



Endogenous market structures and contract theory: Delegation, principal-agent contracts, screening, franchising and tying

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ABSTRACT

I study the role of unilateral strategic contracts for firms active in markets with price competition and endogenous entry. Traditional results change substantially when the market structure is endogenous rather than exogenous. They concern (1) contracts of managerial delegation to non-profit maximizers, (2) incentive principal-agent contracts in the presence of moral hazard on cost-reducing activities, (3) screening contracts in case of asymmetric information on the productivity of the managers, (4) vertical contracts of franchising in case of hold-up problems and (5) tying contracts by monopolists competing also in secondary markets. Firms use always these contracts to strengthen price competition and manage to obtain positive profits in spite of free entry.

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1. Introduction

Contractual arrangements between different stakeholders of a firm are crucial for the efficiency of its production process and for its profitability. Contract theory has widely studied these arrangements within a firm in the presence of informational asymmetries (Laffont and Martimort, 2002), contractual incompleteness (Hart, 1995) or other inefficiencies in principal-agent relations.¹ However, contract theory has less often investigated the relation between contracts within a firm and competition with other firms; some important works have focused on simple delegation games in duopolies (starting with Fershtman and Judd, 1987; Bonanno and Vickers, 1988), but limited attention has been paid to principal-agent contracts for firms competing in markets whose structure is endogenous, that is where entry of firms is endogenous. This paper analyzes this issue focusing on the following basic question: how competitive pressure affects the optimal contracts and how these contracts affect the resulting market structure?² I answer this question through a rather general model in which a firm adopts optimal contractual arrangements with some stakeholders (its manager, its retailers, its customers, . . .) before competing with other firms.

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¹ See Bolton and Dewatripont (2005) for a wide survey.

² A second question one may ask is what should be the equilibrium structure of the market and of the contracts when all firms adopt contractual arrangements and market strategies in equilibrium. For an investigation of this issue in the presence of principal-agent contracts with asymmetric information I refer to Martin (1993), Martimort (1996) and Etro and Cella (2010).

The characterization of the optimal contracts can be relevant also for empirical and policy analysis. On the empirical front, I emphasize the crucial impact of endogenous entry threats on the nature of the optimal contracts; for instance, one should expect the emergence of sale incentives, high-powered incentive mechanisms and strong bonuses inducing extra effort for the managers of firms which face strong entry threats, and not (or less) for firms without such threats. In line with these findings, recent works have emphasized a weak but positive relation between different measures of competition and incentives to promote effort (Cuñat and Guadalupe, 2005; Bloom and Van Reenen, 2007; Czarnitzki et al., 2010), but further research could fruitfully focus on the precise impact of entry pressure on the contractual arrangements.

On the policy front, I analyze the general welfare implications of strategic contracts and, in particular, the antitrust implications of vertical contracts and tying contracts adopted by a firm facing competition, respectively, in the downstream market and in the market for the tied good. Also here, the presence of endogenous entry threats is crucial, because it leads to the adoption of contractual arrangements that are aimed at strengthening price competition without predatory purposes. Contrary to what happens in models with an exogenous number of firms (first analyzed by Bonanno and Vickers, 1988; Whinston, 1990), franchising contracts and tying cannot lead to monopolization of new markets and they actually tend to reduce prices and improve welfare. As I will show, this generates conclusions that are in radical contrast with the post-Chicago approach to vertical restraints and exclusionary contracts, and that can change our perspective on relevant antitrust cases.

To introduce our theoretical framework and establish the link with the traditional literature on strategic contracts, let us consider basic price competition between two firms. It is well known that in a price duopoly a profit-maximizing firm can increase profitability through a particular form of strategic delegation: this requires a commitment to adopt accommodating strategies which relax competition and increase prices and profits of both firms. The important works by Sklivas (1987) and Fershtman and Judd (1987) have emphasized the gains from delegating decisions on prices to managers with negative sale incentives. Raith (2003) has suggested that in the presence of moral hazard of the managers, there are gains from incentive schemes (*à la* Holmstrom and Milgrom, 1991) with a low variable (output-related) compensation that generates low effort and softens competition. The same occurs in the presence of asymmetric information on the productivity of the managers faced with optimal screening contracts. Bonanno and Vickers (1988) and Rey and Stiglitz (1995) have emphasized the gains from separation in two vertically related firms, where the upstream firm charges the downstream firm with a franchise fee and a wholesale price above marginal cost once again to soften price competition. In the same spirit, Whinston (1990) has shown that when a monopolist in a primary market is also active in a secondary duopolistic market, tying strengthens competition and can be profitable only to deter entry and monopolize the secondary market. These results are a consequence of strategic complementarity between price choices (Fudenberg and Tirole, 1984; Bulow et al., 1985; Gal-Or, 1985): a strategic contract that induces the manager of a firm to increase its price, induces also the rival firm to increase its price and therefore it generates higher profits for the former and, even more, for the latter. Unfortunately, all these results are not robust to changes in the form of competition, and they break down when the two firms compete in quantities rather than in prices: this leaves the literature on strategic contracts with ambiguous results.

As suggested in Etro (2006), a limit of the literature on strategic commitments is that the number of competitors (two in most applications) is pre-determined and independent from the market outcome: this is in stark contrast with most real markets, where entry is attracted by the profitable opportunities left over by the active firms and by expectations on future profitability. Even in concentrated markets where entry cannot be regarded as free (i.e. easy and immediate) because of the presence of large sunk costs, the number of active firms can be often seen in the medium-long run as endogenously determined by the profit conditions taking into account the exogenous (or endogenous) entry costs (Sutton, 1991). This paper shows that when a firm is active in such a market, that is where the number of competitors (two as above, or more) is endogenous, the cited contractual commitments can still play a role, but in a radically different way. Our results for markets with price competition and endogenous entry can be summarized as follows:

- operative strategies should be always delegated to managers whose objective function is a weighted average of profits and sales, and we characterize the optimal (linear) sale incentives;
- in the presence of moral hazard, managerial compensation should provide high-powered incentives with a larger variable compensation than the other firms, and we derive the optimal strategic incentive payments in a model *à la* Holmstrom–Milgrom;
- in the presence of asymmetric information, managerial payment schedules should induce a higher effort than the other firms, and we derive the optimal screening contracts;
- vertical separation between an upstream producer and a downstream retailer should always entail wholesale prices below marginal costs for the downstream firm, and we determine the optimal franchising contracts (and verify the consequences of hold up problems on the same optimality of vertical separation);
- tying contracts can be effective devices to gain profits in a secondary market without fully deterring entry, and we determine the conditions for the optimality of tying.

The underlying reason of these results is that the strategic purpose of any contract changes when entry in the market is endogenous. Contractual arrangements that lead to a price increase are ineffective because they attract entry and reduce sales and profits. To the contrary, any contractual commitment to implement a price reducing strategy is effective because

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