Econ 566
Aghion-Bolton Theory of Exclusionary Long Term Contracts

Why would a seller and buyers in a market enter a contract that is anticompetitive, in the sense of reducing total surplus?

Consider an incumbent seller in a market selling to one buyer, facing a potential entrant with uncertain costs, c_E. The incumbent considers the strategy of offering a contract to buyers prior to the realization of the entrant's costs. (This we interpret as a long term contract, since it is written well before the transactions take place.) . The cost of production c_E on the part of the entrants is uncertain but common across entrants. The distribution $G(\cdot)$ of c_E is smooth with continuous density $g(\cdot)$ and has support given by $[0, \bar{c}]$ with $\bar{c} > v(\bar{c})$. The density $g(\cdot)$ is bounded away from 0 on its support.

In discussing the post-Chicago theories of how an incumbent can induce buyers to enter contracts that raise its profit but reduce total surplus, we follow Aghion and Bolton (*American Economic Review* 1987). Assume that each buyer purchases 0 or 1 units of the product and values the unit at v. Any explicit exclusivity constraint would be superfluous under this assumption, so a contract contains no reference to purchasing from the entrant. The question is whether simple long term contracts can be anti-competitive. A general long term contract between the incumbent and the buyer contains a price p and a liquidated damage (stipulated damage) d that is paid by the buyer should she decide not to purchase from the incumbent ex post. This contract can be equally interpreted as a *call option*: the buyer pays a price d up front for the option to buy a unit ex post at an exercise price $p - d$.

Proposition 1 *(Aghion-Bolton) Under these assumptions, the optimal contract is a call option with exercise price, $p - d < c_I$.*

Proposition 2

It is useful to offer a short proof of this proposition. Note that if the buyer turns down the offer of a long term contract she will benefit from Bertrand competition between the incumbent and the entrant ex post. The ex post price following a realization c_E is therefore given by $\min(v, \max(c_I, c_E))$: if the realized $c_E \in (c_I, v)$ then the incumbent sells to the buyer at the limit price c_E; if $c_E < c_I$ then the entrant sets a take it or leave it price c_I and if $c_E > v$ then the incumbent sells at a price v. Ex ante, the buyer's expected surplus from rejecting a long term contract offer, and relying simply upon the ex post market, is therefore given by $G(c_I) \cdot (v - c_I) + \int_{c_I}^{v} (v - c_E) dG(c_E)$.The buyer realizes surplus $v - p$ from accepting the long term contract whether breaching or not, since the entrant (making a take it or leave it offer) extracts any surplus from the breach decision. The individual rationality constraint on the contract offer is therefore

$$v - p \geq G(c_I) \cdot (v - c_I) + \int_{c_I}^{v} (v - c_E) dG(c_E) \tag{1}$$

If a long term contract (p, d) is signed, the buyer will exit (or breach) the contract, paying d in exchange for the right to buy from the entrant, if $c_E < p-d$ since then the entrant can offer a price that will not leave the buyer worse off. The incumbent's expected profit is therefore given by

$$G(p - d) \cdot d + [1 - G(p - d)](p - c_I) \tag{2}$$

The optimal contract maximizes (2) subject to (1). The first-order condition for the optimal d in this optimization is

$$G(p - d) + g(p - d)[d - (p - c)] = 0 \tag{1}$$

Any contract with $p < d$ is equivalent to a contract with $p = d$, which from (1) is dominated by a contract with $p > d$. Therefore $p > d$, which implies that $G(p - d) > 0$ and $g(p - d) > 0$. It is immediate from (1) that $p - d < c$. ■

The impact of adding market power on the part of the entrants to the Chicago benchmark is thus to *reduce the optimal exercise price of the call option below* c_I. The optimal contract leads to exclusion of the more efficient firm, the entrant, whenever the entrant's cost is above the optimal exercise price of the call option but below c_I, i.e. whenever $c_E \in (p-d, c_I)$. Long term contracts are anti-competitive in this sense. The source of the inefficiency is in the incentive for the incumbent and the buyer, as a contracting pair, to extract rents from the entrant. For each dollar that d is raised, the price charged by the entrant must fall in those states in which it enters the market. The contracting pair trades off the creation of surplus in the market and the extraction of a higher share of this surplus in the same way as would a monopsonistic purchaser of the entrant's input facing the random supply at c_E. Entry is deterred in the Aghion-Bolton I model but not completely: $G(p - d) > 0$. Finally, the incumbent makes more profit in the event of breach, under the optimal contract, than in the event of production: $d > p - c_I$. (This follows, under the call option interpretation, from the fact that the exercise price is less than the incumbent's cost.)

In the Chicago theory all parties excluded from the contract compete as perfectly competitive agents in markets with free entry, and therefore bear no externalities from the contract. The set of post-Chicago theories can be organized in terms of who bears the externality from a long term contract. In this first Aghion-Bolton theory, the source of the inefficiency is the externality imposed on the entrant.[1]

[1] The first Aghion-Bolton theory has been criticized on several grounds. As Masten and Snyder (1989) first pointed out, the Aghion-Bolton entry deterrence effect requires the following: (1) that courts force stipulated damage greater than last profit $(p - c_I)$. In fact, under

the "penalty doctrine", US courts have refused to do so. (It is also an unrealistic implication of the model that the incumbent hopes that entry is *not* detered.); and (2) no ex post renegotiation. The Aghion-Bolton effect, however, can be predicted without these conditions by recognizing specific investments on the part of the incumbent (Tai-Yeong Chung (1995), Spier and Whinston (1995)). The argument is that if the incumbent's cost c_I is reduced by specific investment i, via $c_I(i)$, then a marginal increase in i results in a reduction in the price that the entrant must charge to attract the buyer. This transfer from the entrant induces excessive specific investment on the part of the incumbent and inefficient entry deterence. The most recent extensions of the Aghion-Bolton theory involve contracts with downstream buyers that compete with one another (Fugagalli and Motto AER 2006, and Simpson and Wickelgren AER 2007.)