



The Treasury Bill Market in The Bahamas: An Efficiency Analysis

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SECTION I

INTRODUCTION

Abstract

If one accepts the premise that markets are efficient when they gather all the available information and treat it to the point where prices reflect fully what is known and the risks attached to any single asset, then one would be led to question the efficiency of the market for treasury bills in The Bahamas.

The Treasury bill auction in The Bahamas, as the majority of auctions of government securities in both developing and industrial countries, falls into the category of multiple-price/sealed-bid auctions, also known as discriminatory auctions when referring to the sale of multiple units of a single good, based on the similarity to a discriminating monopolist's charging different prices to the highest paying consumers in order to extract the surplus under the demand function.

Although certain assumptions are generally made concerning the Treasury Bill market in The Bahamas, in recent years only limited research has been conducted domestically, with previous work tending towards summary descriptions of the tender mechanism. This paper attempts some analysis of the efficiency of the market, indicating trends and developments which could assist in enhancing the volume of information available for policymakers. Section II provides the conceptual framework for the analysis; Section III chronicles the evolution of the market to its current state, charting key

characteristics; and Section IV critiques the market using criteria of functional efficiency, allocative efficiency and market availability. Prospects for revision and reform are also presented in this section, followed by brief concluding remarks. The survey period for the efficiency analysis, largely dictated by data availability, is 1989-1995, although where possible and instructive, reference is made to earlier years.

SECTION II

LITERATURE REVIEW

Auction theory provides four basic formats:

- multiple-price/sealed-bid auctions
- uniform-price/sealed-bid auctions
- multiple-price/open-outcry auctions, and
- uniform-price/open-outcry

but the literature on auction of government debt focuses on comparative assessment of uniform-price/sealed bid auctions and multiple-price/sealed-bid auctions.

The uniform-price/sealed-bid auction⁵ also known as second-price auctions, are conducted for multiple units of a homogenous good (e.g. Treasury bills), with the usual practice being to award units to the highest bidders at one price interval above the highest unsuccessful bid. Other pricing rules involve setting a common auction price at the lowest accepted bid, or, for example, at the quantity weighted average of the successful bids.

In contrast, the multiple-price/sealed-bid auction, a.k.a. first-price auction, while it also involves bidding for multiple units of a homogenous good, determines a cut-off price and awards units to the highest bidders, at the price bid.

The literature proffers revenue equivalence between uniform-price auctions and multiple-price auctions, and thereafter favours the uniform-price format on the basis of other considerations of market efficiency and competitiveness. Price discrimination, as conducted in the multiple-price auction, is held to strengthen the “winner’s curse” because successful bidders are charged the full extent of their “overvaluation” of the auctioned good. This feature is seen as a penalty of first-price auctions (as the Bahamian treasury bill market), with the winner’s curse more severe than in second-price auctions (uniform-price auctions), since in the latter, bidders pay a price that incorporates other bidders’ assessment of the value of the good.

It is acknowledged, however, that risk aversion skews bidders’ preference (and therefore auction proceeds) towards multiple-price, counteracting the effect of the winner’s curse. A rejoinder to this is the argument that the size of auctions of government securities relative to actual and potential participants’ wealth negates any realistic degree of risk aversion.

Several approaches have been advanced for the determination of efficiency in short-term government markets, among them the “revealed preference mode”, which offers the cynical assertion that based on the absence of firm theory on critical auction issues, how auctions *are* organised provides the best prediction of how they should be organised. Indeed, by the revealed preference standard, the multiple-price/sealed-bid auction would appear to be the choice of the majority of economies for which data are available. Ironically, however, the bulk of theoretical literature favours the uniform-price auction which is held, not without exception, to allow financing of government debt at lower costs and thus higher revenue, provided collusive behaviour is inhibited by

appropriate use of minimum auction prices and continued monitoring of bidders' behaviour. It is postulated that in an environment of mild asymmetry of information, auction formats can be ranked in terms of efficiency, and uniform-price formats would tend to dominate multiple-price formats.

For the purposes of this paper, efficiency is defined as the condition that the auctioned goods are awarded to those who value them most, while the seller obtains the maximum revenue from the auction (Bartolini & Cottarelli, 1994). It is illustrated that in the case of The Bahamas, with the establishment of reservation prices, comparable optimality is achieved through the multiple-price auction, although aspects of the Treasury bill auction, particularly institutional constraints, may encourage sub-optimal performance and therefore warrant further consideration and possible revision.

SECTION III

EVOLUTION OF THE MARKET

The sale of short-term Government paper in The Bahamas had its beginnings in the early 1960s in the form of treasury bills, consequent upon the Bahamas Government's recognition of the need for some additional source of financing to bridge the shortfall between seasonal revenue flows associated with tourism, and recurrent expenditure requirements.

The market was actually instituted in 1959, with the passage of the Treasury Bills Act, paving the way for the first issue in 1962, of Bahamian£205,000 in July of that year and B£95,000 a month later, to banks and other financial institutions. Although these inaugural issues were referred to as public sales, the placement was made individually, with the Treasury approaching potential participants. Participation was weak, however,

due to a combination of factors, chief among which was lack of market transparency and the associated lack of knowledge. The rate of discount on bills varied at around 4% at the time.

Between 1962 and 1964, issue amounts steadily increased as the market of participants expanded to include business firms, and issues were being made on a regular monthly basis. So as to avoid the tedium of recourse to Parliament for resolutions, therefore, an amendment was passed in early 1965 vesting the Minister of Finance with authority to borrow by way of Treasury bills, sums not exceeding £3 million, which was at the time approximately 20% of government revenue. Initial issues were in domestic currency-- Bahamian pounds, but US dollar issues were introduced in June 1965 (\$750,000) and soon surpassed the amount outstanding in domestic currency. The foreign currency issue was brought on by the unavailability of domestic surplus funds, and the need for foreign currency to satisfy foreign obligations. The rate differential as per currency was minimal at the time and rates were comparable with existing international short-term rates, at approximately 5%.

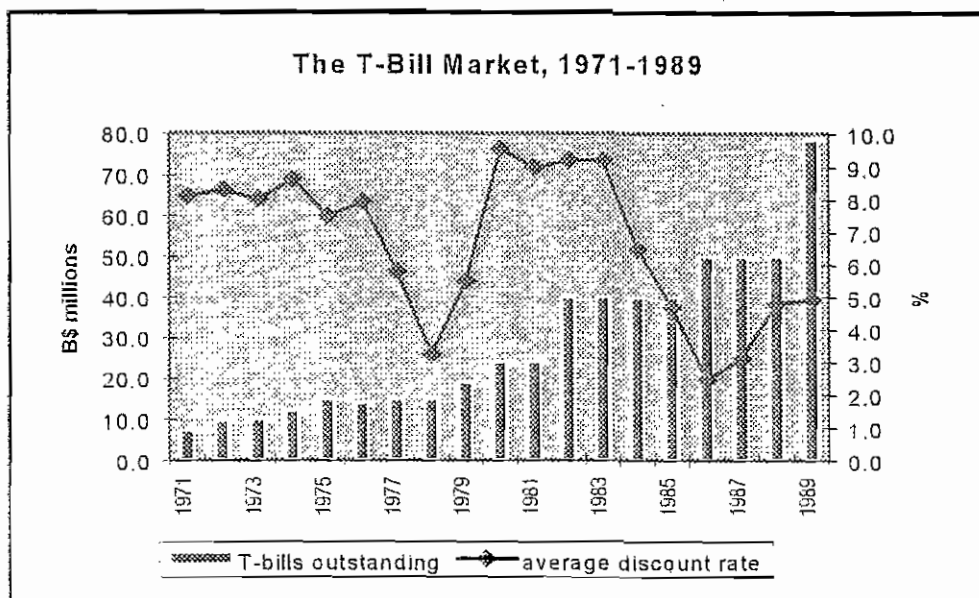
With the currency conversion from Bahamian pound to Bahamian dollar in May 1966, rates were maintained at about 5% but the domestic currency component (\$1.3 million) surpassed the foreign portion (\$0.8 million) and by November of 1968, the US dollar issues had been retired, only to be reintroduced in May 1970-- when discount rates escalated to 11.64% in line with global trends-- and finally retired permanently by mid-1972 after response to the Bahamian dollar issues registered considerable improvement. Between 1966 and 1968, the volume of outstanding bills was virtually constant as issues were rolled over, but by end-1968, the B\$ component had increased to \$4.8 million.

The Bahamas Monetary Authority (precursor to the Central Bank) entered the market for Treasury bills in 1969, offering itself as ready discounteer, and at the same time prepared to lend to banks for periods of not fewer than seven days, amounts up to a ceiling of 75% of bills pledged as security.

In 1971, the Authority assumed the role of agent of the Bahamas Government in the management of the short-term paper and opened the market by instituting the public tender system. Within months, all holders of Treasury bills were purchasing bills through competitive bidding and during the same year, on the encouragement of the Authority, the T-Bill ceiling was raised from £3 million to \$15 million, as revenues were approaching \$80 million and the bill's importance as the only money market instrument was receiving enhanced acknowledgement. Given these developments and the establishment of the Central Bank of The Bahamas in 1974, amounts outstanding began to show increased fluctuation and the rates of discount became more representative of the availability of short-term funds and the seasonal economic cycles, fluctuating between 5.76% and 8.62% in 1974 alone.

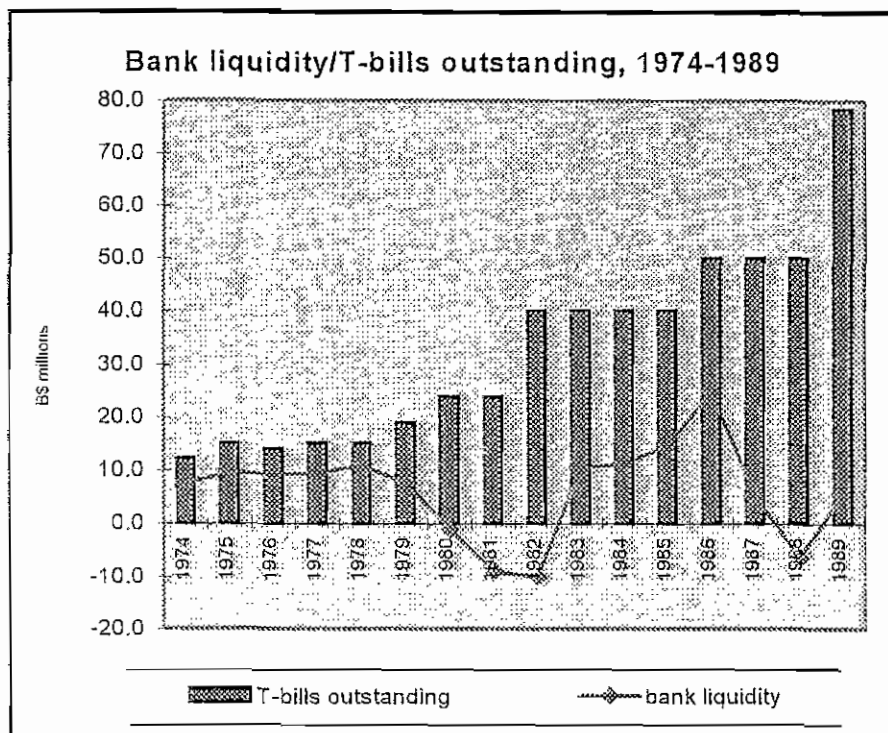
To summarize, since the 1970 peak of 11.64%, rates declined considerably, as demand for bills surged (*See Figure 1*), attributable to high levels of liquidity amid the slackened pace of growth in business demand for bank credit.

Figure 1 OVERVIEW OF THE MARKET, 1971-1989



This trend changed in the 1980s, as liquidity at times registered negative levels, (see Figure 2) and in 1981, the Central Bank issued an operating circular to all banks, bringing into effect the secondary liquidity ratio requirement (in relation to their B\$ deposit liabilities) and listing eligible liquid assets as treasury bills, government registered stock, balances at the Central Bank, till cash and other specified assets. Subsequently, commercial bank holdings of treasury bills increased from \$1.0 million in 1980 to approximately \$8.0 million in 1981, to account for some 33.3% of total bills outstanding. Trends in later years are also indicated in Figure 1 above. In terms of the average discount rate, this moved from 9.53% in 1980 to 4.92% by 1989.

Figure 2 BANK LIQUIDITY/TREASURY BILLS OUTSTANDING, 1974-1989



TENDER MECHANISM

Here an examination of the treasury bill tender mechanism is useful in prelude to a review of the current market. Initially, the three-month Government paper issued was repaid at maturity; however, given the favourable cost structure of these instruments and the protraction of the revenue/expenditure mismatch, rollovers at maturity have become a fixed feature, despite continued deferral of payment of short-term advances to Government and a relatively static bank system overdraft facility.

Before the actual tender is undertaken, the Banking Department of the Central Bank engages in a pre-tender survey, involving canvassing prospective bidders for interest and formulating a reservation rate of discount based on trends in bank deposit and lending

rates and other market indicators. Subsequently, a pre-tender memo is prepared for the Investment Committee of the Central Bank, recommending the reservation price which is either approved or amended; and the tender is then gazetted to advise the public, normally two working days in advance for the evening daily newspaper, on the morning of the tender for the morning daily, and on the eve and actual morning of the tender for public broadcast.

The tender for Treasury bills occurs two working days prior to maturity of previously issued bills, and has been sequenced such that at least one occurs per month (two when 6-month issues reach maturity). Bills are made available in blocks of 100 to commercial banks, savings and loans institutions, insurance companies, business firms, public corporations and private individuals. *(See Table 1 for summary features of the auction)*

At the actual tender, applicants bid for a particular amount of Treasury bills at a specified price via a written request in a sealed envelope, until the auction deadline of 3 p.m. The results are recorded manually on a Treasury bills worksheet, listing the prices in descending order. If accepted, applicants with the highest bid price (i.e. lowest investor yield) are given first consideration.

Table 1 SUMMARY OF AUCTION FEATURES

Auction technique	
current	multiple-price/sealed-bid
previous	private placement
Admission	
participants	unrestricted, except to non-residents
deposit requirement	none
Central Bank participation	auctionhouse, residual buyer, post-tender discounter
Bid competitiveness	competitive bids not admitted
maximum number of bids per bidder	none
maximum award	amount of tender
minimum amount	\$100 nominal value
maximum share	none
Management discretion	
pre-announced cut-off price/yield	rule: 10% ceiling for yield
flexible cut-off price/yield	yes, set by Banking Department subject to approval of Investment Committee
revision of auction size	yes
rejection of specific bids	yes
Auction results	
lag between announcement & auction	varies: few hrs - 2 working days, depending on medium employed
lag between bids and results	2 hrs - 1 day
lag between results and settlement	2 working days
published information	yes
Publication of information	avg discount rate, avg tender rate, re-discount rate, amt applied for, amt allotted, amt outstanding,, amt outstanding by creditor category
Screening of participants	none
Key institutional constraints	statutory ceiling: 25% of average ordinary revenue of Govt
Typical features	
number of competitive bidders	small
spread on competitive bids	post-1991: 0.00%-0.35%; 1989-1991: 0.00%-1.00%
Other	
maturities	3-month, 6-month
minimum denomination (nominal value)	B\$100.00
frequency of auction	monthly
year of first public auction	1971
Note: The format for this table is guided by work by Bartolini & Cottarelli (1994)	

Each applicant is considered separately, and the cost to each applicant determined as the bid price expressed as a multiplicand of the amount tendered. A running total is kept of the amount for which bids are submitted, and all bids exceeding the cutoff point are rejected.

In the event of oversubscription at identical rates, pro-rating of bids becomes necessary. (An absolute rule justifying rejection is that investor return should never exceed 10%. In recent years, however, some indication of an "unfavourable" benchmark is given by the Central Bank's Investment Committee prior to tender, and any bids below that benchmark price are rejected. In fact, this new approach has sometimes resulted in all bids being rejected, with the Central Bank taking up the undersubscription at an average tender rate or average discount rate estimated by the Committee.)

Successful applicants only are notified by telephone and subsequently by formal written correspondence, usually with a lag of one day. The results of the tender are then reported and published in the daily newspapers and announced over public radio, and would give the date of tender, amount allotted, average tender rate, average discount rate per annum. Settlement is effected two working days after the tender.

CURRENT MARKET FEATURES

The current market for treasury bills is characterised by a limited number, volume and variety of paper. Trading activity remains largely at the primary level, with the main participants being the Central Bank-- which still is responsible for conducting tender operations; the National Insurance Board; commercial banks; and of course the Central Government as ultimate issuer.

When the Government in 1990 hiked the ceiling on Treasury bills outstanding to 25% of its average ordinary revenue, the amount outstanding was correspondingly increased to \$109.0 million in 1991, and in 1993, to \$124.0 million, virtually at its ceiling where it remains to date.

Table 2 TREASURY BILLS MARKET SHARE (%) BY CREDITOR CATEGORY, 1989-1995

	Public Corporations	Central Bank	Commercial Banks	Other Private
1989	41.4	42.0	16.5	...
1990	58.0	34.4	7.6	...
1991	37.8	47.6	14.7	...
1992	36.0	49.9	10.6	3.7
1993	36.7	33.1	30.2	...
1994	36.5	52.6	10.9	...
1995	28.8	60.4	10.9	...

Disaggregation of treasury bills holdings by creditor category for the review years of 1989-1995 indicates an average share for the Central Bank of 45.7%; for public corporations (mainly the National Insurance Board) of 39.3%; and for commercial banks, 14.5%. For other private investors, a market share of 3.7% was registered, representing participation in a single year only. Annual market shares over the period 1989-1995 are indicated in *Table 2*.

A statistical indication of the relative significance of the treasury bill instrument to its various holders is noteworthy. For commercial banks, of total net eligible liquid assets recorded for the survey period of 1989-1995, treasury bills represented, on average, 4.9%. In contrast, the Central Bank's balance sheet for the same period showed an average ratio

of treasury bills to *total* assets of 15.6%, a feature which has implications for balance sheet integrity given the comparatively low-yield feature of these assets.

SECTION IV

A CRITIQUE OF THE MARKET

The position of the Government as regards Treasury bills is that they are specially designed to meet recurrent expenditure needs; they represent risk-free investments and should therefore be attractive to investors for cash management purposes. It is held that investment in treasury bills allows banks a return on perhaps otherwise idle balances, concurrent with satisfying secondary reserve requirements. Further, the National Insurance Board as a major investor, it is contended, fulfills a vital role in the provision of short-term funding for government's deficit.

Based on past observations of idle commercial bank balances, a strong argument has been advanced in the past that in the absence of the Treasury bill market, a considerable portion of the funds so invested would not otherwise have been transferred to comparatively profitable investment. That notwithstanding, price rigidities, as seen in the Treasury bill market, may be seen to prevent optimal utilisation of available resources. Intuitively, low interest rates reduce domestic private savings and contribute to disintermediation, via low yield investment. Facilitation of government's propensity to borrow domestically at preferential interest rates to finance fiscal deficits reduces funds available to the private sector and may indeed have a crowding out effect, driving up the cost of funds to the private sector in a counterbalancing effort.

As Cottarelli observed, rate stickiness is to be expected in an environment of weak market forces because there is no penalty for inefficiency; in fact, if any penalty exists, it would appear to accrue to the lender in the case of the Treasury bill market, as discussed earlier in this section.

On the matter of efficiency, this paper accepts as definition the situation where choices made are as closely analogous as possible to such choices for private goods and services in a perfectly functioning market economy with the least price distortion. An efficient market, then, would not only provide liquidity, but would also allocate resources to their most productive use at least possible cost, with approximately equal rates of return obtained on investments of comparable risk.

By this standard, the market is to be found deficient. While one may accept the argument that multiple-price auctions encourage bidders to shade their bids, and that lenders must strike a balance between lowering their true valuation of the paper and having bids rejected, it is still a fact that lenders are being forced to provide funds at rates well below prime and the bank rate (*see Figure 3*), which at the time of the writing of this paper were still maintained at 6.75% and 6.50% respectively. The divergence in rates between 1992 and 1994 in particular, is indicative of frequent rejection of the majority of bids, with the Central Bank subsequently taking up the undersubscription at pre-determined average tender rates, as further borne out in surplus tender application ratios (*see Table 3*). Interest rate policy in the market may therefore be seen to result in fragmentation of the potential capital market, with rates varying from one sector to another largely because of institutional constraints rather than competitiveness.

The situation is compounded from an investor perspective by the fact that unsuccessful bidders needing to satisfy secondary liquidity ratios would have to enter the post-tender market at further penalty, charged via the market rate.

It is instructive here to consider the level of divergence between the competitive-bid spread and what we may call the all-inclusive bid spread, the latter of which would encompass all bids, whether or not they are accepted. As indicated in *Table 4*, the divergence tends to move within a range whose upper end exceeds the margin charged for post-tender trading.

Table 3 TENDER ALLOCATION RESULTS, 1989-1995

B\$ millions	1989	1990	1991	1992	1993	1994	1995
Amount applied for at tender	202.0	247.6	235.2	237.5	452.7	477.5	323.5
Amount allocated	223.0	314.0	372.5	347.0	410.0	391.0	430.0
tender application ratio (%)	90.6	78.9	63.1	68.4	110.4	122.1	75.2

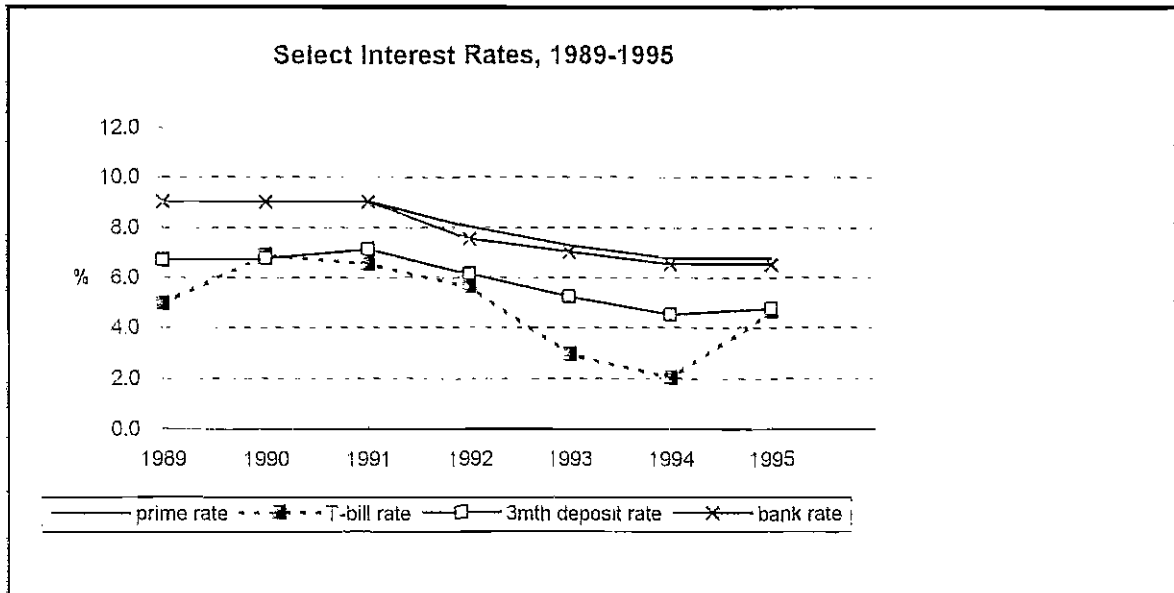
Table 4 COMPETITIVE BID SPREADS VS. ALL-INCLUSIVE SPREADS, 1989-1995

	basis points						
	1989	1990	1991	1992	1993	1994	1995
range on competitive bids	9-66	0-99	0-46	0-35	0-28	0-31	0-13
bid divergence	9-39	8-28	0	0-33	0-31	0-170	0-50

A key question here is who bears the loss suffered by such institutions, i.e. how do banks, for example, recoup the interest foregone? A cursory review of movements in

lending rates and deposit rates provides tentative grounds for further study. The captive market (The National Insurance Board), however, has no similar opportunities for recouping its losses. Moreover, investment in the Treasury Bill market seems to be inconsistent with the Board's obvious investment objectives of yield maximisation on the criteria of safety, liquidity and yield.

Figure 3 SELECT INTEREST RATES, 1989-1995



As regards the determination of risk premia, essentially no risk is incurred by purchase of government securities, therefore no premium is to be expected and consequently, no compensation via a higher expected rate of return. Notwithstanding, comparable instruments, for example, short-term deposits at well-established banks, may be seen as equally free of risk.

At the time of this writing, operational costs were considered a positive feature of the market, as operations are merely another duty of Central Bank staff at no addition to regular remuneration; postage costs are minimal; the issue of paper is carried out with

relatively small costs of promotion (newspaper and broadcast announcements in addition to pre-tender surveys); and re-discounting requires little more than a central location and adequate telecommunications facilities. In this regard, therefore, the market cannot be presumed any less efficient than financial intermediaries in handling a given amount of finance. Duplication of effort and manual recording methods are perhaps the aspects requiring greatest attention at present.

In the auction's favour is the fact that in the context of the Bahamian financial services system, official supervision of trading appears to increase the attractiveness of assets as it lends confidence to the entire process, with potential traders feeling less exposed to the risks of market manipulation and other abuses which are more readily facilitated in trading characterised by a lesser degree of supervision or regulation.

The Central Bank's management of the market, then, does appear to reduce opportunity for certain market abuses, and the concept of a reservation price has sound justification, although the frequent situation of significant rejection of bids on the basis of unfavourable prices would tend to suggest the need for pre-announcement of such reservation price. The literature offers strong support against pre-announcement, however, positing that reserve prices may lead to clustering of bids, providing a firm reference point for bidders wishing to corner the market. Using but not announcing reservation bids at sealed-bid auctions is therefore the preferred recommendation.

In terms of market availability and admission, the huge pool of non-resident funds is prevented from affecting the market as non-residents are as a rule presently precluded from transaction in any domestic security. The question of attracting international capital flows is therefore not pertinent for the present analysis. Aside from the outright exclusion

of non-residents, admission is open, although the paucity of information may be seen as a barrier to wider participation.

Prima facie consideration of the details of published information on the tender may deem them sufficient information for potential bidders, but clarification is necessary.¹

The amount allotted may include the Central Bank's purchase of either amounts undersubscribed or amounts rejected and therefore does not provide a true representation of tender results (see Table 3); the average tender rate is calculated using *accepted* tenders only and therefore does not fully represent overall bidding activity. The average discount rate is of course calculated based on the average tender rate and is, therefore, an accurate reflection of the cost to Government of borrowing funds, or the average annual yield to the investor.

The efficiency of no admission criteria or deposit requirements is to be balanced against the opportunity for fraudulent practices and entry by undesirables; and the prudence of retaining tender application forms in the existent format is also questionable. Currently, commercial banks tend to submit bids by way of written correspondence, although a tender application form exists (See Appendix A). If the form is to be retained,

¹ Key Treasury bill rates provided by the Banking Department of the Central Bank on a monthly basis and published in the Central Bank's Quarterly Statistical Digest are:

- average tender rate (ATR): amount actually paid for bills as a proportion of the amount on offer, i.e. principal/offer amount
- average discount rate (ADR): cost to Government of borrowing funds, or annual yield to investor, calculated as $ADR = 100\% - ATR \times 4.00$ (for 91-day bills)
- re-discount rate (RDR): penalty rate for early redemption, calculated as $RDR = 0.5 + ADR$

Not included in publication is the market rate (MR): rate offered for bills following the official tender, calculated as $MR = ADR - 0.1$, the margin of 0.1 having been set by the Ministry of Finance and World Bank consultants as a penalty for non-participation in the tender

revision would appear necessary and could involve a simpler replica of the application form for long-term government securities. In particular, some provision should be made for submission of bidder information: name, address, telephone contact; and stipulation of permissible settlement terms may be included.

PROSPECTS FOR REFORM

For purposes of enhanced transparency, several aspects of the auction may stand to benefit from review. A seemingly worthwhile objective would be to provide full disclosure and wide dissemination of accurate information about the market and the Government as issuer, to encourage broader market participation.

The minimum order of \$100 (face value), though theoretically low and unfavourable in terms of transactions costs, would be prudently maintained if the long-term objective is to broaden the market such that commercial banks, for instance, would operate as primary dealers; as this level would encourage participation by small buyers. What may be required is the development of a range of debt instruments to satisfy the diverse preferences of investors as regards maturity, yield structure and liquidity.

The current profile of participants would suggest limited usefulness of screening in the existent market, but as suggested in the previous section, if market deepening is an objective, the establishment of qualification requirements may also be a consideration for further review.

As regards the functional aspect, the Central Bank should routinely update, on a computerized system, statistics on the Government's average ordinary revenue, such that at any given time, the Government could be apprised of its borrowing capacity via short-

term paper. In addition, consideration should be given to an eventual change in the system of trading to screen-based.

CONCLUDING REMARKS

The market is a potentially powerful one in terms of monetary policy execution and could provide the central bank with an ideal vehicle for interest rate influencing; however, at present, the market has been set up solely to finance government operations. A developed Treasury bill market could spur growth of other financial markets and serve as the main channel for the Central Bank's open market operations. However, the market has remained relatively small, by design.

The importance of the market's contribution to timely settlement and enhanced market liquidity cannot be ignored, and indeed it represents a fine base for the country's financial development programme, specifically the development of the short-term money market. However, relative rigidity has been introduced into the market at an early stage, through the Government's desire to manipulate the financial system to finance its own expenditures at low interest cost. The sale of bills is mainly to captive buyers, enhanced by the unavailability of pertinent market information.

What may be required to encourage development of the Treasury bill market are competing markets. At present, the only short-term market is the interbank market which in The Bahamas, as in most developing countries, features a limited number of participants and a low volume of transactions, in what may be described as a two-tiered market with little interaction.

It may well be, however, as one author has posited that markets evolve, or are designed, with certain well-established structures, which are better off respected and

enhanced than undermined. If liquidity, for instance, is provided by committed marketmakers, then lending of securities to those marketmakers exclusively may be justified, as it enables them to take on their obligation to the benefit of all market users.

As regards financial services, inclusive of the market for credit to Government, The Bahamas has admittedly been more of a quick follower than an innovator, and the development of the Treasury bill market is further evidence of this approach. Further research is required into market structure, performance and potential. Isolated promotion of the market will not lend itself readily to justification, but presented within the framework of a consistent package of economic and fiscal policy, prospects are promising.

Meantime, in the absence of adequate guidance from auction theory, policymakers generally employ the experiences of others as models for their domestic institutions. As Cottarelli submits, key controversies remain unresolved and much is still left to trial and error strategy.

References

- Bartolini, Leonard** and **Cottarelli, Carlo** (1994) "Treasury Bill Auctions: Issues and Uses", IMF Working Paper 135
- Batten, Dallas S., Blackwell, Michael P., Kim, In-Su, Nocera, Simon E. and Ozeki, Yuzuru** (1990) "The Conduct of Monetary Policy in the Major Industrial Policies: Instruments & Operating Procedures," *IMF Occasional Paper 70*
- Cottarelli, Carlo** and **Kourelis, Angeliki** (1994) "Financial Structure, Bank Lending Rates, and the Transmission Mechanism of Monetary Policy," *IMF Staff Papers* Vol. 41 No. 4, pp.587-623.
- Chari, V.V., and Weber, Robert J.** (1992) 'How the U.S. Treasury Should Auction
- Drake, P.J.** (1977) "Securities Markets in Less Developed Countries," *Finance in Developing Countries*, Frank Cass & Co. Ltd., London, pp.73-91
- Shaw, Edward S.** (1973) *Financial Deepening in Economic Development*, Oxford University Press, London
- Slemrod, Joel** and **Yitzhaki, Shlomo** (1996) "The Costs of Taxation and the Marginal Efficiency Cost of Funds," *IMF Staff Papers* Vol. 43 No.1, pp.172-198.
- Zawadzki, K.K.F.** (1981) *Competition and Credit Control*, Basil Blackwell Publisher, Oxford
- Fry, Maxwell J.** (1988) *Money, Interest and Banking in Economic Development*, 1988, Johns Hopkins University Press
- Willis, Parker B.** (5th ed.1972) *The Federal Funds Market, its origin and development*, Federal Reserve Bank of Boston
- Wai, U. Tun** and **Patrick, Hugh T.** (1973) "Stock and Bond Issues in Less Developed Countries," *IMF Staff Papers*, Vol. XX No. 2, pp.253-317.

APPENDIX A

DATE.....

The Banking Manager
The Central Bank of The Bahamas
Frederick Street
P. O. Box N.4868
Nassau, Bahamas

Dear Sir,

I/We hereby tender for 91 days Treasury Bills of the nominal value of B\$......at B\$......per cent say.....per cent. The Bills should be dated theday of19..... and should be issued in the following denominations:-

SIGNATURE

/jk