

Chapter Title: Introduction

Book Title: Agency Theory: Methodology, Analysis

Book Subtitle: A Structured Approach to Writing Contracts

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Published by: Peter Lang AG

Stable URL: <https://www.jstor.org/stable/j.ctv9hj826.4>

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I Introduction

1 The Contracting Problem

Trade will only take place if each party feels certain that the counterparty honours its obligation once it has performed its part. It can only derive this certainty from an enforceable contract. In contracting, three problems have to be dealt with: The contract parameters must be defined, observed and a mechanism for enforcement provided. For every conceivable contract parameter, problems might arise on any one of these levels. Either they cannot be solved or at least not without cost. If, however, the problem of contracting is not solved, no trade will take place, resulting in a loss of welfare. Provisions for solving the contracting problem can therefore be valuable even if they come at a cost.

Consider a principal who hires an agent to develop a marketing strategy for a certain product. One might think that what he cares for is to be able to sell more of the product at a possibly higher price. However, this is not exactly what the principal demands of the agent. If there is a boycott against the principal's products or should a highly publicized blackmailing affect consumers' preferences for the good, the principal will suffer a loss. Will he blame this loss on the agent? Probably not. Not to be mistaken, the principal's aim ultimately is to sell more at a higher price. And he knows that in order to get there, he has to take action. Some of this action, though, may require specialized know-how or just time, which the principal does not have. He also knows that even if these tasks are performed, there is still some uncertainty about how things will turn out. He may ask himself whether he is willing to take this risk, or whether he would prefer to shed some of the risk; but the two questions of delegation via an agency relationship and risk management are a priori unrelated to each other. Therefore, when hiring a "marketing specialist", the principal really wants to make sure that he exerts effort and does everything a marketing specialist can do to boost sales. But if he cannot contract on effort (or something related), no trade will occur.

When trying to contract on effort, the first problem, however, can be to **define** what this contribution expected from the agent actually comprises. This will be especially difficult if the principal does not know the **production function** or, to put it differently, if he does not know the drivers of success or failure in this area. In particular, this will be true in settings where tasks require **specialized knowledge** and are **non-routine**. In such cases, it is likely that no reliable information based on prior experience exists, neither in the principal's organization nor readily available through simple research. But, even if the principal can define total contribution expected from the agent, he may very well

not be able to observe it. Maybe he can **observe** it at a cost by putting in place some kind of monitoring device. Possibly, he cannot observe it at all.

Even if the principal can observe effort, this will not be enough. In order to contract on it, an agreement must also be **enforceable**. Consider the above example, wherein the company hires the marketing specialist. The marketing specialist visits the company's premises, spends time, produces a report, but, in the end, the company feels that he did not exert effort. Perhaps the company's managers have observed that the marketing specialist and his team were working on two projects at a time. The managers cannot prove that when they entered the consultants's on-site office the consultants seemed to behave strangely, quickly switching from one computer document to another, etc. Without entering into further details, it becomes clear that there are verifiable, objective "**hard facts**" on the side of the agent, but only elusive, subjective "**soft facts**" on the part of the principal. If the parties rely on the court system for enforcement, it is clear that there will be problems of enforcement for the principal. The concept of effort is too elusive for the **court with its bias towards objectivity**. In order for a contingency to be **enforceable** in court it must be **verifiable**, and in order to be verifiable it must be **objective**. Thus, the court enforcement mechanism sets constraints on the set of contingencies that can be used as performance criteria in a contract.

This set of performance criteria can, of course, be expanded by introducing other enforcement mechanisms. First of all, the parties are free to **choose any jurisdiction** and any court in the world to settle disputes. There might be differences in quality and bias¹. Second, parties can resort to **arbitrage**, barring the recourse to courts (where possible). Arbitrageurs usually represent a third party that is more accustomed with the subject matter of the contract than unspecialized courts. So, they will probably be able to deal with "softer" contingencies, relying on their judgement and thereby making it possible to enlarge the set of contractible contingencies.

But there is an even more radical alternative: One can try to put in place a **self-enforcing mechanism** which is able to enforce **subjective performance measures** that depend to a certain extent on the **discretion** of the parties involved. The basic problem of subjective performance measures is the following: If the decision of whether effort was exerted or not is left to one of the two parties, say, the principal, he will have the incentive to report that no effort was exerted. Thus he releases himself from his own obligations to pay the agreed-upon fee. In other

¹ It is said e.g. that a seller will always prefer Swiss law and a buyer German law.

words, he will have the incentive to **renege** in any event. So, any mechanism relying on subjective performance measures must address this problem.

One such self-enforcing mechanism is the **tournament mechanism**. Here, the principal, dealing with a group of agents, makes a **verifiable pledge as to the total amount** of bonus paid out to one agent or group of agents. However, the decision on what agent or group of agents receive the bonus is left at the discretion of the principal. This allows him to introduce judgement. The argument goes that, since the principal cannot save by renegeing, he will live up to his obligation. This is true if he has at least a **marginal preference for rewarding merit and keeping his promise** and there are **no side-payments**² from the agent to the principal³ which will cause the **mechanism to break down**. In fact, **promotion** can be seen as some sort of tournament mechanism. This mechanism can be used when dealing with many agents, or if one wants to reward relative overperformance and punish relative underperformance.

Another self-enforcing mechanism is the **reputation mechanism**, which will be treated at length later in the analytic part of this thesis. Still, just to provide a taste of the argument: The idea is that if the principal or the agent reneges on their promises their reputation will suffer, not allowing them to do certain kinds of business in the future. This is surely the case with the **specific counterparty**, but also with **other counterparties**, if the **news is spread**. So, long-term reputation concerns may counterbalance the prospect of short-term gains on renegeing.

The principal must therefore be able 1) to define total contribution, 2) to observe it and 3) to enforce it. It can be seen from the above that, on each of these levels, problems might arise. Sometimes these problems can be solved at a cost, but sometimes they cannot be solved at all. In this case, the parties can only switch to alternative measures of performance.

2 Applications

Based on relatively recent developments in microeconomic theory, such as game theory and economics of information, contract theory has a wide range of applications. The design of incentive contracts within and between companies (e.g. with suppliers or sales partners), the structuring of financial transactions, the design of market structures, pricing and guarantee arrangements and the economic

² Side payments would induce a cooperative equilibrium in game theoretical terminology.

³ Social relations and favours can play a part.

analysis of legal and other institutions are only a few possible examples. In contrast to the usual problem of optimization *within constraints*, contract theory is concerned with the optimization *of constraints*. When stuck in a setting where the interaction of people leads to suboptimal solutions, the challenge is to design contracts which allow them to reach better outcomes.

3 Models of Contracting

There are various kinds of contracting models. Different classifications exist, but none is universally recognized. The author tends to distinguish between models of “moral hazard”, “adverse selection” and “incomplete information”. Moral hazard problems arise if the agent can benefit from taking advantage of information asymmetry after the contract is concluded. This can come in the form of action that he can take which cannot be observed by the principal, or by information that, at a given point of the interaction, becomes available to the agent but not to the principal. Moral hazard problems therefore come in two variants: Moral hazard with hidden action and moral hazard with hidden information. Adverse selection models refer to asymmetric information *before* the contract is concluded. Sometimes models of moral hazard with hidden information are also regarded as problems of adverse selection. Possible strategies to overcome the adverse selection problem are signaling and screening. In the case of signaling, the agent is trying to send a credible signal revealing private information. This can be done by taking some kind of action which would cause a loss to the agent if he was not telling the truth. In the case of screening, it is the principal who, by offering a menu of different contracts, tries to extract information from the agents. Signaling and screening are sometimes treated as separate types of models. Models of incomplete contracts deal with the problem that contracts are often concluded knowing that not all possible contingencies are covered by the contract, because this would be either too expensive or impossible due to bounded rationality. Incomplete contracts are therefore often considered as belonging to “transaction cost economics”, while moral hazard and adverse selection are considered as belonging to “economics of information” – the difference being that the first assumes less perfect rationality than the second.

4 Obsession with Modeling Single Effects

The literature on contracting is extensive and complex. A considerable investment of time has to be made to read articles which model only a tiny effect within the broader phenomenon of, say, moral hazard with hidden action. While simultaneous modeling of many effects is not sensible, as will be argued below,

modeling single effects is the right thing to do. However, little effort is given in trying to summarize the different effects and in trying to show how these can be applied to specific problems. Real-world problems usually comprise a multitude of effects. When assessing a contract between a company and its sales partners, there is usually both a moral hazard and an adverse selection problem. If the sales partners are not exclusive partners, there is the effect of many principals competing for the attention of one sales partner. Many other effects can probably be found in the specifics of a particular situation. It can, of course, be argued that some effects are more important than others which can subsequently be safely ignored; however, it would at least be good not to make a leap of faith but to carefully weigh different effects according to relevance. As will be argued later, this weighing should be done close to the specific problem.

5 Methodological Reflection

In order to apply contract theory to specific problems, it is not sufficient to summarize the different effects. The specific methodological problems of application also need to be discussed. In addition, although economic method is largely analytical and this approach is helpful, it must also be clear that there are other important sources for understanding contracts. As contracts like other institutions are the product of evolution, it is plausible to grant them the presumption of implicit wisdom. Contract theory is therefore a potentially multidisciplinary field combining the methods of economics, law, sociology, history, anthropology and psychology.

Starting with some brief remarks on philosophy of science in general and then proceeding to a discussion of orthodox microeconomic methodology, this thesis will present the methodological foundations of contract theory. It will be argued that contract theory takes a microanalytical approach but can learn from the implicit wisdom of existing institutions if and insofar as they can be interpreted as the product of evolution. A mix of analytical models and casuistic work is expected to be most fruitful.

6 A Note to the Reader

Part II can be seen as an attempt by the author to come to terms with the epistemological foundations of science. Although in some respects it sets the stage for part III, it is clearly longer than needed for an economic monograph and is not necessary in order to follow the rest of the text. Although the analysis in part IV is only concerned with moral hazard with hidden action, the methodological

reflections in part III are much more general. The reason for this seeming imbalance is that this thesis is intended as both proposal and description of a research programme plus the realization of a tiny bit of it. So, the methodological discussion is meant to be an essential part of this thesis in its own right rather than just a preliminary exercise. Part V summarizes the result, provides a checklist for analysing contracts from the perspective of moral hazard and finally provides an outlook for further research.

The author tries to insert many synoptic sections in order to make the text more readable than it was in earlier drafts. Each part opens with a complete overview. In the analytical part, hypotheses which are to be derived are stated at the beginning of the Section. At the end of each Section, results are discussed verbally without taking recourse to mathematical notation. This should make it possible for the non-technical reader to browse through the material while treating the analytical parts as black boxes.