Does competitive entry structurally change key marketing metrics?

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ABSTRACT

To what extent does competitive entry create a structural change in key marketing metrics? New players may just be a temporal nuisance to incumbents, but could also fundamentally change the latter's performance evolution, or induce them to permanently alter their spending levels and/or pricing decisions. Similarly, the addition of a new marketing channel could permanently shift shopping preferences, or could just create a short-lived migration from existing channels. The steady-state impact of a given entry or channel addition on various marketing metrics is intrinsically an empirical issue for which we need an appropriate testing procedure.

In this study, we introduce a testing sequence that allows for the endogenous determination of potential change (break) locations, thereby accounting for lead and/or lagged effects of the introduction of interest. By not restricting the number of potential breaks to one (as is commonly done in the marketing literature), we quantify the impact of the new entrant(s) while controlling for other events that may have taken place in the market. We illustrate the methodology in the context of the Dutch television advertising market, which was characterized by the entry of several late movers. We find that the steady-state growth of private incumbents' revenues was slowed by the quasi-simultaneous entry of three new players. Contrary to industry observers' expectations, such a slowdown was not experienced in the related markets of print and radio advertising.

1. Introduction

Many markets experience the occasional entry of new contenders or see incumbent players add a new channel to their channel portfolio. Such entries/additions may leave some marketing metrics unaffected, create a temporal disturbance in others, and fundamentally alter the long-run evolution of still other measures. In practice, it is often hard to determine a priori which metrics will be affected, when those effects will materialize, and (provided that they are affected) what the steady-state implications will be.

Deleersnyder, Geyskens, Gielens, and Dekimpe (2002), for example, documented that the addition of an Internet-based version reduced the revenues for 10 out of 85 newspapers. Nijs, Dekimpe, Steenkamp, and Hanssens (2001) concluded that new-product introductions created a significant market-expansive effect in 30% of the studied FPCG markets. In addition, Pauwels and Srinivasan (2004) showed that store brand entry caused a structural change in some, but not all, of the investigated performance series, such as brand sales and revenues, category sales, and store traffic. As these studies illustrate, whether or not the entry of a new player structurally changes certain marketing metrics remains *an empirical issue*, making the use of proper testing procedures of central relevance.

The development of such a testing procedure faces two fundamental challenges. First, incumbents may not only face *multiple* intruders, they may also experience *other* major events that could cause a structural break in the metric of interest. In this respect, one could think of political changes with ramifications for the marketing metrics under investigation. Examples are the studies by Lamey, Deleersnyder, Dekimpe, and Steenkamp (2007), who control for the impact of the German unification in their study on the evolution of German private label share; and by El Sehity, Hoelzl, and Kirchler (2005), who study the implications of the 2002 introduction of the Euro. Another example of a major event that may cause a structural break is an unexpected product harm crisis that may impact not only the affected brand but other incumbents as well (see e.g. Van Heerde, Helsen, & Dekimpe, 2007). To avoid biased inferences on the steady-state impact of the focal competitive entry, one should account for the (potentially) confounding effects of such other events. To do so, we introduce a structural-break testing procedure that accounts for all significant breaks in the market, in contrast to the current standard in the marketing literature of allowing for at most one break (see, among others, Deleersnyder et al., 2002; Lim, Currim, & Andrews, 2005; Nijs et al., 2001; Pauwels & Srinivasan, 2004).

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Second, one has to allow for the fact that the change in some marketing metrics may not coincide exactly with the competitive entry, but only become evident with some delay; other metrics, in turn, may already be affected prior to the actual occurrence of the event when market participants change their behavior in anticipation (see e.g. Doyle & Saunders, 1985; Pauwels & Srinivasan, 2004, p. 368). As such, added flexibility is needed to allow for such lead and lagged effects, which may hamper the a priori (i.e., exogenous) imposition of break-date locations.

In this study, we develop a testing procedure that accounts for multiple structural breaks at unknown locations. We apply the proposed methodology to the demand for advertising in the Netherlands. Specifically, we consider whether the quasi-joint introduction of three commercial channels in 1995 permanently altered the outlook of the industry, i.e., whether this event had implications for the steady-state growth of incumbent private and public channels and/or affected related markets (print and radio advertising).

We first position our work in earlier literature on the impact of late entrants. Next, we introduce our testing framework, which allows for *multiple* breaks at *unknown* locations. We subsequently describe our data, after which we discuss the empirical results and benchmark our findings with various competing models. We conclude with the key implications of our study and identify several areas for future research.

2. Literature review

The impact of new entries on key marketing metrics has been of interest to many researchers. Relevant empirical research has covered the areas of marketing mix effectiveness, competitive behavior, and incumbents' performance.

2.1. Marketing mix effectiveness

New entrants may very well create fundamental changes in the marketing mix effectiveness of incumbents (Fok & Franses, 2004). The direction of these changes depends on various factors, such as the type of instrument or brand position. For example, Chintagunta (1999) analyzed the impact of a new entrant in the liquid laundry detergent market and documented that the new entrant tends to increase the price sensitivity, but lower the promotional sensitivity of households. Pauwels and Srinivasan (2004), in turn, demonstrated that after a store brand entry, premium brands experienced lower, while second-tier brands experienced higher, steady-state price sensitivity.

2.2. Competitive behavior

The arrival of a new entrant may provoke competitive reactions from the incumbents. While it is well established in (game-) theoretical studies that the equilibrium price is expected to fall with entry (Gruca, Kumar, & Sudharshan, 1992), the empirical investigations of Fok and Franses (2004) could not confirm this hypothesis. Pauwels and Srinivasan (2004), in turn, found a decrease in the equilibrium price in only two out of four categories.

Other studies have investigated the extent of competition in relation to the number of incumbents. Exploiting the cross-sectional variation in the number of players in local markets, Cleeren, Dekimpe, and Verboven (2006) found, unlike the predictions of many normative models, that the level of competition increased more in a duopoly than in a monopoly, and therefore concluded that any inferences on the competitive impact of new entrants remains an empirical issue.

2.3. Incumbents' performance implications

Empirical research on the *performance* implications for incumbents of (late) entrants has been performed by Mahajan, Sharma, and Buzzell (1993), Nijs et al. (2001) and Van Heerde, Mela, and Manchanda (2004), among others. Mahajan et al. (1993) studied the performance of a pioneer within the instant camera market that faced a new entrant. They concluded that about 32% of the entrant's sales came from the pioneers' potential buyers, and that the entrant expanded the market's primary demand by 37%. Nijs et al. (2001), while focusing on the primary demand effects of price promotions, observed across over 500 FPCG markets that new-product introductions may actually be a more effective way to permanently expand the category. Van Heerde et al. (2004) studied the market structure dynamics that resulted from an innovative product entry into the US frozen pizza market. The innovation in this stagnant product category was found to have increased the substitutability of the existing brands and to have expanded the target market.

Apart from the impact on incumbents in the focal market, *competing* and *complementary markets* may also be affected. For example, Reiss and Spiller (1989) demonstrated that, although direct and indirect flights in small airline markets were not perfect substitutes, competition in one group affected entry and exit in both groups. Berry and Waldfogel (1999a,b) analyzed the US radio broadcasting market. In their first study, they found a large substitution effect between existing radio stations and new entrants. In the second study, evidence was found of a substitution effect between public and private stations. Deleersnyder et al. (2002) measured the impact of new online newspapers on the circulation and advertising revenues of incumbent hard-copy editions. They a priori imposed the launch dates of 85 online newspapers in the UK and the Netherlands and did not find strong evidence of substitution effects between the Internet and print market.

Our empirical illustration is situated in this third research stream, as we investigate to what extent new entrants affect key performance metrics of both incumbents and competing markets. While our approach follows the tradition of, among others, Nijs et al. (2001), Deleersnyder et al. (2002), and Pauwels and Srinivasan (2004) in that we also use structural-break time-series econometrics to investigate the steady-state implications of new market introductions, we extend their methodology in that we explicitly allow for *multiple* breaks at *unknown* locations.

3. Methodology

3.1. Testing procedure

In line with recent literature in both economics (see e.g. Ben-David & Papell, 2000; Perron, 1989) and marketing (see e.g. Nijs et al., 2001; Steenkamp, Nijs, Hanssens, & Dekimpe, 2005), we define a structural break in terms of a parameter change in the deterministic part of the model, in this case the slope and/or intercept of the deterministic growth path. This approach is consistent with the intervention-analysis approach of Box and Tiao (1975), in that unique historic events are separated from the regular noise function (Perron, 1994). We refer to Hanssens, Parsons, and Schultz (2001, p. 293–296) for a review of marketing applications of intervention analyses. Conceptually, one assumes that the coefficients of the deterministic trend function are driven by long-term economic or market fundamentals which very rarely change, while regular (frequently occurring) shocks drive the stationary component of the data-generating process (Perron, 1994, pp. 114–115). These regular shocks do not change the parameters of the model process (Pesaran & Samiei, 1991), while the irregular interventions are allowed to affect the parameters of the deterministic part of the model.

Our proposed approach ends with the iterative procedure outlined in Ben-David and Papell (2000) where, for consecutive values of M, the null hypothesis of M breaks is tested against the alternative hypothesis of $M+1$ breaks. However, since this testing procedure requires stationarity of the series under investigation, we first apply formal unit-root tests to assess the stationary versus evolving nature