

Is Category Expansion a Realistic Long-Term Objective for Established Brands?

ABSTRACT

How often do established CPG categories expand following a period of stationarity? To what extent can the levers under manufacturer control bring about persistent growth in total category value? The authors explore these questions in order to test the commonly held assertion that brand leaders in established markets can grow sales by expanding total category demand. Findings from a study of US household panel data describing the purchasing of nearly 500 small and large categories by 60,000 households over a nine-year period are presented. The observations focus on the growth impact of three sales levers, category penetration, purchase volume per buyer, and price per volume paid, in various strategic windows ranging from one to nine years.

The results demonstrate that category penetration increase is the most likely lever for category growth. The association between over-time revenue increase and growth in buying household numbers is far stronger than that between unit price increases or category usage. While this clearly indicates a promising strategic direction for brand management, results also carry a health warning: categories are relatively volatile in the short term, but highly stable over time, therefore while the direction is clear the path is very narrow indeed.

Keywords: Category Growth, Long-Term, Panel, Penetration, Consumption, Value

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INTRODUCTION

Category expansion has become a topic of interest to brand management (Yoon *et al.*, 2017), and particularly for firms that compete in established consumer packaged goods (CPG) markets. In an environment of intense rivalry but stable total demand, loyalty strategies are known to have little persistent effect on consumer switching propensities (Dawes *et al.*, 2017), while household brand repertoires tend to expand over time (Banelis *et al.*, 2013; Trinh, 2014). Persistent brand share growth is therefore infrequently ever achieved (Dekimpe & Hanssens, 1995). At the same time, management face a growth imperative (Day, 2002) and so there is mounting interest in one solution frequently proposed in the strategy literature; that of expanding total category demand (Kotler *et al.*, 2017) as a means to deliver sustained brand sales increases.

Category level dynamics have been discounted in much of the consumer behaviour literature. Many of the most valuable empirical generalisations and models in marketing science, along with associated and highly generalised theories, *depend* on an assumption of category stationarity (at least in the short term) to predict brand level outcomes. Models such as the NBD (Goodhardt and Ehrenberg, 1967) which describe the distribution of heterogeneous household choice incidence over stationary category or brand demand, or the Pareto/NBD (Jerath *et al.*, 2011) closely predict period to period repeat and attrition rates in the customer base under stationary conditions. The NBD-Dirichlet (Goodhardt *et al.*, 1984) has gained wide commercial acceptance because its output simultaneously describes performance metrics for competing brands, but again, under equilibrium “for the time being”. The contribution in this literature has focussed on periods of a few quarters, where it describes penetration as the primary behavioural lever of the sales equation, but (perhaps from a lack of data) has yet to establish the likelihood and impact of long-run category expansion.

The brand growth literature in addition mostly reports elements of the marketing mix that *are not* expected to deliver category growth. For example, Nijs *et al.*, (2001) demonstrate that although category demand effects from price promotions are strong, they have little or no persistence. Eagle & Ambler (2002) investigated brand advertising effects and found no growth in category demand in the chocolate confectionery categories of five European countries. Distribution effects at maturity have often centred on the idea of category management, but Dhar *et al.*, (2001) suggest that this may simply be a system where a brand enables one retail partner to exceed their fair share for the category rather than expand total demand. Despite the acceptance of category expansion into marketing lore as a brand growth strategy, little is yet known about its incidence or its drivers.

A further motivation for the study is the contribution to a growing debate about identifying and balancing long run and short-term marketing investments (e.g. Hanssens & Pauwels, 2016; Lodish & Mela, 2007). The availability of longer run store scanner datasets alongside larger and longer panels now provides the empirical evidence necessary to link long and short-term outcomes more clearly. Important contributions here would be those that allow marketers to distinguish more confidently between investments leading to non-persistent category effects and those that can develop sustained growth. The recent availability of reliable long-term household panels is crucial here, because unlike store scanner data they contain the penetration metric that underpins sales.

In sum, although brand-sales level persistence analysis is well established in long runs of scanner data (Dekimpe & Hanssens, 2018), our aim here was first to describe the likelihood of sustained category sales growth but then point to its underlying drivers, by linking the long and the short term changes in three metrics only available together in household panel data. Category sales revenues can only expand, from one period to the next, through the interaction of these levers.

First, the product field might diffuse across more of the population - penetration increases. The second is household consumption, increases in average category purchase volume across buying households. Third, the value lever can expand the category if average price paid for the category increases without volume being significantly reduced. Category value dynamics would result from changes in one or more of the three levers - more buyers, buying more, for more money - although each face different interacting forces. This means that the range of feasible changes may vary between the three levers. For instance, larger and more sustained changes in penetration may be far more feasible than large changes in consumption, especially in smaller categories.

Using Nielsen Kilts panel data, we observe the purchases of approximately 60,000 US households over nearly 500 consumer good categories in various extending time windows between 2007 and 2016. Our objectives were to establish the incidence of growth, its persistence over time, the role of each lever in delivering those dynamics, and the strength of those relationship with sales increases. We find that categories are dynamic from period to period, but that persistent growth is rare, and largely associated with further increases in category size. This implies that growth in sales value and household consumption are both limiting factors, while introducing new category buyers is a daunting task for any brand in already large markets.

These findings offer a path forward to a better understanding of category growth, and the development of empirical generalisations and explanatory theory. We proceed as follows. In the next section we discuss the three levers as context to the research questions. We then describe our method before presenting the results. Finally, we explain the implications of our findings for theory and for practice, and particularly the implications for brand management hoping to drive category expansion. We conclude by outlining a future research agenda based on these foundations.

BACKGROUND

In this section we briefly discuss category expansion and decline, and the three category levers. This background is provided in order to contextualise current knowledge and develop five research questions to meet the aim of this study.

Category Expansion and Decline

A category, or product-market is “*the set of products judged to be substitutes, within those usage situations in which similar patterns of benefits are sought, and the customers for whom such usages are relevant*” (Day *et al.*, 1979 p.10). Because a category is defined by the perceived closeness of the competition, once all potential buyers are reached, demand for each brand achieves a near-steady state defined by the number of its buyers and the fact that those buyers then satisfy a stable category requirement by switching easily within a small repertoire of familiar alternatives (Ehrenberg, Uncles and Goodhardt 2004).

At this point, market leaders are usually advised by strategy texts to invest in the expansion of total category demand (Kotler *et al.*, 2017). If successful, this would then benefit all actors in the category marketing channels, but with the highest rewards reserved for the brand leader. On the other hand, destabilising category structure leaves the brand leader with the most to lose, which may appear to be an unattractive option when set against the alternative, of maintaining a leadership position leveraging the superior resources available.

While market leaders are often advised to expand their categories to achieve growth targets, there has been an absence of evidence about the extent to which categories can experience growth and in cases where they do, what levels of growth can be considered realistic. In fact, it is yet to be established that category sales are actually any less stable than established brands' market shares. Understanding norms for category growth is critical for setting objectives and allocating resources for category growth, as well as evaluating past performance. Our first research question aims to address this need through investigating the incidence of category revenue expansion and contraction. The second research question then builds on this by examining the rates of category growth across longer-term time periods, up to nine years. The purpose is to understand the extent to which category expansion can continue to be a source of growth year-on-year.

RQ1: What is the incidence of category revenue growth and decline?

RQ2: How persistent is category revenue growth and decline across consecutive time periods (from one to nine years)?

Further insight into the nature of category expansion and contraction can be gained by decomposing the changes into three levers – category penetration, category consumption and category value. We briefly discuss each of these levers below.

Category Penetration

The first way in which a category can grow is through acquiring new buyers to purchase from the category. Despite product diffusion having a long history of being used to measure market development (Bass, 1969; Fisher & Pry, 1971; Rogers, 2010:), the literature on changes in category penetration has not been well established. Diffusion curves suggest it is easier to achieve category growth at lower levels of penetration than higher, therefore brand leaders might more easily drive growth in smaller rather than larger categories.

Category penetrations were examined in a recent study of nearly 400 established CPG categories (Nenycz-Thiel *et al.*, 2018). Incidence of significant annual changes was observed to be relatively rare with a quarter of categories within 1% and two thirds within 5%. Additionally, category penetration levels were more volatile among categories with low average quarterly penetration (e.g., below 10%). While this study was useful in proving initial benchmarks, it did not compare the changes in penetration with those from the two other potential levers. It is unclear whether changes in penetration typically have a greater or lesser impact on total category revenue than those from consumption and value, especially over the longer-term.

Category Consumption

Total category revenue could also be increased if there were to be an increase in category purchasing by existing buyers. Such an increase in consumption per buyer could occur through

encouraging more usage, perhaps through reaching existing buyers on more purchase occasions with greater in-store prominence or even new distribution channels (e.g., vending machines, e-commerce).

Another strategy that is commonly believed to expand category consumption is finding, communicating and diffusing new uses for existing products across existing users. An often-quoted example is Arm & Hammer baking soda, which can be used to deodorize fridges in addition to leavening baked goods. New uses are expected to increase the rate of sale. However, the evidence for such strategies is largely anecdotal with little empirical evidence for its success in expanding either brand or category sales.

Category Value

Finally, the category revenue can be expanded if there is an increase in the average price being paid for the category. An increase in price paid can occur through increases in the list prices across competing brands or, at least, a reduction in the overall level of price promotion activity in the category. Average prices paid can also grow through premiumisation of the category.

Dawes *et al* (2019) define premiumisation as a strategy whereby a firm converts some category volume to a higher dollar value, by delivering new tangible or intangible benefits. These benefits give a consumer a reason to pay more, creating a value-add or premium offer. If the premium innovation diffuses across rivals, then higher revenue per sale will eventually grow total category value as a premium partition emerges. Horizontal innovation occurs without shifting penetration if some buyers choose to pay the premium sometimes (Soberman & Gatignon, 2005).

Strategies relating to category penetration, consumption and value are often proposed, but without any tangible evidence as to how much and how often each of these levers actually change. For instance, is an objective to grow category consumption by 5% attainable? Do categories typically change more in penetration or consumption? Can category value continue to grow year on year? Our third and four research questions address this area by examining incidence and persistence of changes in each of these three category levers.

RQ3: What is the incidence of growth and decline across category levers (penetration, consumption, value)?

RQ4: How persistent is growth and decline for the category levers (penetration, consumption, value) across consecutive time periods (from one to nine years)?

Finally, any changes to category sales value will be the results of various changes across each of the three levers. Simply increasing one lever does not guarantee growth of the entire category. For example, an increase in average price paid may be offset by losses in penetration and purchase volumes. Our final research question examines how the changes observed in each of the three category levers relates to the overall category expansions and contraction in revenue.

RQ5: What is the relationship between changes in category sales revenue and each of the three category levers (penetration, consumption, value)?

METHODOLOGY

Data

To answer these questions, we analyse Nielsen household consumer panel data, made available through the Kilts Centre for Marketing. The dataset comprises over 60,000 panellists in each year recording their household purchases. We analyse the sales of 495 consumer goods categories over the period of 2007 to 2016. These categories cover a range of different product types, including dry grocery, dairy, health & beauty care, and alcoholic beverages. Two selection criteria were used to filter the full universe of categories to the 495 for this study. First, we excluded any categories with an average quarterly penetration of less than 2% to focus on established product categories. Secondly, we excluded categories that had competing UPCs with different units of volume measurement (e.g., litres and grams). This was necessary to measure accurately the changes in category volume between years.

The sample of product categories have an average quarterly penetration of 15% and average quarterly purchase frequency of 1.6 times. Average quarterly penetrations range from 2% up to 89% and average quarterly purchase frequencies range from 1.0 to 7.2.

Analysis

Category sales revenue is first calculated for each category across all ten years. To account for year to year changes in the number of households in the panel (min: 60,502, max: 63,346), we calculate a standardised measure of sales revenue (\$) per 100 households (i.e., total sales revenue / number of panellists * 100).

For each category across all years, we also measure each of the three levers as:

- Average quarterly household penetration (%)
- Average quarterly volume purchase per buying household (e.g., grams, litres, etc)
- Average quarterly revenue per volume (e.g., \$ per gram, \$ per litre)

To measure the changes in total category revenue (per 100) and the three levers between years we use Compound Annual Growth Rate (CAGR).

$$\text{CAGR} = (\text{Value in Final Year} / \text{Value in First Year})^{(1/ \text{Years})} - 1$$

The CAGR indicates the annual rate of growth or decline that would have resulted in the growth (or decline) from the initial value in the first year to the value in the final year. It should be noted that the CAGR does not represent year to year changes between the first and last year, rather the rate of growth/decline that would have occurred if it was the same rate every year from first to last.

One of the advantages of the CAGR metric is the ability to directly compare growth rates over time periods of different lengths, due to the rate being standardised to an annual rate. In this research, we compare CAGRs for total category revenues (per 100) and category levers over time periods of 1 Year, 3 Years, 5 Years, 7 Years and 9 Years. This means that we can obtain nine category observations when looking at one year (e.g., 2007-08, 2008-2009, etc. up to 2015-16). However, only one observation per category when looking at nine years (i.e., 2007-16).

RESULTS AND DISCUSSION

Category Revenue Growth and Decline

First, we report the descriptive statistics from the CAGR analysis of total category sales revenue (per 100 HHs) in table 1. Overall, the mean and median values are close to 0 across all time periods, indicating similar probabilities of categories growing and declining. The most notable difference when looking to longer time periods is the shift in standard deviations from 13.8 with one year to 4.8 over nine years. This indicates the range of possible values is much greater in the shorter-term with more extreme values (positive and negative) less likely to persist across years. It is also notable that the difference in standard deviation values between one year to five years (13.8 vs 5.5) is far greater than the difference from five years to nine years (5.5 to 4.8)

Table 1. Descriptive statistics for category revenue growth CAGRs

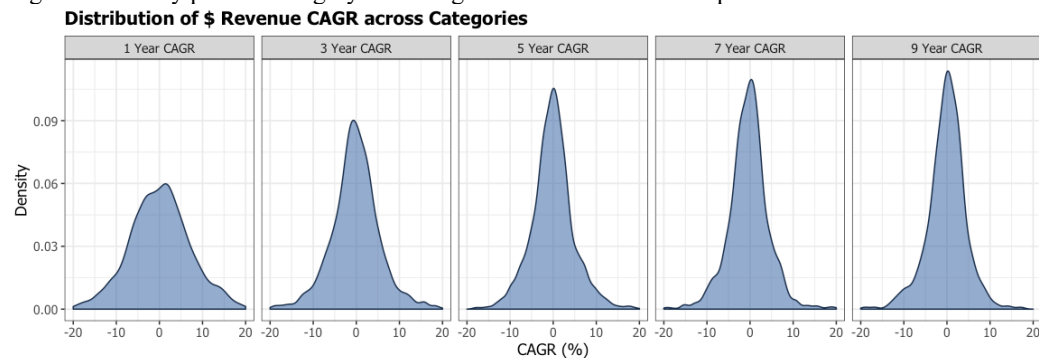
	Mean (%)	Median (%)	Std. Dev (%)
1 Year (<i>n</i> =4219)	0.4	-0.3	13.8
3 Years (<i>n</i> =3312)	-0.2	-0.2	6.6
5 Years (<i>n</i> =2382)	-0.2	-0.1	5.5
7 Years (<i>n</i> =1441)	-0.4	-0.2	5.0
9 Years (<i>n</i> =487)	-0.1	0.1	4.8

We further investigate the distribution of category revenue changes by splitting the values into quintiles of growth and decline (table 2), as well as demonstrating this concentration of CAGR values in density plots (figure 1). When looking over a period of just one year, we see the top quintile of categories grew by more than 6% and up to 151%. However, these large annual growth rates do not appear to be able to be sustained across longer time periods. For instance, expanding to five-year periods, the top quintile CAGR values drop to between 3.2% and 29.5%.

Table 2. Category revenue growth CAGRs by quintiles

	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
1 Year	-60.7	-5.7	-5.7	-1.7	-1.7	1.9	1.9	6.0	6.0	150.8
3 Years	-51.2	-5.7	-5.7	-2.0	-2.0	0.9	0.9	4.5	4.5	53.4
5 Years	-37.2	-3.6	-3.6	-1.1	-1.1	0.8	0.8	3.2	3.2	29.5
7 Years	-31.5	-3.5	-3.5	-1.2	-1.2	0.7	0.7	2.7	2.7	25.4
9 Years	-27.5	-3.0	-3.0	-0.7	-0.7	0.9	0.9	3.0	3.0	20.3

Figure 1. Density plots of category revenue growth CAGRs over time periods



The density plots in Figure 1 visualise the distributions of category revenue CAGR values that range from -20% to 20%. Category revenue is most volatile in the one-year window, with stability becoming the norm as the time period increases. While substantial rates of growth or decline can happen over a year, it is exceedingly rare for these to continue across multiple years.

Dynamics in the Category Levers

The CAGR analysis applied to the category levers of penetration (average quarterly penetration), consumption (average quarterly volume per buyer) and value (average quarterly revenue per volume) is reported in table 3.

Table 3. Descriptive statistics for category lever CAGRs

	Average Quarterly Penetration			Average Quarterly Volume per Household			Average Quarterly Revenue (\$) per Volume		
	Mean (%)	Median (%)	Std Dev (%)	Mean (%)	Median (%)	Std Dev (%)	Mean (%)	Median (%)	Std Dev (%)
1 Year (n=4219)	-1.6	-1.7	8.1	-0.1	-0.3	4.8	2.4	1.8	6.5
3 Years (n=3312)	-2.0	-1.7	5.5	-0.2	-0.3	2.7	2.1	1.8	3.4
5 Years (n=2382)	-2.1	-1.8	4.6	-0.2	-0.2	2.2	2.1	1.9	2.7
7 Years (n=1441)	-2.2	-2.0	4.3	-0.2	-0.3	1.8	2.0	1.9	2.2
9 Years (n=487)	-2.1	-1.7	4.1	-0.2	-0.3	1.6	2.2	2.2	1.9

In terms of means and medians, the volume per buyer results most closely resemble the category sales revenue, whereby values are close to 0 indicating similar probability of increasing or decreasing. Yet, the other two levers deviate from this pattern. The revenue per volume CAGRs have a greater tendency to be positive, with mean and median values closer to 2 across all time period lengths. This persistent pattern is what may be expected given inflation. In contrast, with penetration, these values are negative and closer to -2.0. This indicates that underneath the stable category sales revenue there are still changing lever dynamics, with price increases being, on average, being offset by less buyers.

We further examine the propensities for lever changes through reporting their distributions of CAGR values with density plots (figure 2) and quintile ranges (table 4-6).

Table 4. Average quarterly penetration growth CAGRs by quintiles

	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
1 Year	-61.2	-5.9	-5.9	-2.8	-2.8	-0.6	-0.6	2.3	2.3	131.5
3 Years	-56.2	-5.1	-5.1	-2.6	-2.6	-1.0	-1.0	0.8	0.8	51.7
5 Years	-41.9	-4.7	-4.7	-2.6	-2.6	-1.2	-1.2	0.4	0.4	28.5
7 Years	-34.4	-4.6	-4.6	-2.8	-2.8	-1.3	-1.3	0.3	0.3	20.3
9 Years	-30.8	-4.2	-4.2	-2.5	-2.5	-1.2	-1.2	0.4	0.4	16.5

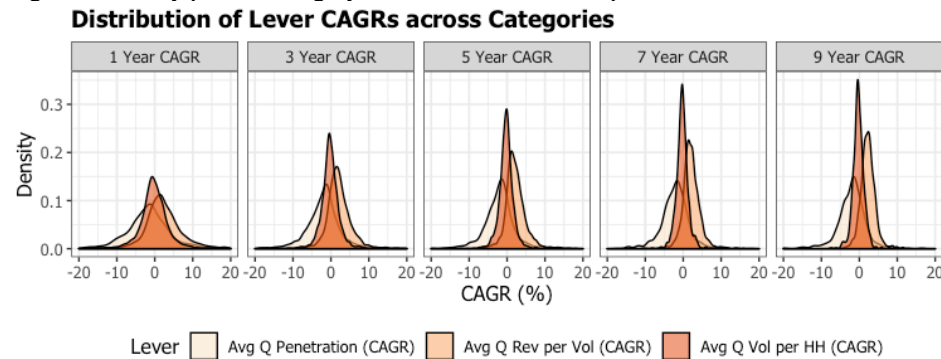
Table 5. Average quarterly volume per household growth CAGRs by quintiles

	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
1 Year	-49.9	-2.6	-2.6	-0.9	-0.9	0.5	0.5	2.3	2.3	62.0
3 Years	-16.8	-1.8	-1.8	-0.7	-0.7	0.2	0.2	1.3	1.3	28.0
5 Years	-8.8	-1.4	-1.4	-0.6	-0.6	0.1	0.1	1.0	1.0	18.2
7 Years	-8.3	-1.3	-1.3	-0.6	-0.6	0.0	0.0	0.8	0.8	15.9
9 Years	-4.8	-1.3	-1.3	-0.5	-0.5	0.0	0.0	0.8	0.8	11.5

Table 6. Average revenue per volume growth CAGRs by quintiles

	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
1 Year	-44.0	-1.1	-1.1	1.0	1.0	2.8	2.8	5.5	5.5	138.9
3 Years	-18.9	-0.1	-0.1	1.2	1.2	2.4	2.4	4.2	4.2	34.4
5 Years	-20.3	0.4	0.4	1.4	1.4	2.4	2.4	3.9	3.9	21.2
7 Years	-10.4	0.5	0.5	1.5	1.5	2.4	2.4	3.6	3.6	11.1
9 Years	-7.4	0.9	0.9	1.7	1.7	2.6	2.6	3.6	3.6	8.8

Figure 2. Density plots of category lever CAGRs over time periods

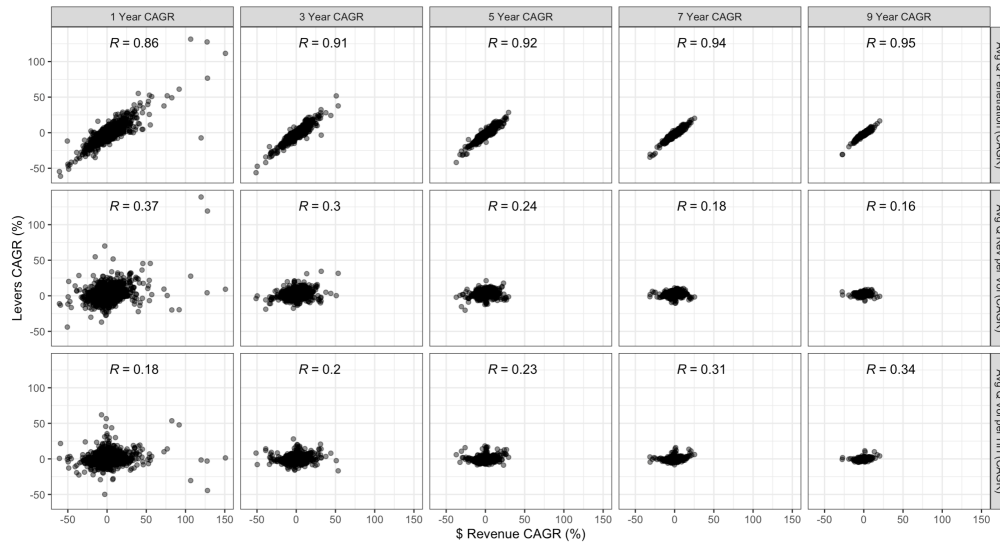


In addition to the differing average rates of growth between the levers, the quintile ranges and density plots also demonstrate differences in the ranges of values observed. Of the three levers, volume per buyer was the most stable with values highly concentrated around 0. Even when just looking across one year, 60% of volume per buyer CAGR values fell between just -2.6% and 2.3%. When looking across nine years, this range shrinks to between -1.3% and 0.8%. Compared to volume per buyer, there was a greater range in CAGR values for penetration and revenue per volume. The CAGR values for both of these levers become more concentrated over the longer time periods, but this happens to a greater extent with revenue per volume.

Influence of levers on \$ Sales

Finally, we investigate the relationship between the observed category revenue changes and the changes in the three category levers. These relationships are displayed in figure 3 through scatter plots and correlation coefficients. There is a clear relationship between the changes in penetration and the changes in total category sales revenue. This relationship is consistent with CAGRs covering all time periods of analysis. This indicates that when categories have experienced substantial and persistent changes in category sales revenue, they have been accompanied by substantial and persistent changes in penetration. The relationships between category sales revenue and changes in other two category levers (volume per buyer, revenue per volume) are far less consistent.

Figure 3. Scatter plots of category revenue CAGRs by category lever CAGRs over time periods
 \$ Revenue CAGRs by Levers CAGRs



Discussion

The analysis shows that category sales dynamics themselves reflect current knowledge of persistent brand level changes. Over the short-term, value tends to be extremely volatile, but those changes are seldom persistent. Decline is also as likely as growth. When viewed in strategic windows of five or nine years, category stability is the norm with only some incidence of substantial and persistent growth. Of the three levers involved in dynamic performance, penetration is by far the most strongly associated: this means that relatively, unit price alone, whether as an annual increment, or through premiumisation is less of a driver than attracting new buyers, and that strategies to increase general category usage are also, in isolation, rather limited. In short, although the route to category growth is now rather clearer, the advice for brand leaders should be framed with a caveat that success is hard to come by.

IMPLICATIONS FOR THEORY AND PRACTICE

Knowledge of the incidence and nature of persistent category growth from category maturity is limited to date. Managers of brands in such markets are asked to face the unattractive challenge of answering shareholder demand for brand growth with a tools now known to provide only short-term market response; it is therefore hardly surprising that category growth is being considered as a strategy to break the log jam at a brand level. However, since the effort might jeopardise future profits from maintaining an otherwise near-stationary brand outcome, a more comprehensive knowledge of long-run category performance is needed to provide new benchmarks and theory.

We start that process by contributing results from a large-scale descriptive study across many different sets of data to establish the incidence and parameters of category growth. The findings presented here are novel. The results provide valuable managerial benchmarks for evaluating past performance in terms of category expansion, as well as allowing future objectives to be empirically guided by what growth rates are attainable and realistic to aim for. When it comes to planning for how to achieve category expansion, our research clearly demonstrates the need for strategies to

focus on growing the number of buyers in the category. The research also provides a valuable contribution to the understanding of product category structure and dynamics over short-term and long-term time periods. In this case, taking a short time frame such as one year, could lead to overestimating the volatility of category sales and with this, the potential for persistent growth. When taking longer views, stability increasingly becomes the norm. Our method also successfully extends the use of a common financial metric (CAGR) to measure behavioural outcomes.

Limitations

This study has a number of limitations. First, the data available covered only the US, and only CPG categories, so findings are restricted to these markets at present. Second, for the sake of simplicity in this first descriptive study, although nearly 500 categories were examined, many were excluded because, for them, a consistent \$/volume measure was not possible to obtain without much further analysis. It may therefore be that categories with multiple pack formats perform in some exceptional way. Third, the data were collected over a period of substantial macroeconomic turbulence so it is clearly possible that in the earlier years of the observation window certain category sales values may have been suppressed through the more extreme cycle (see e.g. Gordon *et al.*, 2013). Finally, while it is established that the online channel has an incremental effect on total *brand* sales, it is not yet clear if this translates into category growth effects. Further analysis of panel data sets may determine if this is the case by separating out the online components.

Future research

The study has established a range of initial managerial benchmarks, but they have raised many further questions to be addressed by research. The overarching motivation is to establish the role that individual brands can play in category expansion, but more work is needed first to describe and account for the category development stages, and their characteristics. Further study must separate the effects of price inflation, from the effects of premiumisation which are at present obscured in the straightforward \$/volume metric. As noted above it is also desirable to separate the dynamics associated with macroeconomic effects and those that are driven by marketing level interventions, including for example incremental distribution channels (e.g. Pauwels and Neslin, 2015) or the introduction of new products (Nijs *et al.*, 2001). At the brand level the research then raises the question of whether further penetration growth is the domain of only the largest brands in a category; or indeed if premiumisation and disruptive innovation is the territory of the smaller more entrepreneurial brands.

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