Solving and Estimating an Incomplete Information Entry Game

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Suppose there are two firms, A and B, that simultaneously decide whether to enter in the market $m \in \{1, \ldots, M\}$ or not. If firm $i \in \{A, B\}$ decides to enter, its profits are given by

$$\Pi_{i,m} = X_{i,m}\beta - D_{j,m}\alpha + \nu_m + u_{i,m}, \quad \forall\ i, j \in \{A, B\},\ i \neq j$$

where $X_{i,m}$ is an observable characteristic of firm i that boosts profits in market m, $D_{j,m} \in \{0, 1\}$ is j's decision of entering the market, ν_m is a market fixed effect, and $u_{i,m}$ captures unobserved idiosyncratic shocks to profits.

On the other hand, if firm i decides not to enter market m, its profits are zero.

Notice that $u_{i,m}$ is observed by i but not by its opponent j. Consequently, the firms are playing an incomplete information entry game.