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Hubert GATIGNON
Erin ANDERSON
Joseph LAJOS
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NEW PRODUCT DISTRIBUTION AND INTER-CHANNEL COMPETITION: MARKET-MAKING, MARKET-TAKING, AND COMPETITIVE EFFECTS IN SEVERAL EUROPEAN COUNTRIES

Hubert Gatignon*

Erin Anderson**

and

Joseph Lajos***

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* The Claude Janssen Chaired Professor of Business Administration, Professor of Marketing at INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, hubert.gatignon@insead.edu, phone: 33.1.60.72.44.37, fax: 33.1.60.74.55.00

** The John H. Loudon Chaired Professor of International Management, Professor of Marketing, Dean of Executive Education at INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, erin.anderson@insead.edu, phone: 33.1.60.72.44.48, fax:33.1.60.72.92.40

*** PhD Candidate, Marketing at INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, joseph.lajos@insead.edu, phone: 33.1.60.72.92.28, fax: 33.1.60.74.55.00.

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We use a simultaneous equation model to examine sales and distribution coverage of two brands of a new consumer durable in competing channels of distribution in five European countries. We find evidence that channels were market-takers (i.e., that sales significantly increased contemporaneous distribution coverage) in all five countries. Furthermore, we find that channels were market-makers (i.e., that distribution coverage significantly increased contemporaneous sales) in two of these countries. Thus, we show that market-making and market-taking can occur simultaneously over extended periods of time within a risky, durable product category. We also examine the particular influence that sales and distribution coverage in all-under-one-roof value stores (hypermarkets) and in large specialist stores may have on sales and coverage in other channels.

Key words: Channels of Distribution; Market Response Models; New Product Research; Retailing and Wholesaling

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1. Introduction

The distribution literature provides ample evidence that it is difficult for retailers to decide whether or not to carry a product, especially a new product. Many retailers face more new products than they are capable of stocking. Furthermore, retailers must try to select the optimal mix of products in order to cope with competition from other channels. Intuitively, different types of retailers make these decisions in different ways.

In this research note, we use a simultaneous equation model to analyze sales and distribution coverage of two brands of a new consumer durable in competing channels of distribution. This model allows us to examine how distribution coverage arises. This question is important, because, just as consumers take a risk when they buy a new product, retailers take a risk when they decide to carry it.

When increases in distribution coverage increase sales of a new product, channels of distribution act as "market-makers." Alternatively, channels may increase coverage of a new product in response to sales increases. In this case, channels are "market takers." We test the existence of these relationships and, in particular, we test whether market-making and market-taking can occur simultaneously for a new consumer durable.

We also analyze the role of a type of retailer that has seen explosive growth in recent years but does not fit current taxonomies. All-under-one-roof value stores (i.e., hypermarkets; e.g., Carrefour, Tesco, Wal-Mart Supercenter) include both a supermarket and a large general merchandise offering. These characteristics make hypermarkets both habitual stores (meriting regular trips for consumables) and destination stores (meriting special visits for uncommon

purchases, such as durables). We propose that this combination gives hypermarkets unusual properties that may influence both sales and coverage in other distribution channels.

Finally, we test whether some distribution channels act as "scouts" and others as "troops" when increasing (or decreasing) coverage of a new product. We propose that troop channels imitate the decisions of scouts.

Our unit of analysis is a brand of an innovative consumer durable within a type of retail distribution channel. Thus, we study inter-channel competition at the brand level, with channels defined by retailer type (e.g., department stores, mail order stores, large specialists). We utilize a dataset that covers an unusually comprehensive variety of distribution channels. It describes both the sales and distribution coverage of two competing brands (Sega, Sony) of a new consumer durable (32-bit video game consoles) in multiple distribution channels in five European countries (France, Germany, Netherlands, Spain, United Kingdom).

2. Conceptual Model

2.1. Market-Making and Market-Taking

Retail coverage makes it physically possible for consumers to purchase new products. Furthermore, retail displays and the efforts of salespeople can help make a new product salient among consumers. In this way, retailers, in the aggregate, can make markets by offering coverage. For example, Parsons (1974) showed that retail coverage increases sales of new brands of fast moving consumer goods (FMCGs), and several studies in a cinematic context have shown that screen availability (coverage) influences movie receipts (sales), (Eliashberg et al. 2000, Jones and Ritz 1991, Lehmann and Weinberg 2000, Neelamegham and Chintagunta 1999). However, Lehmann and Weinberg (2000) note that consumers do not regard new movies as

risky. Thus, the idea that coverage can increase sales of a risky product, such as an expensive new durable, remains untested in the literature.

Previous research has also shown that the relationship between sales and coverage can proceed in the opposite direction, such that increases in sales lead to increases in coverage (Farley and Leavitt 1968). One explanation for this effect proposes that retailers use sensing mechanisms to forecast latent demand and then meet it by providing the requisite supply (Coughlan et al. 2001). Thus, channels can be reactive, acting as market-takers.

Market-making and market-taking are not mutually exclusive. For example, in a study of the launch of ready-to-drink tea, Bronnenberg, Mahajan, and Vanhonacker (2000) showed that distribution influences market share (i.e., retailers are market-makers) and that market share also influences distribution (i.e., retailers are market-takers), but only for a limited time, early in the category's lifecycle. In this research note, we hypothesize that market-making and market-taking can occur simultaneously within channels over extended periods of time within risky, durable product categories.

2.2. All-Under-One-Roof Value Stores

Existing taxonomies overlook a type of retailer that we propose has the potential to uniquely impact both sales and coverage in other channels. One factor in established taxonomies of retailers is the consistency of a store's assortment (i.e., how closely related its end products are in terms of usage). Generalist stores carry many inconsistent lines, thereby meeting unrelated market needs, whereas specialists carry many consistent lines, thereby meeting related market needs (Miller, Reardon, and McCorkle 1999). Additionally, Levy and Weitz (1998) propose a taxonomy in which general merchandise retailers sell goods that are nonperishable, whereas

supermarkets sell food and other FMCGs. They propose that these characteristics make supermarkets "habitual stores," which consumers visit on a fixed basis (e.g., once per week) for consumables, and make general merchandise retailers "destination stores," which consumers visit irregularly for special purchases.

One type of retailer, which has seen explosive growth in recent years, has features that cut across these established taxonomies. All-under-one-roof value stores (hypermarkets) carry a large assortment of food and other FMCGs typical of supermarkets. Due to their depth of assortment within these categories, these stores have features consistent with specialists, and are habitual stores for many consumers. However, hypermarkets also carry high-priced durables (e.g., appliances, computers, furniture, garden equipment, electronics) typical of general merchandisers. Due to their breadth of assortment across these categories, these stores have features consistent with generalists, and are destination stores for many consumers. We argue that these distinctive hybrid features may give hypermarkets the ability to distinctly influence sales and coverage in other channels.

For example, since many consumers visit hypermarkets habitually, these stores may have the opportunity to preempt durable purchases in other channels. Consumers make large numbers of unplanned purchases (Inman and Winer 1998). Thus, when shopping for groceries in a hypermarket, consumers may see a display for a new durable and purchase it on the spot before looking elsewhere. Furthermore, consumers who have seen the durable elsewhere may visit a hypermarket while in the deliberation stage. The availability of the product in a habitual store may end the deliberation stage, especially if consumers see that others have already purchased the durable in the store. Based on this argument, it follows that cumulative sales in hypermarkets

may decrease sales in other channels, beyond any influence that may be attributed to differences in price.

However, consumers may hesitate to buy new durables in hypermarkets due to low salesperson knowledge in the product category. When purchasing a new durable, consumers are often unsure about the benefits that it conveys, the purposes for which they will use it, the features that they should prioritize, and even the attributes possessed by each brand (Gatignon and Robertson 1985). Advice on these topics is typically more readily available at specialists and department stores than at hypermarkets. If hypermarkets increase consumer interest in new durables but have difficulty converting this interest into own-store sales, then cumulative sales in hypermarkets may increase sales in other channels, beyond any influence that may be attributed to differences in price.

If sales of a new durable in hypermarkets influence sales in other channels, it follows that these channels might take coverage increases (decreases) in hypermarkets into account when making their own coverage decisions. For example, when hypermarkets increase coverage of a new durable, this may signal to other retailers that it is saleable. Furthermore, if hypermarkets carry a new product, consumers might expect other types of retailers to carry it as well. Thus, coverage increases in hypermarkets may lead to coverage increases in other channels.

However, hypermarkets compete intensely with other types of retailers. Thus, when hypermarkets increase coverage of a new durable, their low prices and consumers' free-riding attempts may reduce the product's profitability in other channels, thereby discouraging these channels from carrying it (Cespedes, Corey, and Rangan 1988, Coughlan et al. 2001). Thus, coverage increases in hypermarkets may lead to coverage decreases in other channels.

2.3. Scouts and Troops

Retailers often face the important and difficult decision of whether or not to carry at least one brand in a new category of consumer durable that would constitute a significant purchase for consumers. Research in organization theory, economics, and sociology suggests that, when faced with a risky decision, retailers may imitate a common role model, leading to mimetic adoption of practices (Haveman 1993). Haveman proposes that role models should be considered successful by their peers, and Greve (1996) proposes that role models should be highly visible so that others can pick up the signals that their actions send.

Based on this research, Jones and Mason (1990) propose a conceptual model in which individual "scout" stores stock new products first. According to the model, these stores possess superior information about the new product and how customers are likely to react to it. Furthermore, innovation is an integral part of their operations. Other stores ("troops") observe the scouts and imitate their decisions.

Whereas Jones and Mason (1990) apply the notion of scouts and troops to different stores within the same channel and even the same chain, we apply this notion to types of distribution channels. Specifically, we propose that the scout role is played by distribution channels that (1) are large enough to be easily observed by members of other channels, and (2) are specialists in the product category, since specialists are likely to acquire a deeper understanding of consumer behavior, product offerings, and supplier behavior than their generalist competitors. Furthermore, the decision to pioneer is likely to support specialists' differentiation strategies. Based on this reasoning, coverage increases in large specialists may lead to coverage increases in other channels.

3. Empirical Analyses

3.1. Data Source and Product Category

Data requirements to explore the hypothesized effects are high, and could explain why published effort linking distribution coverage and sales exists for FMCGs and movies but not for risky products such as durables. Model estimation requires compatible data that cover the entire consumer market and all relevant retail channels carrying a new durable in an uninterrupted time series from introduction until the advanced growth stage. Furthermore, these data must be large and varied enough to test for possible effects of inter-type rivalry and simultaneity.

Such data exist for a consumer entertainment durable (32-bit video game consoles), available in two brands (Sega, Sony) that were introduced in five European countries (France, Germany, Netherlands, Spain, U.K.) in the 1990s. GfK Marketing Services, a multinational market research firm that specializes in tracking retail operations for consumer products, collected bimonthly or monthly data on consumer sales and distribution coverage for each brand in these five countries. Depending on the market, up to 24 bimonthly observations or 48 monthly observations per brand per channel were available from introduction of the category until as late as September 1999[1]. Although the product category had not achieved saturation by the end of the time series, distribution coverage had. Therefore, these five country datasets contain all the information needed to analyze the hypothesized relationships between sales and coverage.

Thirty-two bit video game consoles are next-generation durables. Although earlier generation 8-bit and 16-bit consoles had already been widely adopted, 32-bit consoles had the characteristics of a major innovation, offering sharply improved performance at a much higher

[1] Bimonthly data are available for France from June 1995 to January 1998, the Netherlands from January 1996 to August 1999, and Spain from June 1995 to January 1997. Monthly data are available for Germany from January 1997 to September 1999 and the U.K. from September 1995 to September 1999.

price than the earlier generation consoles. The Sega and Sony brands dominated the 32-bit video game console product category in Europe. These brands were introduced at the same time, and together obtained between 80% and 100% of the share in the product category over the period of study. Both brands were expensive in all countries. For example, in France, 32-bit video game consoles were priced as high as 3000 French francs, which was half of the monthly minimum gross salary. Sega and Sony competed intensely. Thus, sales of one brand were likely to slow sales of the other. Furthermore, the brands were incompatible, and European households rarely purchased both (Euromonitor 2001).

3.2. Channels and Countries

GfK tracked all distribution channels in those countries in which the products achieved any significant level of sales. Up to four types of distribution channels in each country carried the brands (see Table 1, Figure 1). Distribution coverage (i.e., the percentage of stores within a channel that carried a brand, weighted by sales volume in that channel) evolved at different rates with different patterns across these channels (see Figure 2).

Although the five retail environments that we examine are converging, they differed considerably at the time of the study (Leeflang and van Raaij 1995). Market research reports concur. Sega and Sony competed in three countries (France, Spain, U.K), whereas Sony completely dominated two markets (Germany, Netherlands).

3.3. Simultaneous Equation Model

We develop an econometric model with a simultaneous relationship between sales of brand i ($i = 1, 2$) in channel j ($j = 1, ...,4$) and the coverage of brand i in channel j at time t. In order to

control for sales growth, we employ a sales response model specification that is consistent with models specified in studies of new product introduction (Shankar 1997, 1999, Shankar, Carpenter, and Krishnamurthi 1999)[2]. Equation 1 is the sales equation.

$$SQ_{ij}(t) = \exp\left[\alpha_{0j} + \alpha_1 \cdot ON(t) + \alpha_2 \cdot DJ(t) + \phi \cdot \frac{1}{T_{ij}(t)} + \pi \cdot NHS_j \cdot CSH_i(t) + \gamma \cdot CSC_i(t)\right] \cdot \left(RP_{ij}(t)\right)^{\beta} \cdot \left(WD_{ij}(t)\right)^{\delta} + \varepsilon_{ij}^{SQ}(t) \quad (1)$$

where:

$SQ_{ij}(t)$ = sales quantity of brand i in channel type j in period t
$ON(t)$ = 1 if t = October - November bimonth, and 0 otherwise
$DJ(t)$ = 1 if t = December - January bimonth, and 0 otherwise
$T_{ij}(t)$ = number of periods, at period t, since brand i was introduced in channel type j
NHS_j = 0 if j = hypermarket channel, and 1 otherwise
$CSH_i(t)$ = cumulative sales of brand i in the hypermarket channel up to period $t-1$
$CSC_i(t)$ = cumulative sales of the competing brand (brand i') across all channels up to period $t-1$
$RP_{ij}(t)$ = price of brand i in channel type j at time t relative to the average price across brands and channels over the period of analysis
$WD_{ij}(t)$ = distribution coverage of brand i in channel type j in period t weighted for volume of sales in product category
α_{0j} = basic propensity to buy in channel type j without influence of prior buyers in channel type j
α_1, α_2 = seasonal effects on propensity to buy
ϕ = impact of time
π = propensity or resistance to buy in a channel type other than hypermarkets due to cumulative sales in hypermarkets
γ = propensity or resistance to buy a brand due to cumulative sales of the competing brand
β = impact of price
δ = impact of distribution coverage
$\varepsilon_{ij}^{SQ}(t)$ = error term distributed $N\left(0, \sigma^{SQ}\right)$

[2] An alternative model for this type of data is the nested multinomial logit specification in which brand choice is nested within channels to reflect the desirability of brands in channel selection, or in which channels are nested within brand choice to reflect the desirability of channels in brand selection. The results for the three countries where two brands compete do not support the nested structure, as the coefficients corresponding to the nested structure are not statistically significant. Nevertheless, the conditional models provide results consistent with those of the model reported in this study.

The proposed influences of channel type on sales are above and beyond those that can be accounted for by any channel's discounting policy, which may accelerate adoption (Golder and Tellis 1997, Parker 1992, Tellis 1988). Therefore, in order to test our hypotheses about inter-channel competition, we must control for price effects. Furthermore, since consumers often anticipate and wait for price declines (Bayus 1991, 1992), we must consider price over time. In our model, the price of a brand in a channel is represented by $RP_{ij}(t)$. For normalization purposes, we express $RP_{ij}(t)$ relative to the average price across brands, channel types, and periods, consistent with Bass, Krishnan, and Jain (1994)[3]. This specification accounts for differences in prices across brands and time, since prices have a tendency to decrease after introduction (Golder and Tellis 1997)[4].

The 32-bit video game console product category is seasonal around the end-of-the-year holiday season. We account for this seasonality in Equation 1 with two dummy variables ($ON(t)$, $DJ(t)$), which represent external influence factors that do not depend on prior adoption. Furthermore, we tested the significance of dummy variables for channel types in order to account for possible channel-specific effects other than those that we propose in our conceptual model.

We control for the growth of sales of a brand in a given channel, beyond the explicitly included variables, with the parameter ϕ, consistent with previous research on new product introductions (Shankar 1997, 1999, Shankar et al. 1999). Furthermore, we represent the possibility

[3] We also tried employing relative measures of distribution coverage in order to reflect competitive effects. When we did so, the fit indices were similar for the sales equations but significantly worse for the distribution coverage equations. The parameter estimates in the sales equations did not change significantly, although they were less likely to be significant.

[4]Advertising, another external influence, is substantial in this product category. Unfortunately, brand advertising expenditures are not available in the dataset. However, the pattern of expenditures followed the pattern of seasonality. Thus, the seasonal dummy variables should capture advertising effects, such that the omission of an explicit advertising expenditure variable does not bias the other results.

that cumulative sales of a brand in hypermarkets influenced sales in other channels with the parameter π. Finally, we represent the impact of cumulative sales of brand i's competitor (i') on sales of brand i with the parameter γ.

In addition to modeling sales as a function of coverage to reflect market-making, we also model coverage as a function of sales to reflect market-taking. Specifically, we model the distribution coverage of brand i in channel j at time t as a function of sales of brand i in channel j at time t. Equation 2 is the coverage equation.

$$WD_{ij}(t) = 1 - \exp\left\{-\left[a_0 + a_1 \cdot \ln\left(SQ_{ij}(t)\right) + b \cdot WD_{ij}(t-1) + \varphi_s \cdot NSC_j \cdot WDS_i(t-1) + \varphi_h \cdot NHC_j \cdot WDH_i(t-1)\right]\right\} + \varepsilon_{ij}^{WD}(t) \qquad (2)$$

where:

$WD_{ij}(t)$ = weighted distribution coverage of brand i in channel type j in period t
$SQ_{ij}(t)$ = sales quantity of brand i in channel type j in period t
$WD_{ij}(t-1)$ = weighted distribution coverage of brand i in channel type j in period $t-1$
$NSC_j = 0$ if j = large specialists, and 1 otherwise
$NHC_j = 0$ if j = hypermarkets, and 1 otherwise
$WDS_i(t-1)$ = weighted distribution coverage of brand i in large specialist channel in period $t-1$
$WDH_i(t-1)$ = weighted distribution coverage of brand i in hypermarket channel in period $t-1$
a_0 = intercept
a_1 = impact of sales
b = inertia, or effect of prior distribution coverage
φ_s = propensity to imitate or counter coverage in large specialist channel
φ_h = propensity to imitate or counter coverage in hypermarket channel
$\varepsilon_{ij}^{WD}(t)$ = error term distributed $N\left(0, \sigma^{WD}\right)$

As in Equation 1, we specify distribution coverage as the percentage of distribution outlets in a channel that carried the brand at time *t*, weighted by sales volume in that channel at time *t*. Thus, the model's functional form represents saturation as 100% coverage.

For consumers, adoption, if it occurs, is final. However, distribution channels may first adopt and then discontinue (dis-adopt) a product (Jones and Mason 1990). Thus, in Equation 2 we specify a time-dependent process with lagged distribution, thereby allowing for decreases in coverage over time. Equation 2 also shows decreasing returns to scale for the variables that affect brand distribution coverage.

Although the number of units of a brand stocked fluctuates seasonally, it is rare for outlets to de-list and then re-list products. Correspondingly, graphs of distribution coverage do not show this type of seasonality in any of the channels (see Figure 2).

We include a lagged distribution coverage term to account for inertia in the process, reflecting the switching costs of discontinuation. Finally, we model possible inter-channel effects by including the lagged distribution coverage of hypermarkets and large specialists.

The model expressed in Equations 1 and 2 assumes that differences in sales growth across brands and channels are explained by marketing mix variables, the hypothesized imitation effects, and channel-specific effects that we account for with dummy variables. Inclusion of these channel-specific dummy variables enables us to pool the data across brands and channels without assuming that sales growth was the same across brands and channels.[5]

[5] Although, in principle, it is possible to estimate the models separately for each channel and/or brand (completely unrestricted), the results are unstable due to the small number of degrees of freedom. Furthermore, estimating the models in this manner would not allow us to test our hypotheses, which involve simultaneous effects across brands and channels. Thus, we estimated the model using all the available data.

4. Results

We estimated Equations 1 and 2 simultaneously using two and three-stage nonlinear least squares. The two and three-stage results are almost identical. Taking the correlations between the contemporaneous error terms of the two equations into consideration resulted in only minor improvements in efficiency. Nevertheless, we report the three-stage results (see Tables 2 and 3)[6].

The *R*-squared values for each equation in each country indicate satisfactory explanatory power for a descriptive model in which the parameters are constrained to be a function of the hypothesized variables. If predictive power were the sole objective, unconstrained separate estimations for each channel would be preferred in order to maximize fit. However, parameter estimates from separate estimations would not allow us to test simultaneously whether the sales and coverage parameters vary across channels.

Our results indicate the importance of distribution channels in the innovation adoption process. Omitting the terms that represent these effects significantly impacts the results. Restricting the distribution parameters (i.e., the channel dummy variables, the impact of distribution coverage on sales, and the effects of coverage in hypermarkets) to be zero significantly reduces the model fit in four of the five countries studied ($F_{\text{France}} = 113.17$, $F_{\text{Germany}} = 78.45$, $F_{\text{Netherlands}} = 61.77$, $F_{\text{Spain}} = 0.57$, $F_{\text{U.K.}} = 140.93$). It follows that failing to explicitly recognize these distribution effects introduces two biases--one due to the restrictions on the missing distribution variables, and a second that results from failing to recognize the simultaneity of the relationship between sales and distribution coverage.

[6] The results reported for Germany and the UK are based on monthly time series data which provide greater estimation efficiency**.** In order to compare these results with those from the other three countries, which were based on bimonthly time series data, we re-estimated the model for these two countries aggregating the data bimonthly. The results were similar to those reported in Table 2.

4.1. Sales Equation

All the estimated values of α (propensity to buy) are positive and significant. Propensity to buy typically differed across channels, except in Spain, where these differences were not significant.

Consumers' propensity to buy one of the brands in any channel increased around the end-of-the-year holiday season, as indicated by positive, significant coefficient estimates on the seasonal dummy variables in all countries, except the Netherlands, for which the estimates are also positive, but not significant.

The product growth phenomenon was significant in France, Germany, and the U.K. Consumers' propensity to buy a given brand through a given distribution channel increased over time in these countries, as indicted by negative, significant coefficient estimates on the inverse of time ($\phi_{\text{France}} = -1.00$, $p < .05$; $\phi_{\text{Germany}} = -1.37$, $p < .01$; $\phi_{\text{U.K.}} = -1.41$, $p < .01$). Estimates of ϕ are also negative, but not significant, for Spain and the Netherlands.

Cumulative sales in hypermarkets increased contemporaneous sales in other channels in France ($\pi = 2.95 \times 10^{-6}$, $p < .01$). Estimates of π are negative and not significant for the other four countries.

In two of the three countries in which Sega and Sony competed (France, U.K.), cumulative sales of one brand significantly decreased contemporaneous sales of the other ($\gamma_{\text{France}} = -4.8 \times 10^{-6}$, $p < .01$; $\gamma_{\text{U.K.}} = -2.2 \times 10^{-6}$, $p < .01$). The estimate of γ for the third competitive country (Spain) is not significant.

Relative brand price significantly influenced sales of the brand in France and the U.K. ($\beta_{\text{France}} = -1.64$, $p < .01$; $\beta_{\text{U.K.}} = -1.13$, $p < .01$). Estimates of β are also negative, but not significant, for the other three countries.

Channels significantly engaged in market-making (i.e., coverage significantly increased contemporaneous sales) in Germany and the Netherlands ($\delta_{Germany} = 3.40$, $p < 0.01$; $\delta_{Netherlands} = 7.69$, $p < 0.05$). Estimates of δ are also positive, but not significant, for the other three countries.

4.2. Coverage Equation

Channels significantly engaged in market-taking (i.e., sales significantly increased contemporaneous coverage) in all five countries ($a_{1\ France} = .07$, $p < .01$; $a_{1\ Germany} = 0.49$, $p < .01$; $a_{1\ Netherlands} = 0.61$, $p < .01$; $a_{1\ Spain} = .16$, $p < .05$; $a_{1\ U.K.} = 1.85$, $p < .01$).

Coverage inertia within channels was significant in all countries except the Netherlands ($b_{France} = 1.93$, $p < .01$; $b_{Germany} = 1.31$, $p < .01$; $b_{Spain} = 0.69$, $p < .05$; $b_{U.K.} = 1.49$, $p < .01$). We also estimated models that allowed the coefficients of sales, coverage in large specialists, and coverage in hypermarkets to vary with time, but did not find support for these adaptation theories.

The coverage decisions of large specialists significantly influenced those of other channels in the Netherlands ($\varphi_s = 0.79$, $p < .05$). Estimates of φ_s are also positive, but not significant, for France and Spain. For Germany, the estimate of φ_s is negative and not significant. Large specialists were not present in the U.K. To allow for slower reactions or anticipation, we introduced sales lagged by one and two periods, as well as lead sales of one and two periods. However, the coefficient estimates on these variables were typically not significant, and in the rare instances in which they were, they simply weakened the effect of contemporaneous sales without changing the substantive results.

Other channels significantly countered the coverage decisions of hypermarkets in Germany ($\varphi_h = -0.42$, $p < .01$). Estimates of φ_h are also negative, but not significant, for France

and Spain. For the U.K., the estimate of φ_h is positive and not significant. Hypermarkets were not present in the Netherlands.

5. Discussion and Conclusion

In this research, we used a simultaneous equation model to examine sales and distribution coverage of two brands of a new consumer durable in competing channels of distribution in five European countries.

In all five countries, we found that channels were market-takers (i.e., sales significantly increased contemporaneous distribution coverage). The implication is that, in the aggregate, channels have accurate and timely sensing mechanisms that enable them to quickly spot trends and join them. Furthermore, when sales of a brand fell, channels tended to decrease their coverage of it. Nevertheless, our results suggest that this effect was tempered by significant coverage inertia. In four or the five countries studied, channels were unlikely to drop a brand once they had stocked it. This effect is likely due to the large investments that channels must make in order to stock a new durable.

We also found evidence that channels were market-makers (i.e., distribution coverage significantly increased contemporaneous sales) in two of the five countries studied. In the other three countries, the results were directionally consistent with market-making, but not significant. These results indicate that widespread availability of a product increases sales in some cases.

Our evidence indicates that market-making and market-taking occurred simultaneously in two of the five countries studied. Ours is the first demonstration of such an effect over extended periods of time in a risky, durable product category.

We also examined the effects of hypermarkets, which have the unusual property of being both habitual and destination stores. Although this combination should make hypermarkets potent competitors, our results suggest that sales in this channel do not necessarily harm competing channels. To the extent that hypermarkets offer lower prices, they may take sales from other channels. We provided evidence of such price effects in two countries. However, our results suggest that, beyond price effects, cumulative sales of 32-bit video game consoles in hypermarkets did not decrease contemporaneous sales in other channels in any of the five countries studied. Furthermore, in one country we found that cumulative sales of a brand in hypermarkets significantly increased sales of that brand in other channels. This result may have occurred because coverage in hypermarkets increased consumers' interest in the brand beyond the extent to which these stores were capable of converting this interest into own-store sales.

Coverage increases in hypermarkets led other channels to decrease their coverage of the product category in one country. This result may have occurred because other channels viewed coverage in hypermarkets as a threat. However, our finding that, beyond price effects, cumulative sales in hypermarkets do not necessarily decrease (and may even increase) sales in other channels, suggests that such reverse imitation may be counterproductive for retailers. The influence of hypermarkets on the decisions and market outcomes of other channels appears to be a promising topic for future research.

Finally, we found that other channels imitated the coverage decisions of large specialists in one country, providing initial support for the hypothesized scouts and troops effect. Importantly, our results suggest that, in this country, other channels followed the decisions of large specialists not only to increase, but also to decrease, coverage of a brand. Haveman (1993) notes that previous research has focused on imitation among actors who are deciding whether or

not to embrace a practice, and calls for future research to establish whether imitation also occurs among actors who are deciding whether or not to decrease their usage of a practice. Our findings suggest that it can. We believe that the tendency of other distribution channels to imitate the decisions of large specialists, and the potential ramifications of such mimicry, present another exciting future research opportunity.

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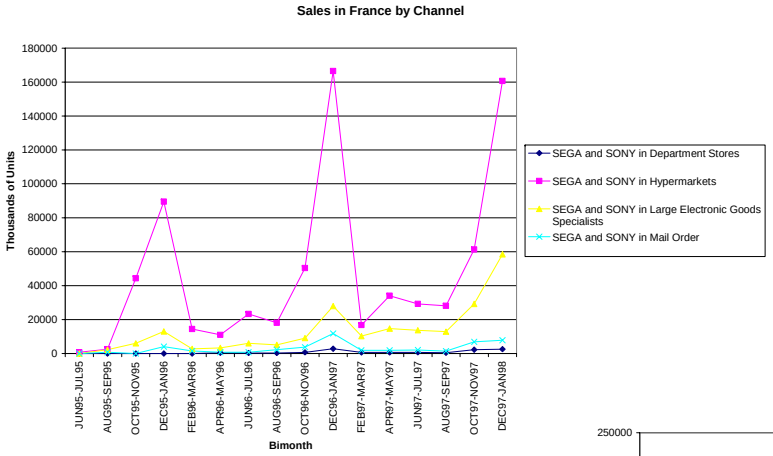
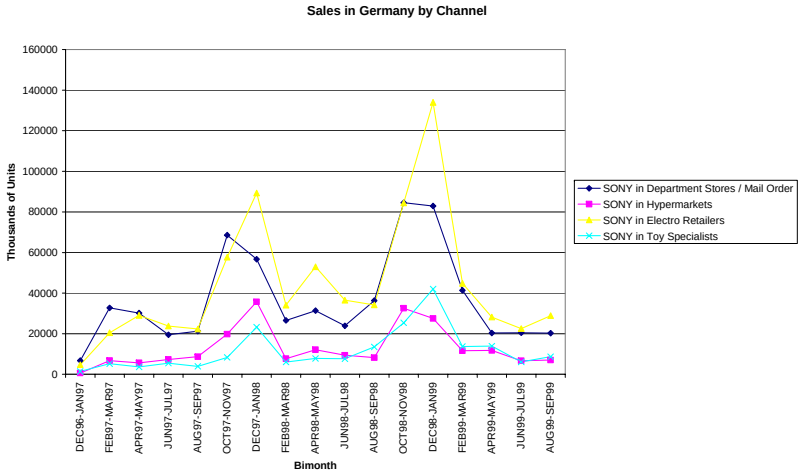
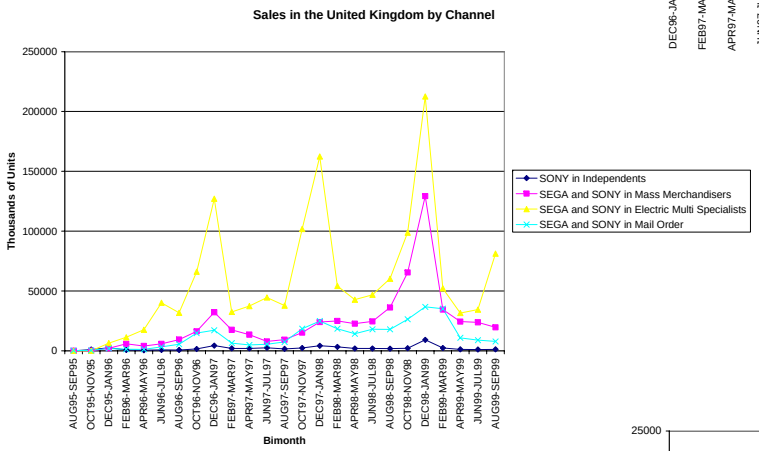
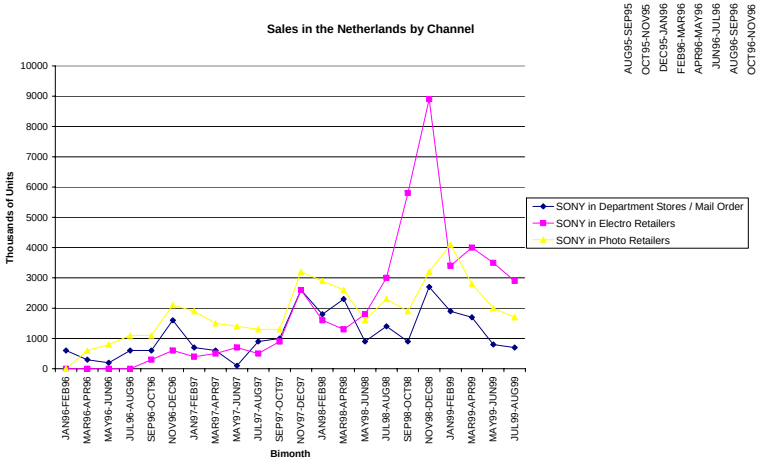
Figure 1 Unit Sales in Europe









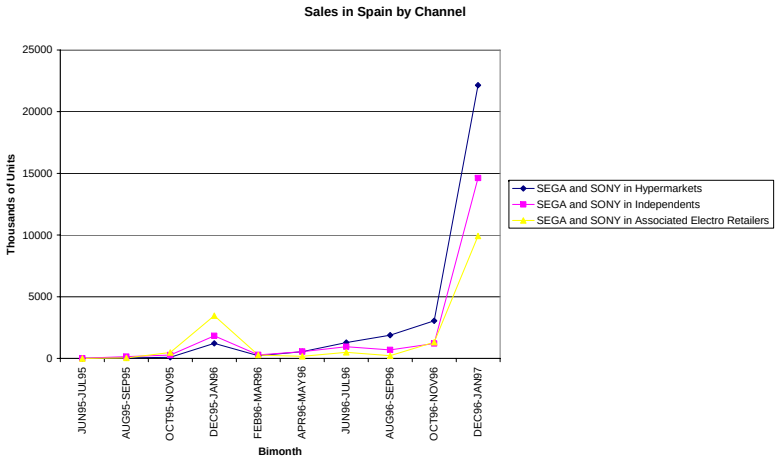


Figure 2 Illustrative Distribution Coverage by Channel Type for One Brand In One Country

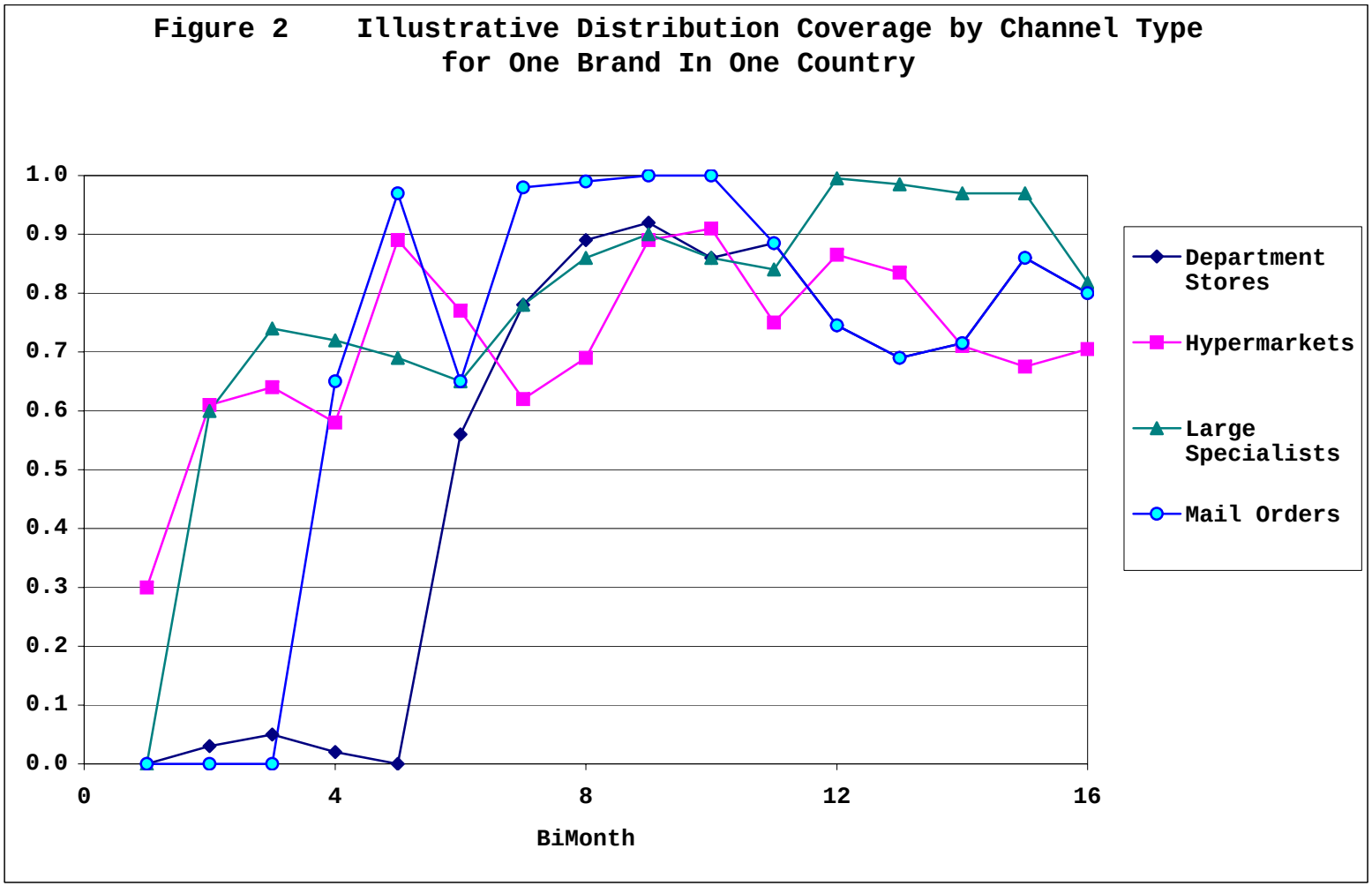


Table 1 Channels and their Roles by Country with Descriptive Statistics

Country	Channels	Scout	Troop	All-Under-One-Roof Value Store	Large, Named Example Member of Channel Type	Average Channel Share of Market	SONY Average Price (in local currency)	SEGA Average Price (in local currency)	SONY Average Distribution Coverage	SEGA Average Distribution Coverage
France	Department Stores		√		BHV	0.013	1517	1842	0.600	0.629
	Hypermarkets		√	√	Carrefour	0.740	1575	1982	0.907	0.715
	Large Electronic Goods Specialists	√			Hyper Media	0.201	1647	1799	0.848	0.825
	Mail Order		√		La Redoute	0.046	1658	1750	0.750	0.841
Germany	Department Store / Mail Order		√		Hertie / Quelle	0.349	292	N/A	0.955	N/A
	Electro Retailers	√			Fröschl	0.419	287		0.905	
	Hypermarkets		√	√	Allkauf	0.122	285		0.861	
	Toy Specialists		√		Vedes	0.110	324		0.807	
Nether-lands	Department Stores / Mail		√	N/A	Hema/Otto	0.207	443	N/A	0.940	N/A
	Photo Retailers		√		Foto Plus	0.360	424		0.964	
	Electro Retailers	√			Megapool	0.433	362		0.897	
Spain	Hypermarkets		√	√	Continente	0.466	42136	55003	0.893	0.759
	Independents		√		Too small to name	0.283	48155	57210	0.631	0.640
	Associated Electro Retailers	√			Fadesa	0.251	46647	56510	0.550	0.368
United Kingdom	Electric Multi	N/A	N/A		Dixon's	0.611	151	137	0.976	0.971
	Mail Order				Empire States	0.128	261	284	0.963	0.853
	Hypermarkets			√	Tesco	0.240	161	172	0.972	0.870
	Independents				Too small to name	0.021	157	N/A	0.994	N/A

Table 2 Nonlinear Three Stage Least Squares Estimation

Sales Growth Equation Parameter	Effect of	France Estimate (*t*-value)		Germany Estimate (*t*-value)		Netherlands Estimate (*t*-value)		Spain Estimate (*t*-value)		U.K. Estimate (*t*-value)	
α_0	Propensity to buy in Channel 1 (see Table 1 for channel numbers)	5.785	(15.16)****	9.847	(93.49)****	7.302	(19.43)****	5.316	(10.28)****	5.042	(27.73)****
$\overline{\alpha}_0$	Dummy for Sony observations	0.037	(0.11)	N/A		N/A		0.599	(1.71)*	1.536	(9.27)****
α_{02}	Channel Dummy 1	4.520	(10.94)****	-1.011	(-6.71)****	0.678	(1.76)	-		2.281	(16.75)****
α_{03}	Channel Dummy 2	2.494	(6.36)****	0.152	(1.52)	0.423	(2.39)****	-		3.129	(19.64)****
α_{04}	Channel Dummy 3	1.254	(3.00)****	-0.779	(-4.46)****	N/A		N/A		2.335	(8.46)****
α_1	Seasonal Dummy 1	0.213	(0.98)	0.722	(7.21)**	0.359	(1.14)	0.493	(1.74)*	0.601	(5.31)**
α_2	Seasonal Dummy 2	1.306	(5.71)**	0.922	(9.59)**	0.196	(0.99)	2.055	(6.58)**	0.897	(8.17)**
ϕ	Inverse of time since introduction within channel	-1.996	(-1.79)*	-1.370	(-4.46)**	-0.154	(-0.32)	-0.771	(-0.65)	-1.405	(-2.51)**
π	Cumulative sales in hypermarkets	2.95E-6	(3.23)****	-7.8E-7	(-1.12)	N/A		-1.0E-5	(-0.11)	1.56E-7	(0.35)
γ	Cumulative sales of competing brand across channels	-4.8E-6	(-4.86)****	N/A		N/A		1.08E-4	(1.75)	-2.2E-6	(-9.32)****
β	Relative price across brands and periods	-1.638	(-2.43)**	-0.530	(-1.30)	-0.862	(-1.12)	-0.161	(-0.27)	-1.134	(-3.72)**
δ	Weighted distribution coverage in channel	0.617	(1.24)	3.398	(4.12)**	7.694	(1.78)*	0.925	(1.05)	3.016	(1.56)

Table 2 Nonlinear Three Stage Least Squares Estimation (continued)

Coverage Equation Parameter	Effect of	France Estimate (*t*-value)		Germany Estimate (*t*-value)		Netherlands Estimate (*t*-value)		Spain Estimate (*t*-value)		U.K. Estimate (*t*-value)	
a_0	Intercept	0.032	(0.63)	-2.277	(-4.16)****	-1.859	(-1.42)	-0.287	(-0.83)	-8.607	(-5.41)****
a_1	Contemporaneous sales in channel	0.069	(3.42)**	0.485	(5.96)**	0.614	(2.93)**	0.157	(1.70)*	1.848	(5.85)**
b	Weighted distribution coverage in channel in previous period	1.926	(7.28)**	1.307	(3.46)**	-0.098	(-0.21)	0.693	(1.64)*	1.493	(7.81)**
φ_s	Weighted distribution coverage in scout channel in previous period	0.034	(0.30)	-0.623	(-2.26)	0.786	(1.77)*	0.740	(1.31)	N/A	
φ_h	Weighted distribution coverage in hypermarkets in previous period	-0.228	(-1.43)	-0.424	(-2.83)****	N/A		-0.316	(-1.14)	0.306	(0.96)
n		118		132		61		53		294	
R^2 for sales growth equation (N2SLS)		0.876		0.855		0.657		0.689		0.854	
R^2 for coverage equation (N2SLS)		0.818		0.597		0.318		0.374		0.411	

*significant at α =0.05 (1-tail test) **significant at α =0.01 (1-tail test)
*** significant at α =0.05 (2-tail test) ****significant at α =0.01 (2-tail test)

Table 3 Summary of Findings

	France	Germany	Netherlands	Spain	U.K.
Brand Sales in a Channel					
Price Effect on Sales Beyond Growth Effect (Price cuts increase sales)	✓	NO	NO	NO	✓
Market-Making Effect Beyond Growth Effect (Coverage drives sales)	NO	✓	✓	NO	NO
All-Under-One-Roof Value Store Sales Booster Effect (Positive effect on sales in other channels)	✓	NO	N/A (No such store)	NO	NO
Brand Competition (Cumulative sales of one brand across channels hurt sales of the other brand)	✓	N/A (Only Sony)	N/A (Only Sony)	NO	✓
Brand Coverage in a Channel					
Inertia (Current coverage follows coverage last period)	✓	✓	NO	✓	✓
Market-Taking Effect (Sales drive coverage)	✓	✓	✓	✓	✓
Troops Follow Scouts (Other channels follow coverage of scouts)	NO	NO	✓	NO	N/A (No such store)
All-Under-One-Roof Value Store Coverage Avoidance Effect (Other channels decrease coverage)	NO	✓	N/A (No such store)	NO	NO

Europe Campus
Boulevard de Constance,
77305 Fontainebleau Cedex, France
Tel: +33 (0)1 6072 40 00
Fax: +33 (0)1 60 74 00/01

Asia Campus
1 Ayer Rajah Avenue, Singapore 138676
Tel: +65 67 99 53 88
Fax: +65 67 99 53 99

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