item by simply posting a price (in order to maximize the return to the seller; the price should equal the highest private valuation of the item). In practice, private valuations are not known. Therefore, the organizer may benefit from the bidding process to drive up the price of the item, but it is not always guaranteed that the participant with the highest private valuation receives the item (see earlier). A question relating to the lack of information is whether auctions provide a more feasible method of disbursing an item to the market than just posting the price and selling the item to an interested buyer. It is argued that an auction market is the most often used method when the seller is uncertain about the demand for the object. In particular, when the commodities offered for sale are different or their market values are highly variable, a posted price may not function properly. Recently, Wang (1993) analyzed the decision of a seller, relating to the choice between price-posting and auctioning of an object. He argues that this choice depends on the slope of the marginal revenue curve related to the distribution of buyers' private valuations of the item. An auction becomes attractive when the marginal revenue curve is relatively steep; this supports the argument that an auction market is often preferred when private valuations are widely dispersed and there is considerable uncertainty about the equilibrium price.

There is extensive literature on the theory of auctions which offers a systematic approach to the decision-making processes of buyers and sellers in the market. Recent developments in the auction theory have been reviewed by McAfee and McMillan (1987), among others. An auction market provides an efficient method of allocating resources. In theory, it is possible to rank various bidding techniques on the basis of their expected returns; however, the ranking is influenced by assumptions describing the behavior of bidders, including attitude toward risk, asymmetry of information and independence of the valuations of the item, while strategic considerations would also be important. In practice, auction market arrangements are often more complex than those considered in the theoretical literature and therefore it becomes difficult to judge the relative merits of alternative bidding techniques, or grant an unambiguous answer to the question on the best bidding technique.

Four basic bidding techniques can be identified, each of them suitable for either single unit or multiple unit exchange (see Table 2). The English auction, or the ascending price auction, is probably the most common auction type. 1/ In the English auction, an initial bid price is either announced by the auctioneer in the beginning of bidding (which is usually the seller's reserve price), or the starting bid price is requested from the potential buyers participating in the tender session. Following the establishment of an initial price, the auctioneer begins the process of increasing the bid price by small increments where the size of an increment is determined by the auctioneer. The process continues until there is only one bidder left. Then the item is "knocked down" to this bidder who pays his own bid price. When multiple units of identical items are sold, each individual lot is sold as a single object and each buyer is charged his own bid price. 2/ The English auction, as an open outcry auction, reduces the cost of information gathering and organizing a tender session. However, the participation in a tender session may become expensive, and inconvenient to some potential buyers, since it is required that they are physically present for the occasion. An additional disadvantage of the English auction is that it is relatively easy to manipulate the auction system, for instance, by setting a ring among several bidders who agree to coordinate their bids, and share the proceeds.

1/ The word auction comes from the Latin word auctus (meaning increase). In fact, Romans used auctions extensively in commerce, and it appears that they utilized the English-type progressive method in bidding.

2/ The English auction is utilized for the sale of livestock in the United States and wool in Australia. Recently, the English auction has been used in Lithuania for foreign exchange.

Table 2: Selective Characteristics of Bidding Processes

Type	Bidding	Pricing
English or ascending price auction	Open outcry	A successful bidder pays his own bid price
Dutch or descending price auction	Open outcry	A successful bidder pays his own bid price
Discriminative auction	Sealed-bid	A successful bidder pays his own bid price
Uniform price auction	Sealed-bid	A successful bidder pays the marginal price

1/ If the tender session is for a single unit, then this type of auction is called the first-price auction.
2/ If the tender session is for a single unit, then this type of auction is called the second-price auction.

The Dutch auction, or the descending price auction, is the converse of the English auction where the auctioneer calls an initial price which is normally significantly above the market-clearing price. This price is then lowered in small increments until a bidder accepts the offer price and pays this price for the amount he requested. 1/ When an auction is organized for multiple units, the descending bidding procedure is modified slightly. First, a bidder with the highest reservation price exercises his option to purchase a portion of the offered quantity and pays his own bid price. The remaining portion is then offered to the remaining bidders at a lower price and the price is lowered until all the available supply is fully exhausted.

The first-price auction is a common form of sealed bid auction where the highest bidder is awarded the item at a price equal to his own bid. 2/ The multiple unit generalization of this auction is called the discriminative auction where each bidder is charged his own bid price for the quantity he has bidden for. The difference between the first-price auction and the English auction is that in the former a bidder is unable to observe the bids submitted by other participants, and therefore the bidders are less likely to manipulate the bidding process (the bidders are not allowed to revise their bids during a tender session). In a discriminative auction the

1/ This type of auction is used in Holland for the sale of cut flowers.
2/ The discriminative auction is often called the Dutch auction in the finance literature.

chance of winning of an item is positively correlated with the price offered by a bidder. Consequently, the winner may end up paying a high price for the item. 1/

The second-price auction is a sealed bid auction where the bidder with the highest bid price is awarded the item at the price equal to the second highest bid price. The multiple unit version of second-price auction is called the competitive auction, or the uniform price auction, where items are awarded to the successful bidders whose bid prices equal or exceed the market clearing price, that is the lowest successful bid price. The price charged from the successful bidders, however, is the highest unsuccessful bid price. 2/ Vickery (1961) argues that this bidding technique ensures that each participant bids according to his own reserve price.

In practice, auction markets for foreign exchange have been dominated by discriminative and uniform price bidding. It is common that the method of determining the price of foreign exchange is changed after a few tender sessions. The experience shows that the discriminative bidding technique is more widely used although it is more problematic since it is likely to lead to a significant spread between the highest bid and the market-clearing bid price, thus hindering the unification process. 3/ This feature can be a real concern for emerging foreign exchange markets where the participants are not experienced and the lack of information concerning the underlying equilibrium exchange rate is a significant source of uncertainty. Spread may thus discourage participation in the sessions and facilitate parallel

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1/ This phenomenon is often called the winner's curse (Feldman and Mehra (1993)).

2/ This type of auction is rarely used in practice in its purest form, but instead it is modified so that each successful bidder pays the lowest successful bid price, i.e., the market-clearing price, regardless of his own bid price.

3/ In Jamaica, the uniform price technique was changed to discriminative bidding in 1983. In Ghana, the uniform price technique was only used for the first tender session, thereafter the discriminative bidding technique was utilized. In Nigeria, the bidding was initially conducted according to the uniform price method, but in 1987 this was changed to the discriminative technique. Zambia also switched to the discriminative bidding technique and Guatemala started with the uniform price technique, but later moved to the discriminative mechanism.

market activity. 1/ As the market becomes more informed on the causes of exchange rate movements and the participants become more comfortable with the auction process, the spread tends to narrow significantly. 2/

The incentive to collude also plays an important role in the auction markets. In principle, the English and Dutch auctions, by being open-cry auctions, are more susceptible to collusion than sealed-bid auctions since in these auction types participants are allowed to observe other bids and hence adjust their own bids accordingly while the session is in progress; such openness may lead to "behind-the scene" rings which might attempt to manipulate the bidding process. The English auction is more vulnerable to collusion than the Dutch auction, but the likelihood to collude diminishes as the number of participants increases since a ring becomes less capable of manipulating the bidding process when the number of participants is larger. On the other hand, a sealed-bid auction is less vulnerable to collusion that an open-cry auction, but there collusion may involve the auctioneer and one or more participants.

2. Features of foreign exchange auctions in practice

The frequency of tender sessions varies across countries and reflects, in part, the availability of foreign exchange for auctions, as well as the intended role of the auction market. Typically, auctions are held once a week in countries where the auction market is the only official market for foreign exchange (Ghana, Guinea, Kazakhstan, Moldova, Uganda, Ukraine, and Zambia). In some cases, however, the tender sessions are held fortnightly (Ethiopia, Lithuania, and Sierra Leone which later moved to monthly tender sessions) which might reflect the limited availability of foreign exchange. In countries where foreign exchange is widely available, or auction markets supplement interbank markets, more frequent auctions are common; this is the case in Bolivia, Guatemala, and Nigeria. When auction fixings are used, for instance in Germany, Greece, Romania, Russia, Turkey, and Viet Nam, then the tender sessions are normally held daily.

The supply of foreign exchange to tender sessions is derived from the obligatory surrender to the central bank of foreign currency receipts by the exporters. Foreign exchange surrender may be partial or complete, depending on whether the government permits the exporters to retain a portion of their foreign currency proceeds (a complete surrender is used in Ethiopia, Sierra Leone, and Uganda). Foreign exchange surrender requirements may also apply differently across exporters within a country. The purpose of using partial

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1/ For instance, in Ghana the spread between the highest bid price and the marginal price was initially about 8 percent. In Ethiopia, the spread in the first few tender sessions was close to 40 percent, but has declined since.

2/ For instance, in Bolivia the spread is very small, whereas in Ghana the spread gradually declined as the participants became more experienced with the auction mechanism.

surrender, inter alia, is to ensure the availability of the foreign exchange for exporters who mainly need it to purchase imported intermediary products used in the production of exports. When only partial surrender is required, the exporters are allowed to deposit foreign exchange on domestic bank accounts, or sell it in the interbank market. For instance, in Bolivia the surrender applies only to visible export receipts whereas all invisible receipts may be sold directly in the interbank market. Partial surrender was required for exporters in Ghana, Guinea, and Zambia, while in Nigeria the surrender only applies to hydrocarbon receipts. Partial surrender is also common in Russia and in other countries of the former Soviet Union (Kazakhstan, Moldova, and Ukraine). Lithuania, on the other hand, has no surrender requirement.

Since an auction market operates only at discrete intervals, the exchange rate applied to surrender must be decided. When a uniform price auction is used, the obligatory surrender is effected at the marginal rate obtained from the previous auction. In a discriminative auction, several alternatives exist. The authorities may use the marginal rate from the previous auction as the surrender rate (this is done in Ethiopia, Ghana, and Zambia), or they may use a weighted average of the successful bid rates from a previous tender session to effect the surrender (earlier used in Bolivia). When an auction market is implemented in the context of the dual rate arrangement (Ethiopia, Ghana, Guinea, Jamaica, Sierra Leone, and Uganda), foreign exchange obtained from the exporters through the obligatory surrender can be allocated to the auction market and to the official market at different exchange rates. For instance, in Ghana the rate used to allocate surrendered foreign exchange to the official market was more appreciated than the rate used for the auction market. These types of arrangement are problematic since they may hinder the market unification and give rise to a multiple currency practice.

Dual markets have often been part of the auction arrangement in their early stages; for instance, auction market arrangements of Ethiopia, Ghana, Guinea, Jamaica, Nigeria, Sierra Leone, Uganda, and Zambia were implemented within the context of dual markets. Multiple exchange rates are common in the economies of formerly centrally planned countries. 1/ A temporary use of dual exchange rates may reflect the partial depreciation of the exchange rate for certain official transactions, such as the imports subject to price controls or subsidized by the government, or the fact that the authorities do not view the parallel exchange rate appropriate for the unified market. However, multiple exchange rates are undesirable. This has become evident as they have caused serious distortions in the allocation of foreign exchange while lack of transparency hinders the development of international

1/ When dual exchange markets are used, the arrangement provides an implicit subsidy to the imports which are channeled through the dual, or official, market. The elimination of the multiple exchange rate therefore has fiscal implications as the subsidies provided through the dual market will need to be included explicitly in the government budget.

trade. It has also proved difficult to enforce multiple exchange rates in practice due to leakages between different markets and many countries have given up such arrangements.

The supply of foreign exchange available for the auction market may not be known to the bidders before their submission of bids. In most developing countries, the amounts to be supplied are not announced in advance. This is an important feature of auction markets because lack of relevant information on the available supply of foreign exchange increases uncertainty about the equilibrium exchange rate and hence may add to the exchange rate volatility. Sometimes the central bank has announced a minimum amount of foreign exchange it is willing to provide for a session (Uganda), but even there the authorities have relaxed the constraint and sold more than was initially announced. In Zambia, the supply announcements included limits for the maximum allocation of foreign exchange.

Regulations governing access to foreign exchange auctions vary across countries which reflects, among other things, the role of the auction markets in the financial systems (retail auction vs. wholesale auction), the nature of exchange controls and the authorities' concerns about the availability of foreign exchange in the foreign exchange market, together with social and political views concerning the appropriate allocation of foreign exchange resources. In countries where the auction market is the only officially recognized market for foreign exchange, or a significant disparity exists between the supply and demand for foreign exchange, exchange controls are usually maintained while bids are only accepted from the end-users for the selected group of imports on the positive list (Ethiopia, Ghana, Guinea, Sierra Leone, Uganda, and Zambia). Further, bids are usually channeled through the commercial banks who forward them to the central bank, but the banks are normally not allowed to supply bids on their own account. When a wholesale auction is utilized (Bolivia, Ghana, Jamaica, and Nigeria), then the participation in each tender session is limited to authorized dealers, banks and nonbank dealers, who may bid on their own account or on behalf of their customers, whereas all retail transactions are then effected through the interbank market. 1/ The wholesale nature of the auction market may also be reflected in the size of the minimum bid (US$5,000 in Bolivia and US$50,000 in Jamaica); this is designed to encourage intermediation through a secondary market, or interbank market, system. 2/ Among the countries of the former Soviet Union, access to foreign exchange auctions is usually granted to the licensed dealers who act as representatives to channel the bids of the end-user customers (Kazakhstan, Moldova, and Ukraine). In Lithuania, however, no limits have been established on participation in the tender sessions, except that

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1/ Ghana shifted to a wholesale auction in 1989. Since then the banks and foreign exchange bureaux have had access to the tender sessions.

2/ A small minimum bid may be harmful for the development of an interbank market. For instance, in Romania the minimum bid was lowered to US$2,000 which effectively eliminated the interbank market.

foreigners are not allowed to buy foreign exchange in the sessions. In countries with fixing systems, the access to markets is limited to banks and other authorized dealers who are allowed to buy and sell foreign exchange on their own account (Romania, Russia, and Viet Nam).

V. The Assessment of the Performance of Currency Auctions

During the past ten years or so, a number of developing countries have implemented flexible exchange rate regimes within the context of an auction market: Uganda and Sierra Leone (1982); Jamaica (1983); Bolivia and Zambia (1985); Ghana, Guinea, and Nigeria (1986); Guatemala (1990); and Ethiopia (1993). 1/ Among the formerly centrally-planned economies, including some countries of the former Soviet Union, market-based reforms have occasionally been implemented within the context of auction markets. In these countries, where the authorities are faced with problems relating to deficiencies in the institutions and payments systems, foreign exchange auctions have been regarded as one way of addressing these difficulties. Experiences in these countries suggest that new institutions may be created quickly, evidenced by a rapid emergence of new commercial banks and other foreign exchange dealers in the market. While markets for foreign exchange have begun to function, interbank markets lack depth to be efficient and the markets have remained highly segmented. Notwithstanding, among the Baltic States, Russia, and the countries of the former Soviet Union, only a few have introduced auctions for foreign exchange (Kazakhstan, Lithuania, Moldova, Turkmenistan, and Ukraine).

1. Sustainability of foreign exchange auctions

Past experience in the developing countries shows that auction markets have not been sustainable over a longer period of time since several of the auction markets implemented after the early 1980s have been terminated, in many cases soon after the initial implementation: Ghana and Jamaica in 1990, Nigeria in 1988, Sierra Leone in 1983, Uganda in 1985, and Zambia in 1987. In all cases, except Ghana and Nigeria, a pegged regime was introduced after the termination of the market-based system. While the reasons for failures are numerous, and usually country-specific, in most cases the auction market has failed to ensure the desired exchange rate stability as the authorities have not followed fiscal and monetary policies that would be consistent with exchange rate stability. The failure to achieve a stable exchange rate has prompted the authorities to change the auction format, or to intervene in the auction market to influence the exchange rate, thus undermining the public's confidence in the market arrangement. Further, the failure to absorb activities in the parallel market into the official system has made foreign exchange supply to the auction market erratic.

1/ Uganda reintroduced an auction market for donor funds in 1988 in the context of a bureaux market for foreign exchange.

In Nigeria, the auction system was part of the dual market structure where retail transactions took place in the interbank and bureaux markets while auctions were used to disburse receipts from hydrocarbon exports. After failing to control the depreciation of the exchange rate, a result of domestic monetary expansion, the authorities terminated the auction market and unified the exchange rate in the context initially of an interbank market. In Ghana, the role of auctions in the foreign exchange market was gradually reduced as the financial system was developed further. Later the auction system was terminated altogether and the system was transformed into an interbank system. 1/

2. The role of auction markets when interbank markets exist

The auction arrangements introduced by some countries, including those in Bolivia (1985), Guatemala (1990), and Guinea (1986), have continued their operations, but a concern may be raised about their transparency within the context of the whole market, since it appears that the interbank market is perfectly capable of channeling all foreign exchange transactions. The auction arrangement is then used merely to determine an official exchange rate, which is then applied for all official transactions, or to establish the rate for interbank transactions. The interbank market exchange rate may not be free to adjust, because the authorities either fix the rate or allow it to fluctuate within specified limits. In this case, the role of an auction market becomes ambiguous, as it may add little to the competitiveness of foreign exchange allocation.

For instance, Bolivia's auction market is part of a foreign exchange allocation system in which commercial banks and nonbank dealers operate. Most transactions are already channeled through the interbank market, while the auction market is used mainly to establish an official exchange rate. In practice, the role of the auction market is further reduced as it has only attracted marginal demand for foreign exchange, despite the requirement to surrender receipts from visible trade. The flows of foreign exchange to the Central Bank have been smaller than the overall flows indicated by balance of payments data. In Guatemala, on the other hand, the auction market was set up after a short period of interbank trading in 1990, as a way to assume a closer control over the exchange rate. 2/ There, the base auction rate and the buying rate are fixed while bidding in each tender session is confined to a range of 0.05 quetzal on each side of the base rate. The base rate is adjusted to changes in the market exchange rates, while the trading in the interbank market takes place at auction-based rates. Guinea's weekly tender sessions were introduced in 1986 and the

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1/ In 1988, foreign exchange bureaux were introduced and the system was changed into a wholesale auction, thus giving the interbank market a larger role to play. The auction market was terminated in 1992.

2/ Guatemala first introduced a floating exchange rate regime in 1989, in the context of an interbank market, but the exchange rate system was changed to an auction-based system in 1990.

auction market assumed a central role in the allocation of foreign exchange resources since the majority of foreign exchange transactions are channeled through this market, though the banking system appears well integrated. In countries of the former Soviet Union, the role played by the market outside auctions is often undermined as most foreign exchange transactions are forced into the auction market; hence, the scope of foreign exchange transactions in the markets outside auctions has remained limited. Further, part or all of the foreign receipts are surrendered to the auction market, but such arrangements have not been successful in attracting foreign exchange flows in the auction markets. In general, a weak regulatory environment, lack of supervision, and the shallow organized market outside auctions, may initially justify the introduction of a centralized trading system in the interim, but limitations in the scope of trading outside the auction market are likely to slow down the development of a genuine interbank market.

3. Transparency and efficiency of foreign exchange auctions

Relative to an administrative allocation of foreign exchange, an auction market is likely to improve the efficiency of allocation since it provides a transparent system of foreign exchange allocation. In developing countries with auction markets, however, the auction market has often been subject to authorities' interference as they have attempted to influenced the exchange rate or the allocation of foreign exchange resources. Further, some buyers and sellers have been influential enough to manipulate the auction outcome. Such experiences easily undermine the trust of the auction market and hence the efficiency of foreign exchange allocation as well as the transparency of the outcome.

For example, the submission of bids in Guinea's auction was flawed as banks encouraged importers to bid for foreign exchange at rates established in the previous tender session, thus effectively fixing the exchange rate. The deadlines for submission of bids were often ignored while the buyers of foreign exchange were allowed to modify their bids during tender sessions. In Zambia, the operating rules for tender sessions were frequently changed, which undermined the public's confidence toward the arrangement and the authorities introduced new regulations to slow down the depreciation of the exchange rate. For example, in order to stabilize an auction-determined exchange rate and raise government revenues, new documentary requirements were introduced, requiring evidence of payments of the customs duty; bidders with overdue excise and sales taxes were required to settle their arrears before submission of bids). In Jamaica, the exchange rate was influenced, to a significant extent, by the Government's frequent interventions in the market which caused substantial exchange rate instability and resulted in the de facto fixing of the auction-based exchange rate, thus undermining trust in the market arrangement. Official transactions were channeled, to a substantial degree, outside the auction market, including purchases of the government, debt service obligations, and the imports by petroleum firms.

In Uganda, the auction market suffered from implementation problems as it was impossible to assess whether the exchange rate was actually a market-clearing rate. The monitoring of funds was not efficient, which resulted in capital flight as the funds were used for unauthorized transfers. In Sierra Leone, the monitoring of transactions was likewise not efficient while the exporters successfully avoided the surrender and sold their receipts in the parallel market. Foreign exchange was also allocated without any regard to the auction outcome. The government interfered with the auction market, for instance, by eliminating bids they considered too high in order to keep the parallel spread small. Among countries of the former Soviet Union, serious problems have emerged as a result of government interference in the auction markets. In Kazakhstan, for instance, the auction arrangement was poorly implemented and the Central Bank manipulated the auction exchange rate. 1/ On the other hand, in Ukraine, bids were discarded from the auction market and the Central Bank influenced the determination of the auction exchange rate (the pricing system has not been fully transparent).

An important question for exchange market reform is whether or not the reform improves the efficiency of foreign exchange allocation, at least relative to the earlier administered system. An auction is an efficient means of allocating foreign exchange if the market is competitive. However, lack of competition may turn out to be a serious problem in many developing countries where the financial system is repressed and access to foreign exchange is restricted. In this case, the allocation may be substantially influenced by factors working outside the auction market; for instance, a concentrated demand and supply of foreign exchange, or a state-owned banking system, may allow some participants to manipulate the auction market which then fails to produce a competitive outcome. In Guinea, serious problems emerged because the mining sector dominated the foreign exchange flows and supplied most of the foreign exchange to the market. 2/ Also, the mining sector sold foreign exchange to the Government outside the auction market, while certain imports, including the imports of mixed economy companies, were channeled to markets outside auctions. While the concentration was a major problem, access to tender sessions was also limited since the participants were required to open external accounts which required the permission of the Central Bank. In Jamaica, certain importers limited the demand for foreign exchange in tender sessions, while the banks occasionally declined to open letters of credit to importers without foreign exchange resources, thereby effectively restricting their access to tender sessions as most letters of credit were required.on a repaid basis owing to Jamaica's external payments arrears (this problem was eliminated in 1984, when foreign

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1/ For instance, the rate was kept below market clearing exchange rate while the sellers were forced to surrender some foreign exchange at the rate established in the previous auction (which was too appreciated). Also, the settlement period was much longer than in the interbank market.

2/ For instance, in 1986 only about 15 percent of export proceeds were received by nonmining exporters.

exchange for the opening of the letter of credit could be obtained from auction market). In Sierra Leone, a few influential trading companies manipulated the auctions since the export receipts and imports were concentrated on few sectors. In Zambia, the mining company had special retention privileges which reduced the flow of foreign exchange to the auction market substantially; further, the supply of foreign exchange was erratic and smaller than expected, which increased the exchange rate volatility. Foreign exchange for various other purposes was allocated by the Central Bank at the auction-based exchange rate outside the auction arrangement.

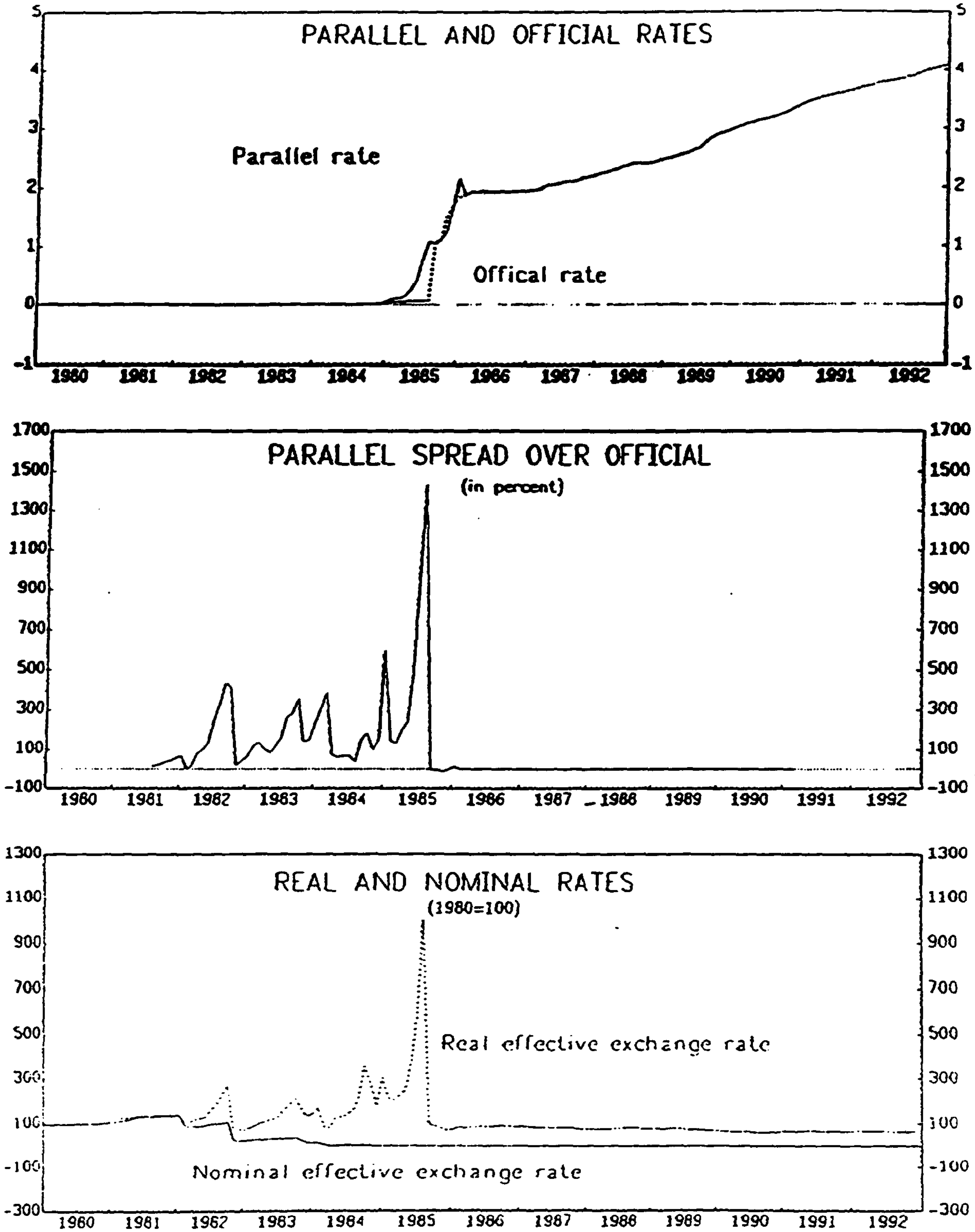
4. Exchange market unification and the scope of transactions

Prior to the introduction of a market-based regime, overvaluation of the domestic currency vis-à-vis other currencies facilitated the creation of the parallel market for foreign exchange, together with a substantial spread between the official and parallel market exchange rates. Thus, an important goal of implementing an auction market is to bring the official exchange rate to the market clearing level and hence absorb the activities of the parallel market into the official system; however, the experience suggests that the auction markets have rarely been successful in initially unifying the foreign exchange markets (Charts 1-9). Obviously, this reflects, in part, the fact that the authorities have failed to maintain an exchange rate which is at a level consistent with market-clearing and the economic policy stance. In addition, the parallel exchange rate premium also reflects the limited scope of transactions allowed in the auction market since most invisible transactions and capital transfers are prohibited, or severely restricted, and therefore are channeled through the parallel market. Bolivia provides an example underscoring the role of comprehensive exchange market reforms when the exchange and trade system is practically free of restrictions on international transactions, both current and capital transactions, while the access to foreign exchange in the interbank market and the auction market is unrestricted. As the result, the Bolivian authorities have succeeded in unifying the foreign exchange markets and the spread has been practically eliminated. In other countries, the scope of transactions allowed in the official market has remained limited, and while the spread between the official and parallel exchange rates has declined it has not disappeared because certain activities have remained prohibited in the auction market. In some cases, certain external transactions have continued to be channeled through the parallel market (such as diamonds and gold exports in Guinea).

In countries where the financial market is thin or poorly developed, or foreign exchange allocation is highly centralized, lack of competition may be an obvious concern in a market-based system. An auction arrangement is often seen as an important step in the interim to facilitate a market-based system of foreign exchange allocation. Gablis (1993), however, emphasizes that the market for foreign exchange can operate well only when the access to foreign exchange is sufficiently improved and measures are implemented to ensure the competitiveness of the market arrangement. One alternative to

Chart 1: Bolivia, Exchange Rate Developments, 1980 - 1992

(Period averages; in bolivianos per U.S. dollar) 1/

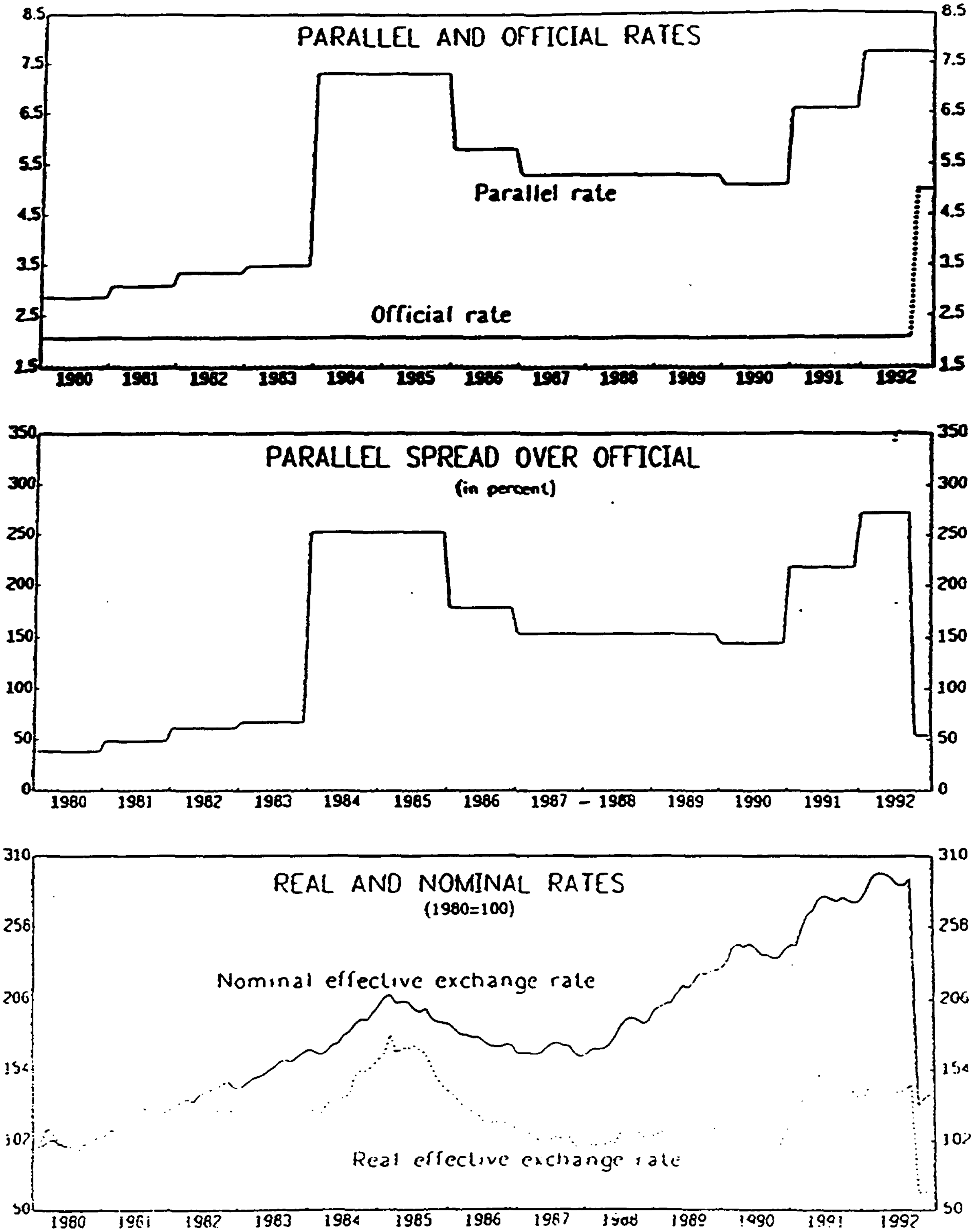


Source: Central Bank of Bolivia; and IMF Information Notice System.

1/ Bolivian pesos per U.S. dollar prior to January 1987; one boliviano equals one million old pesos. August 1985 marks the introduction of an auction market for foreign exchange.

Chart 2: Ethiopia, Exchange Rate Developments, 1980 - 1992

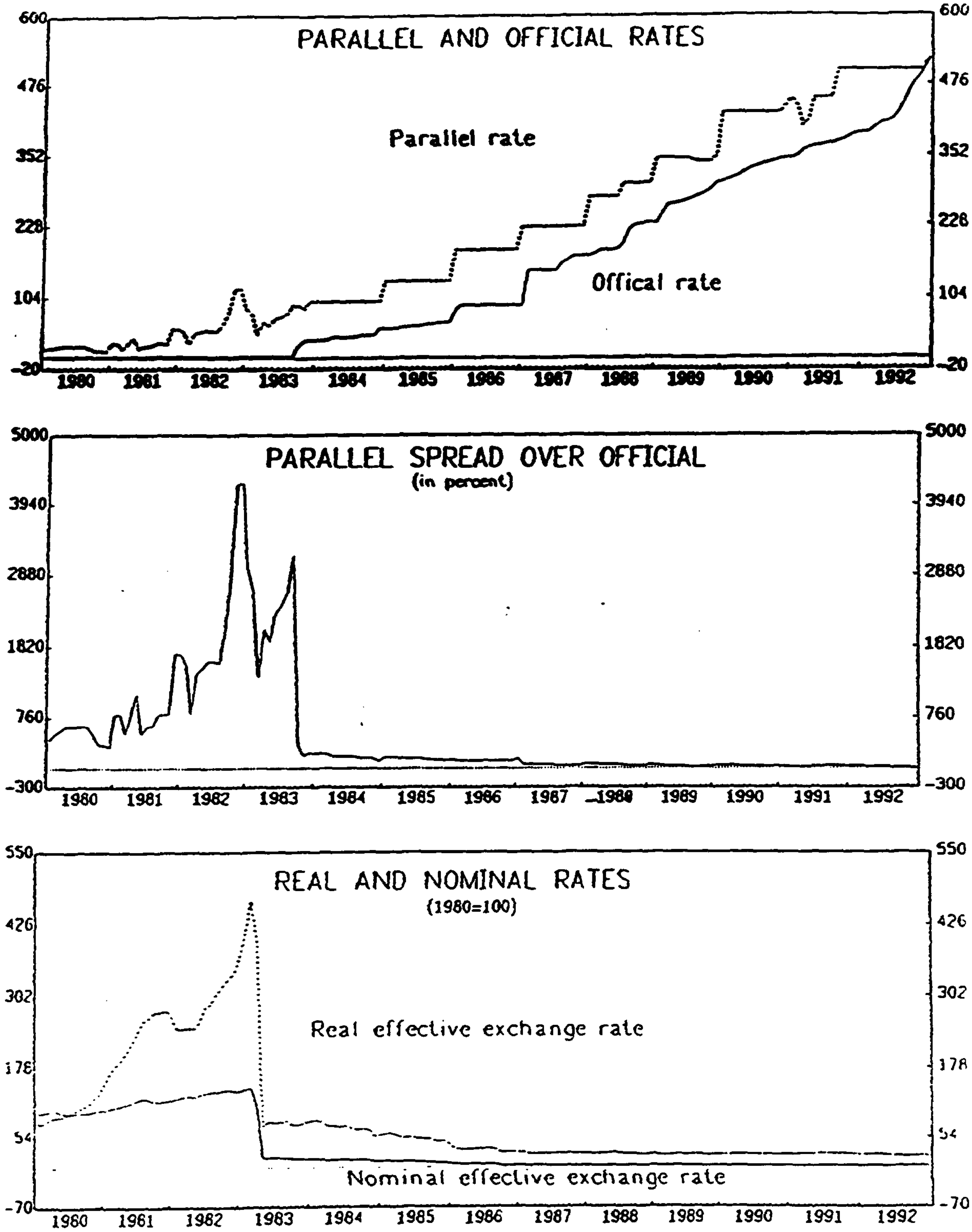
(Period Averages: in birr per U.S. dollar)



Source: IMF Information Notice System; Financial Times International Reports; and IMF International Financial Statistics

Chart 3: Ghana, Exchange Rate Developments, 1980 - 1992

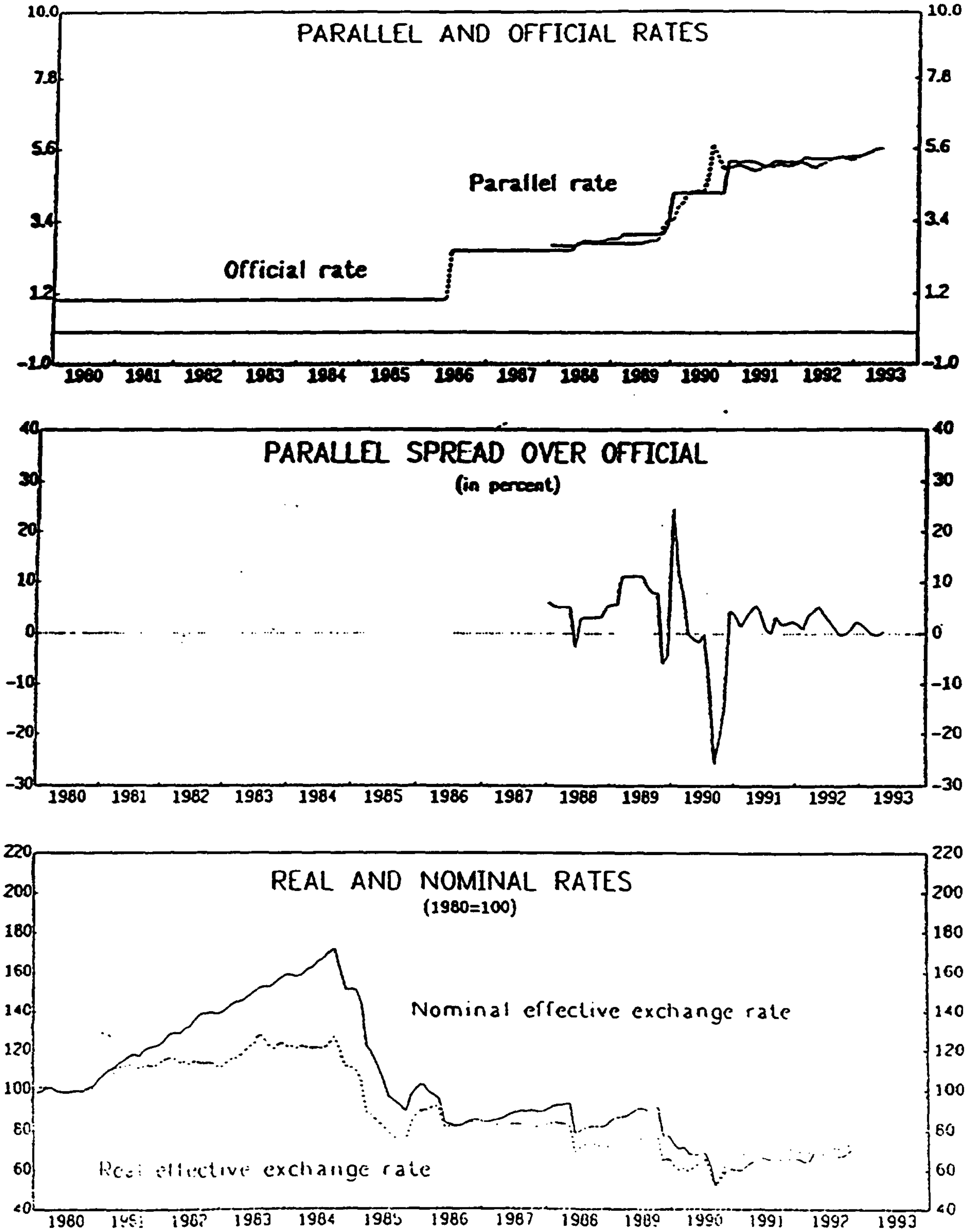
(Period averages; in cedis per U.S. dollar)



Source: Financial Times International Reports; IMF Information Notice System; and IMF International Financial Statistics.

Chart 4: Guatemala, Exchange Rate Developments, 1980-1993

(Period averages; in quetzales per U.S. dollar) 1/

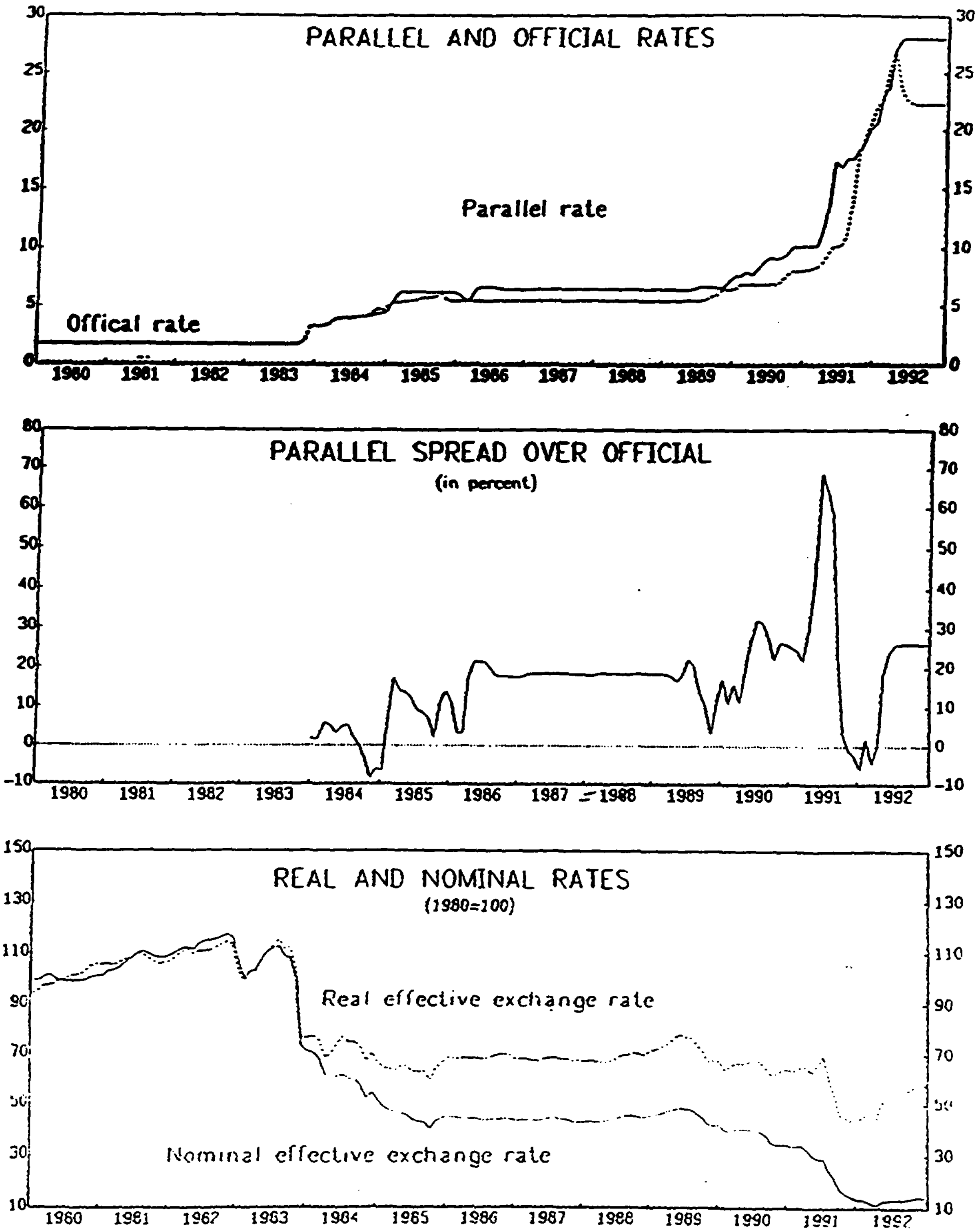


Source: IMF Information Notice System; Financial Times International Reports; and IMF International Financial Statistics.

1/ Data on parallel rates available since 1986.

Chart 5: Jamaica, Exchange Rate Developments, 1980 - 1992

(Period averages; in jamaica dollars per U.S. dollar) 1/

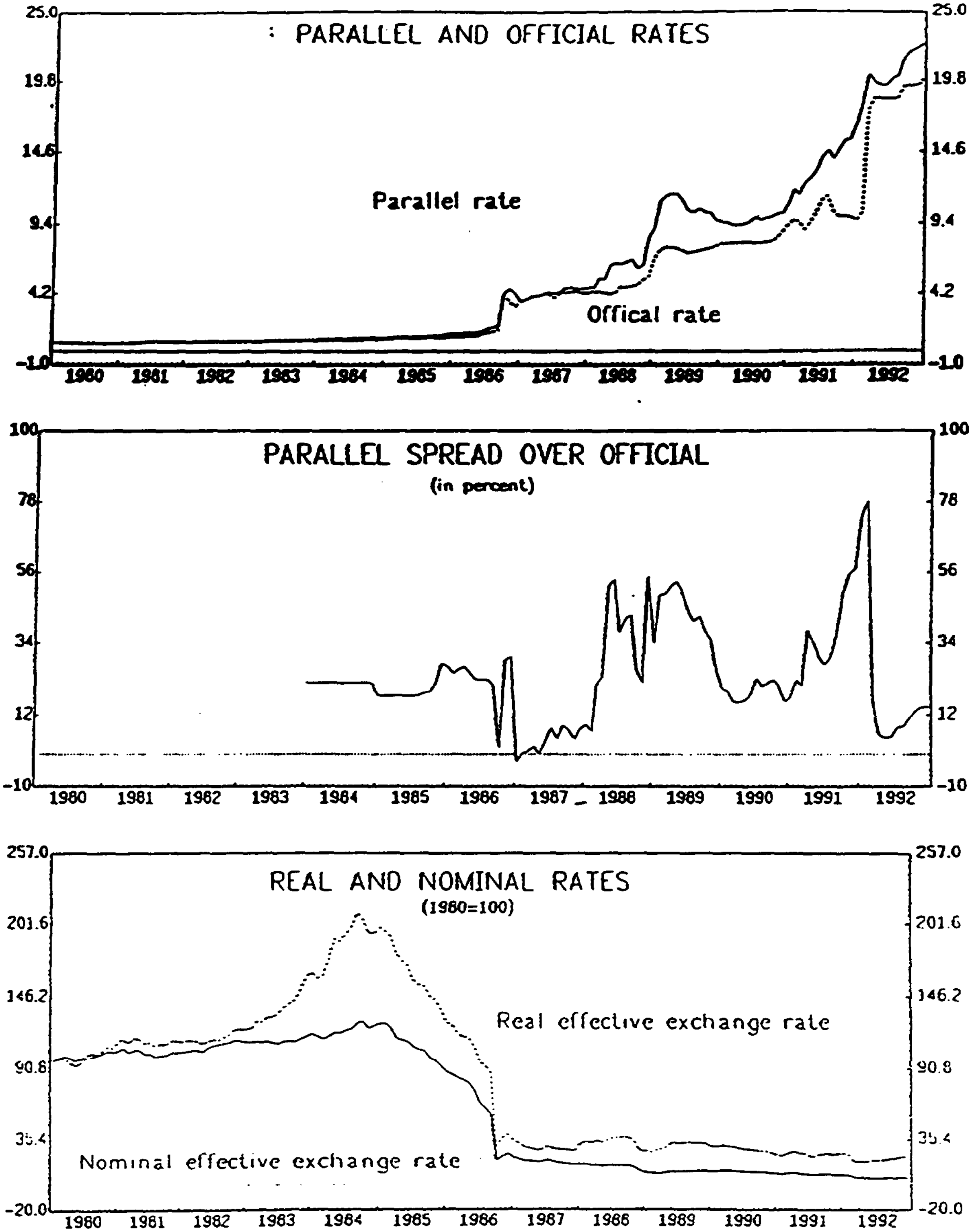


Source: Financial Times International Reports; IMF Information Notice System; and IMF International Financial Statistics.

1/ No data on parallel market rates for the period 1980-1984. September 1990 marks the creation of the Interbank Foreign Exchange Trading System which determines the exchange rate of the Jamaica dollar.

Chart 6: Nigeria, Exchange Rate Developments, 1980 - 1992

(Period averages; in naira per U.S. dollar) 1/

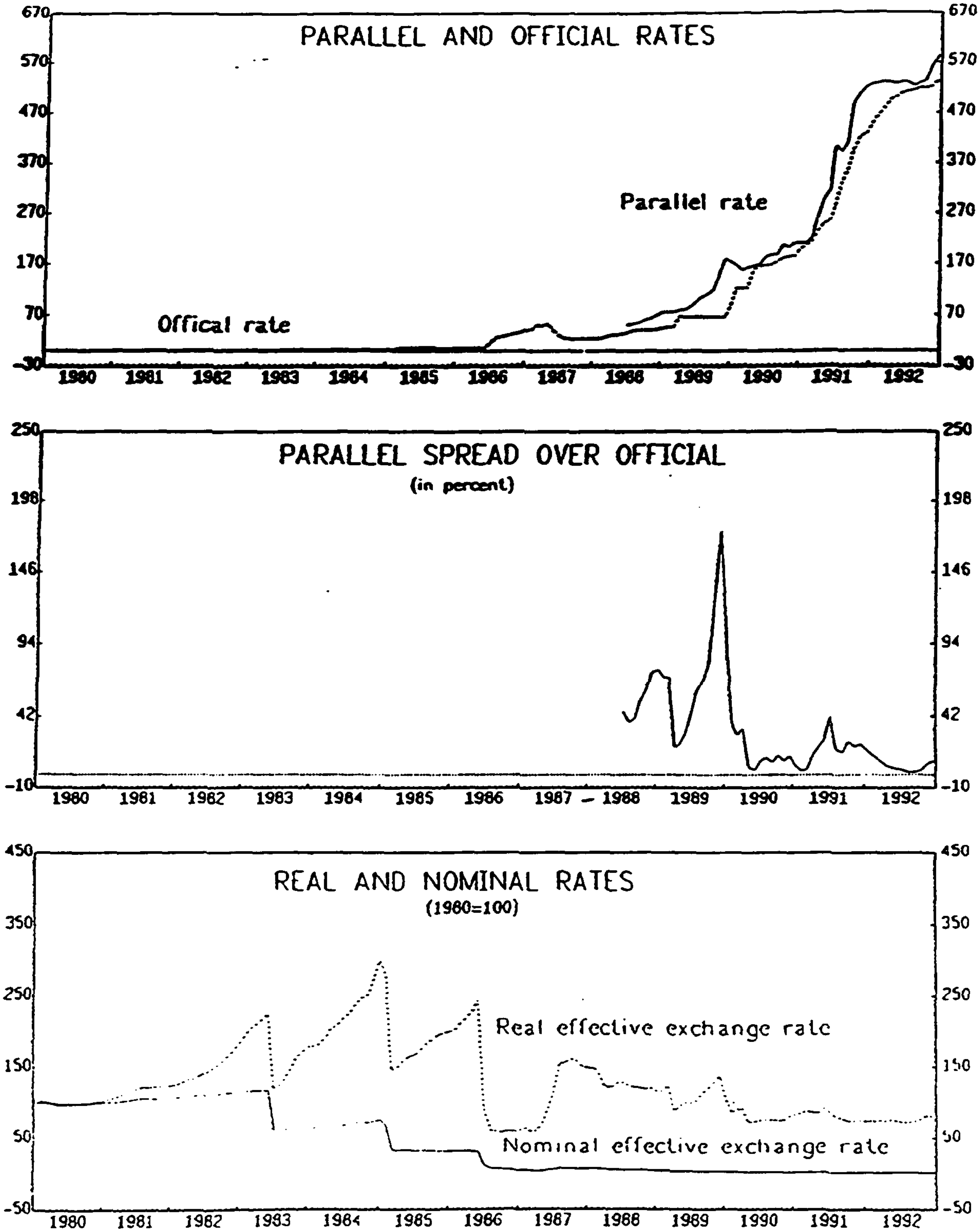


Source: Data provided by Nigerian authorities; IMF Information Notice System; and IMF International Financial Statistics.

1/ Data on parallel rates available since 1984. On July 2, 1987 the auction rate and an earlier official rate, used for certain transactions, were merged into to what is now the official rate.

2/ The official rate quoted corresponds to the principal rate.

Chart 7: Sierra Leone, Exchange Rate Developments, 1980-1992
(Period averages; in leones per U.S. dollar) 1/

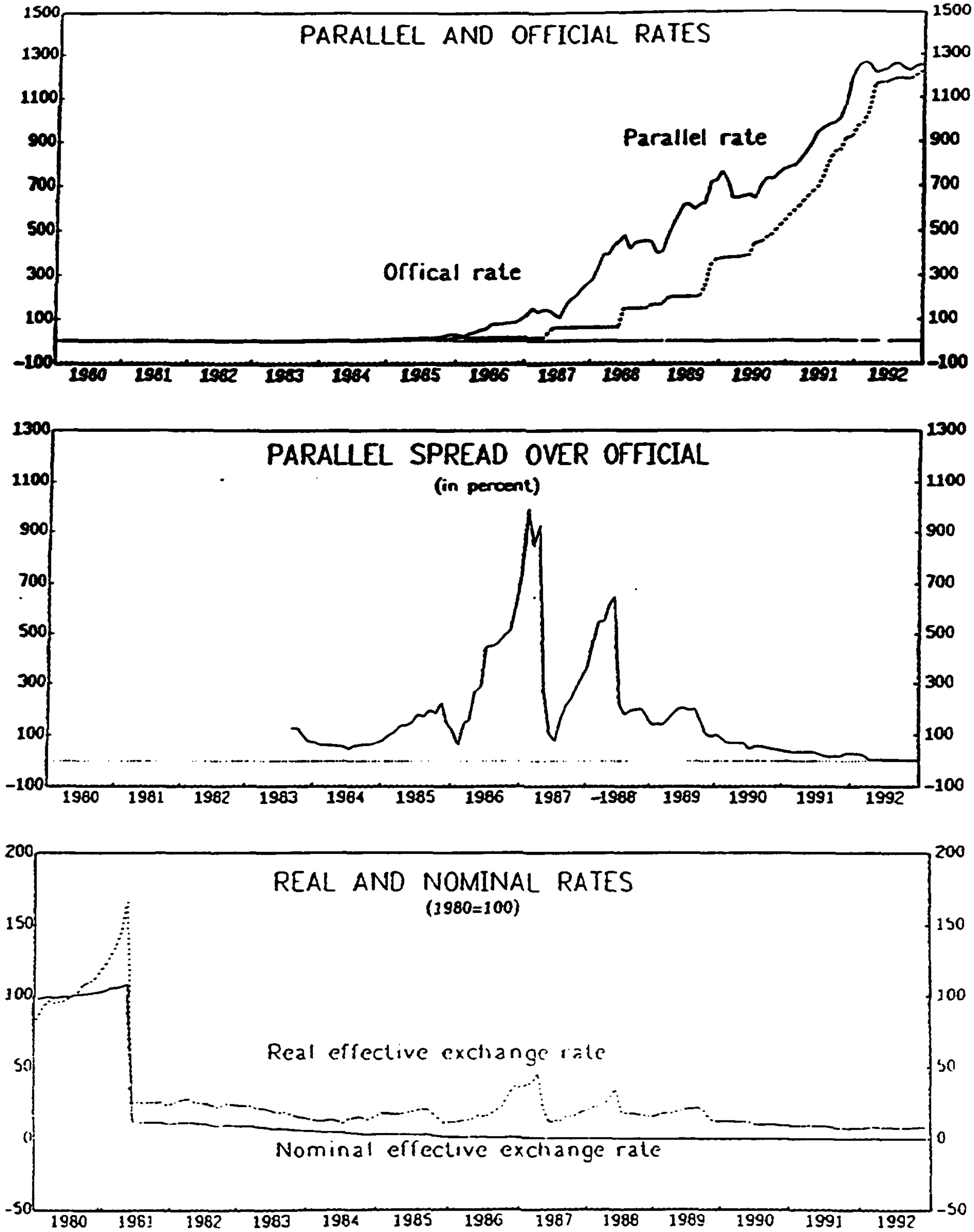


Source: Data provided by Sierra Leonean authorities; IMF Information Notice System; and IMF International Financial Statistics.

1/ Data on parallel rates available since 1988. April 1990 marks the liberalization of the exchange rate.

Chart 8: Uganda, Exchange Rate Developments, 1980 - 1992

(Period averages; in shillings per U.S. dollar) 1/2/

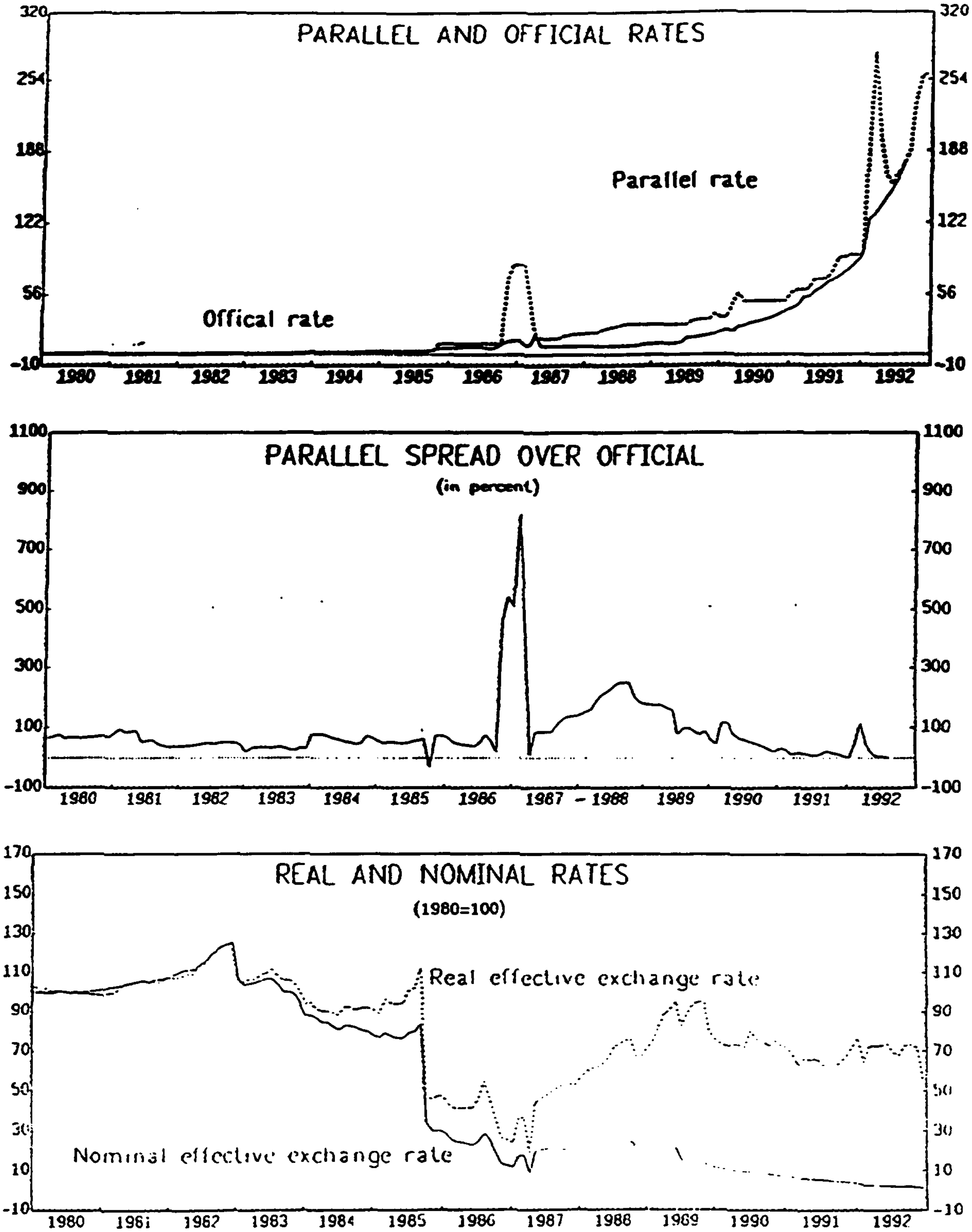


Source: Data provided by the Bank of Uganda; IMF Information Notice System; and IMF International Financial Statistics.

1/ Data on parallel rates available since 1989. Data from 1989 to June 1990 are parallel market rates. Thereafter, forex bureau rates are quoted

2/ The official rate quoted corresponds to the principal rate.

Chart 9: Zambia, Exchange Rate Developments, 1980 - 1992
(Period averages; Kwacha per U.S. dollars) 1/



Source: Financial Times International Reports; IMF International Financial Statistics; and IMF Information Notice System.

1/ The official rate quoted corresponds to the principal rate.

expand the scope of transactions in the market is to introduce nonbank dealers to operate alongside the commercial banks in the foreign exchange market. The network of nonbank dealers can effectively deepen the market and therefore improve access to foreign exchange. This also helps absorb activities of the parallel market. While these bureaux offer only a limited number of services, including the buying and selling of foreign currency notes and travelers' checks, they are likely to ensure that access to foreign exchange services at the retail level is secured. The degree to which the nonbank dealers are successful in absorbing the activities in the parallel market reflects the scope of other reforms in the foreign exchange market in order to augment the external transactions. The network of nonbank dealers in the foreign exchange market existed prior to an introduction of foreign exchange auctions in Bolivia, while in other developing countries the nonbank foreign exchange dealer network was only established later after the introduction of an auction market, as the need for them became evident. In some cases, such arrangements were only introduced in the context of an interbank market, for instance Jamaica and Sierra Leone, after the termination of auction market. Uganda reintroduced a floating exchange rate regime in 1988 the context of a bureaux market that was supplemented by an auction market for donor funds, while Ghana introduced its foreign exchange bureaux in 1988, Guinea in 1992, and Nigeria in 1989.

VI. Fixing Arrangements

In some countries, official fixing sessions are organized by central banks, or joint-stock companies (the arrangement may be called an interbank auction), either to establish the exchange rate for official transactions or for the interbank market as a whole. In the fixing sessions, both the demand for and the supply of foreign exchange are determined endogenously. Lack of prior surrender makes the auction fixing quite different from an ordinary foreign exchange auction, in which the central bank maintains control over the allocation of foreign exchange through the surrender requirement. The auction fixing thus becomes close to continuous interbank trading and hence is likely to eliminate some of the problems associated with an ordinary auction.

A fixing arrangement is part of an interbank market, which is the retail market for foreign exchange, while the auction market comprises the wholesale market and is participated in by authorized dealers, banks and nonbank dealers who buy or sell foreign exchange. 1/ The sessions are held daily, either by the central bank (this is the case in Greece, Turkey, and Viet Nam) or by the private joint-stock company (as is the case in

1/ A rare exception is Viet Nam where also trading organizations, gold producers and some remittance companies are allowed to participate in the sessions. Viet Nam has a surrender requirement but it is not enforced in practice.

Germany and Russia). All retail transactions are channeled through the interbank market. The fixing market also provides the central bank with an addition channel to intervene in the foreign exchange market. 1/

Typically, a fixing arrangement includes the ex ante submission of bids and offers and live quotations are received during a tender session. At the outset of a fixing session, buying and selling orders are received by the organizer who determines the opening rate; this may not be a representative equilibrium rate since it is based on information available at the time and it is merely used to initiate the bidding process. During each fixing session, the live rate drifts up or down in response to actual quotations, reflecting the disequilibrium between buying and selling orders. In the end, a market-clearing rate is established as a midpoint rate while the buying and selling rates for all currencies are calculated on the basis of specified margins which normally apply to buying and selling orders effected in the fixing sessions; exchange rate quotations outside the sessions are not restricted. Sometimes, it is possible that no trading is effected in a fixing session; the rate may then be established on the basis of interbank quotations.

Until recently, several industrial countries used fixing arrangements, but all except Austria and Germany have since eliminated them. Are such arrangements are generally redundant in that they add little to the efficiency of foreign exchange allocation? In the industrial countries, the interbank markets are efficient and direct dealings have replaced the need to fix the exchange rate, while the central bank can intervene directly in the interbank market. In Germany, the daily exchange rate is fixed in the Frankfurt Currency Exchange (FCX). 2/ These fixing sessions are used to establish the buying and selling rates for convertible currencies, but the rates may also be used by banks in their dealings with customers in the interbank market; however, this is not enforced since other rates may be negotiated for the customers.

Fixing sessions are quite rare in developing countries, where they are often used to manage the exchange rate for the official transactions, or to establish the rate for interbank transactions. 3/ In Greece, the official rate is fixed daily by the central bank, but the authorized dealers are free to quote other rates in the interbank market where no limits are specified

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1/ However, the central bank may intervene in the interbank market as well.

2/ Even in Germany, the daily fixings represent a small portion of foreign exchange dealings which are dominated by interbank trading (see Appendix I for details). The exchange rate is fixed daily in Austria, but this is not done in a formal fixing session.

3/ In Greece, Romania, Russia, Turkey, and Viet Nam fixing arrangements are presently used. Zaïre utilized auction fixings during 1983-1991, but has moved to a system where the official rate is determined on the basis of the quotations by authorized dealers in the interbank market.

for buying and selling rates. Turkey has adopted a managed float regime and utilizes daily fixing sessions to establish the official exchange rate. A spread of 0.25 percent is determined on the buying and selling rates but the limits do not constraint the buying and selling quotations in the interbank market.

Recently, a few emerging market economies, including Romania, Russia, and Viet Nam, have introduced fixing arrangements as transitional institutions to facilitate foreign currency trading in economies that are characterized by highly segmented foreign exchange markets, lack of competition, and weakness of the payments systems. These arrangements have often been subject to same sort of difficulties that have been associated with earlier auctions elsewhere: governmental interference, lack of transparency, and severe limitations on the access to foreign exchange outside the fixings. In Romania, for instance, the new foreign exchange system was introduced in February 1991 by which the fixing arrangement was implemented to establish a rate for the interbank market (this is called the "market outside the auctions", since the banks are not allowed to deal among themselves). The fixings are organized by the central bank and participated in by the commercial banks, who place bids on their own account or on behalf of their customers. In practice, the commercial banks have acted as brokers to intermediate foreign exchange transactions on behalf of the customers, while exchange rates in the interbank market have been limited, and have been established by the rate obtained in each fixing session; little trading takes place outside the fixing sessions. The fixing sessions have been subject to central bank manipulation that has attempted to set limits to the depreciation of the exchange rate, thus resulting in continuous excess demand for the foreign exchange, thus driving a wedge between the official and parallel market exchange rates. 1/

In Russia, the official exchange rate of the Russian ruble has been determined in the sessions, currently held daily, organized since 1992 by the Moscow Interbank Foreign Currency Exchange (MICEX). MICEX is a joint-stock company whose membership includes commercial banks and nonbank dealers in the foreign exchange market, and the Central Bank of Russia which is a share holder. The exchange rate established through a tatonnement process is only used for transactions effected in these sessions, but the Central Bank of Russia also uses the rate to effect partial surrender of foreign exchange receipts, customs valuations and official transactions. In each session, authorized banks and nonbank dealers execute the buying and selling orders for the U.S. dollar. The supply of foreign exchange is provided by the participating foreign exchange dealers, although the Central Bank of Russia intervenes in these sessions primarily to smooth out fluctuations in the exchange rate. Participation is voluntary. Supply to the auctions has

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1/ The minimum order was reduced to US$2,000 in order to eliminate the segmentation in the foreign exchange market which has reduced the spread between the auction-based and interbank exchange rates.

increased steadily over the years; nonetheless, the market is still only a small portion of overall foreign exchange flows as indicated by balance of payments data.

In Viet Nam, as part of a broader reform effort to establish a market-based exchange rate for the dong, the central bank started to sell foreign exchange in tender sessions held in Hanoi and Ho Chi Minh City in 1991. This reflected the segmentation of foreign exchange markets between the two cities. The tender sessions are held once a day in either of the two cities and are open to commercial banks, both domestic and foreign, as well as foreign trade organizations, gold producers and remittance companies. The exchange rate, which is the closing rate from the previous session, opens each session and moves in the increments of five points at a time in response to the live quotations of participants. The exchange rate that clears the market is determined as the midpoint rate, while buying and selling rates for various currencies are calculated by applying a 0.5 percent margin. These rates establish limits for trading in the interbank market. The fixing arrangement has operated smoothly and the spread between official and parallel exchange rates has remained negligible, despite large interventions by the central bank in the foreign exchange market in recent years. 1/ The authorities have utilized the fixing sessions to maintain a degree of control over the exchange rate. While the supply of foreign exchange to the fixing sessions has varied in the range of US$300 million per week, it accounts only for about one-half of the foreign exchange receipts implied by balance of payments data.

VII. Conclusions

This study reviews the recent experiences with foreign exchange auctions in developing countries. Such auctions have provided a market-based method of determining the exchange rate in these countries, but they have not been without problems. In order to succeed in implementing a credible market-based exchange system, the experience shows that the authorities must be fully committed to the reforms and to safeguarding the integrity of the auction market. When the exchange system is changed from one where foreign exchange transactions are directly controlled by the authorities, into one where the allocation is market-based, it is important that fiscal and monetary policies are adjusted to support a stable, market-determined exchange rate. Unfortunately, this has not usually been the case with auction arrangements, which has led to developments that eventually have undermined the credibility of the auctions. The efficiency and transparency of an auction market has often been undermined by government interference and the manipulation of the auction-based exchange rate, or the official allocation of the foreign exchange receipts.

1/ In principle, there is a partial surrender, up to 30 percent of export receipts. However, the authorities have tolerated full retention but all receipts must be repatriated.

Overall, auction markets have not been very common among the developing countries since in most cases exchange rate flexibility has been implemented in the context of an interbank market. Among the Baltic States, Russia, and countries of the former Soviet Union, auction-based markets are relatively rare despite problems associated with the financial system (capitalization and the early stage of developing arrangements for supervision by the authorities). Where auction markets are utilized, they have rarely been sustainable over a longer period of time, and they have been unsuccessful in facilitating the development of institutions necessary for the emergency of a genuine interbank market; in fact, these markets have often been terminated and replaced by a fixed rate or interbank regime. In countries where the auction markets are maintained alongside interbank markets, they have tended to slow down the development of a genuine interbank market because transactions are usually channeled through the auction market, while trading outside these auctions is either limited in scope or the exchange rate is not free to adjust in response to demand and supply pressures in the interbank markets. Therefore, the transparency of the auction market has become compromised, while the form of the market has contributed little of lasting value to the efficiency of foreign exchange allocation.

Neither have auction markets succeeded in absorbing activities in the parallel market. Hence, additional measures are often needed to deepen the financial system and improve the transparency of the foreign exchange market system. The experience indicates that a network of nonbank dealers has been successful in augmenting the scope of the official market and improving access to foreign exchange at the retail level. Further, the access to the tender sessions and the coverage of the auction market has often been less than needed to ensure the efficiency and competitiveness of foreign exchange allocation.

A significant drawback associated with the fixing arrangements has been that they have most often been redundant, and have had little role to play in improving market competition. Most industrial countries have therefore abolished such arrangements in favor of direct interbank dealings, while only a few developing countries continue to use them. A fixing system can also hinder the development of a genuine interbank market, as foreign exchange transactions are artificially centralized around the fixing sessions.

Germany: Arrangements for Exchange Rate Fixing

There are five currency exchanges in Germany: Frankfurt, Berlin, Düsseldorf, Hamburg, and Munich. The Frankfurt Currency Exchange (FCE) is the largest and plays a key role in the determination of the official exchange rate of the Deutsche mark vis-à-vis other currencies since the rate of the Deutsche market is fixed exclusively at FCE. Other exchanges mainly function as collection points where purchase and sales orders are organized, and then transmitted (only their net amounts) to FCE. Also, the central bank of Germany, the Bundesbank, intervenes in Frankfurt foreign exchange trading.

Each working day, Monday through Friday, a fixing session is held in Frankfurt. Purchase and sales orders are accepted by phone or in writing. The orders must specify the price either "at limit" or "at best". If an order is given at limit, then the price specified in the order defines an upper (a lower) limit for price which the buyer (seller) is willing to accept. Any price which is within the specified limit will be acceptable. If an order is given at best, then the buyer or the seller will accept the best possible price which will be the official exchange rate of the day.

Once the Frankfurt Currency Exchange has received all purchase and sales orders for the day, the Kursmaker begins his work to determine the official exchange rate of the day. First, he estimates the spread between which the market clearing price will be, based on the price quotations in the interbank market in Germany or abroad. The spread is then used to calculate the bid price and the ask price. Once they are announced, the traders are allowed to further instructions to FCE concerning their purchases and sales orders. 1/

If the market does not clear after the initial round, the Kursmaker will modify his estimate for the spread, based on the information concerning purchase and sales orders. Then a second round is conducted. The iteration process will continue until a price can be fixed so that there is no excess demand in the Frankfurt market. Once all sales orders are matched with purchase orders, the market clears and the clearing rate will be that day's official exchange rate. It should be noted that the Kursmaker does not contract with himself, i.e., he does not hold the residual stock for his own account to clear the market (this may happen in a securities market).

Once the U.S. dollar rate has been fixed, rates for other currencies will be calculated. Since the official exchange rate is the midpoint rate, the Board of Governors of the Stock Exchange has specified a digit behind the decimal point with which the middle rate for each currency is expressed. For the U.S. dollar, Canadian dollar, yen, and Italian lira, the midpoint rates have four decimals. For other currencies there are only three decimal

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1/ The minimum amount to be traded is DM 10 million.

points. All buying and selling rates for each currency are calculated by subtracting and adding, respectively, a certain amount, expressed as a fraction of 1 DM and laid down in the form of a spread between the buying and selling rates, from the midpoint rate of the respective currency. For instance, the spread for the U.S. dollar is DM 0.008. If the midpoint rate of the day is DM 1.8000, then the buying and selling rates for the U.S. dollar would be DM 1.7960 and DM 1.8040, respectively.

Banks in Germany usually settle with their customers using the official buying and selling rates for currencies. The spread is perceived as a proxy for the costs associated with currency conversion. Since the official rates merely define the maximum rates that may be used, in certain cases banks may offer lower rates for customers with large transactions.

Bibliography

Aghevli, Bijan B., Moshin S. Khan, and Peter J. Montiel, Exchange Rate" Policy in Developing Countries: Some Analytical Issues", IMF, Occasional Papers, No. 78 (1991).

Aron, Janine, and Ibrahim Edbadawi, "A Typology of Foreign Exchange Auction Markets In Sub-Saharah Africa", manuscript (PRDTM and World Bank) (1993).

Aron, Janine, and Ibrahim Edbadawi, "Some Lessons For the Design And Micro-Management of Foreign Exchange Auctions From Sub-Saharan Africa", manuscript (PRDTM and World Bank), 1993.

Calvo, Guillermo A., Manmohan S. Kumar, Eduardo Borensztein, and Paul R. Masson, "Financial Sector Reforms and Exchange Arrangements in Eastern Europe", IMF, Occasional Papers, No. 102 (1993).

Corden, W. Max, "Exchange Rate Policies for Developing Countries", Economic Journal, 103, pp. 198-207 (1993).

Dominguez, Kathryn M., "Do Exchange Rate Auctions Work? An Examination of the Bolivian Experience", NBER, Working Paper No. 3683 (1991).

Edwards, Sebastian, "Exchange Rates As Nominal Anchors", NBER Working Paper, No. 4246 (December 1992).

Feldman, Robert A. and Rajnish Mehra, "Auctions: Theory and Possible Applications to Economies in Transition", IMF, Working Paper, WP/93/12 (1993).

Galbis, Vicente, "Experience With Floating Interbank Exchange Rate Systems in Five Developing Economies", IMF, Working Paper, WP/93/36 (1993).

Goldberg, Linda S., "Foreign Exchange Markets in Russia: Understanding the Reforms", IMF, Paper on Policy Analysis and Assessment", PPAA/93/1 (1993).

Honkapohja, Seppo and Pentti Pikkarainen, "Country Characteristics and the Choice of the Exchange Rate Regime: Are Mini-Skirts Followed by Maxis?", Bank of Finland Discussion Papers, No. 36 (1992).

IMF, Exchange Arrangements and Exchange Restrictions, Annual Reports, various issues.

Kafka, Alexander, "The Brazilian Exchange Auction System", Review of Economics and Statistics, Vol. 38, pp. 308-322 (August 1956)

Kapur, Ishan, Michael T. Hadjimichael, Paul Hilbers, Jerald Schiff, and Philippe Szymczak, "Ghana: Adjustment and Growth, 1983-1991", IMF, Occasional Papers, No. 86 (1991).

Kimaro, Sadikiel N., "Floating Exchange Rates in Africa", IMF, Working Paper, WP/88/47 (1988).

Krumm, Kathie, "Recent Experience with Exchange Auctions", CPD Discussion Paper, No. 29 (1986).

McAfee, R. Preston and John McMillan, "Auctions and Bidding", Journal of Economic Literature, Vol XXV, pp. 699-738 (June 1987).

Milgrom, Paul R., "Auctions and Bidding: A Primer", Journal of Economic Perspectives, pp. 3-22 (summer 1989).

Quirk Peter J., "Recent Experience with Floating Exchange Rates in Developing Countries", Approaches to Exchange Rate Policy: Choices for Developing and Transition Economies, eds. Richard C. Barth and Chorng-Huey Wong, IMF (1994).

Quirk, Peter J., Bendicte Vibe Christensen, Kyung-Mo Huh, and Toshihiko Sasaki, Floating Exchange Rates in Developing Countries: Experience with Auction and Interbank Markets, IMF, Occasional Papers, No. 53 (1987).

Svensson, Lars E.O., "Fixed Exchange Rates As a Means of Price Stability: What Have We Learned?", NBER Working Paper, No. 4504 (October 1993).

Tenorio, Rafael, "Revenue Equalence and Bidding Behavior in a Multiunit Auction Market: An Empirical Analysis", The Review of Economics and Statistics, Vol LXXV, pp. 302-314 (1993).

Vickery, William, "Counterspeculation, Auctions, and Competitive Sealed Tenders", Journal of Finance, No. 16, pp. 8-37 (1961).

Wang, Ruqu, "Auctions Versus Posted-Price Selling", American Economic Review, Vol. 83, pp. 839-851 (September 1993).

Wulf, Jürgen, "Floating Exchange Rates in Developing Countries: the Case of Zambia", The Journal of Modern African Studies, Vol. 27, pp.503-520 (1989).