

Book Reviews / *Besprechungen*

LAFFONT, JEAN-JACQUES, and TIROLE, JEAN: *A Theory of Incentives in Procurement and Regulation*. Cambridge (Mass.) 1993. MIT-Press. 705 pp.

Regulation, privatization, and efficient government procurement were among the most hotly debated economic policy issues over the last two decades and are most likely to remain so. Widespread public discontent with the efficiency of regulated or state-owned industries have led governments not only in many OECD countries but also in less developed and eastern European countries to experiment with various forms of drastic regulatory reform. It is fair to say that the regulatory theory of the 1970s had little to offer to guide these reforms. The main shortcoming of this theory was that it completely ignored informational constraints and incentive problems. Thus, its recommendations required that regulators possess detailed information about the regulated industries which is simply not available in practice. Second, it started from the assumption that the regulatory agency is maximizing some social welfare function, ignoring the fact that these agencies often have their own objectives and must be prevented from colluding with the industries they are supposed to control.

The recent developments in game theory, contract theory and information economics have provided the tools with which to address these problems in theoretical models of regulation. Much of the pioneering work in this area is due to Laffont and Tirole. The new book builds on, extends and synthesizes their previous work. Even those who have followed the literature closely and know most of the papers on which this book is based will be amazed how well the different pieces fit together into a coherent “Theory of Incentives in Procurement and Regulation.”

The basic building block of the book is a by now classical model first developed in LAFFONT and TIROLE [1986]. This is mainly a model of adverse selection, but it also has a moral hazard component, and it can easily be extended to discuss hold-up problems arising from unverifiable investment decisions and incomplete contracts. It is an amazingly rich and flexible model. Each of the seventeen chapters takes it as a starting point and develops it in a different direction. This procedure has two important advantages: First, the reader does not have to learn a new model in every chapter. Second, and more importantly, it imposes a strong discipline on the authors. A common concern about the use of game theory and principal-agent models in industrial organization, international trade and also regulatory economics is that almost any phenomenon can be explained as “rational behavior” or as an “optimal contract” by choosing the “right” model which delivers the desired effects. By restricting themselves to use the same basic model throughout the book the authors have considerably less degrees of freedom to pick their assumptions. Furthermore, the reader gets to know this model very well and can more easily judge whether a result is due to some particular modelling assumption or whether it holds more generally.

The book begins with an introductory chapter briefly reviewing the history of thought in regulatory economics, summarizing the basic concepts of regulatory practice and previewing the questions to be addressed in the following seventeen chapters. The body of the book is divided in six parts. The first chapter in Part I introduces the basic model. This chapter is particularly well written. It gives a self-contained introduction to adverse selection problems, develops the basic concepts and methods from scratch, discusses

various modifications and extensions of the basic model, and hints at some of the effects to be discussed later in the book. A thorough understanding of this chapter makes it relatively easy to go through almost all of the rest of the book.

The remainder of Part I deals with the control of a single firm in a static environment by a benevolent regulator, including the questions of pricing in single- and multi-product firms and the regulation of quality. Part II continues to focus on the regulation of a single firm, but introduces a competitive (unregulated) fringe. Here problems of access pricing and cream skimming arise. Part III considers many firms bidding for a natural monopoly. The regulator has to auction off an incentive contract. If the auction is going to be repeated in the future, so that later on the winner of the first auction may lose his contract again, then the incumbent's investment incentives may be adversely affected. Hence this must be taken into account when the auction is designed. Part IV is concerned with multiperiod regulation of a single firm. Technically, this is by far the most difficult part of the book. If the regulator cannot commit to a long-term regulation scheme, then the firm will be reluctant to reveal private information at the beginning of the relationship because it rationally foresees that the regulator will exploit this information in the future to extract more of the firm's rents and to put it on a more demanding incentive scheme. This is a formalization of the celebrated "ratchet effect."

Parts I to IV assume a benevolent regulator maximizing social welfare. Part V relaxes this assumption and develops an agency-theoretic approach to deal with regulatory capture, collusion between regulator, firm and/or interest groups, and cartelization by regulation. The regulatory agency maximizes its own payoff rather than social welfare. It has less information than the regulated firm, but is better informed than the ultimate principal (i.e. legislature, the taxpayer, or the general government). The ultimate principal again represents public interests (but this is not crucial). Its problem is to design an incentive scheme for the regulatory agency which induces the agency to regulate efficiently. Finally, Part VI is a first attempt to explain regulatory institutions from an incomplete contract's perspective. It is asked whether there is a rationale to restrict the regulatory agency not to use monetary transfers, or to restrict it to write only short-term contracts. Furthermore, this part contains an interesting model of privatization, addressing the question whether ownership matters for the regulatory outcome.

The book concludes with a summary of the basic insight and an extensive discussion of important topics for future research. Exercises can be found at the end of the book. There are nineteen *review problems* most of which are quite demanding and develop the material of the different chapters in further directions. They offer an excellent challenge for the ambitious reader. There are also thirteen *review questions*, which are much simpler and may be more appropriate for a first course. Answers to these problems (prepared by Peter Klibanoff) are available to instructors from MIT-Press.

Each of the chapters (with the exception of chapter 13 on cartelization by regulation) builds on a previously published paper by Laffont and Tirole. However, this is much more than just a collection of papers. Many new results have been added, a unified analytical framework is maintained throughout the book, and each chapter is organized along the same lines: A brief introduction addresses the questions to be discussed, puts them in perspective and gives an overview on the results to follow. Then the model is set up and analyzed. The presentation of the results is very well structured and the authors do an excellent job in explaining the intuition behind them. Almost all of the proofs are relegated to Appendix A. Appendix B contains some bibliographical notes (sometimes a bit too short) which relate the chapter to other papers in the literature. The big advantage of this procedure is that it makes the book very easy to use. Each chapter can be read separately (given a thorough understanding of chapter 1) and the reader will quickly find what he is looking for. There is a (small) disadvantage, though: If you are going to read the entire book you may get a little bored after 700 pages when the same structure is repeated over and over again.

It is impossible to discuss even a selection of the many fascinating and important results derived in this book. Instead, I restrict myself to briefly comment on two conceptual problems which are partially solved by Laffont and Tirole but certainly deserve more attention in future research. Throughout the book the regulated firm is a black box, identified with a utility function depending on its profits and the effort costs which have to be spent in order to reduce production costs. This makes perfect sense if the firm is run by an owner-manager who is residual claimant on profits and bears the effort cost himself. However, in most applications the manager is an employee of the firm, working under an incentive scheme, while shareholders are residual claimants on profit. As long as the manager's final utility is monotonic in the firm's profit, the basic results derived in this book will probably carry over. However, many new topics arise: How well are shareholders informed as compared to the regulator and the manager? How does the regulation scheme affect the manager's incentive scheme and vice versa? The authors are well aware of these problems and make a first step to address them in chapter 17 (on privatization) which considers an employee-manager responding to both, shareholders and regulator. This is certainly an important topic for future research.

The second problem I would like to discuss is a general problem of principal-agent or contract theory. The shape of the optimal incentive scheme in an adverse selection problem is determined by the regulator's prior probability distribution over the possible cost parameters of the firm. This is unfortunate for two reasons: First, the regulator's beliefs are not observable, which makes it difficult to empirically test the predictions of the theory. Second, the optimal incentive scheme is typically very complicated, much more so than the (often linear) schemes observed in reality.

An important result in Laffont and Tirole's book is that under some technical conditions a highly non-linear incentive scheme can be replaced by a menu of linear contracts. These linear schemes have the advantage that they are robust against the introduction of additional noise (as long as there is no risk-aversion). Furthermore, the more efficient the firm, the more high-powered is the incentive scheme it will choose. This is an important step towards a theory which derives optimal (or nearly optimal) incentive schemes which are simple, robust, and empirically testable. However, it should not be overlooked that the composition of the menu of linear contracts again depends on the underlying probability distribution. The theory of incomplete contracts, also used in the later chapters of this book, may offer an alternative framework to derive more simple predictions. However, right now this theory is still in its infancy and faces much more severe conceptual problems than traditional principal-agent models.

Who should read this book? Certainly, everyone who is interested in the latest developments in the theory of regulation and procurement. As my brief overview above has shown, it covers most areas of theoretical regulatory economics. However, some topics are omitted (which clearly is unavoidable). The book does not address the specific problems of regulation in banking, securities, and bond markets (but see the new book by DEWATRIPONT and TIROLE [1993] on these issues), and it does not deal with the market for health services, with environmental externalities, and with job safety. Still, some of the methods developed here could fruitfully be applied to these problems. The book can also serve as a reference book. However, the bibliographic notes at the end of each chapter are rather brief, and they do not attempt to give a full survey of the literature.

The book is very well suited as a textbook for a graduate course on regulation but also on contract theory. In their foreword, Laffont and Tirole offer detailed instructions which chapters should be emphasized and how the material could be complemented to cover institutional and empirical issues. I used the book as the basic textbook on adverse selection in two graduate courses on contract theory at MIT and Bonn University, and the students and I liked it very much. Chapter 1 offers an excellent introduction to static adverse selection models, Chapters 9 and 10 are by far the best introduction available to

the difficult topic of repeated adverse selection, and many other chapters offer interesting and original applications of principal-agent and incomplete contracts models.

To summarize, this most impressive book is a landmark in the literature and certain to become a standard reference in the rapidly developing theory of regulatory economics.

References

- DEWATRIPONT, M., and TIROLE, J. [1993], *The Prudential Regulation of Banks*, mimeo, University of Toulouse.
- LAFFONT, J.-J. and TIROLE, J. [1986], "Using Cost Observation to Regulate Firms," *Journal of Political Economy*, 94, 614–641.

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HAYAMI, YUJIRO and KEIJIRO OTSUKA: *The Economics of Contract Choice. An Agrarian Perspective*. Oxford 1993. Clarendon Press. 209 pp.

This book provides an overview of what has been an extremely rich research tradition examining the diverse reasons for why individuals – primarily peasants – select one type of contract from a set of contracts that are available to them. For scholars who are interested in the relationship between theory, empirical research, policy analysis, and policy prescriptions, this is a particularly important book. Hayami and Otsuka's work reveals that some of the revered assumptions underlying agrarian law in developing countries are not supported by rigorous theoretical and empirical research. The authors themselves identify on the first page four major questions addressed in the book:

Why is it that hierarchical firms do not become dominant in agrarian economies?

What contractual arrangements among independent farm-operators, laborers, and land-lords are substituted for the large internal organizations?

Why is one form of contract chosen among alternatives in the economic, social, and technological environments of agrarian economies?

What is the mechanism of enforcing contractual terms, especially with respect to the worker's effort?

The book is organized in the following manner. First, Hayami and Otsuka provide a general overview of labor and land contracts in agrarian economies of developing (primarily Asian) countries. Most prior work has undertaken separate analyses of labor, land, and credit contracts using a variety of assumptions about the availability of information, the capacity to monitor and enforce contracts, and the views of participants toward risk. While Hayami and Otsuka initially discuss each of these models separately and examine how various assumptions about information, monitoring, and risk affect individual models, they eventually analyze interlinked credit and cost-sharing contracts over time. Their analysis answers many earlier theoretical puzzles such as why the 50:50 share tenancy is so predominant in agrarian economies, why landlords provide tenants credit at such low levels of interest, and why landlords and tenants so frequently share the costs of outputs and inputs on an equal basis. These interlinked contracts are shown to be an effective counteracting institution to the underdeveloped, imperfect markets for land, labor, and credit that exist in many agrarian economies where unpredictability in weather and the supply of inputs make it difficult to distinguish poor results caused by moral hazard from poor results caused by nature and technological problems. Landlords can obtain credit at a lower cost than tenants, but this does not answer the array of questions. The landlords who engage in 50:50 share tenancies are usually farmers themselves in the same area as their tenants. They are thus engaged with the tenants in a rich