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## Double Jeopardy – 50 years on. Reviving a forgotten tool that still predicts brand loyalty

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## ABSTRACT

Scientific knowledge builds by continuously subjecting its known laws to differentiated replications. Empirical generalisations capturing the Law of Double Jeopardy have been extensively tested in this way for decades, and rightly so because they continue to provide a valuable managerial key to the multi-million dollar question of how brands grow. This research continues that work, first by extending knowledge of the operation of Double Jeopardy in the less familiar conditions of long-run continuous buying, emerging markets, capital purchasing and house of brand strategies, and second by validating the rather overlooked  $w(1-b)$  approximation as a simple tool to predict behavioural brand loyalty. Observations of competitive brand performance in 32 differentiated replications, some over thirty five years apart, find no boundary condition to the operation of the Double Jeopardy characteristic even in contexts that might initially suggest a challenge to its independence assumptions. We outline the implications for managers in these new findings in terms of insight, planning and brand audit.

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### 1. Introduction

Scientists aim for their studies' findings to be replicable. An experiment testing ideas about the rate at which consumers buy shampoo brands should yield the same results when repeated in different times or countries. Similarly, two different researchers studying capital goods buying-behaviour in the same way should come to the same conclusions regarding its measurements and composition. Through the scientific process of replication, researchers aim to reconstruct the unchanging rules by which the universe operates – rules that hold everywhere, perhaps within limits or boundaries, but regardless of who is studying them. If a finding can't be replicated, it suggests that current understanding or methods of testing are insufficient.

The process of science doesn't require that every experiment and every study be repeated, but that many should be, especially those that produce surprising or important results. In some fields, it is standard procedure for scientists to replicate their own results before publication in order to ensure that the findings were not due to some fluke or to factors outside the experimental design (Uncles and Kwok, 2013).

The desire for replicability is one reason that scientific papers include a methods section that describes exactly how the researchers performed the study, defined concepts, measures and operational procedures. That section allows other researchers to replicate the study, to evaluate its quality, and perhaps improve the method or to extend the knowledge base. An empirical generalisation may then emerge which summarises results from repeated empirical studies to the extent that the scientists have confidence that the same pattern or relationship will recur in future tests. Ultimately, enough evidence may accumulate for this to support a statement to the effect that the scientist considers it a statement of fact, the truth, or a law. Replication is the key to identifying laws and the empirical generalisations that summarise them, and to establishing their extent, limitations and conditions in which they do not apply.

#### 1.1. Research questions

This research was undertaken in the spirit of continuously subjecting laws to differentiated testing. It is focussed on the most useful empirical generalisation in marketing, the Law of Double Jeopardy (Ehrenberg et al., 1990). This law has been extensively tested over thirty-five years or more, and rightly so, since it provides a key to the multi-million dollar question of how brands grow. When Double Jeopardy constrains choice behaviour, marketers should know that brand share growth depends on substantially increasing the size of the customer base rather more than on managing customer loyalty (Sharp, 2010; Trinh and Anesbury, 2015).

Every marketing environment is however in flux. Conditions under which this law has not yet been tested may have become more

## Declaration of Interest

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significant, while others that are already critical may only become observable as improving technology gives access to better data. The aims of this paper are thus two fold; first to extend the boundaries of the law by assessing it under new or little tested conditions, and second to revive interest in the now somewhat overlooked mathematical derivation of Double Jeopardy, in order to compare predictions from its  $w(1-b)$  approximation with the output of the more widely adopted NBD-Dirichlet (Goodhardt et al., 1984).

Repeat purchase loyalty receives a great deal of management attention. Brands build shareholder value by delivering repeat purchase over the long run, but some have warned that short-term management and wider consumer choice is leading to a long-term decline in loyalty (Binet and Field, 2013; Dawes et al., 2015; Lodish and Mela, 2007). The first research question (RQ1) here was to evaluate three effects of time on Double Jeopardy choice behaviour; first in cross-section, replicating fittings presented in Ehrenberg et al. (1990) with more recent data from different countries; second using six-year continuous buyer panels to estimate the long-run outcomes of the Double Jeopardy constraint; and last in replications of Consumer Packaged Goods (CPG) categories pre-and post-internet grocery shopping.

Non-western markets are important sources of growth for brands facing market saturation, but the dynamic conditions brought about by new buyers and new entrants challenge the underlying assumptions of zero-order models, which may not then provide usable insight. The next question (RQ2) was to test the boundaries of the law through replications in non-western market conditions.

Double Jeopardy has been most commonly tested at the brand level so the third question was to evaluate its operation in two previously untested category aggregations (RQ3), long term capital goods buying and at a house-of-brands level, where firms manage brand portfolios as a strategy to combat market equilibrium.

Ehrenberg et al. (1990) and Ehrenberg and Bound (1993) credited the development of the  $w(1-b)$  approximation to Goodhardt and Chatfield, showing how closely it estimated normal levels of repeat-purchase loyalty. For managers (and academics) it is easily applied using a handful of common data and a spreadsheet, and yet over the past twenty-five years, it has attracted surprisingly little attention. An empirical generalisation becomes useful if it provides performance benchmarks, but Barwise (1995) suggested that a good empirical generalisation should describe a relationship between variables with precision, and preferably mathematically. The last question (RQ4) was therefore to evaluate the goodness of fit of the  $w(1-b)$  approximation against NBD-Dirichlet output in the new conditions studied here to demonstrate its continuing reliability and usefulness and encourage its use.

## 2. Theory

### 2.1. Double Jeopardy

The Law of Double Jeopardy identified by McPhee (1963) and elaborated in a repeat-buying context by Ehrenberg (1972, 1988) states that behavioural loyalty differs little amongst competing brands of different sizes, but smaller brands suffer twice (hence Double Jeopardy) in having fewer buyers who buy them a little less often.

Double Jeopardy (DJ) captures the predictable relationship between  $w$ , the average rate at which a brand's customers buy it in a period and  $b$ , the proportion of the customers in the product-market who buy that brand at least once in the same time. While  $b$  varies greatly between competing brands,  $w$  varies very much less, and is usually closely in line with  $b$ . The fundamental finding in multi-brand DJ studies is the extent to which marketing management is constrained: there is no simple way to increase sales by persuading existing brand buyers to buy a brand more often (Ehrenberg, 1988).

In modelling CPG category structure, DJ is generally estimated using the NBD-Dirichlet, but an earlier and far simpler mathematical formula summarises the theoretical basis for the relationship and predicts expected purchase frequency for any brand in a category from its penetration without recourse to "heavy arithmetic" (Ehrenberg et al., 1990 p.86). The theoretical expression:

$$w(1-b) \cong a \text{ constant} \quad (1)$$

was reported in Ehrenberg (1972, 1988), demonstrated in Ehrenberg et al. (1990) and expounded in Ehrenberg and Bound (1993). Although it described observed repeat-buying behaviour closely, interest focussed on the subsequent development of the NBD-Dirichlet, probably because it captures a comprehensive range of metrics, and so little testing of the simpler algebra has been conducted since the mid-nineties.

### 2.2. Knowledge, fads and empirical generalisations in the marketing environment

It has been said that: "The past is a foreign country; they do things differently there" (Hartley, 1953). Certainly a great deal was different in marketing in the 1970's and 80's when Ehrenberg & Bound (1993 p.173) claimed that a DJ relationship in consumer choice behaviour had already been established in over 40 categories of food and drink, and in financial services, over the counter and prescription medicines, aviation fuel, petrol, motor oil, motor cars, distribution channels, politicians, newspapers and TV programmes. The pattern had already been observed in the UK, USA, Europe and Japan, across demographic subgroups and in periods ranging from one week to two years.

Between 1991 and today however, global internet connectivity, wireless mobile devices and several financial crashes have reshaped consumer choice behaviour. Advances in technology have also multiplied the volume and types of consumer data now available, which in turn helps to drive globalisation (Steenkamp et al., 2003). In addition, market concentration (Morgan and Rego, 2009), saturation (Liu and Yang, 2009) and the emerging-market imperative (Chattopadhyay et al., 2012) have led to intensifying competition through new distribution channels, particularly hard discounters, convenience stores and on-line grocery (Campo and Breugelmans, 2015), all leaving marketers no choice but to respond to the changing competitive consumer landscape (Kapferer and Bastien, 2009).

Throughout these perturbations, and perhaps because of them, loyalty has never gone out of fashion. It is still widely held that brands should build stronger emotional ties with their buyers (Bohling et al., 2006) leading to patronage behaviour that might break the constraints of Double Jeopardy. And the ubiquity of social media has now spawned strategies that aim to build customer brand engagement (Hollebeek, 2011), brand enmeshment (de Villiers, 2015) and even brand love (Batra et al., 2012). Yet despite the best efforts of marketers, the behavioural outcomes of these effects are simply not seen as often as such authors expect given the current evidence for DJ in many categories (Sharp, 2010), while recent results about the long-term persistence of behavioural loyalty (Dawes et al., 2015) pose further questions about its value to management as a focus for growth.

More than ever then, before investing in loyalty-building schemes it is important to understand the structure of the market and any brand performance metrics that a strategy hopes to change. If the Double Jeopardy law and its  $w(1-b)$  approximation hold across a wider range of conditions in contemporary marketing then the underlying theory becomes stronger and managers gain a robust but easily applied tool to develop actionable insights about competitive market structure.

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