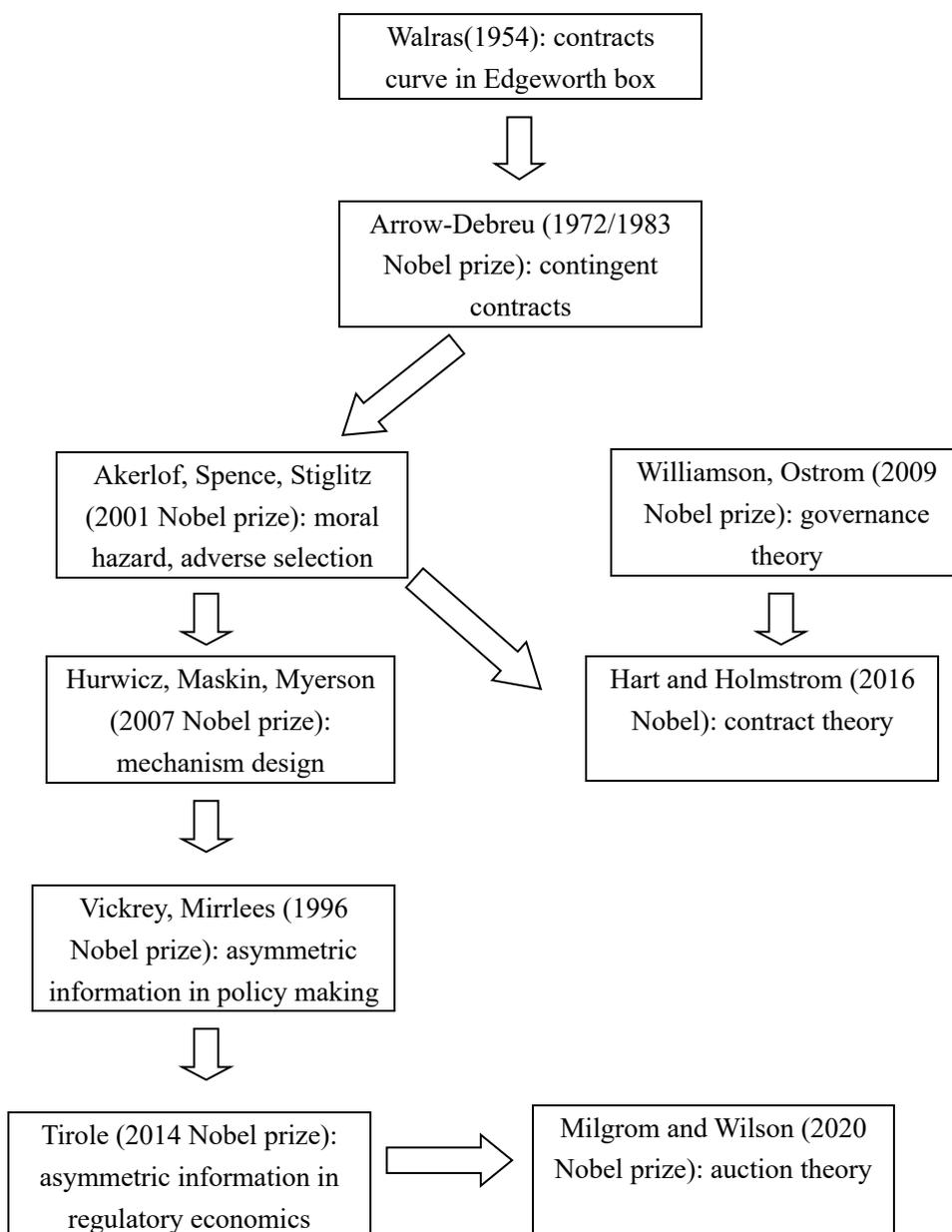


# 1. Introduction

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## 1.1 Overview



## 1.2 Framework

### 1.2.1 Definitions

Principal: contractee/leader/master. Agent: contractor/follower/mastered/participator.

Contract: any voluntary agreements between agents, legal or illegal, explicit or implicit, long or short, formal or informal.

Asymmetric information: the information which at least one agent doesn't know, and is different from imperfect information or incomplete information. (1) Moral hazard: unobservable endogenous variables; hidden actions. (2) Adverse selection: unobservable exogenous variables; hidden information. (3) Holdup: one party expropriate the other party based on contract's leak under the situation with symmetric information.

[Note 1] Some textbook calls the informed party the agent, and the uninformed party the principal. It is wrong for sometimes the principal has advantage of information.

[Note 2] Sometimes moral hazard happens with hidden information.

### 1.2.2 Assumptions

(1) There are conflicting interests and almost informational asymmetry between the principals and the agents. The factor that conflicting interests is fundamental, while there also interest conflict when the information is symmetric.

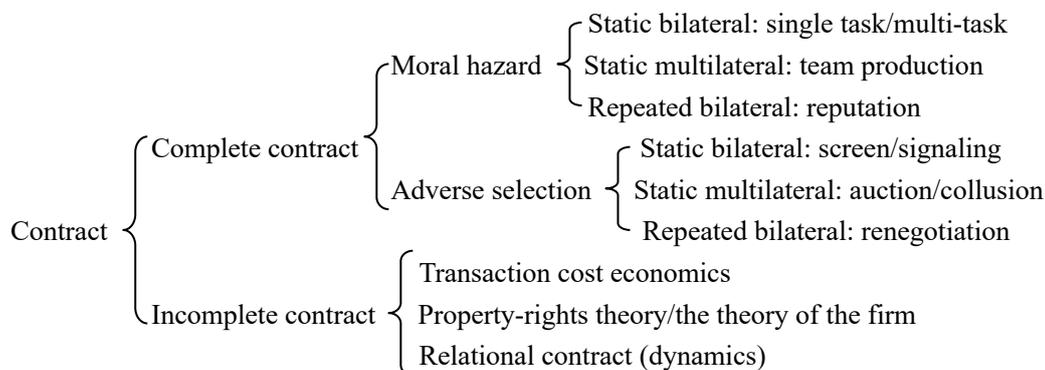
(2) The principal often has all the bargaining power and designs the contract offered to the agent, the agent "take it or leave it". The assumption greatly reduces analysis, and avoids the problem of multi-equilibria. However, we will release it in incomplete contracting setting.

(3) Contracts only conclude verifiable terms.

(4) The object of contractual design is to maximize the principal's utility subjected to the agent's individual constraint and incentive constraint conditions. The agent's individual constraint stands for his preserve utility which indicates market competition. Mathematically, to transpose the positions of the principal and the agent, the result will hold according to dual programming.

(5) Contract theory deals with partial equilibrium, and sometimes deals with related markets.

### 1.2.3 Framework



### 1.2.4 Models

Why do we need an economic model? (1) Getting a framework to watch the world; (2) Thinking rationally.

The main approach is game theory. The basic models are moral hazard and adverse selection in complete contracting theory, and hold-up in incomplete contracting theory. We can summarize ten main static models as follows:

(1) Moral hazard with hidden action ✓

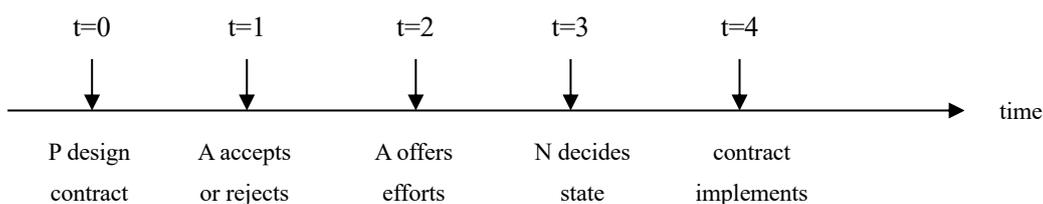


Fig. 1-1

[Note 1] It's the simplest moral hazard model. If there is no uncertain or nature's action, there is no moral hazard. Why?

(2) Moral hazard with hidden information

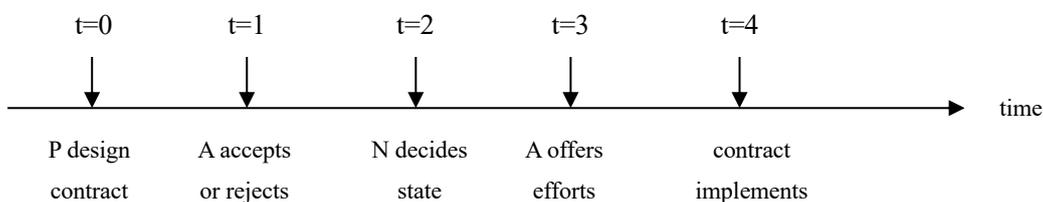


Fig. 1-2

[Note 2] Only can the agent see the state of the nature.

(3) *Ex ante* adverse selection ✓

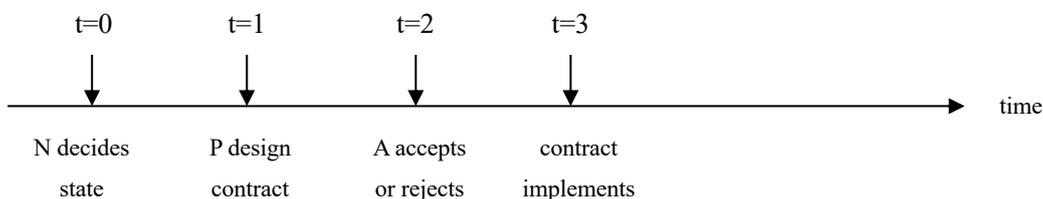


Fig. 1-3

[Note 3] It's the simplest adverse selection model, such as "lemon market", and sometimes the model is named as "screening model".

(4) Interim adverse selection

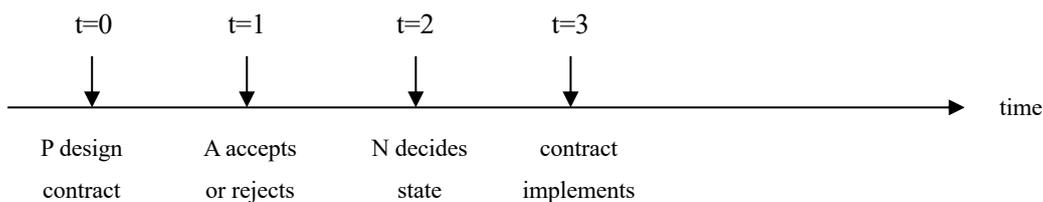


Fig. 1-4

[Note 4] It could be adverse selection with bilateral asymmetric information.

(5) Signaling I ✓

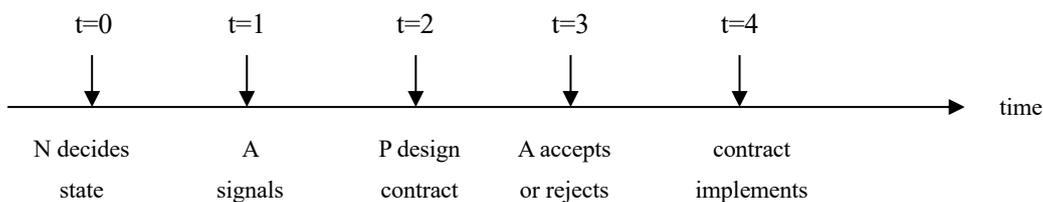


Fig. 1-5

(6) Signaling II

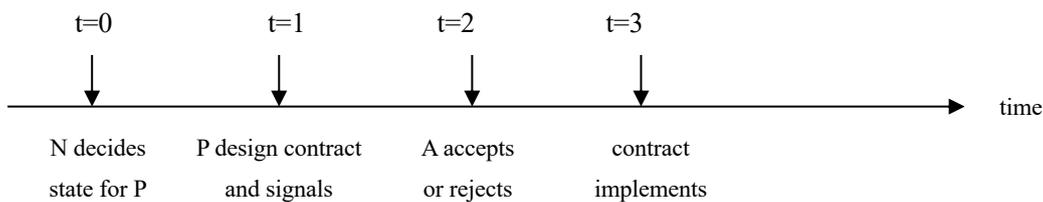


Fig. 1-6

[Note 5] Where now the principal has private information. Of course the model looks like the former model when we transpose the positions of the principal and the agent.

(7) Adverse selection before moral hazard

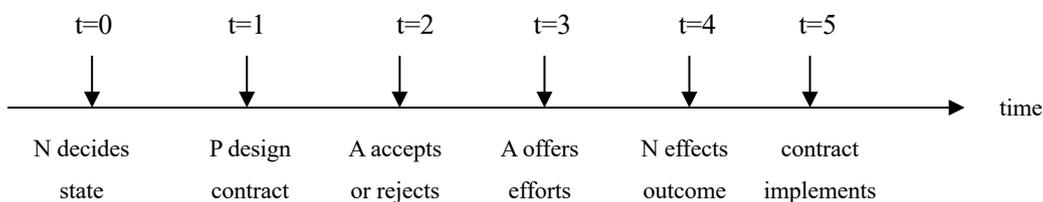


Fig. 1-7

(8) Moral hazard before adverse selection

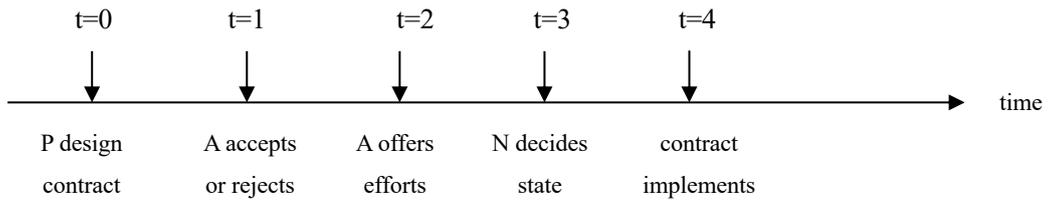


Fig. 1-8

(9) Holdup ✓

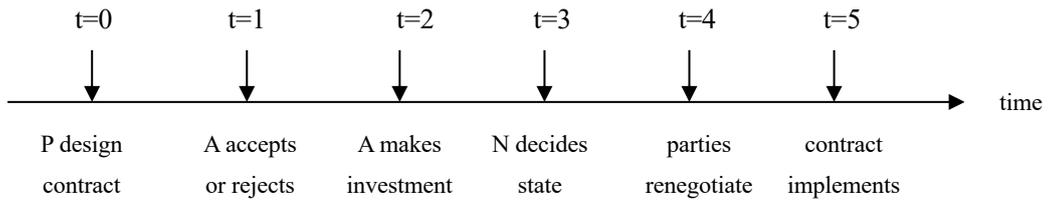


Fig. 1-9