

EXAMPLE OF BOT AUCTION ALLOCATION

Given that each [authorized dealer](#) can submit up to 5 requests, we will consider a competitive auction of 7,000 million Euros of annual BOTs (360-day year), in which 4 dealers participate, submitting the following bids, expressed in millions of Euros:

Dealer	Bid no.	Yield %	Quantity requested	Running total
A	1	1.00	900	900
A	2	1.15	800	1,700
D	1	1.65	800	2,500
B	1	1.70	1,000	3,500
C	1	1.80	1,500	5,000
A	3	1.82	1,000	6,000
C	2	1.82	650	6,650
D	2	1.84	350	7,000
C	3	1.84	1,400	8,400
B	2	1.88	1,100	9,500
B	3	2.60	1,500	11,000
D	3	2.80	1,000	12,000

Calculation of the minimum acceptable yield (or safeguard yield)

The procedure is as follows:

1) If the total amount bid is greater than the amount offered, the weighted average yield of the bids is calculated on those bids that, being ranked starting from the lowest yield, account for the second half of the nominal amount to be issued; if the total amount bid is lower than the amount offered, the weighted average yield of the bids is calculated on those bids that, ranked starting from the lowest yield, account for the second half of the amount bid;

2) The minimum accepted yield, corresponding to the weighted average yield in point 1) minus 50 basis points (1% = 100 basis points), will be identified.

Bids at yields less than the minimum acceptable yield will be automatically excluded and the weighted average allocation yield will be determined by reducing the total quantity offered by the issuer by a quantity equal to the excluded one. The excluded bids will, however, be allocated at the maximum yield between: the one obtained subtracting 10 basis points to the lowest yield allowed in the auction and the minimum acceptable yield.

Example:

1) Following the example of the previous table, since the total amount bid (12,000 million Euros) is greater than the amount offered (7,000), the requests considered are those that, sorted in ascending yield order, constitute the second half of the amount offered (3,500):

Yield %	Quantity requested
1.80	1,500
1.82	1,000
1.82	650
1.84	350
2 nd Half of the amount offered	3,500

- 2) The corresponding weighted average yield (RMP) is calculated, which results in 1.813.

$$\text{RMP} = \frac{(1.80 * 1,500) + (1.82 * 1,000) + (1.82 * 650) + (1.84 * 350)}{3,500} = 1.813$$

- 3) From this value, 50 basis points are subtracted (1.813 - 0.50), obtaining a minimum acceptable yield of **1.313%**.

Therefore, the two requests of dealer A made at 1.00% and 1.15% yields are excluded (for a total of 1,700 Euros) since they are lower than the minimum acceptable yield which is 1.313%. The weighted average allocation yield for the auction is calculated considering 5,300 rather than 7,000 million Euros as the quantity offered by the Treasury.

The excluded bids are allocated at the greater of the following two yields: that obtained by subtracting 10 basis points from the lowest yield allowed at auction and the minimum accepted yield.

Calculation of the maximum acceptable yield (or exclusion yield)

- 1) The bids considered are those that, ranked in ascending yield order, cover the first half of the amount offered (3,500), with the exclusion of the bids formulated at 1.00% and 1.15% that are lower than the minimum acceptable yield.

Yield %	Quantity
1.65	800
1.70	1,000
1.80	1,500
1.82	200
Half of the amount offered	3,500

- 2) The corresponding weighted average yield (RMP) is calculated, equal to 1.738.

$$\text{RMP} = \frac{(1.65 * 800) + (1.70 * 1,000) + (1.80 * 1,500) + (1.82 * 200)}{3,500} = 1.738$$

3) To this value 100 basis points are added (1.738 + 1.00), obtaining a maximum acceptable yield of **2.738%**.

In the example illustrated above one request is excluded from the auction: that of 1,000 million Euros by dealer D, submitted at a yield of 2.8% which is above the maximum acceptable yield.

Auction settlement

Given that the auction is competitive in nature, every bid accepted is settled at the requested yield.

The maximum yield that will be allocated is 1.84%. In fact, it is at that yield that a total of 7,000 million Euros is reached, corresponding to the amount offered (see table on page 1).

Nevertheless, two bids were made at that yield for a total of 1,750 million Euros, while only 350 can be allocated. Thus, the bids made at that yield will be allocated proportionally to the respective quantities, at the percentage of allotment calculated as follows:

$$\% \text{ of allotment} = \frac{\text{Quantity assigned at 1.84}}{\text{Quantity requested at 1.84}} * 100 = \frac{350}{1,750} * 100 = 20\%$$

Therefore, at 1.84% of yield, dealer D will receive, in addition to the quotas allocated at lower yields, 70 million Euros of 350 requested, while dealer C will receive 280 million of 1,400 requested.

Dealer A, who requested 900 and 800 million at a yield lower than the minimum acceptable yield, will be satisfied at a yield equal to the greater between that obtained by subtracting 10 basis points from the yield corresponding to the lowest yield allowed in the auction and the minimum acceptable yield. In our case the lowest yield allowed is 1.65, from which 10 basis points are subtracted (1.65 – 0.10) to get 1.55%. The bids considered will thus be met at the yield of 1.55% (normalised bids).

SUMMARY TABLE OF ALLOCATIONS

Allocation yield %	Quantity assigned per dealer and per allocation yield				Total
	A	B	C	D	
1.550*	1,700	0	0	0	1,700
1.650	0	0	0	800	800
1.700	0	1,000	0	0	1,000
1.800	0	0	1,500	0	1,500
1.820	1,000	0	650	0	1,650
1.840	0	0	280	70	350
Total	2,700	1,000	2,430	870	7,000

* normalised bids

Calculation of the auction's **weighted average yield**:

$$\begin{aligned}
 & \frac{\Sigma (\text{Quantity allocated} * \text{allocation yield})}{\Sigma (\text{Quantity allocated})} = \\
 & = \frac{(800*1.65) + (1,000*1.70) + (1,500*1.80) + (1,650*1.82) + (350*1.84)}{5,300} = \frac{9,367}{5,300} = 1.767
 \end{aligned}$$

Normalised bids are excluded from calculation of the weighted average yield.

SUMMARY TABLE OF AUCTION RESULTS

BOT maturity (expressed in days)	360
BOT offered (mln €)	7,000
BOT requested (mln €)	12,000
BOT allocated (mln €)	7,000
Average weighted gross yield	1.767%
Minimum yield allowed at auction	1.650%
Maximum yield allowed at auction	1.840%
Allotment percentage	20%
Exclusion yield (or maximum acceptable)	2.738%
Safeguard yield (or minimum acceptable)	1.313%

N.B.: The auction mechanism illustrated above is applied to every kind of BOTs.