

## BOOK REVIEW AUCTIONS: THEORY AND PRACTICE

A best-selling staple of front-of-store displays in airport bookshops has been *Bringing Down the House*, the account of how several students from the Massachusetts Institute of Technology apparently found a legal way of extracting several million dollars from the casinos of Las Vegas.

A book by Paul Klemperer, the Oxford academic, might have rivalled that placement had it justifiably been entitled "Going, going, gone: the inside story of how I helped take the British telecoms industry for £22bn". Since he is a very proper academic, it wound up instead with the less thrilling title *Auctions: Theory and Practice*.

Clearly, Prof Klemperer, who advised the UK government in its spectacularly successful auction of third-generation (3G) mobile phone licences, is leaving the blockbuster for another day.

This book is a straightforward account of the basic theory of how auctions work, an intriguing (for economists) but slightly esoteric diversion into how auction theory can illuminate other areas in economics. It contains some conclusions on auction design and a detailed discussion of the European 3G auctions in 2000 that attempts to match the theory to the outcome.

Auctions have long been an essential tool for allocating scarce resources, used particularly by governments to get the best price for assets such as sovereign bonds and mineral concessions. But the wildly differing outcomes of the series of European 3G auctions focused attention within both the business and economics worlds on auction design. That the UK government hauled in a sum equivalent to €650 (\$793) per head

of population as opposed to the €20 per head brought in by the Swiss version is substantially down to the way the auctions were designed. The design of auctions is now clearly a subject of mainstream business relevance.

That said, as a handy guide to auctions and applications of auction theory for non-experts, this book has some flaws.

Written as a collection of independent lectures rather than a coherent whole, it suffers from inevitable repetition, and the accessibility of the different chapters for

## AUCTIONS

Theory and Practice

By Paul Klemperer

Princeton University Press, £19.95

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 readers without a background in technical economics varies considerably. The most interesting sections for more general readers are the case studies of the European 3G auctions, which contain detailed discussions of how the strategies of the bidders interacted with the design of the auction.

Having been involved in auction design himself, Prof Klemperer's insights are valuable and often intriguingly counter-intuitive. One of his central conclusions is the paradoxical view that, when it comes to designing auctions, auction theory per se is not much use. It tends to focus too much on situations in which there are a fixed number of bidders and the bidders do not collude with each other.

In practice, increasing the number of bidders that can be attracted into an auction, and making sure they do not have incentives to conspire against the auctioneer, are the critical elements of making an auction yield as much

revenue as possible. Like the MIT students who worked out a way to count cards in blackjack, bidders have ruthlessly sought out the large potential gains from exploiting weaknesses in badly-designed auctions.

The disastrous Swiss 3G auction, for example, used a simple open ascending auction for four licences, and in effect sanctioned collusion by allowing joint bids from companies up to the last minute rather than trying to maximise the number of applicants. The potential number of bids fell from nine to four the week before the auction. With no competition, and being able to monitor each others' bids all the way through, the bidders walked off with ludicrously cheap licences.

Prof Klemperer's preferred course in such cases is an ascending auction followed by sealed bids at the last stage once the bidding is down to the last few companies. This discourages collusion by making it impossible for companies to be sure that their co-conspirators stick to any deal, and encourages entrants into the bidding process by giving them a shot against established incumbents.

This kind of analysis, rather than relying on esoteric auction theory, is common-or-garden undergraduate microeconomics. It is also common sense. The chance for companies to appropriate large gains in any market is minimised when they are subject to effective competition and entrants can undercut them.

What is true for companies producing cars is true for companies bidding in auctions. "In short," as Prof Klemperer puts it, "good auction design is mostly good elementary economics."



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Journal of Economic Psychology 26 (2005) 155–157

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## Book review

**Auctions: Theory and practice, by Klemperer, P., Princeton University Press, Princeton, NJ, 2004, pp. 246, ISBN: 0-691-11925-2, (5 figures, 1 Table), \$29.95 (Paperback)**

In the summer of 2000, observers of the third generation (“3G”) spectrum license auctions witnessed both amazing revenues for some governments as well as embarrassing failures for others. At the same time, Paul Klemperer presented on various occasions his analysis of what constitutes a good auction design. His detailed analysis is collected in this book, enriched with a brief introduction to auction theory. Klemperer was the principal auction theorist advising the UK government on the design of its 3G auction and his enthusiasm for the UK auction should be understood in this context; nevertheless Klemperer argues his case very well. To audiences of any of his talks on the topic, it will not come as a surprise that this book is enlightening and entertaining to read.

All the chapters have been published before. As a consequence, there is quite a bit of redundancy among the chapters, but the advantage is that they are all self-contained. For a collection of previously published work, the book presents a quite coherent treatment. Only Chapter 2, which deals with applications of auction theory to other areas of economics, departs from the main topic, the discussion of good auction design. This chapter is, however, very insightful and highly readable and indeed shows that, as the title suggests, “... every economist should learn some auction theory”.

Chapter 1 contains a survey of auction theory, complemented by a set of very useful exercises (with solutions). This chapter provides a comprehensive overview of the auction theory literature, but as an introduction to the theory of auctions it might not be the easiest to digest. A total of 155 footnotes may be almost inevitable for a literature survey, but it does not help readability. The appendix, containing derivations of fundamental concepts like the revenue equivalence theorem (RET), is very helpful but again, for a first contact with auction theory, it might be a bit too dense. Furthermore, while this chapter is explicitly understood as an introduction to auction theory, the extremely limited discussion of empirical and experimental papers seems unfortunate, in particular because the book’s topic is not only the theory of auctions, but also its practice.

In Chapter 2, Klemperer presents an extensive collection of examples where auction theory inspires new insights into other areas of economics. For example, an

application of RET allows immediate insights into comparisons of different litigation systems (and the uselessness of a proposal by Dan Quayle). This is an enlightening chapter that requires not much more understanding of auction theory than familiarity with RET.

The next two chapters take the opposite view, arguing that for practical auction design, standard concerns in competition policy might be more relevant than the issues auction theorists are usually concerned with. In Chapter 3, Klemperer forcefully argues that good auction design depends on the context, in particular on whether collusion and entry are problematic issues (whereas the auction theory literature usually assumes a fixed number of bidders<sup>1</sup> and ignores the possibility of collusion). He illustrates this point with remarkable failures of some recent high-scale auctions. He proposes measures to make ascending auctions more robust to collusion and advocates the Anglo-Dutch auction that combines an ascending auction with a final sealed-bid stage that encourages entry, compared to an ascending auction at low expected efficiency losses.

Chapter 4 looks at these issues from a more general perspective. Klemperer argues that in the application of auction theory often too much weight is given to factors that are captured in elegant theoretical models, in particular affiliated signals, but have little relevance in practice because of their sensitivity to other assumptions that are not likely to be fulfilled (e.g. risk neutrality). Furthermore, he argues that economic advisors have to take into account how political pressure might alter the design they initially proposed as well as the context, in particular past and future auctions.

The remaining four chapters present a detailed case study of the European 3G auctions. Chapter 5 reports more thoroughly on the European 3G auctions and how the arguments outlined in Chapter 3 explain the different successes. In Chapter 6, Klemperer describes in great detail the issues that had to be considered in the design of the UK auction beginning with a discussion of advantages and potential disadvantages of auctions (and dismissing most of the latter). This is an extremely interesting insider's report on economic consulting. In this chapter, Klemperer also briefly discusses the merits of experiments to complement theory as a basis for policy advice. In Chapter 7, Klemperer discusses potential explanations for superficially irrational behavior of individual bidders in the UK and German 3G auctions. He stresses the role of behavioral aspects like beliefs about other bidders' valuation models, concerns for relative performance, and bidders' beliefs concerning the weight other bidders might put on relative performance. Chapter 8 is a brief defense of the 3G auctions against the criticism that they were responsible for slowed investment in 3G and reduced the market value of the telecoms companies.

In conclusion, this book provides an excellent introduction to the practice of auction design and to the application of auction theory to other fields of economics. It is suited for graduate and advanced undergraduate courses in auction theory, best as a

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<sup>1</sup> For the same reason, experiments may be misleading, because they usually employ a fixed number of bidders, an issue that is unfortunately ignored in this book.

complement to the book by Krishna (2002), which presents a very thorough theoretical treatment, but lacks exactly where Klemperer's book has its strength, the discussion of practical issues. For a comprehensive treatment of auctions, however, a course should be enriched with a more extensive discussion of empirical and experimental evidence. Chapters 2 and 3 would also be excellent material for a graduate course in industrial organization, as would Chapters 3 and 4 for a course in competition policy. Finally, Chapters 4 and 6 are very useful reading for anybody considering consultancy work for government agencies.

## Reference

Krishna, V., 2002. *Auction theory*, Academic Press, San Diego, CA.

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Available online 11 November 2004