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STEPPING UP YOUR GAME

How pharmaceutical and device suppliers can use game theory to improve their strategy in public procurement processes.

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As healthcare systems try to curb costs, the use of competitive procurement processes such as tenders is continuously being fine-tuned and expanded, with the primary goal of achieving value for money.

While innovative pricing models and integrated partnerships provide an attractive equilibrium for patients, payers and companies alike (as discussed in "The way forward: Value-based healthcare in partnerships"), they are unlikely to become the most widespread method of procurement in the near future. In the meantime, the outcome of tenders and negotiations will remain of huge importance to suppliers.

Despite the importance of being successful, it is by no means straightforward for suppliers to navigate tenders and negotiations, or make decisions in a structured and profitable way. In order to succeed, companies need to develop systematic pricing tools and skills.

In "The fair bet in pharma pricing: An investor's perspective", we outlined four guiding principles that payers can follow to improve their procurement practices, avoid disputes, and achieve better outcomes. This time we consider procurement from the other side of the table, that is, from the perspective of suppliers. We outline the challenges that suppliers face in identifying their optimal pricing strategy and describe how game theory can contribute to overcoming these challenges.

PROCUREMENT IS A HIGH-STAKES GAME

Healthcare suppliers often find themselves in a procurement process (a game) where the payer has defined both the competitive landscape of eligible suppliers (the players) and the parameters that will determine the winner (the rules). The payer will also have defined what is at stake (the prize), that is, what will be awarded to the winner: for example, being assigned the majority of new patients for a specific indication, for one or two years.

Each eligible healthcare supplier can play the game and do their best to win given the moves available to them. In practice, these moves often correspond to different potential bids and offers. A bid may consist of several variables (e.g. efficacy, patient outcomes, volumes, support services, etc.) and typically includes a price.

In cases where public authorities have determined that several treatment options can be considered approximately equivalent in terms of safety and efficacy, the process may boil down to a 'one-shot game'. In such cases, each supplier must provide their single best and final offer (i.e. lowest price) and the payer will award a contract to the supplier who offers the lowest price (potentially, but not necessarily, accounting for any differences between treatments in relation to administering and monitoring costs).

PLAY TO WIN, BUT NOT AT ALL COSTS

The pricing decision – the specific price that the supplier decides to offer – is, of course, crucial. The price will determine not only whether the supplier wins the contract but also – regardless of whether or not they are successful – the price at which their product will subsequently be sold. Such a decision can be make-or-break for a local market access team, especially when the procurement concerns a key product in the portfolio.

It is clear that each supplier would prefer to win the competition, all else being equal. This would allow them to gain new patients and increase their market share to the benefit of patients, which naturally also has a positive impact on revenue.

However, suppliers should beware of the temptation to offer a very low price simply in order to secure the contract. In some cases, it might be preferable to accept a loss, if and when it is possible to generate revenue even without becoming the preferred supplier, that is, through existing patients or via a market segment that is uncontested due to an advantageous side effect profile[1] (or by way of other competitions).

Even if and when it does make sense to go for the win, there is no point in offering a discount larger than necessary to beat competitors, given that suppliers need to recoup their costs. This is why it is important to think very carefully about which price to offer.

MANY FACTORS ARE AT PLAY

It can be very difficult for a supplier's local market access team to identify the optimal pricing/bidding strategy (i.e. the move that it should play in the game). This is true particularly because several competing considerations may be in play:

- Short-term considerations
    - What is the value of our 'bird in the hand' and is it worth going for 'two in the bush'? In other words, how much revenue would we make in the upcoming contract period if we were to submit a higher bid and accept a loss versus how much could we make if we gambled by offering a large discount in a bid to win? What would we stand to gain and how much would we risk?

- Long-term considerations
    - How should we account for the long-term revenue impact? Winning the contract now would put us in a more favourable position going into future periods (with a larger existing patient base), but how heavily should this consideration weigh relative to other considerations (e.g. given patent expiries and/or market entries that will have a substantial impact on the long-term)?
    - What signal would we be sending to competitors by offering a certain price? Could we inadvertently trigger a negative price spiral in

    - subsequent periods? Or could we, conversely, send a signal that cools the competitive climate?
    - What other considerations besides revenue do we need to account for (e.g. having access to doctors, brand value, etc.)?

- Payers' behaviour
    - How might the payer react and respond to different prices? Might they extend the contract period if they were offered a price which was favourable enough?
    - Might we encounter switching of existing well-treated patients if the price differential between treatments is large enough?

Recognising the type of questions outlined above is the first challenge for suppliers participating in a competitive procurement process. However, the next, and often much greater, challenge is to decide on how to specifically account for these various considerations in the pricing and bidding strategy.

USE GAME THEORY TO CUT THROUGH THE NOISE

In our experience, local market access teams often have all the right ingredients to make a good decision. They know the size of their existing patient base and how many new patients might enter the market. They know how long patients are usually treated for and they know what the pipeline looks like (in terms of patent expiries and new entrants).

However, even though they have all of the right ingredients, there is room for improving the recipe. It can be challenging to put everything together in a structured way to identify the overall implications for pricing strategy. But this is where game theory provides value.

Game theory is the structured analysis of incentives. It essentially means to combine all available data within the same coherent framework to carefully and quantitatively assess the pros and cons of every possible move – taking into account the moves of other bidders. In practice, this can be done in quantitative simulation software.

In practice, for healthcare procurement processes, this means figuring out the value of winning versus losing the contract (i.e. expected revenue streams) for all potential moves and outcomes. As much as possible, calculations should account for all of the relevant variables that would play a role in determining profitability, such as the ones outlined in the above-mentioned questions. Revenue need not be the only outcome variable: it may also be a good idea to track matters such as market share and branding considerations.

The market access team can then map out the decision space to compare and assess the different options. If and when there is a move that will always be inferior to another move (a move which, in game theoretical terms, is dominated), then it can be discarded.

However, even after having discarded some potential options, several potential moves (e.g. price bids and discounts) may remain. Should we offer a 10% discount or a 20% one? It depends. And it often depends on a crucial unknown variable: competitors' behaviours.

KNOW THE COMPETITION

As in any game, when it comes to public procurement processes, the best players are those who are not focused exclusively on themselves, but those who can also consider how their competitors are likely to act and react.

You might be inclined to go for the win, but if your competitor has an even stronger incentive to do so, then the pursuit of victory may be fruitless. Conversely, you might realise that a competitor can generate a lot of revenue on their existing patient base, potentially implying that it will not take an aggressive discount to beat them.

One way of trying out various potential strategies and evaluating their probability of success is to run a 'war-gaming' exercise. Wargaming is the practice of simulating what could happen at the actual procurement by way of one or more mock runs before the real thing.

For a good wargaming session, it makes sense to try out various scenarios for various assumptions about unknown variables. In addition, it is also a good idea to put yourself in your competitor's shoes and go through the process of submitting a bid. Quantitative insights about what your competitor is likely to do (e.g. derived from a simulation tool) are often most effectively hammered home when you are forced to actually act them out yourself.

NAVIGATING AN UNCERTAIN WORLD

Game theory cannot remove uncertainty. Uncertainty will remain regarding what exactly your competitors will do and how uncertain future variables will play out (e.g. how many new patients will enter the market). Game theory can, however, help you to navigate this uncertainty and identify your best course of action given the information available to you.

Game theory provides a common framework and language that is useful for internal strategy discussions, and in communications with internal stakeholders (e.g. a global pricing team). Most importantly, it can be used to articulate not only what you will do, but also why you will do it, and to communicate clearly upon which key assumptions the decision rests.

FOOTNOTES

[1] For example, even though several treatments may generally be considered equivalent in terms of safety and efficacy, there may still be certain types of patients where a certain treatment is considered preferable, based on clinical data.