

Order Fast Think Fast: How Powerful are Behavioral Economics and Game Theory as Marketing Tools to Drive Fast Food Choices by Consumers?

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The fast-food industry is a key area where this tool where the influence of behavioral economics can be observed. This industry is unique as it is fast paced and hence the nudges that they use need to be attractive and distinct. To understand the process behind this I collected sales data from a leading high profile fast-food company in Vietnam. The analysis of the data showed that the nudges had huge implications in steering individuals towards the target products through limited time offers and habit disruptions. While nudges are powerful tools, they need to be periodically recycled and adapted according to the changing demographics and habits. In the future, AI may optimize behavioral economics and facilitate more personalized nudges. To achieve this we will need drastically better data collection systems.

Introduction

The fast-food industry in Vietnam has spent over 1.2 billion dollars alone on advertising and marketing in 2023¹. Firms heavily rely on this medium to interact with consumers and influence their decision making. Marketing is combined with behavioral economics to make a lasting impact. They both work with the objective of changing consumer behavior. Marketing is about wanting consumers to buy and use their products and this is done by using behavioral economics nudges. Behavioral economics is a very strong tool that firms use to understand the way their consumers think and get influenced. Behavioral economics combines elements of economics and psychology to understand how and why people behave the way they do in the real world. It differs from neoclassical economics, which assumes that most people have well-defined preferences and make well-informed, self-interested decisions based on those preferences². This part of economics stems out from the others as it is showing individuals the reality of how the “perfect” models used in economics fail to recognise the human instincts which are irrational. The sheer power of the nudge theory in an economic context is incredible as it is as small as placement to as big as creating perceived illusions of scarcity which can result in a great volume of sales. Nudges offer a wonderful methodology for identifying, analyzing and re-shaping existing choices and influences that people are given by governments, corporations, and other authorities³. The ways it allows firms to understand their consumers is vital when it comes to developing business strategies and understanding the response. This theory also helps individuals and firms understand different behaviors and these

behaviors vary from industry to industry and hence the nudges applied are also very different. The fast food industry presents an interesting space to consider the impact of nudge interventions. The industry is very fast paced from both the producer and consumers standpoint. This makes it different to others in the consumables sector as the nudges firms apply need to be eye-catching so that the second a customer walks into the store they pick it up. KFC is Vietnam’s most favored fast food chain so they have a good grasp of how its consumers respond to the heuristics. Hence, it can provide the ideal case study to explore how consumers in Vietnam respond to behavioral economic nudges to drive consumption. In the past, KFC has applied many behavioral economic nudges. They did a study on the nudge of disrupting a habit called “cross sales”. Here a special menu with desserts and a few other items are proposed by the hostesses to those who are about to finish a meal. This is breaking the habit of ordering at the counter before the meal and reminds the customers of dessert. This paper looks at a different nudge that KFC has not applied before and also the cross sales study. This heuristic looks at the concept of scarcity and a limited time offer (LTO). This is applied by only putting a product on offer for a restricted time. Scarcity can create a sense of urgency, increase the perceived value of items or opportunity as there is competition for it now. This research seeks to explore the impact of nudges in a Vietnamese context and adds to existing literature as it provides a different perspective to already existing nudges as well as builds on the current ones. People, trends and patterns are constantly changing, hence research is also changing. This research on how Vietnamese consumers respond to nudges, will provide evidence that proves theories of older economists

but in a different setting and time. Furthermore, this can be different in each country. Doing this in Vietnam will give me data and help me draw conclusions that would be very different to other countries. Hence my research broadens how consumers in Vietnam respond to the nudges which have been aligned to go with their preferences and tastes. This study also aids to understand the power of marketing strategy that can be leveraged to influence consumption.

Literature review

The fast food industry utilizes nudges in very unique and innovative ways. This makes it a great case study to study behavioral economics and nudges. This section explores in more detail some core literature on nudges and behavioral economics and dives deeper in some existing case studies in the fast food sector.

Behavioral Economics

The concept of behavioral economics is used widely in all areas of our lives and not only in economics. Behavioral economics is part of recent mainstream economics, sharing with other emergent reach programmes the rejection of fundamental assumptions and commitments of the previously dominant neoclassical economics research programme⁴. This study is diverging away from the hypothetical models based on assumptions and treating people as irrational subjects. Behavioral economics shows not only that our economic decision-making is apparently irrational, but it is powerfully influenced by other people⁵. This irrationality originates from individuals' tendency to have biases. There are a range of behaviors in the laboratory that cannot be accounted for by the rational choice model; the departures from rational choice are not simply random, they exhibit systematic patterns⁶. Behavioral economics is revealing phenomena that bias consumer decisions can be exploited by marketing techniques⁵. We are seeing how marketing and behavioral economics go hand in hand. This shows us how powerful this concept is for firms and individuals as a medium of influence.

Nudges

One branch of behavioral economics is the nudge theory. Thaler and Sunstein define a nudge as: "...any aspect of choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives"⁷. Many nudges work not because they suddenly illuminate the rational option, but because they provide information about how our fellow citizens behave in the same situation⁵. However, the nudge that works depends heavily on context. Nudges are used in government policies, public

policies, restaurants, health and more. The nudge theory is relying on insights from behavioral economics. It doesn't change the options themselves but how the options are presented to look more enticing for the individual. Relying on heuristics, mental shortcuts, and intuitive decision making, real-life agents often systematically diverge from the traditional, abstract ideal of rational choice.⁵ Nudges can be used by the government for public policies. They can run campaigns which have emotional value to nudge individuals to agree with policy. The campaign may use visual nudges such as posters and pamphlets. Businesses and firms may design their menus in certain ways to nudge consumers to buy more. Menu architecture is a popular example of how nudges are incorporated as fast food menus incorporate them in a very different way to restaurants. Setting a default option is another way nudges are incorporated. For example, making people organ donors by default can increase the rate of organ donations, compared to requiring people to opt-in in order to become donors⁵. However, nudges do face some criticism from society as well. Characterizing nudges as being manipulative arises once one connects it to ethics and normative responsibilities. According to Thaler and Sunstein, "A choice architect has the responsibility for organizing the context in which people make decisions"⁷. This power can be misused unintentionally as it is so volatile, hence its something to be conscious about in designs and decisions.

Fast Food Behavioral Economics

Nudges are being used in many fields and industries but the food industry applies these nudges in an intriguing way. Food is everywhere and everyone depends on it. This is a very competitive and profitable industry. This industry generated over 10 trillion dollars in 2023 and is expected to reach 10.78 trillion dollars in 2024¹. Hence, there are major ways nudges and behavioral economics have been leveraged to influence consumer decisions to increase consumption and revenue. Furthermore, there have been many vast nudges used depending on the type of food firm and country. This paper studies the fast-food industry in particular. The fast-food industry has been using marketing and nudges for a long time. It's also an industry where everything is fast paced and there are many firms in that industry making it quite competitive. There are 200,859 fast-food restaurant businesses in the US as of 2023⁸. Hence the nudges applied in this scenario are with the due aim of standing out and being inviting at first glance. Many firms in this industry apply nudges in different ways depending on context and their aim. Some studies have categorized these nudges as "dark nudges". While the food and beverage industry has employed some nudges to create healthy food environments, nudges can also be used to exploit cognitive biases to promote the consumption of harmful products⁹. At first most fast-food places look homogenized so they need something that makes

them stand out to attract consumers. They do this through marketing and nudges. One good case study is Starbucks. They have anchored themselves into consumers through some static Starbucks traits. They use the nudge: cocktail party effect. This nudge leverages the power of personalisation to make sure the consumer is tuned out of distractions and focuses on the information at hand. This is how Starbucks writes the individual names of the cups. This creates a more personal bond. Instead of treating consumers as numbers, like most fast-food chains, they are treating consumers as people. The cocktail party effect is a powerful tool for Starbucks as they are creating a memorable, personalized experience for their customers. By using personalized information like names they create a premium feeling experience that sets them apart from their competitors. Starbucks has also taken grasp of the Irrational value assessment¹⁰. This heuristic explores that people value the price tag as an important indicator for the quality of the product. Starbucks prices their coffee much more than its competitors and offsets it with the ambiance and premium customer experience. That pricing impact has been so huge, researchers have dubbed it the “Starbucks Effect”. In 1990, only 3% of coffee was sold at a more expensive premium price, but by the year 2000 in the middle of the Starbucks craze, 40% of coffee was sold at a premium price¹⁰. The moment one enters a McDonald’s store, they are immediately being sucked into the world of nudges. Studies have shown that no matter what options are available, people tend to stick with the default options and choices they’ve made habitually². Research has also shown that the first thing people notice is the product they end up buying. In a McDonalds store, they use imagery and posters to make the food seem appetizing. Here, they are using decision anchoring and taking control of your first choice. They are using behavioral economics and heuristics to solve a major problem that affects their sales and the consumption of goods. This chain is also very innovative. The fast-food industry is very fast paced and competitive. Consumers want efficiency and these chains must adapt to meet these needs. McDonalds was one of the first fast-food chains to embrace a self service kiosk on a large scale¹¹. They were able to use this medium to leverage nudges. They use the cocktail party effect. The consumer is able to create a personalized menu for themselves based on their habits and needs. They are also able to show the consumer more choices and all the deals. This nudges the consumer to try out new products and order more items as they are able to look at everything at once. McDonald’s has experienced a notable surge in sales and revenue due to its capacity to provide tailored suggestions and customizable choices. This has motivated customers to purchase more items, leading to an uptick in the average order size.

Table 6: Outlining the price competition between the 2 firms

	Price (\$)	Price (\$)	Market Share (%)	Market share (%)
Time	KFC	McDonald’s	KFC	McDonald’s
1	10	10	50	50
2	10	8	25	75
3	8	8	50	50
4	8	7	30	70
5	7	7	50	50
6	7	6.5	35	65
7	7	6.5	45	55
Potential income of KFC	315			

Theoretical Game Theory model:

This section discusses a theoretical model of a situation to rationalize how an organization like KFC might use game theory and resort to nudges. It is assumed in this model that companies primarily compete on price. We also assume that they are reactive to the decisions of the other company. In this hypothetical scenario KFC and McDonalds are competing in their sales of a comparable product. The metric we are observing is their market share (percentage of the overall sales in the market) of this given product.

In time period 1, it is assumed that both KFC and McDonalds start with the same percentage of market share and that consumers are indifferent to the product provided. Furthermore, the price in time period 1 is the same. In time period 2, McDonalds cuts their prices from 10to8 and there is a shift in market power between the 2 companies as consumers respond to the price cut and McDonalds increases their market share. Then in time period 3, KFC responds by matching the price. This restores the equilibrium of time period 1 with both companies having an equal market share. This pattern goes on until time period 7 where KFC can not cut prices anymore due to costs and diminishing margins. Hence, they resort to a change in tactic and implement nudges. By engaging in non-price competition KFC is able to gain 10% of the market share back. The resulting situation is that KFC is able to now sell at 45 percent of the market at a price of 7 which yields a return of 315.

Working with the same assumption it is possible to construct a comparative scenario outline in the table below. Here, in time period 2, McDonalds cuts their prices from 10to8 and there is a shift in market power between the 2 companies as consumers respond to the price cut. But, instead of competing through pricing, KFC decides to implement nudges faster than in Scenario 1. As a result, their potential income of \$350 in scenario 2 is higher to the \$315 potential income in scenario 1.

Table 7: Outlining the scenario where KFC introduces the nudges earlier

	Price	Price	Market Share	Market share
Time	KFC	McDonald's	KFC	McDonald's
1	10	10	50	50
2	10	8	25	75
3	10	8	35	65
Potential income of KFC	350			

Scenario 2:

This game theory model presents an understanding as to why KFC might have used nudges in the first place. It also gives us an insight into the impacts of different strategic decision making on the timing of moving to a nudge strategy. In reality such a decision would need to be informed by suitable elasticity assessments (of both prices and nudges).

Method

The following section summarizes real sales data gathered from KFC directly and explores some descriptive statistics on the impacts of their various nudge interventions. The methods utilized in this paper seek to present the findings in a case study style analysis and do not attempt to derive causal effects statistically. The methods deployed in the research paper are constrained by the data that is made available by the partner organization (KFC) for data protection purposes. Despite not offering a casual statistical analysis the methods still offer valuable insights into these sorts of interventions.

Price elasticity study

KFC did a price elasticity study and ran an experiment where 600 respondents were shown a pair of product builds and asked to choose, at a specific price point. They had over 16,000 conjoint choices and this took place through a basic quantitative survey. They priced the items from 3 categories: price change between -10% to 10%, price change between -5% to 5%. Table 1 shows us the impact on sales if the price was increased from within -5% to 5%. Based on consumer survey data, they were able to conclude that Group Meals, Individual Meals, Snacks & Dessert are comparatively more price sensitive. For these categories, price increase should be conservative. Higher price increases are recommended on categories such as COB ALC (chicken on bone a la carte), Rice ALC, Side Items. For KFC, at a category level Individual meals, Group meals and COB ALC (chicken on bone a la carte) are the transaction drivers while Rice ALC products are sales drivers and Desserts are profit drivers. Hence, the price changes vary across. This experiment that they conducted forms the basis of what they use when pricing goods.

This study is important to consider as it's reflected in the nudges that KFC applies.

Table 1: Summary of KFC elasticity study

Category	Sales Mix	Elasticity	Sales Maximization
Overall			2.3%
COB ALC	23.20%	-0.35	3.9%
Individual Meal	17.50%	-0.56	1.8%
Group Meal	17.30%	-0.63	3.4%
Rice	9.20%	-0.21	4.3%
Snack	7.60%	-0.56	2.9%
Dessert	7.40%	-0.63	0.2%
Burger	7.10%	-0.60	0.0%
Side Item	5.50%	-0.66	3.0%
Drink	3.40%	-0.07	4.9%
Others	1.10%	-0.28	-1.5%
Non-COB	0.50%	-0.50	1.8%

Nudge 1: Scarcity

KFC applied the nudge of scarcity. They introduced this behavioral nudge through the concept of a limited time offer (LTO). When an object or resource is less readily available (e.g. due to limited quantity or time), we tend to perceive it as more valuable¹². Scarcity appeals are often used in marketing to induce purchases. Marketing messages with limited quantity appeals are thought to be more effective than limited time appeals, because they create a sense of competition among consumers⁴. The details of this nudge were provided first hand from KFC. This nudge was applied in-store and online. KFC launched an exclusive - only for 3 months - product called the Smoked Chili Crab Chicken. Getting a LTO into stores is a rigorous process which starts a year in advance. Firstly, they evaluate all the different categories (Burgers, snacks, dessert) and brainstorm different concept ideas for the possible LTOs for each category. Then through internal and external evaluation these concepts for LTOs are shortlisted to around 20 possibilities which are most interesting. These shortlisted possibilities are judged through a process called the Champ standard library. Here they gauge the process of implementing these menu items and see the practicality of it. The supply team costs out all the materials to indicate the price point of the product to attain a certain level of margin. This is put through commercial evaluation where the suppliers pricing strategies are assessed and to ensure they can do it within budget. Once the logistics are sorted the products go through tasting sessions and quantitative surveys are conducted to help finalize the item. If the LTO shows success then it's repeated in 3-4 years.

This LTO is marketed both online and offline throughout the duration of the LTO so consumers understand its exclusivity and the product. Online, they are in the form of posts on social media where the price and combos are outlined in the caption.



Fig. 1 Online advert via facebook

Offline, they are displayed as posters on the counter and on the tables.

This LTO will go on for 2-3 months as they still want to keep the high value created within consumers. To ensure its exclusive nature stays intact they have to create a scare environment around it. They have to meet the MOQ (minimum order quantity) to justify the LTO. MOQ is the minimum quantity that the company must buy from its supplier. So if the LTO does not run for long enough to see the MOQ then it results in losses for the company. This also maximizes sales as anytime more will start to decay its “exclusive” nature. The Smoked Chilli Crab Chicken is applied in all 206 stores in Vietnam.

When pricing the LTO a lot of factors are taken into consideration. Due to its exclusivity they can use premiumisation to price the LTO higher. This price premium is also determined via past launch benchmarks. From table 2 we can see the single piece chili crab chicken was priced 17% higher than regular chicken while the 6 pc bucket was priced 13% higher than regular chicken bucket. This is connected to the price elasticity study as that study indicated to KFC that there was lower sensitivity for ALC chicken pieces while elasticity was higher for combos and buckets.

Table 2: Summary of sales figures of chicken

Product	Price (VND)
1 chili crab chicken	41,000
1 regular fried chicken	35,000
6 piece chili crab chicken	231,000
6 piece regular fried chicken	204,000

The best way to determine if the nudge is working or not it’s through the sales data collected for the spicy chicken crab. This data depicts the sales predicted versus the actual sales (both weekly and cumulative), the total number of sets sold and the sales mix. Overall, the sales data shows us that the sales outran what they predicted, hence its doing better than hypothesized.

Nudge 2: Disrupting a habit

KFC introduced a new concept of ordering dessert at the table and called this the Secondary order order project. This involves using the nudge of disrupting routines and habits. Habit disruption involves intentionally or inadvertently breaking a habit. This can be done by adjusting the environmental cues linked to the habit, modifying the behavior itself, or changing the consequences or rewards associated with it. Here the hostess goes to each table and a special menu with desserts and a few other items are proposed to those who are about to finish a meal. This was implemented as a test from July 1st to August 31st. The way to determine if the nudge is working or not it’s through the sales data. The data entails the total marketing and production cost, Sales mix, Transaction mix and incremental revenue. Through the transaction mix we can see that this nudge incentivised people to add on the dessert.

Results

Chili crab chicken

The nudge is assessed through weekly and cumulative sales data for the chili crab chicken. Table 2 helps us see how the total sales row shows us the actual sales revenue KFC earned through the nudge. The Sales (Plan) row states the predicted sales revenue values. Furthermore, the difference in these values and the %Actual/Plan row shows us how the LTO performed better than expected. The Accumulated column shows us the cumulative data over 3 weeks. They have met 38.30% of their revenue target within 3 weeks of running the LTO. We see the quality consumed through the Total #set row where we see an increase in demand over the 3 weeks. This LTOs sales revenue corresponds to 6.30% of the company’s total revenue earned within the 3 weeks. Here we also see an increasing pattern which ties in with the total number of sets to show us how the demand for the LTO is increasing over time so far. The quantity sold per day in each store was relatively high during the first few days but then it dropped and then increased again.

Table 3: Overall summary of chicken sales

LTO	W3	W4	W5	Evaluation		
Smoked Chili Crab Chicken						
12Jan24-29Feb24	15Jan-21Jan	22Jan-28Jan	29Jan-4Feb	Accumulate	Target	% Target
Total Sales	1,340	2,676	3,269	7,285	15,230	38.30%
Sales (Plan)	1165	2,720	2,720	6,605		
% Actual/Plan	115%	98%	120%	110%		
Total #set	17,931	37,359	45,658	100,948	228,334	44.20%
Days	3	7	7	17	49	34.70%
#set/store/day	23.2	20.7	25.3	23.1	18.1	127.40%
Sales Mix	5.70%	6.30%	6.60%	6.30%	5.48%	

The impact of this nudge to drive consumption can be further analyzed by comparing it with the sales of normal chicken.

Table 4: Summary of chicken sales over the LTO and pre-LTO periods

	No LTO Equivalent Period			During LTO		
	W1	W2	W3	W1L	W2L	W3L
Total Chicken Sales	22989	40684	45993	23333	41538	47143
LTO chicken sales	0	0	0	1400	2700	3300
Incremental Chicken Sales				350	872	1179
LTO Mix	0%	0%	0%	6.00%	6.50%	7.00%
Incremental Mix from LTO	0%	0%	0%	1.50%	2.10%	2.50%
Regular chicken sales	22989	40684	45993	21933	38838	43843

The table outlining the overall summary of chicken sales (table 3) above illustrates the data for the regular chicken sales. From this we can see the sales before the LTO was launched and during. Here, we compare W1 with W1L, W2 with W2L and W3 with W3L. There was an increase in chicken sales from W1 to W1L of 345 units of chicken, a 854 units increase from W2 to W2L and a 1150 increase from W3 to W3L. The LTO chicken sales increased during the weeks the LTO was applied, and the regular chicken sales decreased compared to the weeks with no LTO. However, this was compensated with an increasing incremental mix during the LTO weeks and hence the total chicken sales (LTO + regular chicken) increased relative to the weeks with no LTO. The incremental mix from LTO differed across all 3 weeks. The graphs show us a virtual of the trends as well. Through graph 1 we can see how the normal chicken sales decreased during the LTO, but the total chicken sales increased.

Disrupting a habit

Table 5: Summary of dessert sales

	Test in 208 stores (Jul 01-Aug 31)	
	Actual	Target
#days	62	62
Units sold per day per store	40	38
Sales mix	3.00%	2.00%
Transaction mix	15.00%	13.00%
Incremental Revenue	4,800	4,500

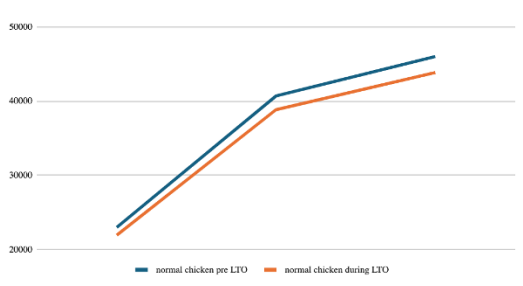


Fig. 2 Normal chicken sales

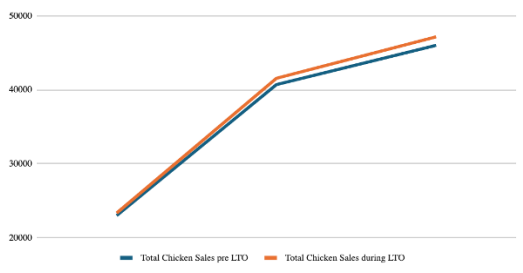


Fig. 3 Total chicken sales

This nudge is determined through the cumulative sales data. From the sales mix data we can see how the predicted percentage was 2% but the actual was actually 3%. As the dessert is priced low, this may not seem much but in reality, means that this nudge incentivized the consumer to add on dessert more than if the hostess didn't go up to the tables and ask them. The TC mix shows us the percentage of consumers which added on dessert. From Table 4 we can see that 15% of the consumers who were shown the special menu ended up adding the dessert. This ended with an incremental revenue of 4800. However, they did have to invest more in marketing than expected. The predicted value was 4000 but the actual value was 4200. We can see that the actual numbers of the nudge always surpassed the target which indicates the nudge performed better than expected.

Discussion

It is clear the KFC has established some structured ways of determining which nudges they will deploy. The first stage of their internal research involved a price elasticity study.

While the study is a useful first step, it mainly relies on the quantitative survey which may not capture a more clear perspective of consumer behavior and preferences. Moreover, the utilization of a basic survey is not sufficient to establish causality. Having a combination of focus groups, business visitations and online surveys would provide better ground in establishing a relationship. These methods of collecting consumer choices need to be done regularly as those preferences and choices are very dynamic and changing. The remainder of this section will discuss further the two primary nudges of interest.

Nudge: Scarcity

Based on the experiment we can see how the scarcity nudge implemented through an LTO drives sales for the LTO as well as the total chicken sales as it was able to create a competition around it.

In Summary of sales figures of chicken table we see how the total chicken sales were significantly lower in W1 and W1L to the rest of the weeks. This difference stems from the fact that most Vietnamese employees get their salaries and wages during the first week. So to treat themselves and their families they tend to eat out more during the following weeks. This is vital information for KFC to understand its consumers as they can plan out the units accordingly. They can also use other nudges according to this information. Post W1 they can push the deals and combos more heavily as they know that the consumers are more willing and able to buy the goods. Furthermore, the incremental LTO chicken sales also increases as the weeks progress which show us that during W2L and W3L there was a lot more consumption for the LTO due to two reasons. Firstly, it's correlated to when they are getting their factor income in the first week and are able to reward themselves with a meal out in the following weeks. Secondly, it could also be that the people who have consumed the LTO during the first week liked it and recommended it to others. Here, due to social proof and validation it incentivises more individuals to consume the good.

Based on the data for chili crab chicken we can confirm that the nudge works. This indicates a lot about Vietnamese consumers. They seem to like innovative and premium products and want to try out new things. This is shown by the tradeoff between regular fried chicken and the LTO (chili crab chicken). The weeks when the LTO was implemented, the demand for normal chicken crab did decrease; however, it was compensated by incremental sales of the LTO. This strategy seems to work effectively as the total chicken sales is increasing. This raises a few potential strategy questions for KFC to consider. Should they make this a constant marketing strategy and keep putting out new and innovative flavors? Or would it be better to leave this as a yearly strategy to make sure the exclusivity factor that comes with the LTO stays. This is a very interesting aspect to

discover as if KFC optimizes its LTOs potential then it could make a lot of profit. To see what the optimal frequency is they would need to experiment and do surveys to understand what the maximum rate is so that consumers still want to try out the LTO. It shouldn't be a case where they know if they miss one LTO another one will come soon. The LTO should still be a scarce concept for the consumer.

Here we have seen the LTO nudge work on a chicken product. Something to further analyze is that the concept of a LTO nudge would also work on other products. The KFC menu is divided into 5 distinct categories: starters, add ons, main meals, dessert and drinks. KFC wants to maximize their revenue in each category. For some categories an LTO would be the most effective form of scarcity behavioral economic nudge but for others it may not. This is important to study as understanding how consumers respond to each category can help decide which heuristic works best for each category. Furthermore, this also helps save costs as KFC will be able to decipher where to invest based on what works best. Also the process of developing an LTO is time consuming, so it's important to also spread out the types of heuristics used by firms to ensure that they are using their time efficiently. The point of a scarcity nudge is to create a perceived shortage amongst consumers which encourages competition amongst them. If the LTO is overdone and used in every category then the concept may not be scarce anymore. On the other hand, if these scarcity nudges are timed correctly they can work out. The sales mix is also a good indicator for whether KFC should use the scarcity nudge or not. From the KFC price elasticity table we can see how the LTO sales revenue accounted for 6% and rising of total chicken revenue. This shows us how the LTO is actually worth it as the cost of the product allows for a big sales mix of the total revenue.

Should an LTO be brought back? If an LTO is successfully increasing consumption by creating scarcity around the product then would it work again if it was repeated years later. This is something KFC considers as if a LTO is very successful then they tend to bring it back after 3-4 years. This time gap is very significant in ensuring that the LTO is also successful after the time space. The time gap allows consumers to forget about the LTO but create a buzz around the product once it's reintroduced. When the LTO is introduced again, the consumers that have consumed the chili crab chicken before would want to consume it again and also recommend it to more people. This will also be easier for KFC to implement as they know the process of that specific LTO and know what aspects to tweak to make it even more effective.

Nudge: Disrupting the habit

Based on the study we can see that when consumers were offered dessert at the table, 15% of the consumers ended up adding a dessert to their order. This shows us how the nudge of disrupting

a habit is effective as it forces the consumer to be reminded of the desert again.

Through this we are understanding how in a fast-food setting, everyone is in a hurry, knows what they want to order and wants it fast. So through this they are breaking that habit; as this was effective should KFC implement more of these habit disruption nudges? They can apply this in a variety of ways: on the food and the environment of the restaurant. Changing up these aspects will make the consumer curious and inevitably want to interact with it. This also shows us how consumer - employee interaction has a positive effect on the company's sales. So they should incorporate this into the nudge as it creates a more personalized feeling. However, it's still integral to keep some of the classic fast-food characteristics as that's what consumers want. If they wanted more of a dine environment then they would go to a restaurant. Hence, when looking at different ways to disrupt the flow, it's important to ensure that consumers don't feel as though they are getting uncomfortable by the changes and would rather go to a different fast-food chain.

The success of this nudge raises the question of if they should make this permanent. This method works and we see this through the raised sales mix and incremental revenue. Making this permanent would be a subtle way of reminding consumers about the desserts while still allowing them to enjoy the fast food environment. Furthermore, this does not incur costs in terms of labor as it requires the already existing employees to go and remind the consumers. However, this requires employee and consumer interaction which may not go as smoothly if there is a language barrier. Vietnam has many expats coming each year, but the majority of the Vietnamese have weak English communication. Hence this may impede the success of the nudge.

Limitations: Scarcity & Disrupting the habit

In a more controlled experiment I would want to test the tradeoff between the chili crab chicken and other goods, not just regular chicken. In a perfect controlled experiment I would have a test group and a control group. The test group would be where the nudge is applied and the control group would be one without the nudge. I would also ensure that these stores (control and test groups) are not in the same geographical area so that there is no cross contamination between the two. This would present data which would highlight the true power of the nudge and how effective it is.

As the sales data is collected during a holiday period when fast food consumption is generally higher, the results could be inflated. Hence, in an experiment with a larger time frame, using a control period with similar conditions but without the nudge to compare sales would help understand the effectiveness of the nudge more. Furthermore, with a longer time frame, being able to implement the nudge during a non-holiday period would

justify if the nudge was incentivising consumers regardless of the time period it was initiated or if time placement of the nudge is just as important to consider.

If I had more detailed data which was not purely descriptive, I would like to analyze the demand for the LTO by time of each specific day. This will allow me to see the peak times where demand was high and if there was a trend for this. For example, during the weekdays the demand for LTO peaked during lunchtime but for weekends it peaked during dinner time. With this data, KFC could accordingly apply more nudges and heuristics during the peak to push the demand even more and maximize the consumption. They could even see the demographics of the type of consumers during the peak times. This will help them adapt their nudges to appeal to the mass even more. Furthermore, during timings where people are in a rush, the hostess going up to them does not affect the sales of desserts. So it will be more useful to optimize the timings where people weren't rushed, like dinner time, then the use of the nudge then would make an actual impact.

In a longer time frame of results I also want to look at trends. Over the 3 months the LTO was applied, was there a peak time and from what point did the sales start to diminish (if they diminish) and what that shows us about the attention span of Vietnamese consumers. I would also analyze when the sales start to diminish and if they do then should the LTO's run for a shorter period of time. However, if the sales don't really diminish then I would further analyze the nature of different nudges as the nature of a scarcity nudge shows us how it creates that premiumised value for the product the whole time.

Having a longer time frame allows for more in depth analysis of the consumers and timings. For example, allowing demographic analysis. I would see if the people who had family were more likely to respond to the nudge by ordering more dessert compared to a person who came alone. This would show us how in a family setting, getting dessert is a treat and enjoyable. This will help KFC approach people accordingly during rush hours as there are only a set number of employees. I would also look at the trend of the sales of the desert once the experiment is over. This will allow me to analyze if the sales of dessert went up, stayed constant or went down. Here we are analyzing if this nudge forced people to become more aware of the desert and hence has become a standard in their ordering routine. If not, then should KFC run this for longer and then see the impact to see if the sales of the desserts were higher relative to the pre-nudge period.

For a more statistically based analysis to gauge the effectiveness of this LTO nudge and determine whether the observed differences in sales are statistically significant, more in depth data is required. It is clear that the sales of chili crab chicken increased, but if there was a greater sample size, t-tests could be performed comparing sales before and during the LTO period to determine if the increase is statistically significant.

With a longer timeframe, I would be able to incorporate more advanced analytical techniques, such as regression analysis, to examine the relationship between the nudges and sales outcomes. For instance, A regression model could be used to determine the extent to which the scarcity nudge (LTO) influences sales, while controlling for other variables like advertising spend or time of year.

Conclusions

Nudge is a powerful tool for companies to utilize. This research paper is an applied study as Nudge theory and behavioral economics is a well established field theoretically. The majority of studies in this area are now focussed at specific applications of the science and there are not always major theoretical contributions to be made. This paper does outline a theoretical game theory model to offer insight towards why KFC chose to utilize nudges specifically.

We see how the scarcity heuristic creates a sense of competition and social validation while disrupting a habit heuristic forces people to become aware of already existing aspects. The fast-food industry is a fast paced industry where they have a lot of consumers and data at their disposal hence they are constantly experimenting with different ways to increase engagement. Nudges have advantages and disadvantages but they are a key in marketing strategies to drive consumption. However, these experiments don't always give the optimal results as they aren't perfectly controlled experiments and hence don't allow firms to use the nudge to its full potential. The type of data they collect is vital in understanding their consumers and trends better. Hence, having bigger analytical teams will allow them to reach more perfect experiments and consequently be able to apply nudges correctly. This also shows us how companies aren't always making informed decisions but experimenting with different ideas. This highlights that even in big organizations and chains there is significant room for improvement in the way they manipulate and collect the data.

But the analysis on the effectiveness of the nudges is limited due to the time period and data constraints and is restricted in its ability to present causal analysis. Hence, future work - If data could be made available - would be interesting to look at the variation in the effectiveness of nudges by demographics and socioeconomic conditions. This study along with technological advancements, data collection could improve leading to automated personalized nudges. As consumers and academics, it will be interesting to see what KFC will become well known for as it hones its own unique market strategy around behavioral nudges.

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