Maximising shareholder value in spectrum auctions

The importance of clear objectives, disciplined bidding and the psychology of value-based bidding

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Introduction

Poorly defined auction objectives and a lack of confidence in spectrum values can lead to decisions which can reduce or even destroy shareholder value

Spectrum auctions are high-stakes and high-profile events for mobile operators which can shape the company's network and technology strategy for years to come. However, poorly defined auction objectives and a lack of confidence in spectrum values can lead to decisions which can reduce or even destroy shareholder value. This paper explores the psychology of spectrum valuation and how operators can design and execute their spectrum auction bidding strategies to ensure the interests of shareholders remain at the forefront of decision making.

The need for clarity in auction objectives

Although spectrum auctions have been standard practice in some markets since the mid-1990s, there are many countries which have only recently started to adopt market-based mechanisms for the award of spectrum. Game theory and auction design are not topics that the boards of mobile operators must grapple with on a regular basis however, the task of setting spectrum auction bidding objectives is almost always a board level decision. We have worked with a wide range of operators and occasionally the objectives given to the bidding team are ill-defined and vague. Examples of such objectives include:

- acquire specific blocks, regardless of the price;
- maximise the amount of spectrum acquired, subject to a certain budget; and
- acquire the spectrum estimated to be the most valuable.

Poorly defined objectives can cause confusion for the bidding team

The fundamental problem with such objectives is that they can cause confusion for the bidding team, require them to make subjective judgements and worse, possibly result in the destruction of shareholder value.

For example, consider the objective to maximise the amount of spectrum acquired given a specific budget. If the bid team followed these instructions to the letter and were given a budget, of say US$ 100 million, then as auction prices increased, the amount of spectrum they could acquire would diminish. Indeed, by the end of the auction it may only be possible to acquire, for example, a 2 x 5 MHz block for the US$ 100 million but the value of the block to the operator may only be US$ 25 million, resulting in the destruction of shareholder value.

Alternatively, consider the instruction to acquire the most valuable spectrum. Suppose this spectrum is considered valuable by all the other bidders as well and as a result, it attracts a lot of bids. The intense bidding will push the auction price higher and with each increment in price, the opportunity to create value, the difference between the price you have to pay, and the value of spectrum acquire, shrinks. It may well be the case that a block with a lower valuation, but a lower auction price offers a greater opportunity for value creation, especially if the bid team have been given a budget for the auction.

The example below highlights that a higher profit can be made by bidding for Lot 2, as the difference between price and value is greater, compared to Lot 1.

To avoid destroying shareholder value or confronting the bidding team with difficult choices, auction objectives should be clear, unambiguous and couched in terms of value creation.

Maximising shareholder value should be the primary objective

The primary objective for the boards of most mobile operators is to maximise shareholder value – the cornerstone assumption of microeconomics and the theory of the firm. Whilst most boards pursue a range of objectives, including those that reflect their corporate and social responsibilities, shareholder value maximisation will always rank highly.

A bidding objective base on shareholder value maximisation is appropriate in an auction context

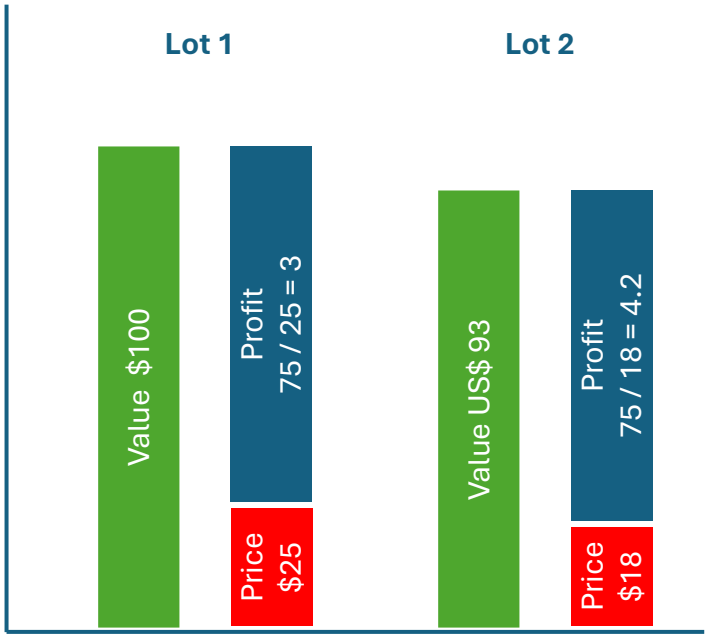
The clearest objective and one aligned with the board's primary task is to ask the bidding team to focus on maximising value in the context of the auction. In a world without budget constraints this would require the bidding team to continue to bid on all spectrum blocks with a positive value provided the auction price is less than the valuation. In theory, this means continuing to bid, even if the difference between the auction price and the value of the spectrum is a mere dollar.

In the previous example, if there were no budget constraint, the value maximising bidder would bid on both lots and would continue to bid until the auction ended or the auction prices reached the valuations.

In practice, nearly all bidding teams have a bidding limit imposed upon them. The board should ensure clarity over the bid limit: is it a global bid limit across all spectrum lots being auctioned, or are there a range of bid limits specific to each frequency band being offered?

In the case of the latter, the bid team continues to bid on the lot until either they win it, or they reach their bid limit and then stop bidding. If it is a global cap, then bidding becomes a little more complex – with a global bid limit the maximisation problem becomes one of maximising the value created for every dollar that is bid.

A simple example is provided below. Both lots generate the same profit, but Lot 1 does so more efficiently generating $4.2 of value for every $ bid.



Confidence in spectrum valuations is paramount

The spectrum valuation exercise converts spectrum into equivalent piles of cash

Prior to the auction, a mobile operator will have undertaken a spectrum valuation exercise. The operator will need to have established valuations for each spectrum band and block being auctioned. The role of the spectrum valuation exercise is to essentially convert the different blocks of radio spectrum into equivalent piles of cash. This means that the bidding team is simply trying to acquire different piles of cash for the lowest possible price. The bidding team can be entirely indifferent to the varying propagation characteristics, frequency range, interference issues, licence conditions, device availability, etc of each spectrum block when placing a bid and simply treat them objectively as piles of cash.

Achieving confidence in spectrum values requires answers to a lot of 'what if' questions

Arriving at the psychological state of mind where the operator and its bid team can simply regard each different spectrum lot as a different pile of cash is a challenging one. This can only be achieved through a comprehensive and robust spectrum valuation exercise. The process of spectrum valuation must ensure that once the auction is under way, there can only ever be one answer to any question related to the value of a particular spectrum block and that is, "*we have already thought about it, and it is already reflected in the valuation.*"

The spectrum valuation exercise must exhaust the board and bidding teams, 'what if' questions and ensure that there is complete confidence in every answer. If there is any doubt or uncertainty over the reasonableness of the spectrum valuations, then these must be resolved prior to the start of the auction.

Changing valuations mid auction can be very detrimental to auction success

It is challenging, but the leader of the bidding team, who will ultimately be responsible for placing the bids, must have enough trust in the valuations that they can bid on the basis that he or she is just bidding for piles of cash. Changing valuations mid-way through an auction can be extremely risky, especially in some auction formats which involve bidding for packages of spectrum lots, where bids in previous rounds constrain what you can bid on in the current round. A change in spectrum values can result in limitations being placed on the bid team with regard to how they can bid. Even in simpler auction formats, the presence of eligibility points, which constrain how much spectrum you can bid on, may mean that changes in valuations mid-auction can be very problematic.

It cannot be stressed strongly enough, that confidence in the spectrum values is a prerequisite for successful spectrum auction participation.

The psychology of auctions

Auction settings are psychologically charged environments and mobile operators should do all that they can to ensure that their auction participation is dull, boring and predictable. This can be achieved by picking the right auction bidding team and team leader, developing a robust auction bidding strategy and ensuring the team is well-trained and disciplined. Of course, the team leader must have unwavering confidence in the spectrum valuations!

The role of leadership: discipline over dominance

One of the most important characteristics of the bid team leader is discipline and the ability to walk away

The psychology of the bid team is a critical determinant of success. Leadership must be disciplined, analytical and dispassionate. While charismatic or competitive leaders may drive successful outcomes in other business contexts, they can be a liability in auctions. Type A CEOs who 'must win' at any cost, should not lead bid teams. Winning the auction is not the goal, creating value is the primary objective. Kahneman and Tversky's prospect theory shows that losses loom larger than gains. A bidder who has mentally committed to winning a particular band may irrationally escalate bids beyond value to avoid the perceived 'loss.' Bid team leaders must be selected for their ability to 'walk away' and to remain calm under pressure as auction prices begin to approach pre-agree bid limits. A structured bid limit escalation protocol should be agreed in advance and activated in good time to prevent last-minute emotional decision-making. Most importantly, the protocol should be followed.

Execution: people, tools and procedures

Auction bidding strategy execution must be flawless

Auction strategy alone is insufficient. Execution must be flawless. The bidding team should be selected with care and each team member should be allocated clear responsibilities such as timekeeper, record keeper, bid entry and bid verification. There should be clearly defined procedures and protocols related to all key auction related activities, especially bid formulation, entry, checking and submission. The team should be chosen to minimise the risk of group think where dominant personalities or internal pressure to conform suppress healthy discussion and debate, especially if the auction develops unexpectedly. The team should have the confidence to challenge the team leader if there is a risk that they may deviate from agreed bid limits or strategies.

Security protocols

Access to valuation and bid limit information must be tightly controlled

Information security is paramount in auctions, especially in relation to bid limits. The leakage of sensitive data such as bid limits, valuation models or strategic preferences can fundamentally undermine a bidder's position and put them at a disadvantage in an

auction context. Robust security protocols are essential and include the creation of a secure bidding War Room with security-controlled access and communications. Bid limits should be shared on a 'need to know' basis and communicated securely.

IT disaster recovery protocols

There should be a full IT and disaster recovery plan in the event of an emergency

Most modern spectrum auctions are performed using an Electronic Auction Bidding System which is accessed via a web browser. The bid teams are often located in the War Room within the operator's offices. The IT infrastructure including PCs and broadband connections should have back-up systems on standby and secure power. During one auction in which Coleago was involved, the client had a helicopter on standby on the roof of the building throughout the auction, ready to fly the bidding team to a reserve venue and War Room in the event of a catastrophic disaster.

Summary and conclusions

Spectrum auctions are high-profile and high-stake events for the mobile industry. To support success an operator needs:

- absolute and resolute confidence in its spectrum valuations;
- clearly defined auction objectives founded on shareholder value creation;
- a robust spectrum auction bidding strategy;
- a team leader who is disciplined and able to 'walk away';
- a well-trained, organised and disciplined bid team;
- agreed procedures and protocols;
- strong security; and
- a War Room backed up by a robust disaster recovery plan.

How Coleago can help

Coleago has over 20 years of experience in advising both operators and regulators on issues related to spectrum including spectrum management strategies, roadmaps, pricing and award process design and implementation, including auctions. We have supported operators in consultations, spectrum valuation projects and developing and executing spectrum auction bidding strategies.

About the Author and Coleago Consulting Ltd

Graham Friend, M.A., M.Phil., (Cantab), ACA, is an economist, an award-winning author and the Managing Director and Co-Founder of Coleago Consulting. Coleago is a specialist telecoms strategy consulting firm and advises regulators and operators on issues relating to spectrum, regulation and network strategy. If you would like to discuss any of the issues raised in this paper, then please contact Graham.

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