

# Setting the reserve price for the Tracer DAO Gnosis auction

Peyman Khezr<sup>\*</sup> and Chris Berg<sup>\*</sup>

<sup>\*</sup>*RMIT Blockchain Innovation Hub*

This version: 4 June 2021

## 1 Introduction

Selling multiple units of a homogeneous good in an auction is one way of determining the market price. Uniform-price auctions have been used in many real-world markets because of their price discovery property: All winning bidders pay the same price (either highest losing bid or lowest winning bid). The question is how a seller could compute an optimal reserve price in a uniform price auction. First we should note that literature suggests a positive reserve price is usually better than no reserve price as it reduces the chance of underbidding by bidders. However, to compute the reserve price for a uniform price auction there are no clear criteria. In this note we follow the criteria given for the second-price auction as the best approximate of the uniform-price auction.

## 2 Model

Tracer DAO would like to sell 5% of 1,000,000,000 tokens in an auction to determine the benchmark price. The estimated value of all the tokens are around USD\$35-50 million dollars. We use the following criteria to compute the optimal reserve price. The optimal reserve price is computed according to the following formula.

$$r = \frac{1 - F(r)}{f(r)} \tag{1}$$

where  $F(r)$  is the distribution of buyers' values and  $f(\cdot)$  is the density of  $F(\cdot)$ .

Suppose the value of each buyer for the tokens is an independent draw from a uniform distribution denoted by  $F(\cdot)$  on  $[0, 10]$  (numbers are in cents). Then the optimal reserve price is computed as follows.

$$r = \frac{1 - \frac{r}{10}}{\frac{1}{10}} \tag{2}$$

which gives,

$$r^* = \frac{10}{11} \simeq 0.9 \tag{3}$$

In other words, we estimate that an appropriate reserve price for Tracer DAO tokens given the above assumptions should be approximately USD\$0.01.

Obviously, the uniform distribution is only one possible assumption. One can compute the above with an  $F(\cdot)$  which is normally distributed with a mean equal to 5. However, that would increase the optimal reserve price compared to the above level.