THE EFFECT OF IN-STORE PROMOTION CAMPAIGNS ON CONSUMERS' BEHAVIOR: EVIDENCE FROM UKRAINIAN RETAIL

by

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Abstract

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The retail sector of Ukraine has shown significant growth during the last years. The high competition on the market, however, induces stores to run effective promotion campaigns in to order to gain profits. In this paper the impact of characteristics of promotions on sales and revenues is estimated using data about 634 promotions that were run in a store located in Kyiv. The estimation technic is robust OLS regressions.

We find that the most effective promotion is a promotion that decreases price. The higher the discount the higher the increase of the sales and the revenues. In the case of the promotions without any price changes, the promotion of the bread and buns, milk products lead to the sales and the revenues growth. If the promotion goes together with an increase of price, then longer duration improves sales and revenues. We find no influence of the day when the promotion is run.

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Chapter 1

INTRODUCTION

Over the last ten years the Ukrainian retail market has been showing high growth rates. The turnover of the retail trade and restaurant business in Ukraine grew by 13.7% in 2011 (to 346.5 billion UAH). In 2012 the turnover increased by 14.4%, which was the highest in Europe. Retail trade turnover in Ukraine in 2013 increased by 9.6% compared to the same period last year (at constant prices) - up to 884.203 billion UAH, according to the website of the State Statistics Service of Ukraine[1].

Despite the relatively positive trends observed in the field, many potential investors delay entering the retail market of Ukraine. This is due to the high internal and external risks such as currency devaluation and political instability. A sharp decline in the population of the country can be also observed among the negative factors that pose a threat for the future development of the retail market in the country, according to the website of the State Statistics Service of Ukraine.

In the 2013 international rankings, compiled by "AT Kearney" (2013), Ukraine is not included in the list of thirty countries with the most promising retail sector. At the same time Georgia holds 8th place because of citizens' income growth, economic growth of the country and business reforms. Russia ranked 23rd due to the maturity of the retail market and the availability of places where the retail sector can expand.

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[1] http://www.ukrstat.gov.ua/operativ/operativ2013/sr/roz/roz_u/roz1213_u.htm

In Ukraine, there is a high level of competition on the market, price differentiation is negligible and most of stores have similar products according to a site which compares prices among major store networks[2]. Thus, an effective marketing and management has the potential to be an important way to gain profits.

The majority of retail stores conduct different promotion campaigns for consumers. They have different objectives: sell some specific types of products which are defined by the company producer, sell products the expiration date of which is close etc. The effective management of such campaigns is important for profits of these retail stores.

In this thesis I investigate how in-store promotion campaigns affect the sales of retail stores. More specifically, I determine what specific characteristics of promotions lead to an increase of sales.

A lot of papers have been written on the topic of promotion campaigns. Each paper considers some specific characteristic of promotion and evaluates its influence on sales. We can group all these effects into three groups. The first group focuses on product characteristics such as brand market share and capacities of marketing activities, the brand image and type of the promoted product. The second group focuses on characteristics of consumers. The third group focuses on the characteristics of the promotion itself: the type of promotion campaigns and the framing of the promotion. This thesis falls in the last group of studies.

[2] http://mysupermarket.org.ua/

In Ukraine there are no studies undertaken on the effect of price discounts on sales, because it is hard to obtain data from retail stores. They keep privacy because after looking through these data each of us can understand the markup on different products and they fear losing their clients. The majority of stores make different statistical reviews of promotion campaigns for internal use, but these are based on simple descriptive statistics without the use of any econometric methods. At the same time several papers in the field of in-store marketing in Ukraine have been written. Rozdobudko (2005) conducts research about what mechanism of in-store marketing leads to higher increase in sales in hair care market and concludes that display and promotions mechanics are the most effective. Khomenko (2003) studies the Ukrainian cigarette market and concludes that advertisement leads to increase of the sales, but the market share of this brand does not increase.

The contribution of my thesis to the existing research is that I check whether there is an effect of different characteristics of promotion on its effectiveness in the Ukrainian retail sector.. In addition, as a result of my research retail stores will be able to better understand the behavior of consumers and mechanics of how to stimulate sales of some specific product.

I make use of the data from scanners from one of the retail networks in Ukraine. I am provided with the information about promotion campaigns which includes: the name of the promoted product, the price of the product before and during promotion, the quantity of products sold before and during promotion, the period of promotion. I concentrate on a specific store situated near the transportation hub in Kyiv which has a high frequency of purchases and a lot of promotion campaigns.

The data about promotion campaigns consist of the dates, description, products that are promoted, prices and quantities sold. I have the information about 634 promotion campaigns starting from June 1 2013 till November 1 2013.

I use regression analysis to answer the above specified questions. The dependent variables are the sales and revenues growth rates comparing before and during the promotion campaigns. I test the effect of the characteristics of promotions such as: duration, percentage change of the price of the product during the promotion, the brand status of the product, the category of the promoted product, the type of promotion (promotion with the price decrease, without any price change and with the price increase), the day of the week when promotion is run and the price elasticity of the consumer depending on the day of the week.

The thesis has the following structure. In Chapter 2 the literature on this topic is discussed. In Chapter 3 and Chapter 4 the data and the econometric specification are introduced. The results of the estimation are presented in Chapter 5. The summary and conclusions are presented in Chapter 6.

Chapter 2

LITERATURE REVIEW

This literature review starts with an overview of the works that analyze why promotions are used and what changes in consumers' behavior can be caused by promotions. Next, it discusses the factors which influence the efficiency of promotions. All factors are classified into three groups: product characteristics, characteristics of consumer and characteristic of promotion. The literature review finishes with research on whether promotions have a negative long-term effect.

In-store promotions can influence the sales of different products. Inman and Winer (1999) study in store consumer behavior using data from about 30 thousands purchase decisions made by more than four thousands consumers. They compare the list of planned products to buy before entering the store and after. As a result, they find that 59% of people changed their decisions in the store. This suggests there is a lot of room for in-store advertising to play a role.

There are many ways how behavior can be changed.. Blattberg and Neslin (1990) define three types of changes in consumers' behavior during promotion campaigns. First, consumers could start buying more of the product. Second, some consumers could switch from one brand to another. And third, consumers could change store and switch to the store with the promotion campaign.

These changes could be caused by specific characteristics of promotions . The first group of characteristics is related to product. The brand of the product promoted has a significant influence on the effectiveness of promotions. Bolton (1989) investigates the effect of brand market share, advertising intensity and

promotional activities on price elasticities of different promotional campaigns. He uses the data about sales of three brands with four categories in twelve stores. As a result, she concludes that variation in price elasticities are mostly explained by brand and market features.

Bell, Chiang and Padmanabhan (1999) show that promotion campaigns have some positive effect on sales, but they stress that the effect depends on the type of the product (meat, fruits etc.). Gupta (1988) researches the promotion campaign associated with coffee. He concludes that consumers easily change the brand of coffee rather than the size of coffee pack when the promotion campaign is run. Thus, it is easier to switch consumer from one brand using price discount than within different sizes of coffee packs using other types of promotions.

The effect of promotion campaigns is also defined by consumer characteristics, which include location and lifestage (social status and age) as is suggested by Lodish (2007). Also Pandelaere and Briers (2011) study the physiological decisions of the consumer. They conclude that the purchase decision doesn't depend on what type of discount is announced (percent or monetary value). The scale of the discount has an effect, so consumers more precisely take into account numerical values rather than the type of measurement units of discount (% versus monetary values).

Also the framing of promotions should be considered. Framing is introduced by Tversky and Kahneman (1981), who analyze the behavior of people depending on the manner in which the information is received (negative or positive). Kausler and Kleim (1978) state that demographical characteristics of consumers have a significant influence on the way how framing affects them. Diamond and Sanyal (1990) find that promotions with negative framing are less effective than

positive ones. On the other hand, Gamliel and Herstein (2011) find that neither positive nor negative frames affect purchase decisions of consumers.

The next group of effects are characteristics of promotion. The focus of my study will be on this group. Kumar and Leone (1988) use scanner data from retail stores and conclude that there is an effect of different types of promotion campaigns on sales of some specific brands. They consider diapers market and concentrate on three brands. The price promotion explains 26% of variation in sales; products signed with special images and placed on upper lines of shelves explain 12%; posters and other display options of product explain 4%. Thus, the price promotion is the most effective.

Different empirical methods have been used to study the effectiveness of promotions. Kumar and Leone (1988) who are mentioned above study their question using OLS regressions. They received the results discussed above after regressing dummies if the product was featured or displayed, the different interaction terms on the sales of specific product.

Rao and Thomas (1973) instead use a dynamic programming model to define the price during promotion which should be set and the number of times this product should be promoted. In his next work Rao (1991) defines two elements of each promotion: depth and frequency. Using this approach he solves the pricing question for retailer.

Finally, Tellis and Zufryden (1995) use numerical simulations to define optimal pricing of the promotional product, and the timing of orders from retailer. They take into account retailer and consumer, so the model considers inventories for both parties. Also multiple brands, categories of products and quantities are

accounted for in the model. As a result, the authors develop the computer program that creates optimal price discount promotion for initially defined group of the products.

So far we have focused on the different groups of influencers on the effectiveness of the promotions, now we focus on an open discussion if promotions have a negative long-term effect. Strang (1975) finds the empirical evidence of the negative effect. On the other hand, Neslin and Shoemaker (1989) didn't find any negative influence of promotions in the long run. Boulding et al. (1994) state that long-term effect can be positive or negative. Jedidi et al. (1999) state that long-term advertising has some positive effect on the brand image, but promotions have a negative effect and make consumers more price sensitive.

Lattin and Bucklin (1989) find that promotions negatively influence the brand image. Consumers can think that if there is a substantial decrease in price, the product has low quality. Also after promotion campaigns consumers may delay their purchases until the next promotion starts. Also Martinez-Ruiz et al. (2006) state that there is some effect of the brand status. They use Support Vector Machine-Semiparametric Regression and study cross-price effects of different brands of products. They find that promotions campaign of the premium brand with higher price will have a lower increase in sales compared to lower price brand.

Unfortunately, we don't have any studies on the effect of price discounts on sales in Ukraine, because stores keep privacy of their data. But there are a lot of papers about other marketing mechanics.

Rozdobudko (2005) pursues research about what mechanism of in-store marketing leads to higher increase of sales in hair care market. As a result, out-of-stocks, own-price, shelf vision, shelf share, competitor's price mechanics of sales stimulation are not as effective as display and promotion mechanics.

Khomenko (2003) studies the Ukrainian cigarette market. He focuses on advertising of cigarettes and concludes that advertisement leads to increase of the sales, but the market share of this brand does not increase.

Summarizing, a lot of papers are written on topic of promotion campaigns. Each paper considers some specific characteristics of promotion and evaluates its influence on sales. We can group all these effects into three groups, which we need consider in our research. The first one is product characteristics which include: the brand market share and capacities of marketing activities, the brand image and type of the promoted product. The second group is characteristics of consumers. The third group is characteristics of promotion: the type of promotion campaigns and framing of the promotion. The long term effect of promotions is still an open question.

I plan to check the effect of the promotion group of the characteristics on the Ukrainian consumer. Also I will consider three different types of the promotions: with the price decrease, without any price change and with the price increase. As a result, I add to the research dedicated to Ukraine.

Chapter 3

METHODOLOGY

I rely on studies by Jedidi et al. (1999) and Martinez-Ruiz et al. (2006) in order to investigate the effect of different characteristics of promotion campaigns on sales. I have no data on characteristics of people visiting the shop or buying products. Thus, I concentrate on characteristics of the product and its promotion in this research. I consider such model:

$$Main_v = \beta_0 + \beta_1 PromoType2 + \beta_2 PromoType3 + \\ + \beta_3 Duration + \beta_4 Price_{before} + \sum_{i=1}^{13} \beta_{4+i} TypeProduct_i + \varepsilon \quad (1)$$

As the dependent variable (*Main_v*) I consider next two variables.

First, the percentage change in the quantity of the product sold before and during promotion (*Sales_change*) for the same period. For example, if the period of the promotion is two months, then I compare it with same period before. This variable is used to define if the promotion campaign increased the quantities of the goods sold.

Second, the percentage change in the revenues before and during promotion (*Revenues_change*) is calculated in such way. First, the revenues are calculated as the quantity of products sold multiplied by the price during that period. Next, we take the percentage difference between revenues before and during. Such a model takes into account that quantity sold can increase, but revenues can move the other way due to the large price discount. As a result, we will be able to define

what type of promotion is better not only for quantity to increase, but also for revenues to increase.

The explanatory variable is the type of the promotion (*PromotionType2*, *PromotionType3*). I consider three types of promotions: with price discount, without any discount and with price increase. Information about all promotions is posted in the brochures, but only for the promotions with the price decrease the discount is shown. For other types of the promotions only the products are mentioned, without any highlighting of the percent changes of the price. PromoType2 is a dummy for the promotion with the price discount, Promotype3 for the promotion with price increase. When both dummies are zeros, the promotion is without any changes in the price.

Duration of the promotion campaign (*Duration*) is included into the model, because promotion the longer is the promotion, the more diminishing effect of sales it might have (Blattberg and Wisniewski, 1987) and I need to check this fact on our data. In our data I have two types of duration: short-term (one day) and long-term (two months). The majority of short-term promotions are initiated by the shop and the long-term usually initiated by producers of the product. It is due to longevity of negotiations between the shop management and producer, which results in long-term promotion campaigns. Duration is the dummy variable: if I have one day duration then it will be one. When it is zero, the duration is two months. Thus, the duration is not only duration per se it also often means different kinds of the promotions.

The price of the product before the promotion launches (*Price_before*) will define the brand status of the product. Martinez-Ruiz et al. (2006) state that there is

some effect of the brand status. I define the status as a higher price - higher status of the brand.

Bell, Chiang and Padmanabhan (1999) show that type of the promoted product (*TypeProducti*) has some effect on sales. Thus, I consider 14 product categories in order to know how to deal with each group. This variable is a set of dummies for each category.

The above regression assumes the effect of the control variables to be the same for all promotions. Next model considers separate regression by type of price discount allowing coefficient of control variables to be different for each type of promotion.

I consider such model which is estimated using OLS:

$$Main\_v = \beta_0 + \beta_1 Discount + \beta_2 Duration + \sum_{i=1}^{13} \beta_{2+i} TypeProduct_i + \\ + \beta_{16} Price\_before + \varepsilon \quad (2)$$

I consider two dependent variables (*Main_v*): the percentage change in the sales and the percentage change in the revenues, which are discussed above.

Using the percentage change in prices during the promotion and before (*Discount*) it is possible to estimate price elasticity of customers.

As a result, I estimate the effect of the amount of discount, duration of the promotion, the type of promoted product, the brand status of the product on the difference in sales. I run three separate regressions due to the nature of the types of the promotions, which is defined based on the discount that is provided. I

consider such three types of the promotions: with the price decrease, without any price change and with the price increase. Thus, it might be that putting all promotions together will result in misleading conclusions.

Also for the case when I have one day duration of the promotion campaign some additional model should be estimated. It includes the same variables as above, but additionally it has 6 dummies for controlling the day of the promotion. Also I include these variables once more, but interacted with the discount variable. Using these variables I estimate the effect of the day of promotion on sales and revenues, and the price elasticity of the consumers depending on the day of the promotion.

The problem that may occur in estimating process is the endogeneity problem, because some variables can be omitted. For example, if some advertisement campaign is run on TV and its effect overlap with the promotion in store. In such case, it might be the case that sales increased mostly due to the advertisement instead of due to the price promotion. Unfortunately, we do not have an instrumental variable that could be used to distinguish such cases.

Chapter 4

DATA DESCRIPTION

I use the data from scanners from one of retail network in Ukraine. I work with the data from one of the stores, which is located in Kyiv near city transportation hub, which has a high frequency of purchases and where many promotion campaigns are conducted.

The data set contains 851 observations. Each observation is a characteristic of some promotion campaign that took place. These characteristics include: the name of the promoted product, the price of the product before and during promotion, the quantity of the product sold before and during the promotion, the period of promotion.

There are four types of durations: daily, weekly, two weeks, and two months promotions. The distribution can be seen from Figure 1.

Figure 1: Distribution of promotion duration

The majority of promotions are conducted for one day, which can be explained by the need to quickly achieve some store objectives or to empty the inventory of the store. This kind of promotions is typically initiated by the store, not by the producer. The second share is taken by promotions that are two months long. It has a relatively big share because such long term promotions are run with the collaboration of the product producer and implemented on a large quantity of products. But such kind of promotions is not flexible in price levels comparing to daily promotion; the store management should follow instructions from the producer. In case of some changes, they should be confirmed with the producer. Other small shares are taken by promotions with week duration and two weeks duration.

Due to the relatively low quantity of promotions with a week duration and two weeks duration, 57 observations are dropped from the dataset. Thus, I try to see the effect of short term promotions comparing to long ones. Next, I drop the outliers and promotions with zero items sold before the promotion, which in total is 152 observations. It is due to the inability to calculate the percentage increase in sales due to the division by zero. Also I drop the promotions with products that cannot be assigned to some specific product category, which is 8 observations. As a result, I have 634 observations in total, which includes 415 promotions with daily duration and 219 with two months duration. Duration is the dummy variable: if I have one day duration then it will be one. When it is zero, the duration is two months.

There are three types of promotions in our dataset: 381 promotions with some price discount, 135 promotions without any price change and 118 promotions with price increase. The information about all these promotions is posted in brochures distributed in the store.

In order to estimate the effect of the product category on the promotion result, I consider 14 groups of products. The distribution can be seen form Figure 2.

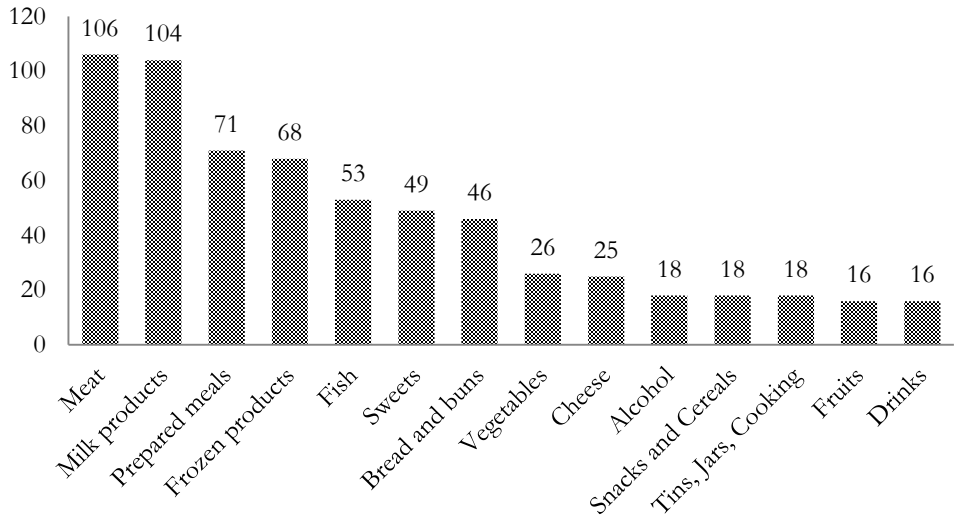

Figure 2: Distribution of product categories

As can be seen from the graph, the majority of products promoted are the products being perishables: meat, milk products and prepared meals. Thus, the store tries to promote and sell products that should expire in close time.

Also products for home, drinks, cooking stuff, cereals and snacks have the lowest quantity of promotion campaigns in the data set. A similar explanation applies – these are long-term storage products.

Alcohol has a long period of the shelf life, but it is also in the middle group. It can be explained by the consumption basket of some groups of people in

Ukraine. For example, according to prices for vodka in the stores[3] almost all brands have the same prices, so a small reduction in the price can have a sizeable impact on sales.

Table 1. Descriptive statistics of promotions with price discount

Variable	Obs	Mean	Std. Dev.	Min	Max
Price during promotion (UAH)	381	29.71	30.04	0.59	158.75
Sales during promotion (pieces)	381	76.61	336.34	0.00	5176.00
Price before promotion (UAH)	381	34.57	35.19	0.70	202.65
Sales before promotion (pieces)	381	64.36	297.44	0.11	4278.00
Discount (%)	381	14	9	0	60
Change of sales (%)	381	59	91	-100	344
Change of revenues (%)	381	35	76	-100	297

Table 2. Descriptive statistics of promotions without any change of price

Variable	Obs	Mean	Std. Dev.	Min	Max
Price during promotion (UAH)	135	27.81	28.76	3.45	172.75
Sales during promotion (pcs)	135	85.82	106.56	0.00	714.00
Price before promotion (UAH)	135	27.81	28.76	3.45	172.75
Sales before promotion (pcs)	135	104.10	275.64	0.76	2960.00
Discount (%)	135	0	0	0	0
Change of sales (%)	135	10	65	-100	333
Change of revenues (%)	135	10	65	-100	333

In case of the promotions with the price discount the maximum price before promotion is higher than the maximum value of the price during. A similar situation is regarding minimum values of the same variables.

[3] http://mysupermarket.org.ua/index.php?myr_shop=metro&id=2423&cat=2423&name=2423

For promotions without any price change the discount variables has maximum and minimum values equal to zero and as a result the prices before and during promotion are equal.

If we consider the promotions with the price increase, then the minimum values of the price during the promotion are higher than minimum values of the prices before the promotion. A similar logic applies to maximum values of the prices. The discount variable is negative, because the prices increase.

Table 3. Descriptive statistics of promotions with increase of price

Variable	Obs	Mean	Std. Dev.	Min	Max
Price during promotion (UAH)	118	28.99	31.06	0.67	159.95
Sales during promotion (pcs)	118	165.48	256.33	0.00	1895.76
Price before promotion (UAH)	118	25.51	26.10	0.62	131.70
Sales before promotion (pcs)	118	237.08	459.24	0.77	3595.00
Discount (%)	118	11	11	-63	0
Change of sales (%)	118	-5	63	-100	211
Change of revenues (%)	118	4	68	-100	239

Thus, all variables lie in appropriate boundaries.

Chapter 5

EMPIRICAL RESULTS

Let's start with estimating the effect of different types of promotion campaigns on the change of sales and revenues before and during promotion campaign. I regress dummies of different types of promotions on the change of sales and revenues. In both this cases I use the robust regression, because Breusch-Pagan test shows that there is heteroskedasticity in these models. I also include duration, percentage change of the price of the product during the promotion, the price of the product before the promotion, the category of the promoted product, the type of promotion (promotion with the price decrease, without any price change and with the price increase), the day of the week as control variables.

As it can be seen from the Table 4 for the model 1 almost all coefficients are insignificant. Only the coefficient of the dummy for the promotion with price decrease is significant at 1% level. R-squared is 13.6% for model 1. It can be concluded that on average the promotion campaign with price discount leads to 47.7% increase in sales comparing to the promotion without any price change. For the promotion campaign with price increase the sales decrease is on average by 14.4% comparing to the promotion without any price change, but the coefficient is insignificant (p-value = 0.108). The difference between coefficients of the promotion without any change in the price and with the price increase is significant at 1% level for both models. The results are consistent with the theory, giving a price discount is an effective way of increasing sales in the short term.

Table 4. Results of a regression of the change of sales and revenues on types of promotions and other characteristics

VARIABLES	(Model 1) sales_change	(Model 2) revenues_change
Promotion with the price decrease[4]	0.477***	0.242***
	(0.102)	(0.0934)
Promotion with the price increase	-0.144	-0.0549
	(0.0895)	(0.0912)
Duration (1=one day; 0=2 months)	0.0497	0.0503
	(0.116)	(0.107)
Price before the promotion	0.000886	0.000390
	(0.00135)	(0.00122)
Vegetables[5]	-0.106	-0.170
	(0.270)	(0.224)
Meat	-0.0872	-0.000514
	(0.233)	(0.205)
Fish	-0.0344	-0.0361
	(0.256)	(0.225)
Frozen products	-0.164	-0.128
	(0.260)	(0.233)
Prepared meals	0.0709	0.0219
	(0.243)	(0.209)
Tins, jars, cooking	-0.188	-0.109
	(0.263)	(0.234)
Snacks and cereals	-0.253	-0.223
	(0.293)	(0.242)
Sweets	0.163	0.189
	(0.266)	(0.238)
Alcohol	0.449	0.424
	(0.366)	(0.328)
Drinks	-0.346	-0.271
	(0.304)	(0.268)
Cheese	-0.190	-0.0262
	(0.263)	(0.233)
Milk products	0.0808	0.109
	(0.236)	(0.208)
Bread and buns	0.173	0.104
	(0.249)	(0.211)
Constant	0.0582	0.0451
	(0.239)	(0.212)
Observations	634	634
R-squared	0.136	0.065

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

[4] Base case: promotion without any price change

[5] Base case: Fruits

Now let's consider the model 2, where there are changes of revenues before and during promotion as a dependent variable. In this case the R-squared is 6.5%. Similar to the model 1 only the coefficient of the dummy for the promotion with price decrease is significant at 1% level, other are insignificant. On average promotions with price discount lead to 24.2% increase in revenues comparing to the promotion without any price change. For the coefficient of the promotion with the price increase remains insignificant. Thus, I have the same ranking of promotions by criteria of increase in revenues as in the model 1.

The above regression assumes the effect of the control variables to be the same for all promotions – we next run separate regression by type of price discount allowing coefficient of control variables to be different for each type of promotion.

Next, let's consider the model introduced in the methodology section for each type of the promotions separately. I regress changes in the price, duration, type of the product and price before the promotion on the percentage change in sales and revenues before and during promotion for different types of promotions (promotion with the price decrease, without any price change and with the price increase). As a result, there are five models: the model 3 and 6 for promotions with price discount, the model 4 for promotions without any price changes and the model 5 and 7 for promotions with some increase of the price. I do not run the regression with the revenues as the dependent variable for the promotion without any price change, because in this case the changes in revenues are equal to the changes in the sales.

The model 3 is estimated using robust regression and has an R-squared of 8.7%. The coefficient of discount is significant at 1% level (see Table 5). Thus, one

percent decrease of the price on average leads to 2.21% increase of the sales keeping all other factors fixed or in other words more than two time increase of the sales. As a result, I do not find any support for the fact that duration has a negative effect on the effectiveness of promotion.

Next, we look at the dummies reflecting the 14 types of products. As can be seen from Table 5 there are no significant coefficients. It means that in case of the promotion with price discount the consumer does not care about the category of the product, only the amount of discount matters for him.

After that, let's consider the model 4, which is run using robust regression. It has higher R-squared of 14.4% comparing to the model 3. The discount variable is omitted, because in this case we do not have any price changes due to the promotion design. The coefficient of duration is insignificant and economically low. Four coefficients of dummies for categories of products are significant at 1% level. In this case when we have the promotion without any changes in price, then products from categories such as tins, jars, cooking products lead on average to 32% and 89% respectively decrease in sales. Such category as bread and buns, milk products increase on average sales by 21.2% and by 37.7% respectively.

The model 5 has a constant variance according to the results of Breusch-Pagan test. It has R-squared of 29.2% which is the highest among all models. In this case the coefficient near discount is insignificant, so it does not have any effect on the sales.

Table 5. Empirical results of characteristics of promotions on change of sales

VARIABLES	(Model 3) Promotion with the price decrease	(Model 4) Promotion without any price change	(Model 5) Promotion with the price increase[6]
Discount	2.208***	-	0.762
	(0.598)	-	(0.534)
Duration (1=one day; 0=2 months)	0.428*	-0.0621	-0.598***
	(0.220)	(0.150)	(0.220)
Vegetables	-0.314	0.0774	-0.0674
	(0.361)	(0.207)	(0.612)
Meat	0.106	0.200	-0.924
	(0.316)	(0.196)	(0.611)
Fish	0.215	0.0368	-1.037
	(0.376)	(0.167)	(0.654)
Frozen products	0.353	0.0832	-1.242**
	(0.438)	(0.207)	(0.611)
Prepared meals	0.0754	-0.284	0.737
	(0.311)	(0.249)	(0.693)
Tins, jars, cooking	-0.00830	-0.320***	-
	(0.337)	(0.0828)	-
Snacks and cereals	-0.250	-0.328*	0.410
	(0.355)	(0.166)	(0.693)
Sweets	0.238	0.515	-0.728
	(0.416)	(0.509)	(0.617)
Alcohol	0.684	0.598	0.0607
	(0.613)	(0.435)	(0.793)
Drinks	-0.186	-0.890***	-
	(0.364)	(0.0582)	-
Cheese	0.0178	-	-
	(0.340)	-	-
Milk products	0.0696	0.377**	-0.800
	(0.317)	(0.183)	(0.619)
Bread and buns	0.200	0.212***	-0.203
	(0.316)	(0.0549)	(0.792)
Price before the promotion	0.00106	-0.00161	0.00344
	(0.00176)	(0.00223)	(0.00283)
Constant	-0.240	-0.0397	0.896
	(0.373)	(0.165)	(0.621)
Observations	381	135	118
R-squared	0.087	0.144	0.292
Robust standard errors in parentheses		*** p<0.01, ** p<0.05, * p<0.1	

[6] OLS regression, other models – robust regressions

The other coefficient is near duration, which is significant on 1% level. Thus, one day duration promotion leads to 59.8% lower sales comparing to two months duration. This fact confirms the theory that long-term promotions are more effective. Also another explanation can be applied: the awareness is much higher for two months promotion than for one day, which leads to the increase in quantity of consumers that use the promotion.

I obtain the significance of the coefficient near the frozen products, but we should not attach too much weight to this conclusion due to the low number of the observations for this category of the products and this type of the promotion.

In all three models the coefficient near price before the promotion is insignificant. Thus, there is no effect of the brand status on the promotion efficiency.

Now I consider the models 6, 7 and 8 which have the same specifications that models discussed above, but they have the different dependent variable – the revenues change.

The model 6 is estimated using robust regression. As can be seen from Table 6 the model 6 has lower R-squared of 4.4% compared to the model 3. The coefficient of duration is significant at 5% level; if the duration is changed from two months to one day it on average leads to 40.6% increase of the revenues keeping all other factors fixed. Other coefficients are not significant.

Table 6. Results of a regression of characteristics of promotions on change of revenues

VARIABLES	(Model 6) Promotion with the price decrease	(Model 7) Promotion with the price increase[7]
Discount	-0.101	0.232
	(0.436)	(0.592)
Duration (1=one day; 0=2 months)	0.406**	-0.673***
	(0.189)	(0.244)
Vegetables	-0.290	-0.0993
	(0.273)	(0.679)
Meat	0.0347	-1.139*
	(0.253)	(0.677)
Fish	0.0936	-1.257*
	(0.310)	(0.725)
Frozen products	0.238	-1.470**
	(0.372)	(0.677)
Prepared meals	-0.00234	0.692
	(0.245)	(0.768)
Tins, jars, cooking	-0.0706	-
	(0.275)	-
Snacks and cereals	-0.316	0.302
	(0.282)	(0.769)
Sweets	0.163	-0.904
	(0.342)	(0.685)
Alcohol	0.529	0.000722
	(0.509)	(0.879)
Drinks	-0.220	-
	(0.301)	-
Cheese	-0.0736	-
	(0.278)	-
Milk products	-0.0195	-1.001
	(0.256)	(0.686)
Bread and buns	0.106	-0.278
	(0.249)	(0.878)
Price before the promotion	0.00101	0.00444
	(0.00149)	(0.00314)
Constant	-0.0586	1.107
	(0.306)	(0.689)
Observations	381	118
R-squared	0.044	0.270

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

[7] OLS regression, other model – robust regression

The model 7 has the R-squared of 27%. It has the same significant coefficient as the model 5. The coefficient of the duration is significant on 1% level. Thus, one day duration promotion leads to 67.3% lower revenues comparing to two months duration.

If we compare the change of the sales with the change of the revenues as the dependent variables, we can conclude that the results are almost the same, but in case of the revenues the significant coefficients are bit higher and the effect of the duration appears for the promotion with price decrease.

And now let's consider the effect of the promotion day on the change of sales. I introduce the interaction term for the day of the week and the amount discount and restrict the duration to one day. The results are shown in Table 7.

Breusch-Pagan test shows that both models violate the null hypothesis, thus I use the robust regression. The model 8 has R-squared of 13%. The price before the promotion and product category coefficients are insignificant. The coefficient of discount variable is significant at 1% level. Thus, some increase of discount by 1% on average leads to almost 2.77% increase in the sales keeping other factors fixed. This coefficient confirms finding from the promotion campaign with the price decrease.

The model 9 with the revenues as the dependent variable has a low R-squared of 6.3% and all coefficients are insignificant. Thus, I do not conclude anything from it.

Table 7. Results of a regression of the day of start of promotion on change of sales and revenues [8]

VARIABLES	(Model 8) sales_change	(Model 9) revenues_change
Discount	2.773***	0.815
	(0.849)	(0.720)
Price before the promotion	0.000813	0.000541
	(0.00189)	(0.00167)
Tuesday[9]	0.285	0.229
	(0.204)	(0.187)
Wednesday	0.0589	0.0792
	(0.241)	(0.238)
Thursday	0.136	0.210
	(0.239)	(0.200)
Friday	0.269	0.281
	(0.212)	(0.194)
Saturday	-0.105	-0.180
	(0.173)	(0.154)
Sunday	-0.0539	-0.0188
	(0.209)	(0.174)
Tuesday*Discount	-0.713	-0.414
	(1.282)	(1.051)
Wednesday*Discount	-0.812	-0.836
	(1.441)	(1.303)
Thursday*Discount	-0.666	-1.192
	(1.698)	(1.137)
Friday*Discount	-1.775	-1.704
	(1.311)	(1.054)
Saturday*Discount	-0.210	0.689
	(1.165)	(0.895)
Sunday*Discount	0.690	0.429
	(1.416)	(1.057)
Constant	0.116	0.204
	(0.249)	(0.210)
Observations	415	415
R-squared	0.130	0.063

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The effect of the week day and the price elasticity depending on the day is insignificant. It means that the consumers in Ukraine are affected in same way by

[8] Full table of results is in Appendix (Table A1)

[9] Base case: Monday

the promotions and it does not depend on the day of the promotion. One of the possible explanations that can be applied, that the consumers have low income levels, so they are searching all the time for the advantageous deal.

Chapter 6

CONCLUSIONS

The retail market in Ukraine shows a significant growth during last years. Effective marketing can drive this growth even higher. One of the major mechanics of marketing is promotions that are used in the stores. In this study, I concentrate on the effectiveness of the promotions. I analyze the effect of characteristics of promotions on the sales of promoted product. I use such characteristics: the type of the promotion, its duration, the price change, the type of the promoted product, its price category and the day of the promotion. In this work I find out such determinants of the effectiveness of promotions.

First, the most effective type of promotion is with the price decrease comparing to the promotions with any change of the price and with the price increase. It leads to 2.21% on average increase of the sales if we increase price discount by 1%. But it does not have any effect when the revenues used as the dependent variable.

Second, the effectiveness of the promotions without any price change is influenced by some types of the products. On one hand, if the promoted product is from the category of the drinks category or tins, jars and cooking category, then it will lead to decrease of the sales on average by 32% and 89% respectively. But on other hand if it is from category of bread and buns or milk products, it will lead to increase of the sales on average by 21.2% and by 37.7% respectively.

Third, the duration matters in the case of the promotions with the price increase. If the duration is shifted from one day to the two months it leads to 59.8% on

average increase of the sales and 67.3% increase of the revenues. Also the duration has the effect when the promotion is with the price decrease: when the duration is decreased from two months to one day duration, it leads to 40.6% increase of the revenues. Of course, it is important to remember that the nature of the promotions typically is different for different durations.

Fourth, there is no effect of the day when the promotion is run and the price elasticity of consumers does not depend on the day of the week. Also the brand status of the promoted product does not have any effect.

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APPENDIX

Table A1. Empirical results of the day of start of promotion on change of sales and revenues

VARIABLES	(Model 8) sales_change	(Model 9) revenues_change
Discount	2.088***	0.815
	(0.609)	(0.720)
Vegetables	-0.295	-0.248
	(0.377)	(0.227)
Meat	0.250	0.00343
	(0.356)	(0.214)
Fish	0.335	-0.0791
	(0.384)	(0.266)
Frozen products	0.668	0.434
	(0.497)	(0.373)
Prepared meals	0.188	-0.0239
	(0.324)	(0.214)
Tins, jars, cooking	-0.0105	-0.153
	(0.348)	(0.236)
Snacks and cereals	-0.301	-0.334
	(0.373)	(0.235)
Sweets	-0.141	0.00684
	(0.490)	(0.349)
Alcohol	0.254	0.0621
	(0.664)	(0.442)
Drinks	-0.264	-0.295
	(0.366)	(0.268)
Cheese	0.0668	-0.0499
	(0.325)	(0.242)
Milk products	0.0364	-0.115
	(0.335)	(0.228)
Bread and buns	-0.160	0.0898
	(0.353)	(0.213)
Price before the promotion	0.000813	0.000541
	(0.00189)	(0.00167)

Table A1. Empirical results of the day of start of promotion on change of sales and revenues - Continued

VARIABLES	(Model 8) sales_change	(Model 9) revenues_change
Tuesday[10]	0.285	0.229
	(0.204)	(0.187)
Wednesday	0.0589	0.0792
	(0.241)	(0.238)
Thursday	0.136	0.210
	(0.239)	(0.200)
Friday	0.269	0.281
	(0.212)	(0.194)
Saturday	-0.105	-0.180
	(0.173)	(0.154)
Sunday	-0.0539	-0.0188
	(0.209)	(0.174)
Tuesday*Discount	-0.713	-0.414
	(1.282)	(1.051)
Wednesday*Discount	-0.812	-0.836
	(1.441)	(1.303)
Thursday*Discount	-0.666	-1.192
	(1.698)	(1.137)
Friday*Discount	-1.775	-1.704
	(1.311)	(1.054)
Saturday*Discount	-0.210	0.689
	(1.165)	(0.895)
Sunday*Discount	0.690	0.429
	(1.416)	(1.057)
Constant	0.116	0.204
	(0.249)	(0.210)
Observations	415	415
R-squared	0.130	0.063

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

[10] Base case: Monday

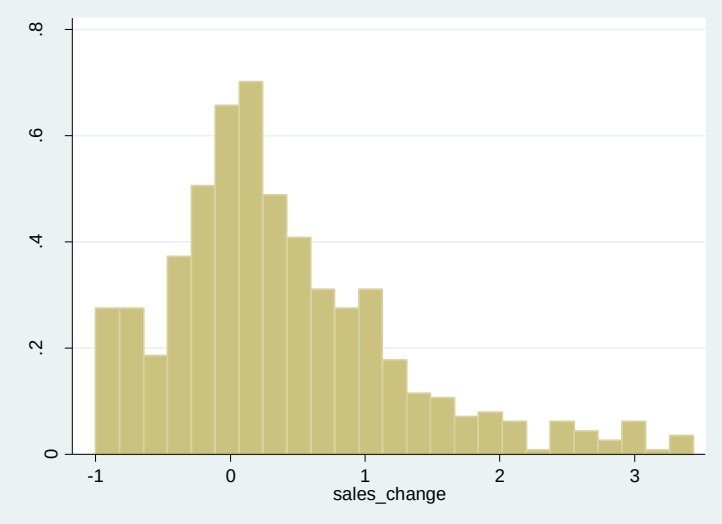

Figure A1: Distribution of sales_change variable

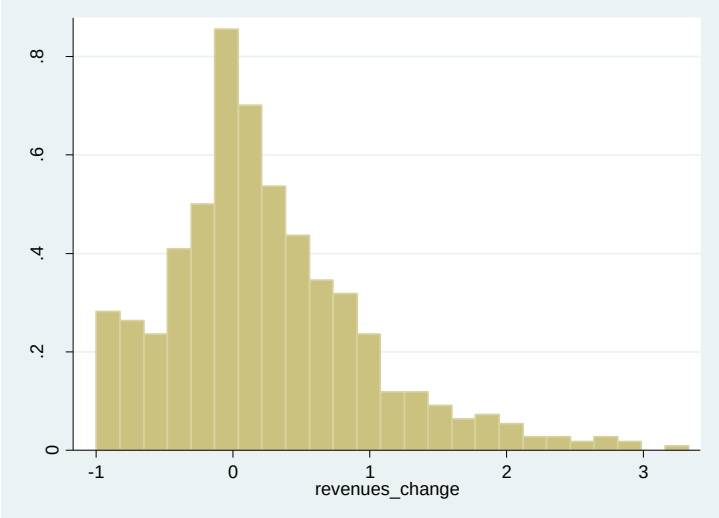

Figure A2: Distribution of revenues_change variable