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Duopolistic competition between independent and collaborative business-to-business marketplaces

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ABSTRACT

This paper studies imperfect price competition between two intermediaries in an electronic business-to-business matching market with indirect network externalities. The intermediaries have different ownership structures: an independent incumbent competes with a collaborative buy side consortium to attract buying and selling firms. When firms can register exclusively with one intermediary, the incumbent can deter entry only if the number of consortium owners is sufficiently small. Otherwise, the consortium can enter and monopolize the market. When firms can register with both intermediaries simultaneously, the consortium can always enter and both intermediaries stay in the market with positive profits.

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1. Introduction

Despite a recently revived promising outlook of business-to-business (B2B) activities, the evolution of B2B marketplaces, acting as intermediaries in two-sided buyer-seller markets, underwent a sharp consolidation process after 2000. Over 400 marketplaces that were predicted a glorious future at the end of the last millennium had already shut down by 2001.[1]

In the following years many independent third-party marketplaces, which act as middlemen that are neither a buyer nor a seller,

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[1] See for example the UNCTAD (2002), GartnerGroup (2000) and The Economist, May 15 (2004) as well as The Economist, May 15th (2001).

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began consolidating by shutting down or merging.[2] Nowadays only very few of these independent marketplaces, such as the procurement platform www.mercateo.com, are still active in selected industries and countries.

Besides internal problems, such as the lack of liquidity evoked by the burst of the "dot-com bubble" at the beginning of the new millennium, one of the main reasons for this decline stems from the increasing direct competition from upcoming collaborative (or biased) B2B marketplaces. These platforms are jointly provided by groups of firms from one market side, as for example the retailers' marketplace www.agentrics.com,[3] by *Sears*, *Roebuck*, *Carrefour* and others or the automotive supply side platform www.supplyon.com. One of the most prominent collaborative marketplaces is *Covisint*, which is a joint buy side platform of the car manufacturers *Daimler*, *Ford*, *General Motors* and *Renault-Nissan*. The European Commission (2006) confirms that such platforms focussing on a few buyers (or sellers) from the same industry are indeed the currently successful business models for B2B marketplaces.

Consortia-led marketplaces dispose of a competitive advantage in the positioning to generate transactions since platform providing companies have a double role: they jointly own the marketplace and act as active participants in the two-sided market. Contrarily, owners of third-party marketplaces are not any trading partners. Accordingly, large or many owners of a biased marketplace can more easily attain a critical mass of participants, which is crucial for an intermediary's prospect of success (see The Economist, March 2nd, 2000).[4]

This paper contributes a theoretical framework to analyze the above described evolution in the B2B landscape, reflecting the consolidated elimination of initially prevalent third-party intermediaries, together with market entry of collaborative intermediaries. This happens by studying the impact on market structures and participation incentives of buying and selling firms when B2B marketplaces with non-identical ownership structures engage in price competition in a bilateral matching market.

We consider a collaborative buy side B2B marketplace that is jointly provided by some buy side firms[5] as a challenging competitor to an independent incumbent intermediary, in terms of attracting participants from each market side.

In particular, we show that even if buyers and sellers have so-called "bad expectations" against the potential entrant, i.e. they hold favorable beliefs for the independent incumbent in terms of registering with the incumbent whenever it is not a dominated strategy, the collaborative entrant is able to gain (at least) some market share, when the quantity of platform owners is large enough. Such beliefs may stem from the historical evolution with independent start-ups as first firms that entered the B2B intermediation market in the late 1990s.

When registration is exclusively possible with only one marketplace, the incumbent can apply an entry deterring pricing strategy only if the number of firms providing the collaborative B2B marketplace is sufficiently small.

Contrarily, when firms can multi-home, i.e. they simultaneously register with both marketplaces, there is no pricing strategy that enables the independent incumbent to deter entry. However, in such a scenario both marketplaces remain in the market, sellers multi-home and buyers are segmented among both intermediaries.

These results are driven by indirect network effects. A buyer's value of participation in a B2B marketplace increases with the number of participating sellers and vice versa. Each participant is not only a consumer but also an input for an intermediary. Therefore an intermediary has to attract many participants from one market side, say buyers, to ensure participation from firms on the other market side, say sellers, while buyers are only willing to participate if they expect many sellers to register with the same intermediary.[6] Due to this particular market characteristic, intermediaries (might) apply a "divide-and-conquer" strategy[7] by subsidizing one market side and recovering this loss on the other market side.

In this regard, there is a crucial difference between an independent B2B marketplace and the collaborative buy side B2B marketplace: besides providing intermediation services the latter already comprises some firms that participate in the matching process, namely those buyers taking ownership in the joined marketplace. Hence, attracting sellers becomes easier for the collaborative marketplace since it can offer an additional input at the time of entrance.

1.1. Related literature

The present paper relates to the literature on two-sided markets, intermediation and matching by contributing a particular focus on ownership structures of B2B markets. Such electronic markets were introduced into the economic literature by Lucking-Reiley and Spulber (2001) as well as by Garicano and Kaplan (2001) who provide overviews on descriptive categorizations of B2B markets and their impact on transaction costs, respectively.

Spulber (1996b) gives a comprehensive introduction to the older intermediation and matching literature (e.g. Rubinstein and Wolinsky, 1987; Spulber, 1996a; or Gehrig, 1993) that analyzes various merchant types of intermediaries. Indirect network effects between participants of intermediary platforms are a crucial feature in the recent two-sided markets literature. Some useful introductory road-maps provide Armstrong (2006), Jullien (2005) as well as Rochet and Tirole (2006). The reader is also referred to Hagiu (2007) for an explanation of the relationship of those two strands of literature. Further, Evans (2003) offers a particular overview of B2B marketplaces as two-sided platforms.

Most related is the model by Caillaud and Jullien (2001), dealing with competition between two ex-ante symmetric third-party intermediaries in a bilateral electronic matching market. They claim that there always exist pricing strategies enabling an incumbent intermediary to prevent entry of a competitor if buyers and sellers have "bad expectations" against the potential entrant. Such a reputation advantage creates a powerful barrier to entry.[8]

We show that the results by Caillaud and Jullien (2001, 2003) do not generally apply to the case of B2B marketplaces when competing intermediaries have non-identical ownership structures. Hence, our approach reflects the observation of recently successful collaborative B2B marketplaces together with the decline of independent intermediaries.

In another related model to Caillaud and Jullien (2003), Hagiu (2006) analyzes intermediating platforms' incentive to commit to prices charged to one market side when the respective other market side arrives earlier at the platform. He shows that such commitment has no impact on participants' multi-homing decision. The section

[2] See the European Commission (2006) stating that since their first appearance around 1999, the number of such independent public B2B marketplaces has fallen considerably.

[3] This platform was formerly known as *GlobalNetXchange*.

[4] Note, although this chapter deals with competition between marketplaces that are either provided by independent third-parties or groups of firms from one market side, the general outcome would also apply for a marketplace provided by just one company from one market side, disposing of a considerable market share.

[5] Considering a sell side instead of a buy side platform would yield symmetric results.

[6] This phenomenon is referred to as the "chicken and egg" problem. See Caillaud and Jullien (2001, 2003).

[7] See Caillaud and Jullien (2001, 2003) for such a definition. The phenomenon of the bilateral buyer–seller network effect is also frequently labeled as the "chicken and egg" problem.

[8] As mentioned above, such a reputation advantage can indeed be attributed to the case of independent B2B marketplaces, which were the first firms to enter the electronic intermediation market in the late 1990s.