
An Investigation of Triple Jeopardy Patterns in E-Store Choice

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Past research on triple jeopardy patterns in the context of store choice has shown contradictory results. This paper extended the research into an online retail environment and examined the jeopardy patterns using data regarding online purchases made exclusively via apps in China. While a clear double jeopardy pattern was found, no triple jeopardy effect was observed, with average expenditures and average categories per visit used as metrics. However, our data revealed a new jeopardy pattern, namely that a smaller retailer brand suffers from a smaller number of categories purchased per customer as well. This resonates with the growth strategies of some retail brands that have achieved significant increases in revenue by expanding their category coverage.

Keywords: repeat purchase, jeopardy, marketing metrics, e-retail

Introduction

Marketing studies have shown that double jeopardy manifests itself in many competitive situations for variables ranging from attitudes, repeat consumption behavior, and even purchase intentions. Noticeably, the double jeopardy empirical generalization is documented for store choice (Bhat and Fox 1996; Keng and Ehrenberg 1984; Uncles and Ehrenberg 1988). That is, small retail store brands get hit twice in that they have fewer customers who patronize them less often (Ehrenberg et al 1990; McPhee 1963).

Triple jeopardy effects in store choice

A third level of jeopardy has been proposed: small stores not only suffer from two disadvantages, fewer customers and fewer visits per customer, but also a third disadvantage - less expenditure per visit. It is termed the “triple jeopardy effect” (Uncles and Hammond 1995).

There is, however, no consistent evidence on this third level of jeopardy effect in the context of store choice. Bhat and Fox (1996) conducted an empirical study of jeopardy patterns for individual supermarkets. The analysis of IRI consumer panel data on household repeat purchases revealed only a weak triple jeopardy pattern. The data showed that the stores with higher sales had more customers who made a higher

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frequency of visits (double jeopardy), and those customers spent more money on each visit (triple jeopardy).

Sharp and Riebe (2005), however, examined grocery store chains and did not find a triple jeopardy pattern. The data suggested that, at least for grocery store chains, triple jeopardy is not a general phenomenon. It was reasoned that triple jeopardy might occur if store size was strongly associated with market share and if store size influenced customers to spend more on each visit.

To our knowledge, these are the only two studies that examined triple jeopardy effects in the context of store choice, and the results that they presented are inconsistent. In this paper, we intend to further examine whether triple jeopardy patterns exist in the e-store choice context.

Factors that may have an impact on triple jeopardy effects in offline store choice

The location of a physical retail store has an impact on the frequency of visits and basket size because the time spent driving to and from the store, as well as the associated fuel expenses, are all part of the purchase equation. It is reasonably assumed that the shorter the distance between a store and a household, the higher frequency of visits, and the smaller the basket size.

Bhat and Fox (1996) “revealed modest evidence” on the triple jeopardy effect using a sample of 1436 panelists and 28 stores from 3 cities, implicitly assuming that the panelists and stores were evenly distributed across the cities. However, this assumption was not validated empirically. For instance, store A may be the only store within 10 miles, while store B is the only store within 1 mile. In this hypothetical scenario, store A would welcome more customers who travel a further distance to shop and would therefore purchase more with each visit and visit less frequently. Similarly, Sharp and Riebe (2005) had 600 households in the sample with store chains as choice targets. Although it seemed that store chains could mitigate the impact of distance on visit frequency and basket size, each chain might have different numbers of individual stores, which in turn may impact the distances between the chains and its customers.

Another factor that may play a role in determining the effect of jeopardy patterns is the zip code of a store. A store located in an affluent neighborhood would attract more affluent customers and thus have higher expenditures per visit than a store located in a comparatively less affluent neighborhood. Again, both studies did not provide the profiles of households as well as stores/store chains.

Both studies explored triple jeopardy effects only in the grocery store choice context. Because of the nature of grocery products, there might be more visits to stores and less consumption per visit overall. Other factors such as pricing policies and promotions

can also aggravate the effect of this flattened expenditure per visit. For example, Bell and Lattin (1998) showed that shoppers who have long shopping lists preferred stores that offered “Everyday Low Pricing” policies over stores that offer “Hi-Lo” pricing policies. As a result, it is difficult to detect a triple jeopardy pattern in the context of grocery store choice.

To sum up, variables influencing the average expenditures per visit of its customers in a store include the zip code of the store, the distance between the store and its customers, the geographical distribution of the sample households, and the pricing policy of the store. These are factors that we can hardly discern when studying triple jeopardy patterns in the offline store choice context.

Therefore, from a theoretical perspective, e-stores are better targets to investigate triple jeopardy effects in store choice. While eliminating the effects of distance and heterogeneities of neighborhoods, the e-retail market has minimum differences among prices charged by retailers given that products are the same. This resembles a perfectly competitive market. We attempt to investigate jeopardy patterns in such a market.

An online store choice context

Online shopping has been growing at a breathtaking pace in the past 15 years in China. Even though this rate has decreased in recent years, the total online sales still reached 10.63 trillion RMB, or 1.5 trillion US\$ in 2019. This represents a 16.5% increase from 2018, according to the State Bureau of Statistics (http://www.stats.gov.cn/tjsj/zxfb/202001/t20200117_1723391.html). By the end of 2018, the number of online shoppers has reached 610 million, 97% of which make online purchases through their smartphones.

One can buy nearly everything online in China, perhaps except for illegal items. All e-retailers offer delivery services, either on their own or by working with a third-party supplier. Products can usually be delivered to your door, no matter where you live, within 3 days. This occurs at a minimum charge, or even without a charge in many areas, enabled by the large workforce in the shipping industry. For example, JD.com, a USSE listed company, has about 120 thousand delivery employees. Additionally, there are three sophisticated mobile payment systems available in China, facilitating online transactions between buyers and sellers.

Our rationale for the existence of triple jeopardy patterns in online retail store choice is different from that in the offline market. In the offline store choice context, having larger store sizes (e.g. product range) may not only increase market share in the sense that more customers shop more frequently on average, but also makes customers spend more on each visit. The argument is reasonable because each shopping trip has a cost.

Au contraire, in the online retail environment, there are theoretically no limitations on the product assortment of the stores, hence, the store size effect does not exist. Our rationale for the existence of triple jeopardy effects is that more visits make customers more likely to explore and make purchases from more categories as they develop a habit of shopping with the retailer's app. The triple jeopardy effect may not be evident when the average expenditures per visit and number of categories purchased per visit are used as metrics; however, it may be evident on the average number of unduplicated categories purchased, since both shopping costs and shipping costs of each visit are close to zero. Therefore, we hypothesize that the average number of visits is strongly correlated with the average number of unduplicated categories per customer, but is less strongly correlated with, or even does not have a correlation with, the average expenditure per visit and the number of categories per visit, in e-store choice context. In both Bhat and Fox's (1996) as well as Sharp and Riebe's (2005) studies, average expenditures were used as metrics for making comparisons across stores. Neither of the papers examined the relationship between the number of categories per visit (or per customer) and number of visits. In this research, average expenditures per visit, number of categories per visit, and the total number of unduplicated categories per customer per year are the three variables that are examined.

Data and results

We collected data from 1036 individuals who made online purchases exclusively via the apps of e-retailers. These apps keep all records of purchases with date, items, quantity, price, and the total expenditure. We asked the individuals to take screenshots of all purchase records that were dated from Jan 1st to Dec 31st in 2019, stored in apps on their smartphones.

The 1036 individuals are aged from 21-65 distributed in 11 cities ranging from Tier 1 to Tier 3. The division of cities into tiers is largely based on their economic development levels. The group of e-retailers under consideration sell grocery products of all types. The variables of interest are the store's market share, penetration, the average number of visits per customer, the average expenditure per visit, the number of unduplicated categories per customer per year, and the number of categories per visit. Data for these variables were extracted from details of the e-receipts. The definitions of the variables are shown below:

Market share: the percentage of \$ amount spent in a store among the overall market expenditure. The expenditure-based market share is consistent with our daily use of the "market size" in terms of revenue.

Penetration: the proportion of customers who shopped a store at least once

Average visits: average number of receipts per customer to a store

Average expenditure: average spending per receipt across all customers in a store

Average category: average number of categories across all receipts by those who made purchases from a store. We coded the categories according to JD.com and Taobao.com, which are the two largest e-stores.

Total categories: total number of unduplicated categories by a customer who made purchases from a store during 2019

Table 1 shows all the data, arranged in decreasing market share, for all the variables of interest.

Table 1 Data for individual e-stores

	MS (expend- iture)	Penetra- tion	Ave visits	Ave expen- diture	Ave cate- gory	Total cate- gory
淘宝(Taobao)	56.2%	83%	42.6	108	1.00	12.2
京东(JD)	28.4%	40%	20.6	235	1.01	8.6
拼多多(Pinduoduo)	6.6%	35%	22.7	56	1.00	7.6
苏宁易购(Suning)	2.6%	5%	13.8	273	1.01	6.8
天猫(Tmall)	2.1%	8%	18.1	94	1.00	8.2
唯品会(Vipshop)	1.8%	6%	11.8	175	1.00	4.6
考拉网(Kaola)	1.6%	4%	13.0	191	1.01	5.2
微店(Weidian)	0.6%	3%	10.0	157	1.00	4.2
当当网(Dangdang)	0.2%	2%	5.4	95	1.00	1.3

Discussion

Table 1 shows that there is a clear double jeopardy effect: the larger the market share, the more customers and the higher the average visit. The correlations between market share and penetration, and between market share and the average number of visits are statistically significant 0.96 ($p=0.000$) and 0.91 ($p=0.001$), respectively. It confirms the expectation that the larger the market share, the higher the number of customers,

and the more visits per customer.

The effect of double jeopardy is amplified on Taobao, as the gap between the average visits of Taobao is much larger than what we typically see in any other research. This may be due to the nature of Taobao -- it is not exactly a retailer, but rather a trade platform resembling eBay. It only facilitates transactions between buyers and sellers. Another firm, Tmall, has a smaller market share in terms of expenditure, but a larger penetration and average visits per customer than what double jeopardy patterns usually accommodate. This deviation is due to the method of calculation – the market share was calculated based on expenditure and not on visits. Tmall's penetration and the average number of visits per customer would have aligned well with its market share had we calculated market share using the average number of visits. One other deviation from the general double jeopardy patterns is Pinduoduo, which has a lower market share, but similar penetration and average visits compared with JD. Pinduoduo believes that store traffic is more important than mark-up at this stage in its business cycle, so it adopts an aggressive pricing strategy where discounts are offered exclusively to groups that reach a pre-determined threshold for the number of buyers within a certain time limit. At the cost of average expenditures, this method successfully pumped up Pinduoduo's frequency of visits and penetration rate.

However, we see no evidence of triple jeopardy effect with respect to average expenditure. In fact, the Pearson correlation coefficient of average expenditure per visit with penetration and average visit are -0.23 ($p=0.55$) and -0.24 ($p=0.54$), respectively, which supports our hypothesis. The average expenditures vary from store to store with no observable pattern – the brand with the largest market share has an average expenditure of 108, while the smallest has 95, but the variable reaches as high as 273 for Suning. It is tempting for us to invoke some positioning theory and say that the large variations in expenditure may be due to the slightly different specialization that the stores have in different product categories. For instance, JD started its business by selling electronics and durables, and that left consumers an impression that it was specialized in certain categories even though it now has extended its coverage to a wide range of other categories. By the same token, Suning was once one of the two largest offline electronics and durables retailers, and now it developed its online business presence Suning. Our data show that both stores have larger percentages of their customers purchasing electronics and durables than other firms, such as Taobao. Similarly, Vipshop has a larger percentage of its customers purchasing skincare products and female apparel, which also results in a higher average expenditure than Taobao. However, this positioning explanation seems to be refuted by the data in that JD has a larger revenue and simultaneously a lower expenditure per visit than Suning, though both are considered to be specialized in electronics and durables. Whether or not the explanation about average expenditure holds, the data certainly does not support the rationale that more visits induce more expenditure on each visit and a larger market share means more expenditure on each visit. The triple jeopardy effect with respect to average expenditure, hence, is not found.

The data also supports our hypothesis that a larger market share or more visits may not induce customers to buy more categories on each visit. More than 99% of visits involve only one category, as a result, the average number of categories per visit across all stores in the table only presents a minor difference of up to 0.01 per visit.

Unsurprisingly, the number of total unduplicated categories is positively correlated with market share, penetration, and average visits. Their correlation values are all statistically significant, being 0.80 ($p=0.01$), 0.83($p=0.005$), and 0.93($p=0.000$), respectively, which supports our hypothesis that more visits would induce purchase from more categories, even though the number of categories per visit remains one, on average. This can be explained by two factors: first, visits build trust, which in turn leads to purchases from other categories; second, a switching cost is present, and adapting to another app requires a certain amount of cognitive effort and time. There is no incentive to switch if the current app meets all possible demands. When customers make purchases of products from different categories, they tend to pay multiple visits to acquire everything they desire. The growth strategy of JD seems to verify this point. JD was specialized in electronics and durables during its early years, but soon reached a revenue ceiling of about 200 Bn. Seeing this, it adopted a strategy of expanding the available categories of products. As of 2019, its revenue has reached 500 Bn.

Conclusions

In general, our empirical research supported the double jeopardy pattern that a larger market share of e-retail stores (calculated using revenue) is related to more customers and more visits per customer, though pricing policy may interfere. However, it did not see a triple jeopardy effect in e-store choice when measured in average expenditures per visit. Average spending is independent of market share and the number of visits, in the online environment. The larger variations in average expenditure may be influenced by consumers' attitude towards retail brands and the stores' product range strategies.

The e-retail environment showed a very interesting jeopardy pattern; smaller stores suffer from a smaller number of unduplicated categories purchased per customer. Even though more visits to a store induce purchases from more categories, customers tend not to buy many different products in one go; rather, they take a single category of products each visit in the online retail market. The newly revealed pattern confirms the growth strategies of some retail names in the market.

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Note

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