Relational Contracting with External Enforcement

David Miller, Trond Olsen, and Joel Watson

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We develop a model of long-term relational contracting with external enforcement, in which \( n \) players interact in discrete periods over an infinite horizon. In each period, there are two phases: the negotiation phase where the players make a joint decision that we call their contract, and the action phase where the players select individual actions and receive payoffs in a stage game. The stage game is compelled by the external enforcer and may vary from period to period. Contractual elements formed in the negotiation phase include an immediate monetary transfer and instructions to the external enforcer on what stage games to compel for the current and future periods, selected from a set of feasible stage games and conditional on the verifiable aspects of the history. Applications include long-term bilateral or multilateral (team) productive relationships. The model allows for external enforcement of transfers, monitoring technologies, and/or production technologies.

The modeling exercise has two objectives. The first is technical: The setting we study is inherently non-stationary because a long-term contract can specify different stage games over time. The related literature has not examined the full scope of contracting and renegotiation in such a setting. We add to the literature by extending the concept of contractual equilibrium (Miller and Watson 2013, Watson 2013) to the class of games studied here. We characterize the set of contractual-equilibrium continuation values, which for any given history is a line segment as in Miller and Watson (2013) but is a function of the players’ externally enforced contractual provisions. For the two-player case, we provide an algorithm for computing the contractual equilibria.

The second objective is practical: We aim to discover key features of optimal contracts and explain some actual practices, such as the interplay of long-run and short-run contractual provisions and stationary terms. Consider a setting with two players. We show that for a class of stage games that avoid compactness problems, an optimal contract’s externally enforced part (in contractual equilibrium) can be expressed as the combination of (1) a “simple stationary” long-term component that specifies a transfer in each period as a function of the productive outcome of this period and (2) a short-term component that the players negotiate or specify anew in each period. More generally, the best way to support self-enforcement is to specify a stationary externally enforced component that maximizes a weighted difference between the payoffs of two action profiles that can be induced in the action phase. We present some applications to illustrate the equilibrium construction and to further explore the form of optimal contracts.

(This project is in progress. The paper has not yet been written.)