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**"Do Firms have self-control problems?
The Coupon Industry Case"**

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Firma dello studente

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"People's actions never arise, not even for the hundredth part of them, from a rational thinking.

A person can be fully convinced of the absurdity of a certain behaviour, and implementing it with fervour anyway."

Hermann Hesse, Letters 1895-1962 (posthumous 1973-1986)[1]

Dedicated to my father Giuseppe, my mother Marisa and my sister Najla,

who have always supported me.

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[1] Hermann Hesse, (1877-1962): German-born Swiss poet, novelists and painter; he received the Nobel Prize in literature in 1946.

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Introduction

The traditional approach in modern economic and management literature rests upon the so-called rationality postulate: economic agents, be they consumers, workers, managers, or generic institutions, make the decision that maximizes their objective function, given the information available, and given a set of constraints they face.

This postulate has been put into questions in the recent years by many researchers who emphasized the role of psychology, sentiments, irrationality (or limited rationality) in shaping human economic decisions; the use of laboratory-controlled experiments has allowed to study in depth the exact response of individuals to specific economic problems.

The results of this literature seem to confirm that, in many cases, the actual behaviour of individuals differs from what is predicted by the rationality postulate, even though the debate is still open on the actual relevance of this difference.

What is certainly not fully understood is to what extent the insights from the lab can be transferred to real world situations; this question is particularly relevant when the decision makers we are considering are managers. Differently from subjects involved in laboratory experiments, but also differently from a typical consumer, managers are (or should be) trained and experienced decision makers, who everyday face the crude rules of the market, which provides heavy penalties for errors; as such, we should expect their behaviour to be close to fully rational.

The question we try to address in this thesis is exactly this: *do managers always take the rational decision?* In particular, the focus here is on inter-temporal decisions, i.e. decisions that involve different time periods: *are managers' inter-temporal decisions always rational?* Inter-temporal decisions are the rule for a manager: most of the times, managers' decisions involve plans for the future.

In this setting, rationality implies what is called time-consistency: what is the optimal plan from today's point of view will still be optimal as time goes by. In other words, unless new information becomes available, if the optimal plan formulated at time 0 calls for a certain decision at time t, then at time t that planned action will still be optimal and thus will be implemented.

To answer this question, we consider a new and specific sector, the Coupon Industry; in this industry, local companies (called merchants) sell their services through a well-known and established on-line platform, which offers an enormous visibility. In exchange for this visibility, merchants have to accept a (very) low price for their service (the coupon).

Clearly, inter-temporal decisions are involved here: the decision of a merchant to participate in the coupon promotion is (or should be) only a part of a multi-period business plan. In fact, joining the coupon platform can be thought of as an investment for the merchant: the low price the merchant has to accept represents the cost of this investment; the benefits will be enjoyed only in the future, to the extent that buyers of the coupons come back to the merchant's activity and purchase again the same products at full prices after having tried them through the coupon. Obviously, the consumers' decision to purchase or not a second time depends on a series of elements that both the online platform owners and the merchants can (with different degrees of intensity) affect in order to maximize the chances of a desired decision by the final customers.

What we ask ourselves is whether merchants do actually perceive the investment nature of the coupon platform and behave rationally over time. This would require the merchant to do its best to provide a satisfactory service, in order to capture the customers' loyalty. On the other hand, a merchant who decides to sell its service through the coupon platform but then loses sights of the investment nature of its choice and acts to secure a short-run profit at the expense of quality, will reduce the probability that the customer will come again in the future. Thus, such a time-inconsistent behaviour would undermine the usefulness of joining the coupon platform, and would also damage the reputation of the platform itself.

This time-inconsistent behaviour might explain why the Coupon Industry, after an initial period characterised by a tremendous growth and positive results, is now facing a declining phase with a decrease in sales volumes and low profitability ratios.

The work starts outlining the main characteristics of the E-commerce Industry (which is the industry where companies selling coupons and daily offers operate) at three different levels; Global, Europe and Italy.

Subsequently, we focus on the leading company in the industry, the Groupon Inc. Company, taking it as representative of the whole industry and trying to portray (through its history, its business model and its financial results) the past and current situation within the Coupon Industry.

Chapter II will revise the standard literature about the Coupon Industry and about the daily offers phenomenon.

The scope of this section is to understand how past and current authors deal with this special way of doing business and to acquire the basic knowledge useful to elaborate a personal thesis in the final chapter of the work.

Chapter III is the core of the work, it will illustrate the ideas supported by new authors and contrasting with the standard approach and will introduce the concepts behind the thesis. Subsequently, we will elaborate a personal thesis based on the concepts of self-control problems and time-inconsistent choices and we will formalize it by means of a theoretical model and a numerical example.

Finally, in the Conclusions, we will summarize the main aspects emerged during the analysis, trying to elaborate some conclusions on the situation underway in the Coupon Industry and, more in general, on the possibility that this specific industry might facilitate the rise of time-inconsistent issues and self-control problems.

E-commerce and Groupon Presentation

1. Overview on the E-commerce Industry

1.1 A Global Point of View

The use of the internet as a tool for making online purchases has been experiencing a steady and sustained expansion at a global level in the recent years.

Figures show that the world B2C sales (Business to Consumer) alone has reached a value of 1.316 billion dollars in the year 2014, with an increase by 22.2% on the previous year.

The expected results for the current 2015 portray a great scenario for this growing business; in fact, analysts expect that online sales will reach a turnover of 1.600 billion dollars this year, with an annual increase of 20.9% with respect to the year 2014.

Looking at the participants in the marketplace, what stands out is the role of US companies in the industry, in fact, the first source of revenues comes from sales involving the United States of America that, not surprisingly, are considered the most advanced Countries in terms of technology.

China plays the role of vice-leader in the E-commerce sector; data show that about 60% of the Chinese population is used to buying through the net at least once per week and this phenomenon is expected to expand further in the next years.

China's online market is expected to overcome the US by the end of 2018, becoming the largest online purchaser worldwide[2].

1.2 The European Situation

Europe is characterized by a fragmented situation for what concerns the development and the use of the E-commerce.

Although all the Countries display similarities in terms of annual percentage growth with regard to E-commerce and online business, the nominal value of online sales is still greatly differentiated across them.

In particular, the UK is the European leader in the online business; most of the companies operating in this new growing sector are located in England, where online sales represent 14.5% of total retail sales made by the population.[3]

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[2] Source: E-commerce in Italia 2015, Report by Casaleggio Associati
[3] Source: Elaborazione su dati E-commerce Europe, 2014

France and Germany are other two Countries where the E-commerce is well established and well accepted by both citizens and companies.

On the opposite side instead, Italy and Spain are the two Countries where, despite the use of internet is rather widespread, the E-commerce is still at the beginning of its growth.

1.3 Internet and the E-commerce in Italy

The possibility to get access to the internet in Italy is in line with other similar advanced Countries such as France and Germany; in fact, as shown by *Figure 1*, 85% of the Italian population can easily get access to internet through some electronic devices.

Personal Computer represents the preferred technological tool by the Italians; 74% of the population uses it as primary device to enter the net.

Instead, smartphones and tablets are used less than in other advanced Countries.[4]

Figure 1: Italians (11-74 years old) with internet access (in .000)
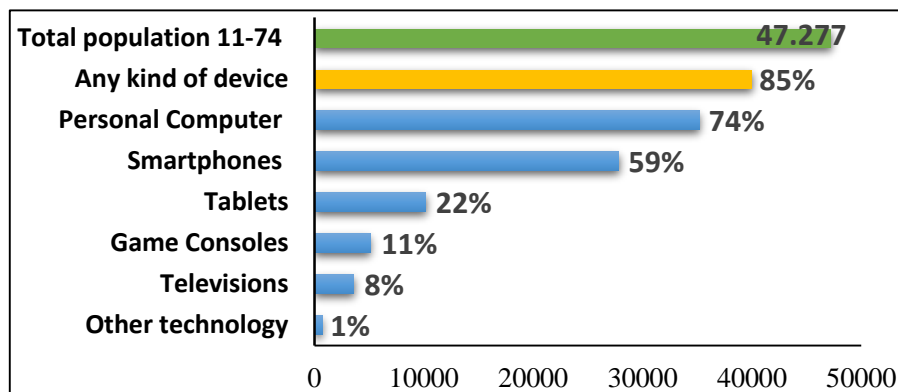
Source: Personal elaboration

The accessibility to the net in the various regions of the Country also represents another important feature; in the southern regions, less people are connected to the internet relative to the rest of the Country. *AudiWeb (2015)* states that in the southern Italy only 79.3% of the population have access to the net and this percentage is lower with respect to the centre (87.2%), the north eastern (87.9%) and the north western regions (87.2%).[5]

The main gap between Italy and the other Countries is in the quality of the web line; most of the internet connections in Italy are represented by the ADSL connection, whereas the ultimate generation in terms of web line connection, High Speed Lines (Fibra Ottica), is what represents the majority of the connections abroad.

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[4] Data Source: AudiWeb 2015
[5] Source: E-marketer 2014 and AudiWeb 2015

Although Italy can be considered at the same level as France, Germany and other Countries in terms of internet diffusion, the level of E-commerce (in terms of turnover and incidence) is still well behind.

The online turnover in Italy amounted to 24.2 billion Euro at the end of 2014[6], much lower than in the UK, Germany and France: UK 64.3€, Germany 51.8€, France 37.7€ (billion) [7]

Despite the online sales are not so mature, they show a positive and strong trend; in fact, since the 2004 the E-commerce has grown at a double-digit annual growth rate and, despite a soft slowdown in the last two years, it is still a growing sector (+8% on 2013) as demonstrated by *Figure 2.*

Figure 2: E-commerce growth in Italy (Billion €)
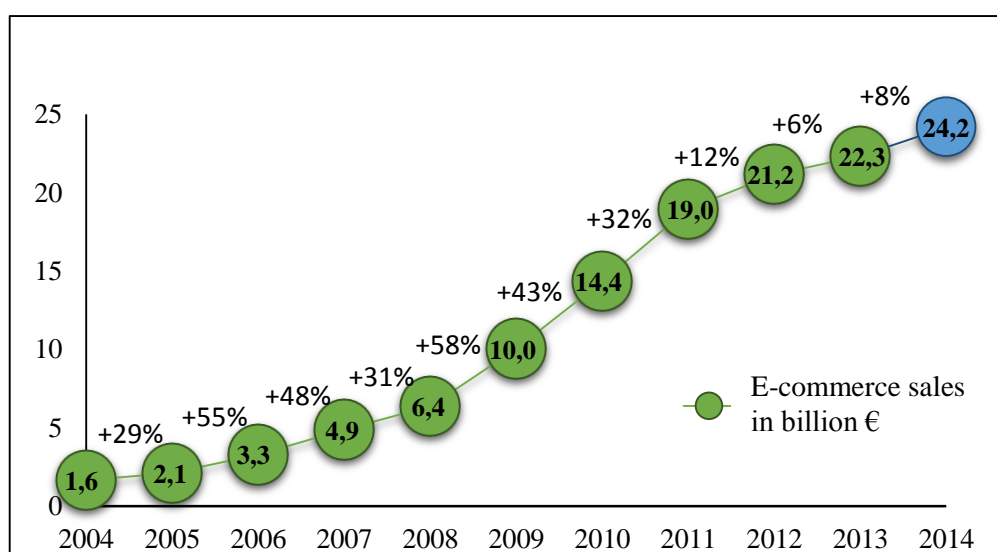
Source: E-commerce in Italia 2015, Casaleggio Associati

The analysis portrays a clear picture where it is possible to state that the E-commerce sector is one of the most profitable market because of its positive, long and stable trends.

The low barriers to entry, a more and more integrated world and a need for new and sustainable competitive advantages let us believe that the E-commerce will represent in the future years the marketplace where more and more companies will try to establish in.

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[6] Source: Report E-commerce in Italia 2015, Casaleggio Associati strategie di rete
[7] Source: Online retailing in the U.S, Europe and Canada, 2013-2016
   Exchange rate used €/$: 1.134835 (15/05/2015) – Il sole 24 ore

2. The Groupon Company

2.1 The History

The adventure of Groupon started in the year 2007 thanks to the brilliant idea of a young university student of Chicago, Andrew Mason.

Mason tried and, for the first time, succeeded in setting up a web site (The Point) with the specific goal to use the power of internet to gather as much funds as possible from many individuals to be used by inventors for funding new projects.[8]

The winning-point of The Point was the fact that the fund raised was made available for the inventor only if a minimum pre-established threshold was reached; otherwise the money would have come back to every funder.

Under the pressure of his financiers, who understood the potential of the new website, Mason was pushed to change the nature of his creation in order to better use its commercial potentiality; the result of these pressures was the introduction of the so-called: *Deals.*

The year after (2008), Mason chanced the name of the website into *Groupon.com* and started selling coupons that allowed the buyers to get some discounted prices on the good or service underlying the coupon.

The first of these Deals was closed with the local restaurant Motel Bar for a deep discounted meal, provided that at least 25 coupons were sold.

The idea had a great success, in the following months other restaurants signed many Deals with the new Mason's business and, in order to let the business grows in a proper way, Groupon hired a net of vendors and agents and the news about the coupons started spreading over the city.

Groupon is not different from other companies and, as for every business, the initial period of its life was not easy; in this particular case, the most challenging obstacle was the creation of a large portfolio of customers capable to attract new companies willing to sign deals.

The problem was overcame when Mason had the idea to ask the online visitors to register their e-mail address; as a consequence a more and more long mailing list has been created with the scope to work as a promotional and incentive tool to convince new restaurants to subscribe the web deals.

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[8] Source: Groupon website

Groupon based its business model on the promotion of a single deal per day, initially the restaurants were the most suitable partners for this kind of activity but, subsequently, Groupon was able to enlarge its offer, by including other goods and services very different among them. By the end of 2009, Groupon had spread to 28 U.S. cities; the following spring it reached all the way to international markets including Germany, France, Italy, Spain, the United Kingdom, Switzerland, and Belgium.[9]

The great success of Groupon attracted a lot of attention; as *Figure 3* portrays, just in one year and just looking at daily figures, the company got a 428% increase in the value of the deals closed and a 190% increase in gross revenues.[10]

Figure 3: Groupon's growth 2009/2010

Source: Forbes.com

2.2 Groupon in Italy

With a particular attention to Italy, it worth to say that Groupon is the current leader in its sector; it promotes deals and sells coupons all over the Country even if not all the cities have a personal page with specific offers dedicated to that city.

As it possible to see in *Figure 4,* Groupon has a strong local presence in the north of Italy, whereas the number of cities with a dedicated page on the website located in the centre and in the south is very low.

Not surprisingly, the company decided to focus its business and to increase its presence in the north area of the State because of the data shown in the previous analyses, which show a higher percentage of internet users located in the upper side of Italy.

Figure 4, together with *Figure 5*, tries to recap the presence of Groupon on the Italian geography.

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[9] Source: Groupon website
[10] Source: Forbes.com

Overall there are 42 cities with a dedicate page on the website, Rome has been divided into different areas (north, south, Rome and Lazio) whereas other regions (Valle d'Aosta, Molise, Calabria, Basilicata) have no cities with dedicated page.[11]

Figure 4: Groupon's presence in Italy

Source: Personal Elaboration

Figure 5: Distribution of cities with a Groupon page
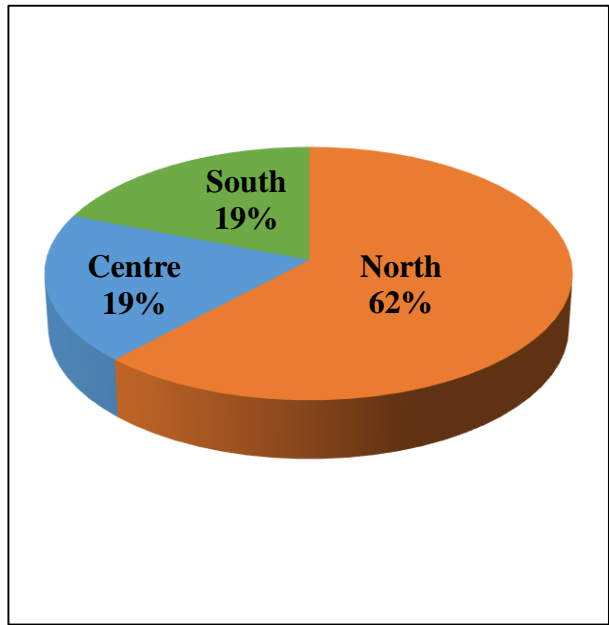
Source: Personal Elaboration

The absence of specific pages for cities located in some regions does not mean that Groupon does not work in those areas; Groupon has a national presence and it sells products all over the Country.

The larger presence of internet users in the north has had a strong influence for the strategic decisions of a company that bases its business model on the E-commerce and the use of technology as advertisement tool.

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[11]Source: Groupon's web page

2.3 The Business Model

The Business Model adopted by Groupon is quite straightforward in its structure; it can be represented trough six steps, as shown in the *Figure 6*.

Figure 6: Groupon's Business Model
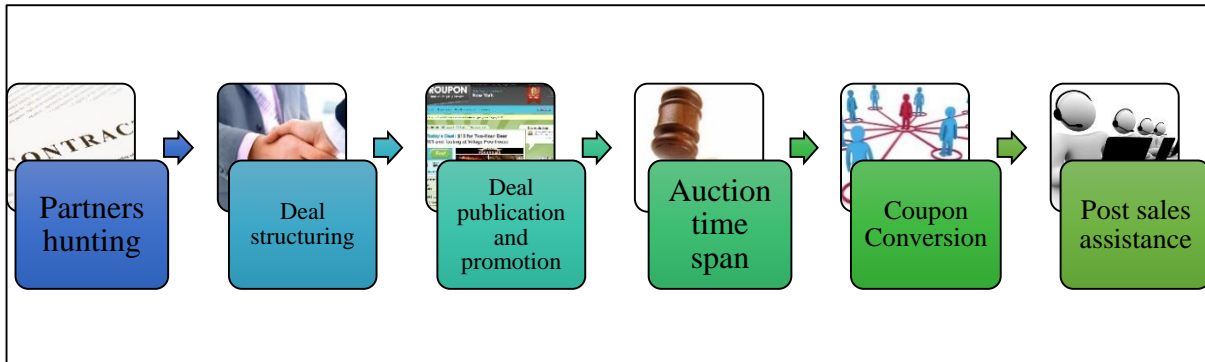
Source: Personal Elaboration

1. ***Partners hunting:*** It is the very first step that Groupon's employees make; professional and reliable *agents* contact for the first time *potential partners* (firms, restaurants and other commercial activities willing to join a coupon promotion) explaining them how the company works and trying to convince them to make their offers using the platform.

2. ***Deal structuring:*** Once that a partner accepts to make an offer, the vendors work closed to him in order to structure the *deal*.

   In practice, all the aspects of the offer are set up in this stage; there are several points to agree on with the counterpart before being able to move on with the publication on the website.

   The parties negotiate the following characteristics:

a. *Type of offer:* Item promotion vs. Dollar/Euro promotion

   The *Item promotion* specifies what the subject of the offer is and shows that it would cost much more without the coupon offer (example: Get a delicious Spanish sea paella for 10€ instead of 25€)

   The *Dollar/Euro promotion* does not specify exactly the product of the offer, but it gives discretion to the customer regarding which products to buy (example: Get 25€ worth of delicious dinner for 10€) [12]

b. *Price:* It is the amount of money the final customer, who wants to accept the offer and to buy the product/service, has to pay.

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[12] Source: How Businesses Fare With Daily Deals: A Multi-Site Analysis of Groupon, LivingSocial, OpenTable, Travelzoo, and BuyWithMe Promotions – Uptal M. Dholakia (Rice University) 2011

As it was for "*The Point*", the purchaser does not have to pay when it decide to take the offer and communicates the credit card data; the money will be automatically withdrawn at the end of the auction if the minimum amount of coupons sold has been reached.

c. *Discount:* It is how much the product/service is offered at a lower price compared to its real value. (typically Groupon's offers propose discounts up to 70/80 % of the nominal value of the underlying good)

d. *Seller's Commission:* It is the percentage of the coupon price withheld by Groupon and which represents the main source of revenues for the company (Groupon's strengths often give its agents the ability to negotiate a 40-50% commission on the price of the offer).[13]

e. *Auction length:* It is the number of days during which the offer will remain available on the website, giving this way the customers the possibility to accept it.

f. *Minimum/Maximum number of coupons:* It is the minimum amount of coupons to be sold before the expiring date of the auction in order to "trigger" the deal; if consumers do not buy enough coupons, the deal will not become effective and the customers will not be asked to make any payments.

Partners can also negotiate a maximum number of coupons available, depending on their own needs and their personal intentions.

3. ***Deal publication and promotion:*** The deal closed with the merchants is uploaded on the online platform with all the above features well visible for all the web visitors.

Groupon actively promotes the *"Daily Deals"* by means of mail lists, social networks and online advertisement, but the real source of promotions are the customers themselves.

The structure of the website, divided into different cities and different categories of products/services, allows the web visitors to find the best deal for them without problems; the way in which this business model works pushes the interested visitors to promote the deal towards other people.

Since the offer will be triggered on only if a minimum level of coupons will be sold, who is willing to buy a certain product or service will be likely to promote the same deal to its acquaintances; a social promotion mechanism is activated in this way, with customers promoting the products instead of Groupon itself.

4. ***Auction Time Span:*** The profile of the deal will indicate a countdown showing the remaining days before the expiring data during all the period in which the offer will remain available on the platform.

In addition, the total number of coupons sold for that offer is always updated, this element lets the customers know how many coupons have already been sold, how far the deal is to be triggered on and, of course, it allows the commercial partners to forecast and organize the future flow of clients.

At the expiration day, depending on the results of the auction there can be two possible alternatives:

a. *Minimum number of coupons has been reached:* The coupon seller withdraws the <u>full price</u> of the offer from the subscribers of the deal, sending them a *pdf* coupon to be brought to the commercial partner when the customers will decide to use it.

b. *Minimum number of coupons has not been reached:* The coupon seller withdraws no amount of money and the deal is not triggered on.

5. ***Coupon Conversion:*** Once the purchaser receives the *pdf* coupon it has a pre-defined length of time to use its coupon.

The day the customer goes to the merchant's activity (for example a Restaurant), it has to bring the *pdf* coupon with him and to give it in exchange for the product/service it bought.

After the length of time available for using the coupons has expired, the owner of the activity (Restaurant owner) will send all the coupons it received to the coupon seller and will obtain the share of revenue agreed with the agent.

It is important to underline that, in case a customer buys the coupons but for some reasons it does not use it during the available period, the coupon company gains all the price of the deal.

This benefit is possible thanks to the business model structure, which allows these companies to collect the full price of the offer at the *"website" expiration day* regardless the number of effective users.

The cash outflows (the payment of the partners' shares) instead are postponed to the *"usage" expiration day* taking into consideration only the coupons effectively used by the purchasers.

6. ***Post Sales Assistance:*** This section represents all the assistance services that Groupon and others companies guarantee to their partners in order to have a fair, complete and serious relation.

In particular, Groupon is responsible for the clients' reimbursements in case they face some problems during the coupon experience, as well as it is responsible for the payment to the partners for their shares of prices.

Groupon is not the only company adopting this business model; in fact, all the companies operating in this industry base their activities on the same model.

Figure 7 is an alternative way of representing a business model, the Business Model Canvas aims to portray, in an intuitive and immediate way, how a specific company works and which are the key elements for the success of its business.

A Business Model Canvas has been reproduced for the Groupon Company, but it is representative of all the major companies of the industry.

Figure 7: Business Model Canvas representation of Groupon's business model.
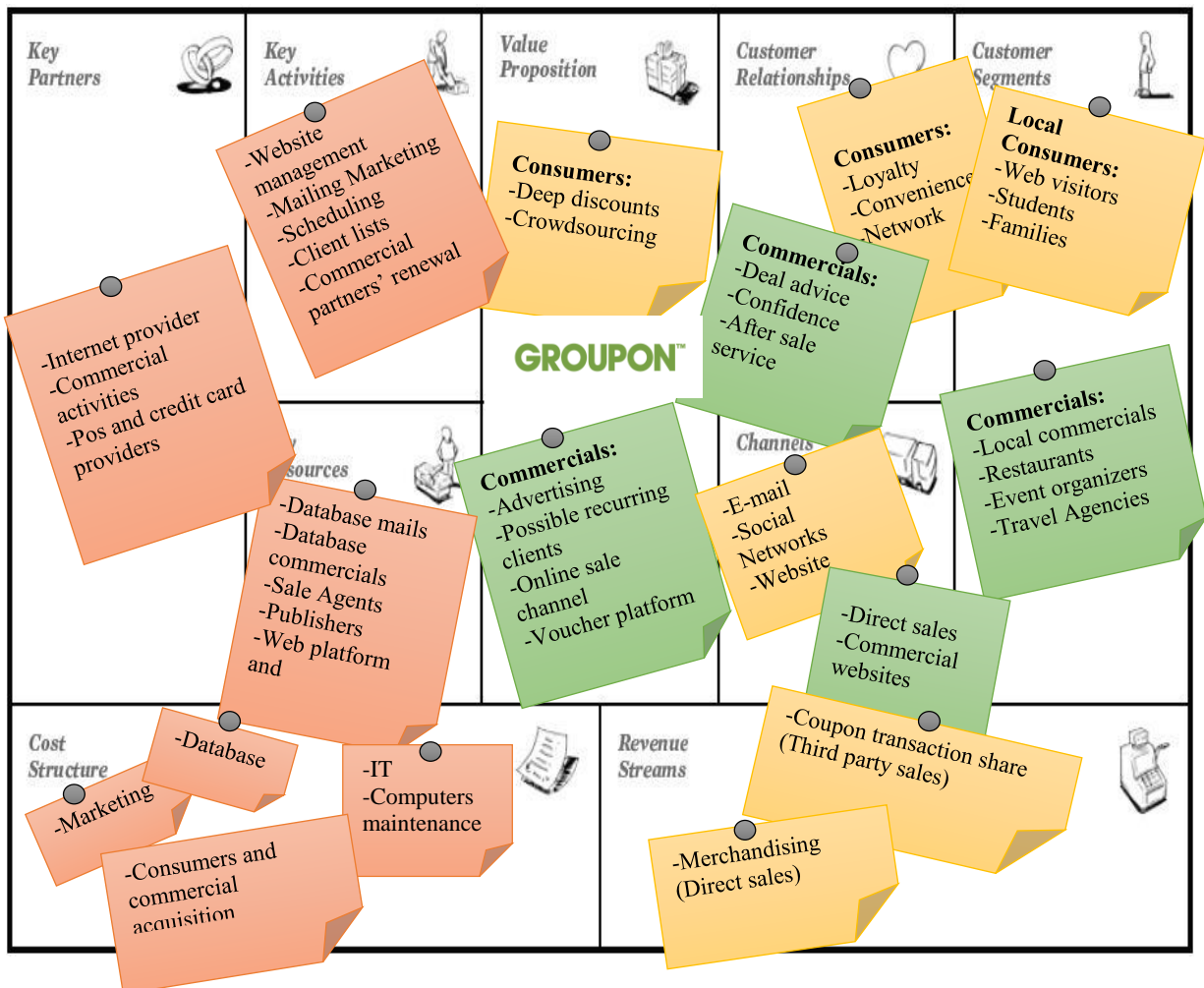
Source: Personal Elaboration

3. Groupon's Financial Statement Analysis

The E-commerce analysis portrays the online sales sector as one of the best performing industries, with a stable growth during the last few years and with positive and ever growing expectations for the future.

In this general favourable climate for businesses, the Groupon Company plays the role of the leader; it has been able to survive during the most difficult phases of its history and to grow at very impressive rate, until becoming the biggest enterprise in its sector.

The little website, created for crowd-funding, has become a multinational company in just few years since its birth, with local presence all over the Countries.

The combined effect of a general positive climate in the industry and a strong and successfully history like the one of Groupon should be absolutely positive and the company should stay far from crises, with high performances and financial results.

With the intention to verify whether the expectations about the company's financial performances (which is what ultimately leads to the success of a firm) are effectively met in the reality; a financial analysis has been conducted and reported in the following pages.

As every financial analysis, the investigation starts from the main lines of a financial statement; in this case, we started from what we believed to be a key element for this thesis: the revenues. The official consolidated financial statement published by the parent company Groupon Inc. based in the United States, reports increasing total revenues for the last three years, as it is possible to see in *Figure 8*.

Figure 8: Groupon Inc. Total Revenues (Billion $)
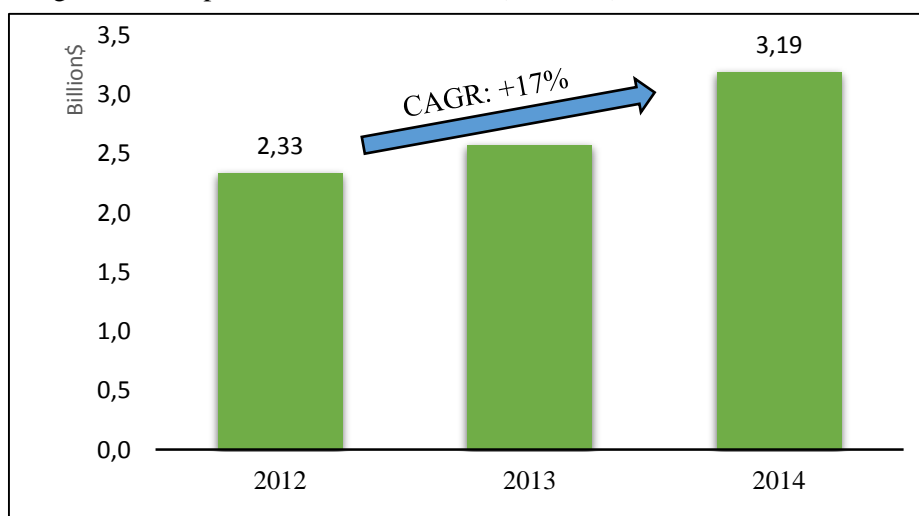
Source: Personal Elaboration on Groupon Inc.'s annual report

Despite the good result that increasing total revenues may represent, a deeper revenues investigation shows a different and less positive picture.

In fact, only by looking at the revenues composition we can deeply understand why the reported figures are not so exhaustive.

Figure 9 helps us to divide the total numbers into their constituents and, to recognize how they, and their contributions, changed over the years.

Groupon's annual report describes two different sources of revenues for the company:

- **Third Party Revenues:** defined by the official financial statement as follow:

"*Third party revenue arises from transactions in which we are acting as a third party marketing agent and consists of the net amount we retain from the sale of Groupon after paying an agreed upon portion of the purchase price to the featured merchant, excluding applicable taxes and net of estimated refunds for which the merchant's share is recoverable*"[14]

The previous sentence classifies this category of revenues as the ones arising from the sales of coupons for Groupon's commercial partners (merchants), or more precisely, they are the portions of coupons prices net of partners' shares.

Since Groupon's business model has been entirely set up around the coupons sales and the collaboration with local merchants, third party revenues represents the turnover coming from the company' core activity

- **Direct Revenues:** the company considers direct revenues every cash inflows arising from the sales of products under the Groupon's own brand and not linked to merchants' products.

Figure 9: Groupon's Total sales composition (Billion $)
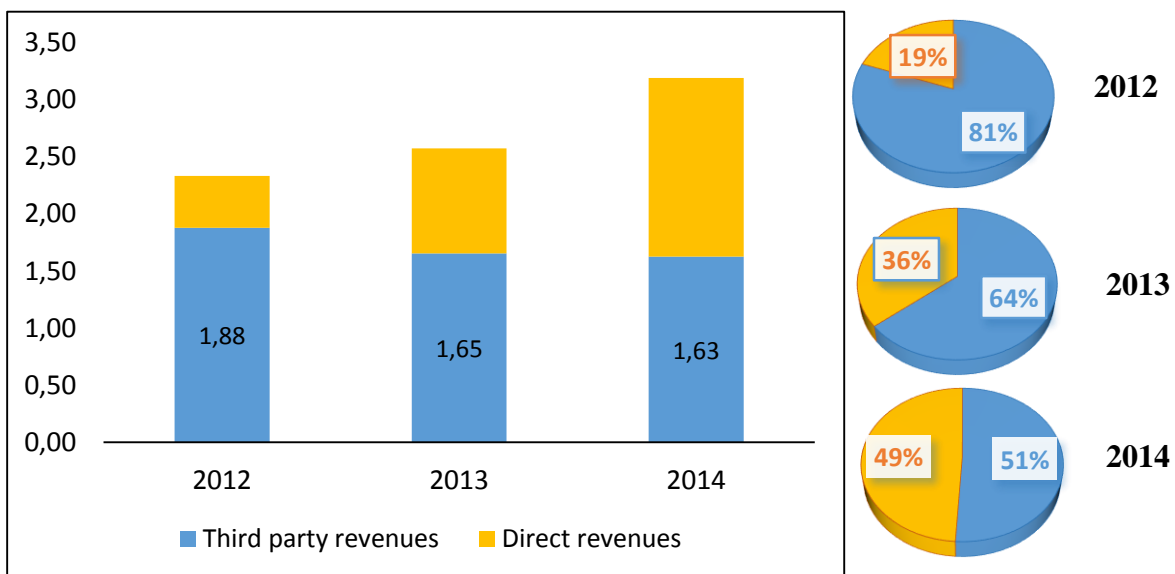
Source: Personal Elaboration on Groupon Inc.'s annual report

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[14] Source: Groupon's 2014 Annual Report

Figure 9 shows that, together with the overall revenues level, also their composition has changed over the years.

The portion of sales arising from third party transactions moved from a level of almost 1.9 billion dollars to a level of 1.6 billion dollars in three years.

The reduction of this class of sales, together with the overall increase in total revenues, represents a shift from third party revenues from the 81% in 2012 to the 51% of total sales in 2014[15].

Although the increase obtained with regard to the direct sales can represent a good result for Groupon, the reduction undergoing in the third party sales might represent the biggest issue the company will be worried about in the future.

A reduction in those particular sources of revenues might be due to a reduction in the merchants' participation on Groupon's website and therefore, a decline in the use of Groupon as *"selling channel"*, which is its core activity.

A scenario in which the third party revenues keep declining because of the reduction in local merchants' usage of Groupon's platform, is far from being a positive news for the online sales company.

A scenario like the previous one will lead to a contraction in the core activity, with immediate and negative consequences on the company's financial performance.

The right question is whether the reduction in third party sales recorded in the last years arises from the described reasons or if there exist other motivations leading to this result and, if the first option turns to be the correct one, it would be necessary to understand the reasons behind the merchants' decision to stop using Groupon's platform.

Figure 10 reported below tries to show the impact that the reduction in third party sales had on the financial figures of the company.

The chart is composed by four key elements: two lines and two areas.

The green and the blue lines simply represent respectively the total sales and the third party sales as above described; taking the level of third sales revenues in 2012 as reference point. The red area shows the reduction in those sources of revenues, whereas the yellow area denotes the contribution of the direct sales to the total revenues.

The goal of the graph is to illustrate that no matter if the direct sales have been able to sustain positive growth rates over the years, if Groupon had been able to keep at least the initial level of third party sales, the total revenues would have been much higher.

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[15] Source: Groupon's 2014 Annual Report

Since the direct revenues come from "secondary" activities (i.e. merchandising), we believe that they might also be only temporary, whereas the reduction in third party revenues will not recover unless the company will take some action in order to revamp its primary activity.

Figure 10: Focus on Groupon's sales (Billion $)
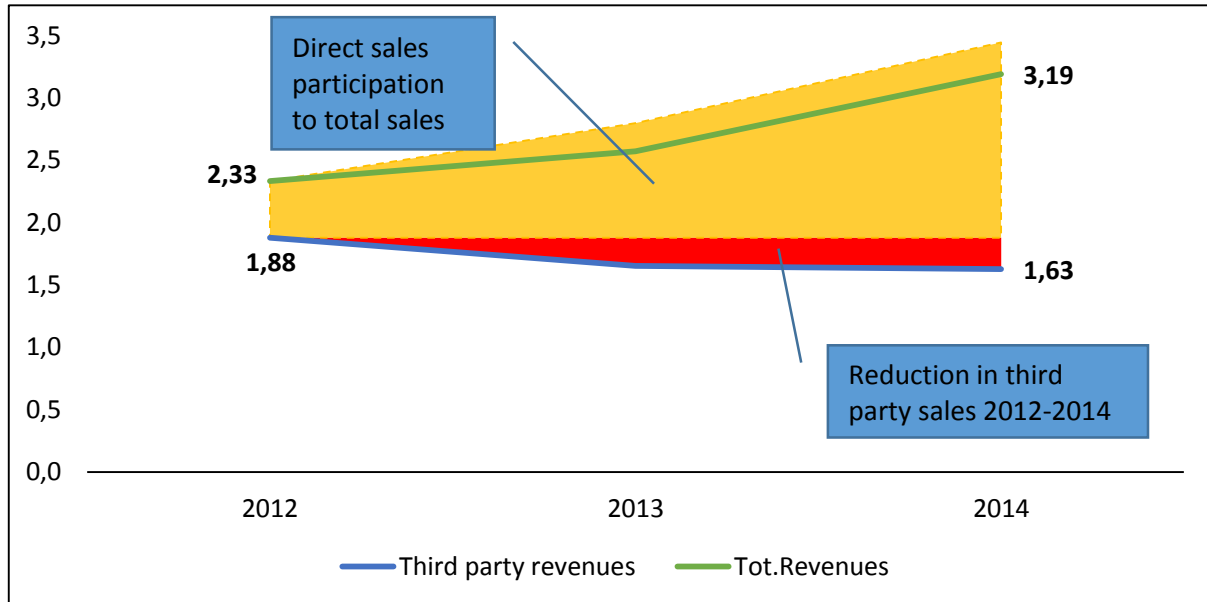
Source: Personal Elaboration on Groupon Inc.'s annual report

This elaboration puts its roots on the losses suffered in the third party revenues by Groupon; it aims to elaborate a thesis, based on behavioural economics' theories, with the intention to understand and to explain how certain business models adopted in some industries may be the causes of the birth of irrational human behaviours.

It may be that, even in a case where the industry climate and the company's name should help to reach good performances; the model chosen to run the activities facilitates irrational human behaviours that contribute to the decline of the businesses.

The revenues are not the only element included in the analysis, in fact, by expanding the attention to other financial indicators, the result we obtain is that, in addition to the third party revenues, the Groupon's overall financial performance has not been so brilliant in the last years. *Figure 11* synthetizes the trends of some important performance indicators such as EBITDA/Revenues and EBIT/Revenues and compared them with the decrease registered in third party revenues.

Notice that all the elements taken into consideration share a common path; all of them have a negative trend in the last three years.

The EBITDA/Revenues ratio decreased from 6,6% in 2012 to 4,1% in 2014; even worse is the trend for the EBIT/Revenues, which closed the 2014 with a negative value (-0,5%), whereas the same indicator was at 4,2%[16] just two years before.

Further confirmations of a poor performance come from the bottom line of the Profit and Loss statement, which shows a negative result (loss) each year from 2012 to 2014; not surprisingly the ROE indicator is negative and it is on average -10% per year.[17]

Figure 11: Performance Indicators' trends (Billion $)
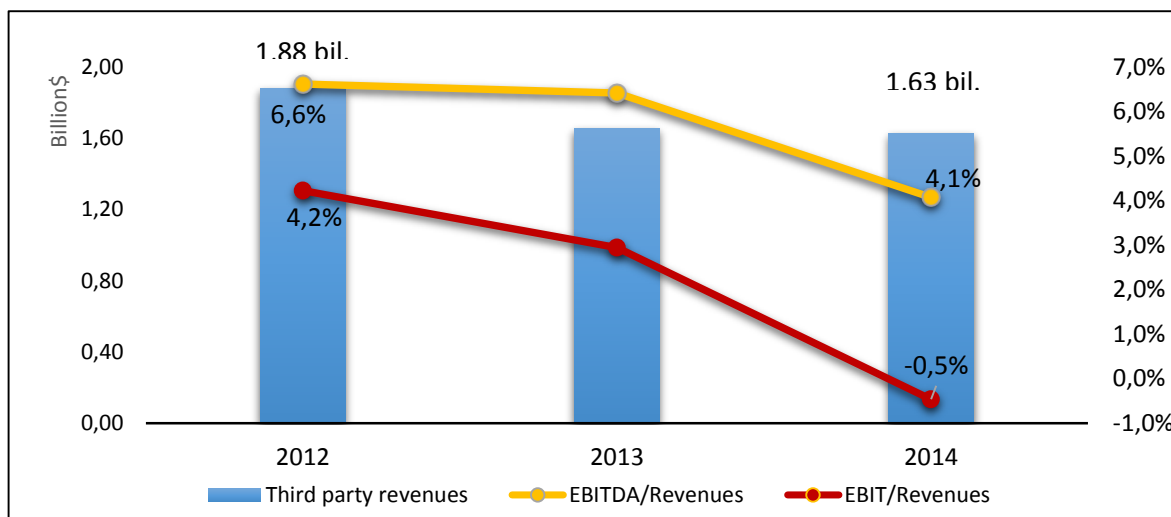
Source: Personal Elaboration on Groupon Inc.'s annual report

A financial analysis has been carried out also for the Italian subsidiary of Groupon (Groupon S.r.l) and the results we got show that the subsidiary mirrored the parent's performance.

The data displayed by Groupon S.r.l. (Italy) let us understand how the subordinated company has replicated the trends already seen for the parent company.

The Italian market's size, which is obviously smaller than the global one, has worsen the financial results, in fact, if Groupon has been able to show an increase in revenues thanks to the direct sales at parent level; this has not happened for Groupon S.r.l.

As it is possible to see from *Table 1*, which summarizes the major financial indicators, the Italian subsidiary closed the year 2014 with a level of total revenues lower than the one of the previous year (-27%).

Together with this negative result, it worth to notice the absolutely negative results in terms of EBITDA and EBIT[18] compared with just two years before.

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[16] Source: Groupon Inc. 2014 Annual Report
[17] Source: Yahoo finance, Bloomberg Business
[18] Source: AIDA Database

The impressive growth registered from 2010 to 2012 has been followed by a decline in sales and margins during the next two years (2013-2014).

The results obtained at both corporate and local levels let the reader understand that something is not working properly in the Groupon's way of doing business.

A summarizing table of Groupon S.r.l. has been reported below and the consolidated financial statement of Groupon Inc. has been attached in the following pages for a complete and transparent information.

Table 1: Groupon S.r.l's Financial summary

Groupon S.r.l. (Italy)					
Figures in ,000 €	2010	2011	2012	2013	2014
Tot.Revenues	1.005	43.454	106.228	98.586	71.902
Growth%		4225%	144%	-7%	-27%
Op.Expenses	7.590	38.751	70.361	95.600	69.770
EBIT	-6.585	4.703	35.867	2.986	2.132
EBIT/Revenues	-655%	11%	34%	3%	3%
Depr&Amort.	9	46	265	5.107	4.520
EBITDA	-6.576	4.749	36.132	8.093	6.652
EBITA/Revenues	-654%	11%	34%	8%	9%
Profit/loss	-4.797	31.182	21.825	-1.207	2.091
NFP	-1.536	-15.839	-15.269	-7.669	-1.536
Debt/Equity	0,0	0,0	0,0	0,0	0,0
ROE		241%	55%	-2%	4%

Source: Personal Elaboration on Groupon s.r.l Aida data

Attachment 1: Groupon Inc. Consolidated Balance Sheets

GROUPON, INC.
CONSOLIDATED BALANCE SHEETS
(in thousands, except share and per share amounts)

	December 31,	
	2014	2013
Assets		
Current assets:		
Cash and cash equivalents	$ 1,071,913	$ 1,240,472
Accounts receivable, net	105,154	83,673
Deferred income taxes	16,271	27,938
Prepaid expenses and other current assets	207,991	210,415
Total current assets	1,401,329	1,562,498
Property, equipment and software, net	182,475	134,423
Goodwill	447,810	220,827
Intangible assets, net	110,557	28,443
Investments	24,298	20,652
Deferred income taxes, non-current	41,835	35,941
Other non-current assets	19,293	39,226
Total Assets	$ 2,227,597	$ 2,042,010
Liabilities and Equity		
Current liabilities:		
Accounts payable	$ 21,855	$ 27,573
Accrued merchant and supplier payables	910,567	752,943
Accrued expenses	230,352	226,986
Deferred income taxes	32,510	47,558
Other current liabilities	130,312	132,718
Total current liabilities	1,325,596	1,187,778
Deferred income taxes, non-current	773	10,853
Other non-current liabilities	136,284	131,697
Total Liabilities	1,462,653	1,330,328
Commitments and contingencies (see Note 8)		
Stockholders' Equity		
Class A common stock, par value $0.0001 per share, 2,000,000,000 shares authorized, 699,008,084 shares issued and 671,768,980 shares outstanding at December 31, 2014 and 670,149,976 shares issued and 665,717,176 shares outstanding at December 31, 2013	70	67
Class B common stock, par value $0.0001 per share, 10,000,000 shares authorized, 2,399,976 shares issued and outstanding at December 31, 2014 and December 31, 2013	—	—
Common stock, par value $0.0001 per share, 2,010,000,000 shares authorized, no shares issued and outstanding at December 31, 2014 and December 31, 2013	—	—
Additional paid-in capital	1,847,420	1,584,211
Treasury stock, at cost, 27,239,104 shares at December 31, 2014 and 4,432,800 shares at December 31, 2013	(198,467)	(46,587)
Accumulated deficit	(921,960)	(848,870)
Accumulated other comprehensive income	35,763	24,830
Total Groupon, Inc. Stockholders' Equity	762,826	713,651
Noncontrolling interests	2,118	(1,969)
Total Equity	764,944	711,682
Total Liabilities and Equity	$ 2,227,597	$ 2,042,010

Attachment 2: Groupon Inc. Consolidated Profit and Loss Statements

GROUPON, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except share and per share amounts)

| | Year Ended December 31, | | |
	2014	2013	2012
Revenue:			
Third party and other	$ 1,627,539	$ 1,654,654	$ 1,879,729
Direct	1,564,149	919,001	454,743
Total revenue	3,191,688	2,573,655	2,334,472
Cost of revenue:			
Third party and other	241,885	232,062	297,739
Direct	1,400,617	840,060	421,201
Total cost of revenue	1,642,502	1,072,122	718,940
Gross profit	1,549,186	1,501,533	1,615,532
Operating expenses:			
Marketing	269,043	214,824	336,854
Selling, general and administrative	1,293,716	1,210,966	1,179,080
Acquisition-related expense (benefit), net	1,269	(11)	897
Total operating expenses	1,564,028	1,425,779	1,516,831
(Loss) income from operations	(14,842)	75,754	98,701
Other expense, net	(33,353)	(94,663)	(3,759)
(Loss) income before provision for income taxes	(48,195)	(18,909)	94,942
Provision for income taxes	15,724	70,037	145,973
Net loss	(63,919)	(88,946)	(51,031)
Net income attributable to noncontrolling interests	(9,171)	(6,447)	(3,742)
Net loss attributable to Groupon, Inc.	(73,090)	(95,393)	(54,773)
Adjustment of redeemable noncontrolling interests to redemption value	—	—	(12,604)
Net loss attributable to common stockholders	$ (73,090)	$ (95,393)	$ (67,377)
Net loss per share			
Basic	$(0.11)	$(0.14)	$(0.10)
Diluted	$(0.11)	$(0.14)	$(0.10)
Weighted average number of shares outstanding			
Basic	674,832,393	663,910,194	650,214,119
Diluted	674,832,393	663,910,194	650,214,119

4. Possible Causes of Groupon's poor Performance

As demonstrated through the financial analysis, Groupon has been facing some turbulences during last years; both at parent (USA) and subsidiary (Italy) levels, and this kind of problems are likely to become even bigger in the near future.

The second part of this work will be dedicated to the identification of possible causes that lie behind the Groupon's poor performances and to the elaboration of a particular thesis in order to explain how human behaviours can step into the business life and influence negatively the performance of a company's activity.

The research of a range of possible causes for the negative trends registered by Groupon starts by looking at the elements that all the companies operating in the E-commerce industry have in common.

Subsequently the analysis will be restricted to the business model adopted by the majority of the firms operating in the sub-segment of coupon sales.

4.1 Hypothesis 1: Negative Climate in the E-commerce Industry

Since the Groupon history tells a story of a great company, with successful ideas and impressive growth, the doubt that may arise is whether the poor performance is due to some external issue, like a negative trend in the whole industry of the E-commerce.

For this reason, the first cause this work wants to verify is the presence, or the absence, of a general negative climate in the E-commerce industry that could cause negative performances for those companies operating in it.

Although this hypothesis appeared to be among the most plausible ones, the considerations reported below led us to the conclusion that this hypothesis cannot be accepted.

As it has been described in the first section, the E-commerce industry is very far from being a declining sector, it worth to remind that the industry analysis shows strong and positive trends at any level it has been conducted (Global, Europe and Italy)

Internet diffusion is spreading all over the Countries and online sales are increasing all over the world (+ 22.2% BtC sales in the last year); experts report only positive future expectations for this Industry.

Since all the data portray a completely different picture from the one of an industry crisis, there are not sustainable evidences for stating that the E-commerce industry is facing a declining phase and, for this reason, the hypothesis of a crisis of the entire industry cannot be accepted.

4.2 Hypothesis 2: Crisis of the Coupon Industry

An alternative, and more restricted hypothesis to the previous one, is the possible presence of common problems not in the whole E-commerce industry, but in the segment of coupon sales.

This second and more restricted check is extremely important from the point of view of this thesis, negative or positive different results will lead to completely different conclusions; in particular, the presence of common difficulties may be the indicator that something in the business models, or in the way the activities is organized, does not work properly.

We believe that the best way in order to test this second hypothesis would be to take into consideration the main actors of the Coupon Sales Industry; since the work is concentrated on Groupon Inc., the participants involved are the main Groupon's Competitors.

Although the economic rationale teaches that, the presence of new competitors leads to a deterioration of profits in the long horizon and so to a decline in the companies' performances, the presence of similarities among the different companies' results could be interpreted also in a different way.

Alternatively to the economic theory, similar negative trends may be the signal that something in that particular way of running the E-commerce business does not work properly and that the business model adopted in that sector may be profitable in the short-run, but not sustainable in the long-run.

After a research on the major companies in the Coupon Industry based on the data available, a set of three Groupon's competitors have been selected: two for the consolidated level and the other one for the Italian market analysis.

a) LivingSocial Inc.
b) Travelzoo Inc.
c) Groupalia S.r.l.

LivingSocial Inc.

LivingSocial is one of the major daily deal sites; it is, together with Travelzoo Inc., the main competitor of Groupon Inc.

Like the other similar firms, LivingSocial offers daily promotions regarding a wide range of products and services (restaurants, sport activities, travels, beauty treatments) at discounted prices and the business model adopted by the company is very similar to the Groupon's one.

The purpose of the analysis is to compare this competitor to Groupon and, to verify whether the two firms operate with the same difficulties.

Figure 12 shows the comparison between LivingSocial and Groupon's revenues.

Figure 12: Comparison Groupon – LivingSocial Revenues (Million $)
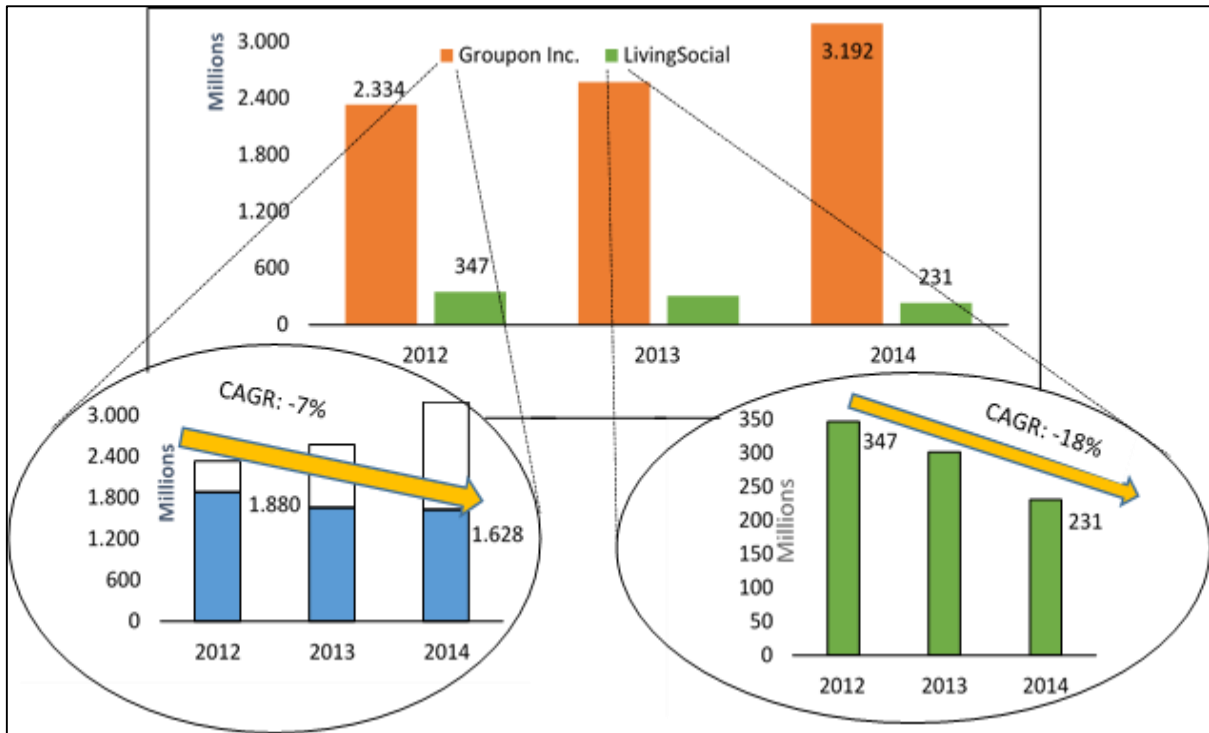
Source: Personal Elaboration on Groupon Inc. and LivingSocial's financial statements

The representation shows the general trend in sales both for Groupon Inc. and for LivingSocial Inc.

The upper part of the chart portrays the comparison between the total sales of the two companies; as described some paragraphs before, Groupon Inc. shows growing revenues over the years, whereas its competitor has recorded a negative trend in the last three years.

The other two little graphs have been thought in order to have a deeper understanding of the combined chart.

Thanks to this particular focus, it is possible to see that the difference between the two companies is not as big as it seems to be.

Groupon has been showing good performance in terms of total revenues, but its third party revenues or, in other words, the core business revenues (represented in blue in the left-side chart) are decreasing, with a negative Cagr over two years of -7%.

This phenomenon has been described during the financial analysis, but it worth to restate that this work focuses only on the third party revenues because they represent the core activities of the company net of the secondary ones.

Since there exist a big difference in terms of turnover between the two companies, the combined representation could not be so clear and a reader could have the impression that the decrease in LivingSocial's revenues is very slightly.

The right-side chart is a hand lens on the LivingSocial's figures, thought in order to overcome the possible misunderstanding and to get a clear insight of LivingSocial's performance.

By enlarging the scale of the graph, it becomes easy to understand that even this second company has been facing troubled years; its revenues are decreasing sharply, with a negative Cagr (2 years) of -18%.

The size and the notoriety of the firm did not allowed the company to hedge the losses in revenues with the sales of products having its own brand (as Groupon has been able to do until now).

In conclusion, it can be said that, despite the different size, LivingSocial's performance has been negative as much as the Groupon's one.

Both companies show similar trends and similar problems and this first results do not contradict the hypothesis of a common negative situation in the Coupon Industry shared by all the participants

Travelzoo Inc.

Travelzoo Inc. is a global internet media company with more than 27 million members all over the world.

The company publishes daily offers about travels, entertainment, restaurants and beauty centres; like LivingSocial Inc., it is not a very large company compared to Groupon Inc., but despite the dimension it is considered one of the main competitors because of its way of doing business which is very similar to the Groupon's one.

Figure 13 shows the performance of Travelzoo over the last three years and tries to make a comparison with Groupon's figures; even in this case seems that the firm has not a good performance.

Differently from the previous two companies, Travelzoo has been able to record an increase in sales (+5%) between 2012 and 2013 (green histograms), whereas LivingSocial and Groupon (third party sales) were losing ground.

At first glance, it could also be possible that Travelzoo took advantage at Groupon and LivingSocial's expenses; but the results recorded in the subsequent year partially contrast with the initial idea, positioning the company at the same level of its competitors.

In fact, as for the other firms, Travelzoo closed the year 2014 with a loss in term of revenue volumes compared with the previous year (-10% between 2013 and 2014) and shows a total negative Cagr over the last two years (2012-2014) of -3%.

Another indicator reported in the graph confirms the global poor performance of Travelzoo Inc., the EBITDA margin (EBITDA/Revenues).

The comparison between the EBITDA margin of Travelzoo and Groupon shows that both of them have a negative path and, in absolute terms, Travelzoo recorded a worse result than Groupon.

In particular, the first firm has seen a change in EBITDA from a level of 31 million dollars in 2012 to 16[19] million dollars in 2014, which means a decrease in the EBITDA margin from 21% to 11% [20]in 2014; due both to an increase in operating expenses and to a decrease in revenues.

Figure 13: Comparison Travelzoo Inc – Groupon Inc.
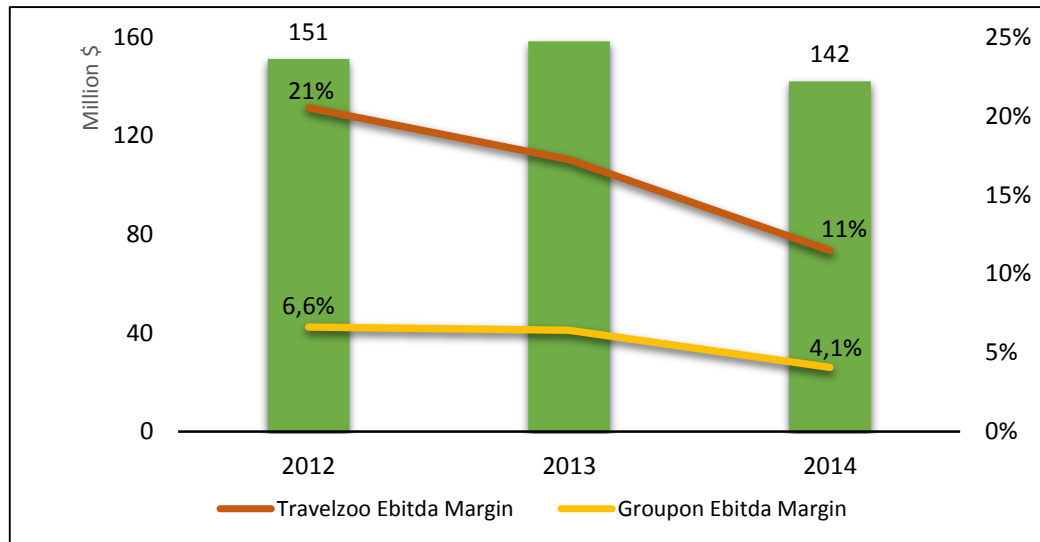
Source: Personal Elaboration on Groupon Inc. and Travelzoo's financial statements

Although Travelzoo performance seems to be less negative compared with the ones of the other two companies previously described, the analysis shows undesired results also for this competitor, whose figures are in line with the ones of Groupon Inc. and LivingSocial Inc., representing in this way another element in favour of the acceptance of the hypothesis 2.

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[19] Considering the operating expenses net of the "Unusual items" that are extraordinary items
[20] Source: Travelzoo 2014 annual report

Groupalia S.r.l.

This last company has been selected in order to have a focus on the specific Italian situation and a comparison between the Italian subsidiary of Groupon Inc. (Groupon S.r.l) and its main competitor in this Country, which is Groupalia S.r.l.

Founded in the year 2010 in Spain, Groupalia S.r.l became an Italian company in 2013 after being bought by the Italian managers Gualtieri Andrea, Gualtieri Alessandro and Claudio Rota. Groupalia S.r.l is based in Milan and it is the main antagonist of Groupon's business in Italy; the two firms work in the same way and share the same business model and, consequently, there exists a strong competition between them.

Groupalia, as the other competitors, has a limited dimension and a shorter history compared with Groupon S.r.l.; but, for the Italian market, it is the best alternative to the Italian subsidiary of the American colossus.

The company's financial figures reported in its financial statements show a very sharp increase in revenues from the year 2010 to the year 2012, where the level of sales moved from 305 thousand Euro to more than 16 million Euro in only two years.

This positive result brought about also an improvement in the operating profitability of the company, confirmed by a growth in the EBITDA margin that closed the 2013 at 17% (of revenues), whereas just two years before was -211% and the company had a very bad financial result.

Figure 14: Groupalia S.r.l revenues vs Groupon S.r.l revenues
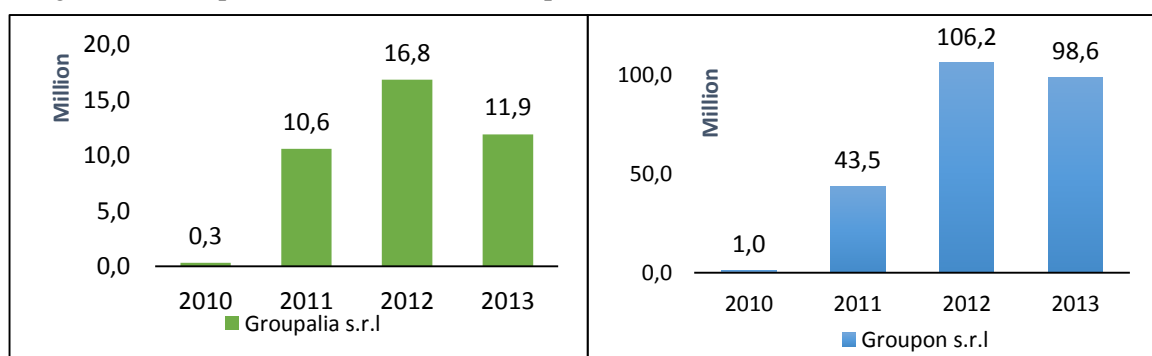
Source: Personal Elaboration on Groupon and Groupalia's financial statements

The year 2013 represents a negative turning point for Groupalia S.r.l; the annual report shows a contraction in revenues by -29% and a deterioration of the EBITDA margin, which came back to a negative value of -16% (EBITDA/Revenues).

Unfortunately, the ultimate 2014 data are not available yet, but we believe that the negative trend is likely to continue even for this last year.

Figure 14 shows both Groupalia S.r.l and Groupon S.r.l annual revenues from the 2010 to the 2013 (which is the last available annual report for Groupalia S.r.l.).

Apart from the different scale, which is due to the big difference in the level of the two companies' sales, it is possible to see how their trends are very similar; they have grown in the same years and started declining in the same moment.

To better appreciate this phenomenon, the two charts have been joined in a new graph, *Figure 15*, which gets rid of the scale and let the reader deeper understand the similarities of the two companies.

Figure 15: Comparison Groupalia – Groupon trends

Year Growth	Groupon	Groupalia
2011-2010	+4.225%	+3.376%
2012-2011	+144%	+59%
2013-2012	-7%	-29%
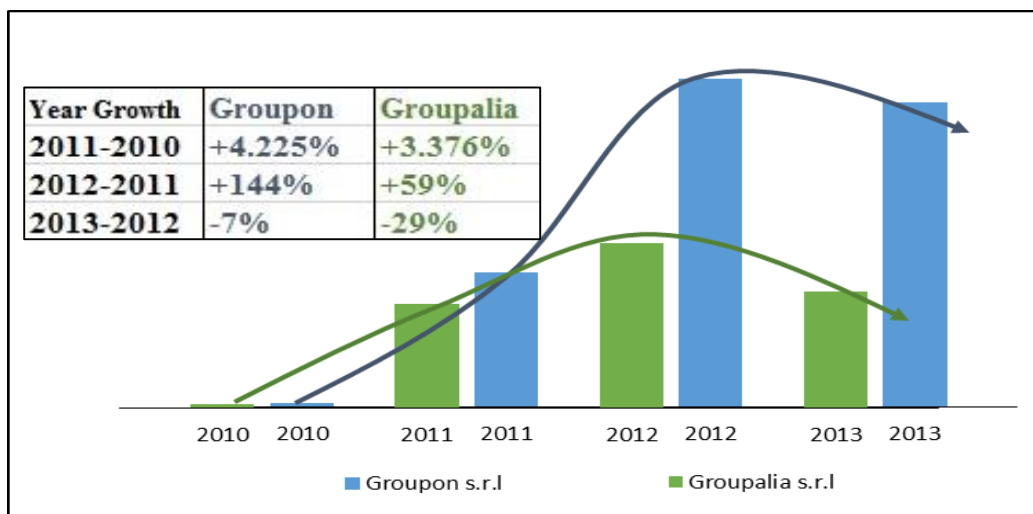
Source: Personal Elaboration on Groupon srl and Groupalia's financial statements

Both firms operating in the Coupon Industry show very similar trends with regard to their revenues.

A first stage characterized by a very impressive growth in sales between 2010 and 2012 and a second phase of decline starting from 2013 (last available data)

It worth to remind that Groupalia has been founded in 2010 and that Groupon started being present in Italy since the end of 2009.

Our point of view is that the poor performance of Groupon S.r.l.is not due to the presence of Groupalia S.r.l. and its activity, but, on the contrary, the presence and the results of the second company reinforce what we sustain.

The competitor's analysis carried out above shows that all the major companies operating in the Coupon Industry (segment of E-commerce) share similarities in terms of performances and negative results.

It worth to reaffirm that the analysis' outcome is in line with many economic theories that explain how competition erodes the companies' profits in the industry and that, the sample of competitors taken into consideration is not exhaustive but, only the major actors have been considered.

Conscious of the presence and the importance of these theories, we would like to give a different possible explanation of what is happening to Groupon and more in general to this industry.

Since the conclusions we would like to arrive at are perfectly in line with the results reported in the previous pages, *we cannot reject the hypothesis 2.*

We do not exclude that the similarities (in terms of performance and financial results) obtained by all the companies involved in the analysis may be the signal of a possible slowdown in this specific industry, which is characterized by a particular business model and a strong collaboration with small and medium enterprises.

4.3. Conclusions

Evidences make it impossible to accept the idea that the entire E-commerce industry is facing a troubled phase; as we said before, data lead to the conclusion that hypothesis 1 should be rejected.

The same evidences do not hold for the second hypothesis; in fact, all the companies operating in the Coupon Industry (a segment of the E-commerce) show negative performances and similar trends.

Despite many economic theories sustain the fact that competition erodes profits in the industry in the long-run, we would like to see the scenario from another point of view and consider the possibility that other elements have played a role in worsening the situation.

Among other possible scenarios, we would like to focus the attention on a specific issue that not always has been analysed enough in the economic world; in particular, we would like to underline the presence of human beings running business activities and, consequently, the presence of human behaviours.

Often, economic theories base their ideas on complete rational individuals, without taking into consideration different, but still plausible human behaviours.

The presence of similarities among different companies operating in the same industry, together with the fact that most of them are based on the same business model; may be interpreted (under our point of view) as the signal that that particular way of doing business facilitates irrational human behaviours, which may impact or not on the performance of companies.

The assessment of the business model adopted by these companies will help to understand whether the possibility that it allows firms to get a great success in the short-run but it also triggers non-standard human behaviours that make the model unsustainable in the long period, should be excluded or not.

The available literature on the Coupon Industry will help us to better understand how coupon promotions are structured and which the drivers of a profitable offer are for both coupon sellers companies and merchants.

The following pages will revise the current literature, explaining how the Coupon Industry works, which are the main issues the participants have to deal with and, ultimately, which are the current authors' beliefs on the sustainability of this business model.

Literature Review

1. Current Literature on Coupon Sales Industry

The online coupon promotions and companies operating in this particular business have a recent history; most of them were funded between 2008 and 2010.

Although the coupon business had an impressive success since the beginning, it is rather new phenomenon; consequently, the literature on this topic is not so vast. Anyway, there exist few papers explaining how coupons sellers organize their offers and debating on the effectiveness of these promotions for the merchants who sell products/services by means of companies like Groupon.

The existing literature has been very useful to understand the main elements distinguishing a successful offer from a failure and to get insights on how merchants (commercial partners) react to this special kind of business.

According to Dholakia (2011), local businesses decide to use sales vehicles as Groupon or other similar companies to promote special offers on their products with two kind of objectives in mind: *Short-term objectives* and *Long-term objectives*.

- Short Term objectives: these are the goals that a merchant expects to reach during, or immediately after, the period in which customers who have bought a coupon on the online platform use it.

The primary short-term goal for local businesses is to *gain exposure* to new customers; exposure to new customers allows merchants to capture new people buying their products or trying their services, increasing their notoriety at the same time.

Notoriety is an important short term objective; by being present on the Groupon (or similar) platform, a merchant has the opportunity to make his activity visible for millions of potential customers, it works as a *promotional tool* without investing a lot of money (a great incentives for new and small companies)

-Long Term objectives: these are the most important objectives from a merchant's point of view; they should represent the "long-term thinking" that an entrepreneur should have.

In every business, it is in the long-term that the value will be created and, also in this case, this sentence holds; the main long-term goal of a local merchant is to *transform new customers who buy coupons into repeated ones*.

Repeated customers are loyal customers that, once they have tested the merchant's products/services using the coupon, come back routinely and buy products and services at their full prices.

Such regular sales not only earn higher margins but they also stabilize the firm's revenues and profit streams, and are crucial to its long-term viability[21].

Although both categories of objectives are important, the short-term goals are directed to the accomplishment of the long-term ones; a successful offer is the one that allows the merchant's products to be exposed to a large range of potential buyers and which tempts many visitors to buy the coupons.

Once the customer has bought a coupon and tried it, the coupon experience, the ability of the merchant and the quality provided will determine whether the customer will become a repeated customer, accomplishing in this way the long-term goal.

The coupon platform company itself (such as Groupon) should not be interested only in the organization and sale of coupons on its platform. Rather, the accomplishment of both short and long-term merchants' objectives is crucial also for the long-term success of companies such as Groupon Inc. and its competitors.

In this industry, companies' activities directly depend on merchants' businesses and, if merchants decided not to use coupons any longer as a sale vehicle, also the success of coupons sellers would be at risk.

Since the failure of local businesses in reaching their goals is extremely tied with the willingness of them to run offers on coupon sellers' platforms, it is in the interest of these latter companies to make the most to increase the probability to succeed in reaching both classes of goals.

Given that local businesses have both short and long-term goals to satisfy and that the success of coupons sellers passes through the accomplishment of such goals by the local merchants, the next step is to look directly at the offers promoted through these coupons, identifying the elements that determine their success.

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[21] Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Uptal. M. Dholakia, Rice University – June 2011

1.1. Drivers of a Successful Offer

As stated before, local businesses have short and long-term goals to satisfy. A merchant, who decides to run a coupon promotion, will evaluate it as a successful one only if will be able to reach both set of objectives; Professor *Uptal M. Dholakia* (2011) identifies three different elements that characterize the success of an offer.

According this paper, the success of a coupon sale is driven by:

- New Customer acquisition efficacy: It is the ability of the offer to bring new customers and coupon buyers to the merchants' shop/activity (i.e. how many coupon buyers effectively use it after having bought it).

- Spending Beyond the coupon's value: It is the percentage of coupon buyers that goes to the merchants' shop with the intention to use it and, once inside, spends more than the value of the coupon.

- Repeated full-price purchase: It is the percentage of coupon buyers that has tried the product/service and that decide to come back regularly and buy the merchant's goods at full prices.

With regard to these three drivers, the first two help reach the short-term goals, whereas the third one identifies the long-term purpose of local businesses.[22]

Most of the literature agrees on the identification of those three drivers of profitability and, at the same time, it states that these three elements are, in turn, affected by some *features* of the promotional offer; in particular:

- Face value of coupon;

- Depth of price discount;

- Offer redemption duration;

- Satisfaction of firm's employees.

According to the literature, the first three features drive the success of an offer in reaching the short-term goals, whereas the last one is the element that leads to the accomplishment of the long-term objective.

Let's analyse each of these features:

- Face value of Coupon: the Face value is the total value of the product/service that a buyer would pay by purchasing it outside the promotion. It represents the "full price" of the good that the buyer should pay without the coupon; researches show that higher face values provide higher perception of saving in the mind of the buyer.

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[22] Source: "What makes Groupon Promotions profitable for businesses?"- Uptal M. Dholakia- Rice University- 2011

For instance, a coupon with a face value of 40€ purchased for 20€ will show a discount of 20€, whereas a coupon with a face value of 20€ purchased for 10€ will show only 10€ of benefits, even though both coupons have the same percentage of discount.

Consequently, Dholakia (2011) affirms that: "*a higher face value coupon is expected to be more efficacious in acquiring new customers*"[23].

On the other hand, *higher face value is expected to have negative effects on the customers' willingness to spend beyond the coupon's face value.*

- Depth of price discount: It is the percentage discount offered by the coupons with respect to the full price.

According to Dholakia (2011), *the depth of price discount is expected to have positive effects both on acquiring new customers and on the willingness of spending beyond the face value.*[24]

With regard to the acquisition of new customers, higher price discounts induce consumers to think that the risk of trying a new product, without being sure that they will like them, is low because of the big discount (at least they have wasted a little amount of money compared to the full price).

On the other hand, the possibility to buy a product with a high discount will increase the incentive to spend additional money for other goods since the coupon has been not so expensive.

- Offer redemption duration: Offer redemption duration indicates how long consumers have the possibility to redeem the purchased coupon before it expires.

Despite from the merchants' point of view offering a long redemption term could not be such a positive idea because it exposes the firm to a longer period of uncertainty, from a consumer's point of view a long redemption term will contribute to make the offer more attractive.

Professor Dholakia (2011) sustains that *the longer the redemption period offer to the customers, the higher the positive effects it is expected to have on acquiring new customers.*

At the same time, *a longer redemption time will also have positive effects on the willingness to spend more than the face value* (because a consumer who uses the coupon long after its purchase has forgotten the "pain" of the initial disbursement).

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[23] Source: "What makes Groupon Promotions profitable for businesses?"- Uptal M. Dholakia- Rice University- 2011

[24] Source: "What makes Groupon Promotions profitable for businesses?"- Uptal M. Dholakia- Rice University- 2011

-Firm employees' satisfaction: The long-term purpose of a merchant using coupons to attract new customers is to transform the highest possible percentage of them into repeated and loyal customers.

According to professor Dholakia and the other authors, the element that drives the merchants towards this ultimate long-term goal is the satisfaction of the firm's employees.

Professor Dholakia (2011) argues that *"although the social promotion's characteristics can bring new customers to the business and influence their behaviour on the occasion when the coupon in used, how their employees view them and treat them will influence whether longer-term benefits accrue to the business."*

The reason why employees' satisfaction might be relevant is that, employees may perceive coupon buyers as "bad customers" because they are less inclined to give gratuities, which in some Countries like the United States represent a large share of an employee's salary.

More customers to serve and lower gratuities may negatively influence the behaviour of employees who could work less professionally; the result could be a low-quality perception by the customers and the consequent decision not to come back again.

The above motivations lead the literature to the common belief that *the more the employees are satisfied of the offer, the higher will be the quality perception by the customers and the probability that they will become repeat buyers.*[25]

Employees should be trained and more compensated by the employers for this special kind of customers in order to increase their satisfaction.

An important contribution to this cause has been given by two important papers written by Edelman, Jaffe and Kominers (2011)[26]; and by Dholakia (2011).

The first work tries to put itself in a merchant's side and tries to understand, through an empirical model, which are the most profitable levels of price discount, face value and redeem period to offer for a successful promotion.

The second paper instead, focuses the attention on the four elements previously described and tries to understand which ones have a bigger impact on the success of an offer.

We want to focus our attention on this second article because of the importance of the results obtained and in order to get useful insights for the elaboration of the thesis.

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[25] Source: "What makes Groupon Promotions profitable for businesses?"- Uptal M. Dholakia- Rice University- 2011

[26] Paper: "To Groupon or not to Groupon: The profitability of deep discounts." – Edelman, Jaffe, Kominers-2011

1.3. The Surveys and the Regression Tests

The purpose of professor Dholakia's work was to test whether the three drivers were effectively what influence the profitability of an offer and whether the four elements affected the drivers in the same manner or not; finally, the result have been tested through a comparison with real data.

In order to accomplish his goal, Dholakia and his team conducted two surveys among firms that ran and completed coupon promotions:

-The first survey was run between June 2009 and August 2010, where a total of 150 US firms have been interviewed and have answered a set of questions.

- The second one between August 2010 and March 2011, where a total of 324 US firms have been interviewed and have answered a set of questions.

Once completed the surveys, the importance of the three drivers and the effects of the four features on *acquisition of new customers*, *spending beyond face value* and *repeated purchases* have been tested by means of regression techniques.[27]

The results of the regression studies show that:

a) Among the three drivers of profitability, only two of them turned to be significant predictors of a profitable coupon promotion: *New customer acquisition efficacy* and the *Percentage returning for full price purchase*.

   On the contrary, merchants do not perceive the percentage of customers that spend more than the coupon's face value as an important element.

b) The *coupon's face value* and the *redemption duration* affect the acquisition of new customers, whereas the depth of price discount is not a significant predictor.

   More precisely, a higher face value makes the coupon offer more attractive for buyers, but the level of discount offered does not influence the attractiveness of the offer.

   The redemption period has two effects: from the consumers' point of view, the longer the redemption period, the more the offer will be attractive; but at the same time, from the merchants' point of view, the longer the redemption period, the lower the possibility to have a profitable offer.

c) The *coupon's face value* and the *depth of the discount* have a strong impact on the willingness to spend beyond the coupon's value.

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[27] Source: "What makes Groupon Promotions profitable for businesses?"- Uptal M. Dholakia- Rice University- 2011

In particular, as it was expected, the higher the face value, the lower the willingness to spend more and, vice versa, the deeper the discount, the higher the willingness to spend more.

Different from expectations, the *redemption period* is not a significant predictor of the willingness to spend beyond the coupon's value.

d) The *employees' satisfaction* turned to be a strong predictor of the conversion of coupon users into long-term loyal customers.

Results show how high employees' satisfaction (interpreted as a proxy of how much employees accept these kind of customers and how much professionally they will serve them), the higher is the probability to reach the long-term objective.[28]

The result of the regression studies are illustrated in *Table 2* and *Table 3* reported below.

Table 2: Regression of daily deal profitability on consumer behaviour

Variable	Standardized Regression Coefficient	t-value	p-value
% of customers that were new	.25	2.60**	.01
Avg. amount spent by new customers	-.08	-.66	.51
% of deal users who spent beyond deal value	.07	.80	.43
Avg. amount spent beyond deal value	.18	1.62	.11
% of deal users that became repeat buyers	.18	2.12**	.04
Avg. amount spent by repeat customers on next visit	-.08	-.89	.38
% of unredeemed deals when promotion ended	.20	2.47**	.02
LivingSocial	-.01	-.12	.91
OpenTable	.10	1.18	.24
Travelzoo	-.08	-.90	.37
BuyWithMe	.01	.07	.94
Age of business	.17	1.97**	.05
Annual revenue of business	.01	.12	.91

ªDependent variable is profitability of the daily deal promotion reported by respondents; **indicates statistically significant coefficient at the p=.05 level of significance; *indicates statistically significant coefficient at the p = .10 level of significance

Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Dholakia 2011

Table 3: Regression of daily deal profitability on deal characteristics

Variable	Standardized Regression Coefficient	t-value	p-value
Daily deal face value	.16	1.97**	.05
% discount off regular price	.01	.14	.89
Redemption duration	-.17	-2.05**	.04
Whether upper limit placed on number of daily deals sold	.18	2.24**	.02
Age of business	.08	1.00	.31
Annual revenue of business	-.08	-.91	.36
Time since the daily deal appeared in days	-.04	-.42	.68

[a]Dependent variable is profitability of the daily deal promotion reported by respondents; **indicates statistically significant coefficient at the p=.05 level of significance; *indicates statistically significant coefficient at the p = .10 level of significance

Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Dholakia 2011

The analysis of the coupons' characteristics suggests that to maximize the probability to have a successful and a profitable promotion, merchants should be able to negotiate with the coupon sellers:

"Promotions on relatively high face value products, with a moderate discount (no more than 25% off) and a relatively short redemption period."[29]

Figure 16 summarizes the structure of the coupons' profitability and its drivers.

It focuses on the Groupon Company, but it is representative of all the other competitors too.

The picture represents the complete framework of what determine a profitable coupon promotion; only in case the promotion will be considered lucrative and suitable by the merchants they will be likely to promote another offer on the coupon sellers' platforms and to recommend to other local businesses to use them.

These two last actions are the ultimate goals of Groupon and similar companies; they will be successful only if merchants continue to use them and the number of users increases over time.

Figure 16 allows us to get another important insight; the profitability of the offer is important both for merchants and coupons sellers, which have to guarantee the success of their promotions in reaching both short and long-term goals in order to survive in the long-run.

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[29] Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Uptal. M. Dholakia, Rice University – June 2011

Figure 16: Conceptual model of Social Promotion Profitability
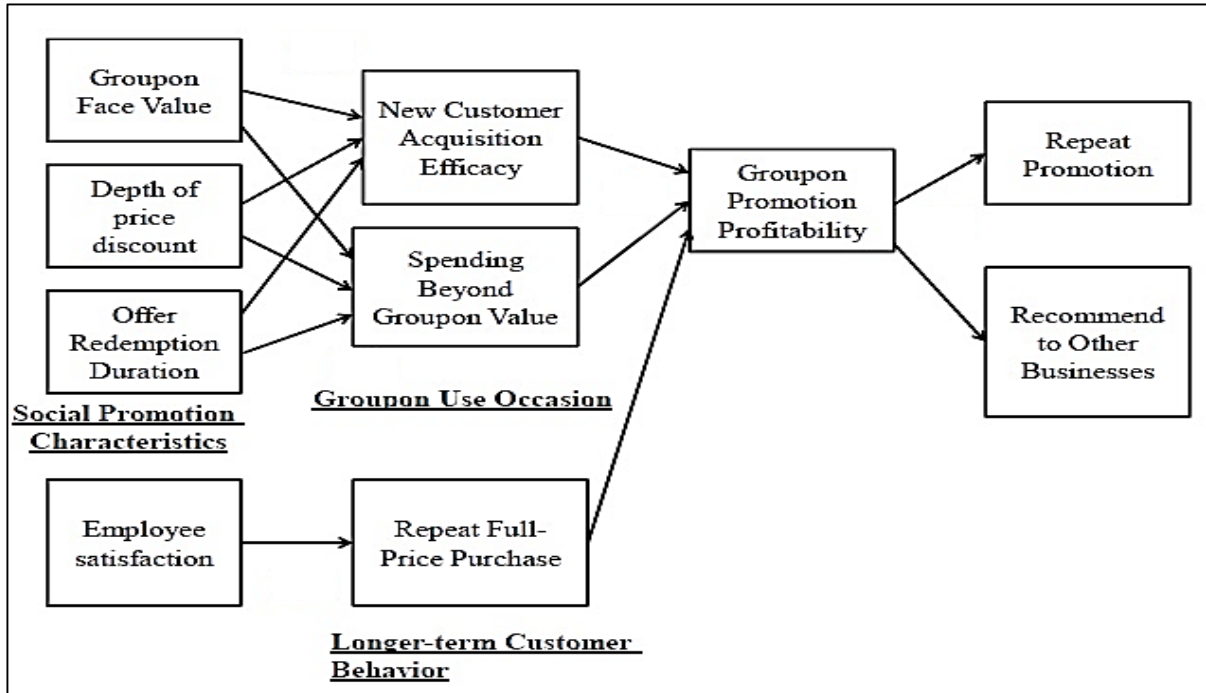
Source: "What makes Groupon Promotions profitable for businesses?"- Uptal M. Dholakia- Rice University- 2011

1.4. Regression Tests' results in the Real World

The previous section has described which are the elements that make a coupon offer profitable for merchants, as well as the features of it that have an impact (positive or negative) on the probability to have a successful promotion.

A further step made by professor Dholakia was to look at the real world in order to understand whether the company operating in the industry were effectively able to reach all the above-mentioned objectives.

A well-structured business model should help guarantee the accomplishment of both short and long-term merchants' goals, with the logical consequence that most of local businesses will be willing to use the coupon platforms again; contributing to the success of the industry and its companies.

Different papers report the results of the survey conducted by the professor Dholakia (2011) and his team on 324 US companies between August 2010 and March 2011.[30]

The survey let us get useful insights about the business models adopted by coupon sellers like Groupon.

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[30] Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Uptal. M. Dholakia, Rice University – June 2011

The first question that comes to mind after having understood the merchants' goals is whether, on average, these local businesses make or lose money running a coupon promotion.

Figure 17 helps us answer the question: it reports the percentage of the interviewed firms that made money, lost money or broke even after running a coupon promotion, divided by the type of coupon platform used.

Figure 17: Incidence of profitable and unprofitable promotions by daily site
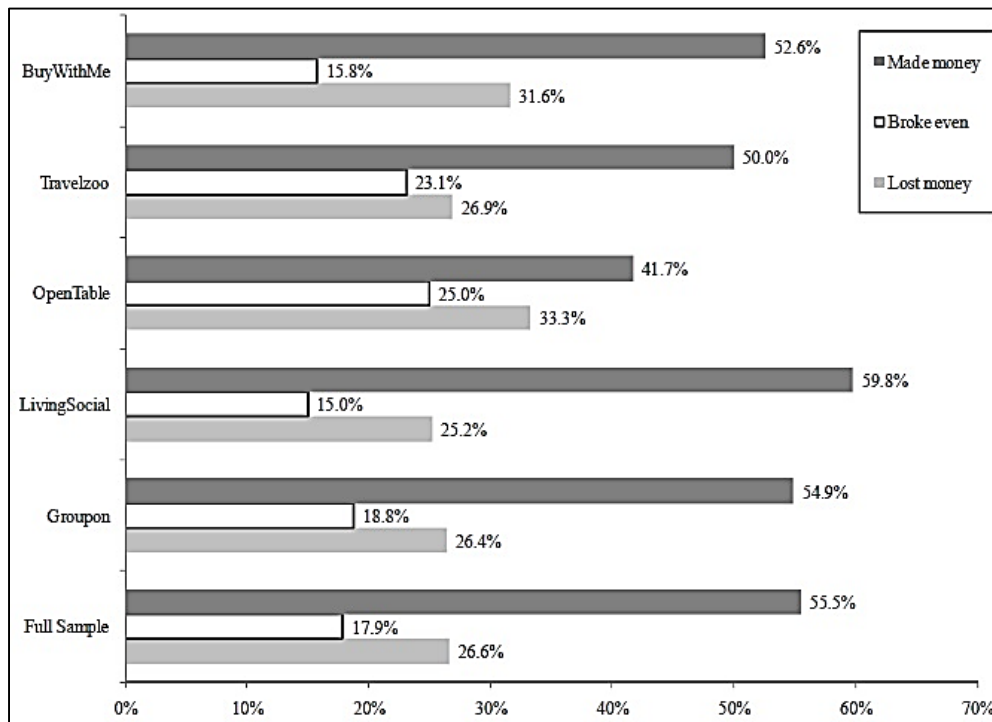
Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Dholakia 2011

Regardless of the platform used, the majority of local businesses made money with a coupon promotion.

On average, 55.5% of respondents made money, whereas just over a quarter (26.6%) lost money; the remainder 17.9% broke even.[31]

The comparison also shows that no significant differences are observed across platforms in terms of incidence of profitable and unprofitable daily promotions.

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[31] Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Uptal. M. Dholakia, Rice University – June 2011

The results essentially confirmed the outcome of the previous survey conducted in August 2010, when the 66% of companies affirmed to have made money and the 33% affirmed to have lost money.[32]

Results shown in *Figure 17* suggest that, for what concerns the short-term period, coupon promotion seems to be a good tool for making money.

The majority of local businesses reported a gain from the promotions and only a small fraction declared to have registered a loss.

The results of the two surveys lead us to state that:

"Coupon promotions allow on average local businesses to make money on the promotions and to reach their short-term goal."

Merchants run coupon promotions for a number of reasons: in the short-run they aim to gain new customers, try to encourage the new customers to spend more than the only coupon's face value and hope to gain a profit from the promotion.

With a more long-term view, the main goal is the transformation of coupon users in to loyal customers who routinely come back and buy the merchants' goods.

Do the coupon promotion allow merchants to reach all their goals?

Table 4 helps to answer this question,

Table 4: Average levels of customer behaviour metrics by daily deal site

| Customer Behavior Metrics	Full Sample	Groupon	LivingSocial	OpenTable	Travelzoo	BuyWithMe
% of customers that were new	79.2%	77.6%	83.0%	51.4%	85.3%	81.1%
Avg. amount spent by new customers	$64.3	$46.0	$84.5	$127.3	$62.8	$50.9
% of deal users who spent beyond deal value	35.9%	36.7%	34.3%	67.2%	21.3%	40.7%
Avg. amount spent beyond deal value	$60.2	$47.0	$93.5	$37.3	$24.2	$29.8
% of deal users that became repeat buyers	19.9%	20.4%	18.7%	30.0%	18.0%	22.0%
Avg. amount spent by repeat customers on next visit	$70.8	$69.6	$73.0	$103.3	$61.3	$66.5
% of unredeemed deals when promotion ended	21.7%	23.4%	20.9%	13.4%	18.1%	18.5%
Number of deals sold	913	1,205	562	665	723	NA

Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Uptal. M. Dholakia, Rice University – June 2011

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[32] Source: How effective are Groupon promotions for businesses? – Uptal M. Dholakia, Rice University – September 201

Table 4 illustrates that coupon promotions have been a powerful tool for reaching and attracting new customers (on average, almost 80% of coupon users were new customers), but, among the coupon buyers, only 35% spent more than the face value of the coupon and, more importantly, only a small fraction became loyal customers.

The average percentage of coupon users that after having tried the merchants' goods decided to come back and to buy again at full price is 20%; the percentage is very low relative to the merchants' expectations and it cannot be considered a satisfying result.

Figures reported in *Table 4* lead to the following additional conclusions:

- Coupon promotions are a successful tool for reaching and attracting new customers to the merchants' activities.

- The percentage of coupon buyers that spend more than the coupon's face value is not as high as the local businesses would like it to be.

- The long-term goal to transform the coupon users into repeated and loyal customers appears not to be satisfied.

The team running the survey in 2011 concluded his analysis stating that:

" By their very nature, daily deal promotions appear to be limited in their abilities to (1) attract free-spending consumers, and (2) to convert deal-users into repeat buyers with the propensity to be relational with, and loyal to, the business afterwards. We can call this a **Structural Weakness** *of the daily deal model in the sense that it is inherent to a marketing program that is based primarily on deep discounting, and thus it is common to all daily deal sites and all daily deal marketing programs."[33]*

It has been demonstrated that coupon sales allow local merchants to reach some of their short-term objectives but they are weak tools in order to accomplish their long-term goal to gain loyal and repeat customers.

To understand whether the business model adopted by Groupon and other platforms can be considered sustainable in the long-run, the attention must be focused on the merchants' decisions to repeat the coupon promotion or not.

It has been illustrated how the sale of coupons, in the way it is set today, helps in reaching short-term goals, but it is essentially useless for the accomplishment of the long-term objective.

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[33] Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Uptal. M. Dholakia, Rice University – June 2011

The question is if this is sufficient to make merchants happy about the coupon promotions and to run another offer, or if the transformation of new buyers into loyal customers has a predominant role in the merchants' minds.

The best way to assess the happiness of local businesses is to look at the percentage of firms that are willing to set another offer by means of coupon sellers' websites after having run a first promotion.

Figure 18 shows the answer to the question: *"Will you run another daily deal promotion in the future?"* proposed to the companies in the survey of 2011.

Figure 18: Intentions to run another daily deal promotion by daily deal site
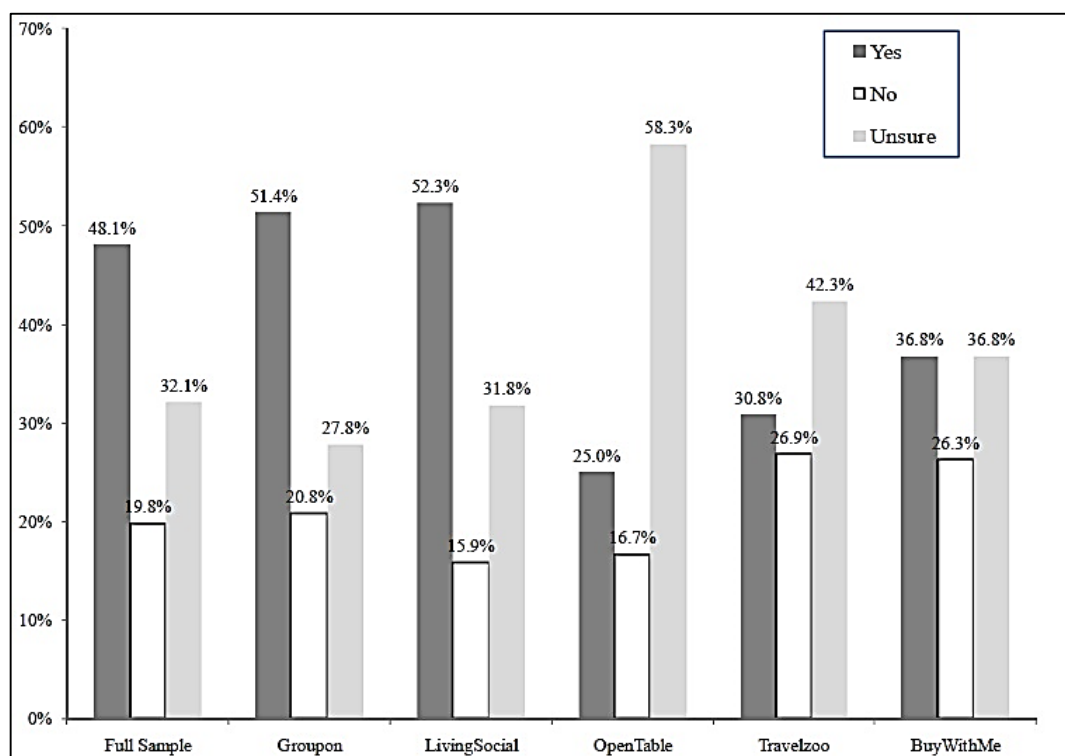
Source: Source: How Business fare with daily deals: a multi-site analysis of Groupon, LivingSocial, OpenTable, Travelzoo and BuyWithMe promotions – Uptal. M. Dholakia, Rice University – June 2011

A little less than half of the companies considered (48.1%) indicated that they would run a second coupon promotion; around 20% declared they would not, and approximately 32% said that they were unsure about the answer.

Figure 18 illustrates that Groupon and the other coupon sellers have substantial problems in keeping their first-time commercial partners and in convincing them to run a second promotion. This suggests that merchants give strong importance to their long-run goal to gain loyal customers and that the satisfaction of the short-term objectives alone is not sufficient to convince them to repeat the promotion.

This inability of Groupon and the other firms to keep the existing customers and to attract new ones will almost certainly lead to troubled periods in the future.

The same conclusion has been given by the professor Dholakia (2011), where it has been stated that:

"The numbers continue to raise serious questions from the standpoint of future sustainability and growth of the daily deal promotion industry. Any industry which is able to convert less than half of the customers who try its services into certain second-time buyers (i.e. those saying yes, they will run another deal) is likely to run into trouble finding enough customers (in this case merchants) to sustain itself at some point in the future."

The studies about the literature on the Coupon Industry, together with the financial analysis of Groupon Inc. and its competitors, raise doubts on the sustainability in the long period of the business model used in the Coupon Sales Industry.

It also worth to remind that the surveys have been concluded in the years 2009-2011, at the beginning of the coupon phenomenon and almost two years before companies started facing financial troubles.

The risk is that some elements do not work properly in the way this offers are run, making in this way the business model unsuitable for the sustainability of the industry.

2. The Concept of Irrationality and Self-control in the Business World

Evidences show that the business model adopted by companies in the Coupon Industry, as it is structured now, does not seem to guarantee the long-term success of the business.

In particular, promotions have a strong focus on the short-term horizon (acquisition of new customers and short-term profitability), whereas little attention has been put on the long-term objective of merchants, (the transformation of coupon users into loyal customers) which is what in turn lead to a repeat use of coupon sellers' services.

Professor Dholakia (2010) suggests proposing promotions that reward the recurring customers more than the transactional ones; rather than promoting the total purchase amount during a visit, it should be split on more than one visits. (i.e. instead of offering 60€ worth of food for 30€, a restaurant should offer 20€ worth of food for 10€ on each of the consumer's next three visits).[34]

Only offering low prices for a series of purchases, the buyer will build a repetitive behaviour and it will be more likely to come back to the merchant once the promotion has finished.

The research of a solution is focused on the consumer's side, in the sense that the current literature identifies the "weak point" in the consumers' rationale.

Coupon buyers need to be treated differently from other buyers because of their nature of being interested only in prices and, consequently, standard offers that are based on rational behaviours of consumers cannot be successful with these different types of customers.

Furthermore, the literature has identified what should be the lever able to increase the probability that the consumers come back again; according to it, the *employees' satisfaction* is the key to augment the chances to convince customers to buy a second time.

At this point, we would like to take a different path and propose an alternative reasoning. This thesis sustain that, differently from the standard belief, coupon buyers are potential loyal customers for local businesses; they, as the other consumers, are interested in the quality of what they buy and the coupon experience is a particular way for testing new products/services without incurring in excessive disbursements.

We believe that *it is not a matter of employees' satisfaction, but it is directly in the merchants' interests to ensure the highest quality; only guaranteeing the best service will increase the probability to transform a coupon user into a loyal customer.*

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[34] Source: How effective are Groupon promotions for businesses?- Uptail. M. Dholakia - 2010

This new point of view does not yet change the results obtained by the researches showing a low rate customers coming a second time and neither helps answer the question *"Why is this percentage is so low?"*.

In order to find an explanation, we consider the possibility that merchants do not always act rationally and, in particular, may be affected by self-control problems when, after joining the coupon platform, they have to make decisions consistent with their initial business plan.

Irrationality of human being is a well-known reality, people's decisions are influenced by emotions, (fear, positivity, urgency, laziness, etc.) and, most of the time, although the subject knows which would be the best solution, it ends up taking the wrong decision because of irrational mechanisms.

Although irrationality and self-control are largely present in the private citizens' life, they should not enter the business world, where companies (and their managers) should base their decisions on thorough studies and business plans.

What would happen if self-control problems entered the business world influencing business decisions?

We believe that, for its structure and its business model, the Coupon Sales Industry represents a case where these self-control problems are encouraged by the nature of the business, which forces the merchants to wait future periods before getting the whole benefits from the promotions.

Irrational actions end up with complicate not only the merchants' performances, but also the coupon sellers' ones, which strictly depend on merchants' decisions.

3. Time Preferences and Self-control

"The core theory used in economics is built on a simple but powerful model of behaviour: Individuals make choices so as to maximize a utility function, using the information available, and processing this information appropriately.
Individuals' preferences are assumed to be time-consistent."[35]

The previous sentence (Della Vigna-2009) summarizes two important elements supported by the majority of economic theories: the existence of a utility function to be maximized and the presence of inter-temporal decisions to be faced by individuals.

Classic economists elaborated a series of models and theories based on the two elements above mentioned, most of them assuming *standard behaviours* and *time-consistent preferences* as two fundamental characteristics of the individuals.

According to the standard theories, individuals take decisions in order to maximize their utility function, as expressed by the function:

$$\max_{x_i^t \in X_i} \sum_{t=0}^{\infty} \delta^t \sum_{s_t \in S_t} p(s_t) U(x_i^t | s_t)$$

According to the equation, individual *i* at time *t = 0* maximizes the expected utility subject to a probability distribution *p(s)* of the states of the world *s*ϵS.

The utility function U(x|s) is defined over the payoff x_i^t of player *i* and the future utility is discounted with a (time-consistent) discount factor δ.

This model implies, as stated above, that the discount factor δ is time-consistent; this does not mean that it is constant over the period, but that it take into consideration that future values in different periods in time have different present values and so, it normally increases as the period considered increases.

The following equation is an example of how the discount factor changes according to the standard discount theory:

$$U = u_t + \delta u_{t+1} + \delta^2 u_{t+2} + \delta^3 u_{t+3} + \cdots$$

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[35] Source: Psychology and Economics: Evidence from the Field – Journal of Economic Literature-Stefano DellaVigna,2009

The standard utility function accepted by the majority of economic theories represents the behaviour of *rational* individuals; who take decisions based on a thorough analysis of the information available and that correctly take the time-effect into account.

For many years, the Discount Utility Model (DU) has been accepted and used all over the world but, over the last two decades, empirical researches on inter-temporal choices have documented various inadequacies of the DU model as a descriptive model of behaviours.

First, empirically observed discount rates are not constant over time, but appear to decline; Furthermore, discount rates vary across different types of inter-temporal choices: gains are discounted more than losses, small amounts more than large amounts, and explicit sequences of multiple outcomes are discounted differently than outcomes considered singly.

The evidence suggests that individuals constantly deviate from the standard theory in the decision making process, opening new possible theories about the way in which they maximize their utility functions.

The thesis that we would like to propose bases its fundamentals on the literature that sustains that the DU model is no longer the best instrument to apply for understanding the reasoning beyond individuals' decisions.

Stefano DellaVigna (2009) stands out for the way in which he lists different thesis and the existence of deviations from the standard theory in his paper.

DellaVigna (2009) sustains that differently from what the standard theory affirms, individuals do not always have standard preferences; on the contrary most of them base their decisions on nonstandard preferences.

The same nonstandard preferences were already been considered in a series of other articles and readings, like the ones written by Frederick, Loewenstein, O'Donoghue (2002)[36]and by David Laisbon (1997)[37], who for the first time proposed the idea of non-standard preferences and hyperbolic discounting.

The discovery of non-standard and irrational behaviours allowed the implementation of new theories about human behaviours and decision-making processes.

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[36] Article: Time discounting and time preference: a critical review – Journal of economics literature-2002
[37] Article: Golden eggs and hyperbolic discounting-1997

Nonstandard preferences.

Nonstandard preferences refer to three different classes of preference:

- *Risk preferences*
- *Social preferences*
- *Time preferences*

The first type of preferences (*risk preferences*) explains how individuals have different perception of risk than the way in which the standard theory affirms; they tend to be more risk averse with regard to losses than they are with respect to gains.

The second deviation from the DU model arises with respect to *social preferences*; in this case, the authors of the different models sustain that individuals are not completely selfish, but they care also about the other people's satisfaction and they take this element into consideration when asked to take decisions.

Among the three classes, the *time preferences* are the most important for the scope of this work. Time preferences bring about *self-control problems* that are not considered in the standard model.

As described above, the DU model use a discount factor between any two periods which is time-consistent and that is independent on when the utility is evaluated; the theory is not sustained by the evidence, in fact experiments and tests suggest that the discount factor is steeper in the immediate future that in the further future.[38]

The fact that the discount factor is steeper in the immediate means that when evaluating outcomes in the distant future, individuals are patient and give them a certain discount rate.

As the future gets near, the discounting gets steep and people attribute to the outcomes a different importance; this means that individuals are time-inconsistent.

To express the fact that an individual has time-inconsistent preferences, the DU model has been modified in order to take the time-inconsistency into consideration and the *Hyperbolic Discounting Model* (HD) has been created.

According to the Hyperbolic Discounting Model, people tend to under evaluate the importance of future outcomes when they appears to be far from now, whereas they tend to increase the importance when the outcomes is getting close.

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[38] Source: Psychology and Economics: Evidence from the Field – Journal of Economic Literature-Stefano DellaVigna,2009

The Hyperbolic Discounting Model very well describes the humans' conducts in presence of *investment and leisure goods*.

- *Investment goods* require efforts at present and deliver happiness tomorrow; physical activity, searching for a job, doing homework or studying are examples of this category of goods.

- *Leisure goods* usually provide an immediate reward, at future cost; consumption of tempting food, watching TV or smoking cigarettes are examples of this category of good.

In presence of such goods, the majority of individuals at time 0 recognize the importance of the investment goods and know that the best thing would be to consume more investment goods that the leisure ones.

Subsequently, when they should take actions at time 1, they decide to use more leisure goods because of the discount rate has become steeper and to make an effort today is less convenient that getting a benefit.

This helps to explain the behaviour of many individuals that make plan on their physical activities, conscious that tomorrow it will be the best thing to do without giving so much importance to the effort it requires; when tomorrow comes they give more importance to the physical effort (and so the cost) and the best thing to do changes.

The consequence of such an "irrational" behaviour is that individuals will end up with postponing the physical activity without starting it.

The new issues that can arise from behaviours like this are called *self-control problems*; individuals have to recognize the presence of time-inconsistency and irrationality in their decision-making processes and have to try to stay focus on the initial decision, without changing it as the time goes on.

The Hyperbolic Discounting Model modifies the DU model, by taking into consideration the time-inconsistency characteristic of individuals' behaviours, the new discounting model according to the authors of the HD model becomes:

$$U = u_t + \beta\delta u_{t+1} + \beta\delta^2 u_{t+2} + \beta\delta^3 u_{t+3} + \cdots$$

The equation, formalized by David Laisbon (1997) and O'Donogue (1999), differs from the standard model only for the parameter β.

The parameter β captures the self-control problems; it can be $0 \leq \beta \leq 1$.

For $\beta < 1$, time-inconsistency is present; the discounting between the present and the future is higher than between any future time periods.

The more β gets close to 0, the less the individual gives importance to the future events.

For $\beta= 1$, it means that the individual is fully rational and the model reduces to the standard model.

It worth to notice that, differently from the discount factor δ, the parameter β remains constant over the different periods and it does not take into consideration time-differences; individuals tends to evaluate with the same importance outcomes that appears to be more (or less) far in the future, without making distinction among them.[39]

The Hyperbolic Discount Model has an important consequence, it sustains that since individuals tend to give more importance to outcomes that are near in the future, their best decision may also change over time; what is the best thing now, may not be any longer tomorrow (as the example of physical activity).

One of the aspects strictly related with the HD model, it the concept of *Naivetè*.

O'Donoghue and Rabin (1999) introduced the Naivetè in the HD model by introducing *Future Time Preferences.*

Individuals thinking about their preferences in a future perspective can be *sophisticated or naïve.*

A *sophisticated* individual is the person who knows about self-control problems, knows that it will be likely to change its mind and so it includes the parameter β in discounting future outcomes or, tries to fix some constrains to keep the same idea also in the future.

On the contrary, a *naïve* individual is the one who strongly believes that it will be able to maintain the same ideas over time, or the one who ignore the time-inconsistency attitude.

It will not include the β parameter in its model or it will be given a value of β=1 (the individual believes to keep the same idea).

A good example of self-control problems and time inconsistency may be represented by the experiment conducted by Dan Ariely and Klaus Wertenbroch (2002), which aims to observe how the above mentioned elements affects the behaviours of students with regard to their homework.

The experiment was divided into two stages, in the first round the subjects were fifty-one professionals enrolled in a section of a semester-longer executive education class at Sloan (MIT), with three homework as a requirement.

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[39] Source: Psychology and Economics: Evidence from the Field – Journal of Economic Literature-Stefano DellaVigna,2009

At the beginning of the semester they were asked to set binding deadlines for each of the three homework; according to the standard model, the best thing to do was to set all the deadlines for the last day of the semester since there were no benefits in setting one of them before.

According to the model that take self-control and time inconsistency into consideration, instead, the deadline is a *powerful commitment device* that a sophisticated individual should use to force himself to work every day and to finish in time.

The explanation of this reasoning is that the homework, like the physical activity, represents an *investment good*, (an effort today, for a benefit tomorrow) and individuals are likely to spend less time on it than they wish to ex ante.

Without a deadline, or by setting it the last day possible, students would end up with dedicating time to the homework only in the last days; a deadline forces them to spend more time on the assignment.

The result of the experiment supports the self-control model, in fact 68% of the subjects set the deadlines for weeks prior to the last week, indicating a demand for commitment.

The second stage of the experiment wanted to verify if the presence of deadlines improves the performances and, whether the subjects are able to set them optimally.

With this objective in mind, sixty students were asked to complete three assignments in 21 days; the students were divided in three groups.

The first group had no deadlines, the second group was asked to set the three deadlines as they wanted and the last group was given three equal-spaced deadlines.

Results show how the group without deadline obtained the lowest grade, whereas the third group did significantly better than the other two groups.

This provides evidence of partial naiveté about the self-control problems, people often believe to be able to keep their initial intention also in the future.

A Model of Self-control in the Coupon Industry

1. The Thesis

The previous section has described the standard model adopted by many economic theories to explain the way in which individuals (most of the time consumers) take decisions and maximize their utility functions.

Last years have seen the birth of doubts about the sustainability of the standard model and the elaboration of alternative theories, among which, the Hyperbolic Discounting model appears to be more realistic and more suitable than the standard one.

So far, the literature focused its attention on the consumers' side, explaining how the three deviation classes impact the decisions of individuals such as consumers, investors and savers. It also sustains that firms, employers, financial operators and all the other business people are expected to be rational and not affected by irrational behaviours.

The justification that many authors give with respect to this thesis, is the fact that *experience* helps to reduce irrationality.

People working in the business world, are expected to accumulate experience in the field of taking decisions and maximize profits and utility; for this reason they should be conscious about the existence of such irrational behaviours and so, be ready to act in order to minimize their effects.

Experience is what leads different authors to sustain that irrationality does not influence the business decisions, or it has a very limited impact on them.[40]

This elaboration would like to propose a different thesis compared with the existing ones:

Based on the Hyperbolic Discounting Model and its implications, we sustain that it is also representative of the decision processes adopted by many firms; in particular, the small and medium companies where entrepreneurs are still the subjects who take decisions according to their beliefs.

According to this new thesis, self-control problems enter the business world and strongly influence the entrepreneurs' decisions, which ultimately lead to the success or the failure of the

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[40] Source: Psychology and Economics: Evidence from the Field – Journal of Economic Literature-Stefano DellaVigna,2009

company. Although it should not happen, we believe that entrepreneurs and managers are not perfectly rationale and their behaviours are not immune from irrationality.

We chose the Coupon Sales Industry as the vehicle by means of which trying to explain how, according to our thesis, the concepts of time-inconsistency and irrationality (sustained by the Hyperbolic Discounting model) enter the business world.

As it has been possible to understand in the first part of the work, companies operating in the Coupon Sales Industry have been facing poor performances, with declining sales and worsening margins in the last years.

After having explained the context of the thesis, we will formalize it by means of a theoretical model.

We will also try to further sustain the Hypothesis 2 made in before (a possible slowdown of the entire Coupon Sales Industry), attributing the cause of it to the presence of *Irrational Human Behaviours (in the form of self-control problems)* on the merchants' side instead of on the consumers' side.

Focusing the attention on the companies' side, this thesis would like to support those authors who sustain the presence of irrationality in the business world and to demonstrate how the merchants' decisions can be strongly affected by self-control problems of human beings.

2. The Theoretical Model

In this section, we develop a theoretical model to formalize our hypothesis that merchants' decisions may be not fully rational because of self-control problems.

The model is based on the Hyperbolic Discounting Model described in the previous Chapter and it has been enriched with elements that are specific to the Coupon Sales Industry.

We can image a time-line and we can pinpoint three different periods:
$t = 0, \ t = 1 \ and \ t = 2$

$t = 0$	$t = 1$	$t = 2$
Decision to participate in the coupon promotion	Coupon experience	Second time purchase at full price
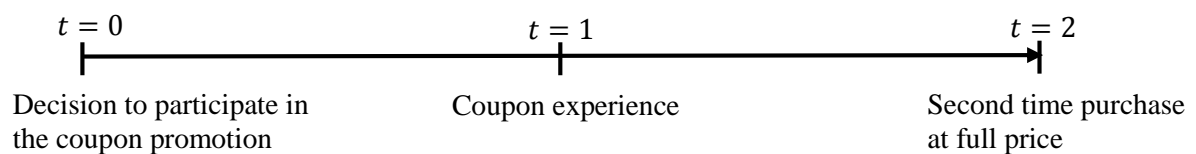
The three different t represent different *key moments* in the relationship between merchants and coupon sellers:

- $t = 0$: denotes the moment in which a merchant decides whether to sign a contract with the coupon seller company in order to promote one of its products and, in case, it decides the details of the deal together with the company.

- $t = 1$: characterises the length of period during which the coupon buyers go to the merchant's activity and use the coupon (at the discounted price) in exchange of the good or the service.

- $t = 2$: represents the period that follows the coupon promotion; in this period, consumers, who have already tried the services by means of the coupon experience, possibly come back to the merchant's shop to repeat the purchase at a full price.

In order to simplify the model with respect to the reality and to point a limit, the assumption behind the time-line is that $t = 2$ represents also the *"last period";* after which there are not other events.

In this particular context, we take the merchant's point of view and we will look at the decisions that he has to take, as well as the consequences of them.

The ultimate goal of a merchant is to maximize its profits during all the period taken into consideration; as the problem has been structured above, the time period considered is from $t = 0 \ to \ t = 2$ since afterward there are not other events.

By positioning ourselves at $t = 0$, the value of the profits can be represented by the following expression:

$$\Pi_0 = \pi_0 + \delta\pi_1 + \delta^2\pi_2$$

The equation describes the way in which a *rational merchant* would calculate its total profit, starting its calculation at $t = 0$; $\delta \in (0,1]$ identifies the discount factor utilized to take the time effect correctly into consideration.

A profit in the future has not the same value of a profit today: the further is the moment in which the future profit will be gained, the higher will be the discount factor δ (δ_{t1}^1; δ_{t2}^2) and, as a consequence, the lower will be the current value of that profit.

The model in this thesis bases its roots on the Hyperbolic Discounting theory that, differently from what described so far, sustains that human decisions are not time-consistent, and so the time-effect is not correctly interpreted.

People tend to give less importance to the future events (future profits or losses in this case) than the "correct" one; this means that, beyond the standard discount factor δ, a second discount factor that captures the self-control problems must be introduced.

Formally, for a merchant with self-control, the total discounted profit at time $t = 0$ is given by

$$\Pi_0^\beta = \pi_0 + \beta(\delta\pi_1 + \delta^2\pi_2)$$

The parameter β:

- Captures the idea that discounting is stronger between $t = 0$ and $t = 1$ than between two future periods (for example $t = 1$ and $t = 2$).

- Can take any values between zero and one ($0 \leq \beta \leq 1$), with $\beta = 1$ representing a full rational subject (no self-control problems) and $\beta = 0$ expressive of the highest level of irrationality; no matter about the value of the future profit, the subject will attribute a current value of 0 to it because it will take place in a future moment.

From the new expression, it is possible to derive two important insights:

Future profits are given further less current values because of the parameter β and, the time-effect is not correctly taken into consideration, in fact the parameter does not change as the time span increases (as it happen for the standard discount factor), but it is a common factor for all the future profits.

For the purpose of this thesis, further simplifications can be made to the previous equation that will facilitate the understanding and the calculations without altering the final outcome; in particular, it is possible to give a neutral value to π_0 and to the discount factor δ:

- $\pi_0 = 0$: at time $t = 0$ the merchant only has to decide whether join the coupon seller and promote a deal with him, or not.

This decision does not bring about any profits at $t = 0$, which can be given a value of zero in order to simply the model.

- $\delta = 1$: by giving the discount factor a value of 1, simply means that for the subjects that correctly take the time into consideration, 1 euro tomorrow has the same value of 1 euro today.

With the two simplifications, the discounted profit, at $t = 0$, for a merchant with self control problems becomes:

$$\Pi_0^\beta = \beta(\pi_1 + \pi_2)$$

It is worth to notice that, apart from the positive multiplicative constant, the expression above is identical to its "rational" version: therefore, from the $t = 0$ perspective, the optimal decision for an individual with self-control problems does not differ from the one made by an individual without self-control problems.

The last important thing to notice is that the profit expression as it has been written, represents the value of the profits calculated at time $t = 0$; if we would like to repeat the calculation but starting from the time $t = 1$, the expression would become:

$$\Pi_1^\beta = \pi_1 + \beta(\pi_2)$$

This demonstration is just to remember that the parameter β, holds only for the future profits and with the same degree, since at $t = 1$, the profit of that period is the "present profit", we do not need the parameter any longer.

Now, the merchant has to take three decisions:

1. At $t = 0$, it has to decide whether to sell its good/service in period 1 through the coupon platform ($c = 1$) or not ($c = 0$). In the former case, the price of the coupon will be equal to P_c.

2. At $t = 1$ and $t = 2$, it has to decide the quality of its good/service, which we assume can be either high (q_h) o low (q_l).

   The cost of providing high quality (C_{qh}) is larger than the cost of providing low quality (C_{ql}).

3. At $t = 1$ (if it decided not to sell its good/service through the coupon platform) and $t = 2$, it has to decide the prices of its good/service.

The profit of the merchant in each period will depend on its own decisions as well as on the behaviour of consumers.

We assume that the purchasing decision of consumers will depend on three dimensions:

1. whether they are aware of the presence of that particular merchant on the market;

2. provided they are aware of the presence of that particular merchant, on the expected quality of the good/service offered by the merchant;

3. provided they are aware of the presence of that particular merchant, on the price of the good/service offered by the merchant.

Our hypothesis is that the coupon platform has a positive *advertising effect* for the merchant, spreading information on the existence of that particular merchant on the market.

As a consequence, if the merchant joins the coupon platform, its potential demand will increase.

With regard to consumers' expectations about the quality of the good/service provided by the merchant, we assume that consumers are naïve (non-strategic).

In particular, in period 1, they expect that the quality of the good/service will be an "average" (i.e. the average between q_h and q_l).

If they consume the good/service in period 1, they will discover the actual quality and they will expect the quality to be the same in period 2; if they do not consume the good/service in period 1, they will again expect an "average" quality in period 2.

The consumers' purchasing decision can be summarized by a per-period demand function

$$D(q^e, P)$$

which is increasing in the expected quality q^e and decreasing in the price P.

The main benefit of joining the coupon platform is related to the vast visibility it provides to the merchant. To capture this "advertising effect", we assume that, if the merchant does not join it, its demand is scaled down by a factor $\lambda < 1$.

It is now possible to write the profit of the merchant in the two periods as a function of its decisions:

$$\pi_1(c = 1, q_1, P_c) = D(\tilde{q}, P_c)(\alpha P_c - C_{q1})$$
$$\pi_1(c = 0, q_1, P_1) = \lambda D(\tilde{q}, P_1)(P_1 - C_{q1})$$

$$\pi_2(c = 1, q_1, q_2, P_2) = D(q_1, P_2)(P_2 - C_{q2})$$
$$\pi_2(c = 0, q_1, q_2, P_2) = \lambda D(q_1, P_2)(P_2 - C_{q2})$$

Notice that the merchant can affect its sales in two ways.

First, through the coupon *advertising effect*: the coupon platform will extend the potential demand for the merchant, both in the first and in the second period; the cost of this advertising is a lower price in the first period.

Second, through a *quality effect*: a high quality in the first period will positively affect the demand in the second period, as consumers will update their expectations towards a better quality; the cost of this quality effect is the cost of implementing high quality in the first period.

We are particularly interested in these two decisions by the merchant: *whether to join the coupon platform* or not to exploit the advertising effect; and *what level of quality to provide in the first period*, in order to enjoy (or not) the quality effect.

In the second period it is always optimal for the merchant to set a low quality: its demand is not affected by quality in the second period, whereas its cost will be lower (in this sense, consumers are naïve, they base their expectations on period 2 quality only on the previous period quality, without taking into account the merchant's incentives).

Notice also that the optimal price in the second period will depend only on the quality chosen in the first period (given that the quality in the second period will necessarily be equal to q_l) but not on the decision to join the platform.

Therefore, we can denote by $P_2^*(q_1)$ the optimal price in the second period as a function of the quality in the first round.

Similarly, we denote by $P_1^*(q_1)$ the optimal price in the first period as a function of the quality in that period.

Finally, it worth to explain that, in the profit function, the coupon price P_c has been reduced to αP_c because of the coupon seller's fees; the merchant does not receive all the price, but only a fraction reduced by the fees.

Now, at $t = 0$, the merchant has to decide whether to join the platform or not, whereas the decision on the first period quality will be implemented at $t = 1$.

However, in order to take the optimal decision at $t = 0$ (joining the coupon platform or not), the merchant has to anticipate what will be the optimal quality in the first period.

From now on, we will focus on a merchant who, at time $t = 0$, finds it optimal to join the platform and anticipates that the optimal quality choice in period 1 will be $q_1 = q_h$.

For this to be true, it must hold that, if the merchant is rational (from now on we omit the explicit indication of the optimal values of q_2, P_1 and P_2):

$$\Pi_0(c = 1, q_1 = q_h) > \Pi_0(c = 1, q_1 = q_l)$$
$$\Pi_0(c = 1, q_1 = q_h) > \Pi_0(c = 0, q_1 = q_h)$$
$$\Pi_0(c = 1, q_1 = q_h) > \Pi_0(c = 0, q_1 = q_l)$$

Notice that, since $\Pi_0^\beta = \beta \Pi_0$, if the above inequalities hold for a rational merchant, they will hold also for a merchant with self-control problems.

In other words, also a merchant with self-control problems will decide to join the platform anticipating that the optimal quality choice in period 1 will be $q_1 = q_h$.

Now, the first inequality implies that:

$$D(\tilde{q}, P_c)(\alpha P_c - C_{qh}) + D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})$$
$$>$$
$$D(\tilde{q}, P_c)(\alpha P_c - C_{ql}) + D(q_l, P_2^*(q_l))(P_2^*(q_l) - C_{ql})$$

From the above inequality it is possible to derive the magnitude of the ***quality effect*** necessary to induce the merchant to join the platform:

$$D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql}) - D(q_l, P_2^*(q_l))(P_2^*(q_l) - C_{ql}) > D(\tilde{q}, P_c)(\alpha P_c - C_{ql}) - D(\tilde{q}, P_c)(\alpha P_c - C_{qh})$$

$$\boxed{\begin{array}{c} D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql}) - D(q_l, P_2^*(q_l))(P_2^*(q_l) - C_{ql}) \\ > \\ D(\tilde{q}, P_c)(C_{qh} - C_{ql}) \end{array}}$$

The left component of the inequality represents the "additional" profit (gained at $t = 2$) arising from the decision to serve high quality in the first period, whereas the right side represents the "additional" cost of serving higher quality.

The implication deriving from the inequality is that only in the case the *quality effect* is sufficiently strong (the additional profits are higher than the related costs) the merchant will decide to accommodate this option and to participate in the promotion.

The second inequality instead can be useful to derive the ***advertising effect;*** if adequately enhanced, it assumes the following form:

$$D(\tilde{q}, P_c)(\alpha P_c - C_{qh}) + D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})$$
$$>$$
$$\lambda D(\tilde{q}, P_1^*(q_h))(P_1^*(q_h) - C_{qh}) + \lambda D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})$$

that can be solved for λ in the following way:

$$\lambda D(\tilde{q}, P_1^*(q_h))(P_1^*(q_h) - C_{qh}) + \lambda D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})$$
$$<$$
$$D(\tilde{q}, P_c)(\alpha P_c - C_{qh}) + D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})$$

$$\boxed{\lambda < \frac{\boldsymbol{D(\tilde{q}, P_c)(\alpha P_c - C_{qh}) + D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})}}{\boldsymbol{D(\tilde{q}, P_1^*(q_h))(P_1^*(q_h) - C_{qh}) + D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})}}}$$

The implication of this second inequality is that the *advertising effect*, or in other words the difference in the expected demands due to the participation or not at the platform, must be sufficiently strong in order to lead the merchant to decide to use the coupon tool.

As stated previously, λ is a parameter $\lambda < 1$ that reduces the expected demand in case of not participation to the platform because we assume that the presence in the coupon seller's platform allow the merchant to reach a larger audience.

Under the (reasonable) assumption that the merchant would prefer high quality to low quality even if it did not join the platform, the last inequality is implied by the second: in fact, the second inequality ($\Pi_0(c = 1, q_1 = q_h) > \Pi_0(c = 0, q_1 = q_h)$), together with the assumption $\Pi_0(c = 0, q_1 = q_h) > \Pi_0(c = 0, q_1 = q_l)$, implies:

$$\boldsymbol{\Pi_0(c = 1, q_1 = q_h) > \Pi_0(c = 0, q_1 = q_l)}$$

Now, what will happen in period 1?

For a rational merchant, nothing relevant will happen: it will implement the high quality, as anticipated in period $t = 0$.

To see this, notice that, for a rational merchant, the total profit at $t = 1$ are exactly identical to those computed at $t = 0$.

Hence, we have that, for a rational merchant:

$$\Pi_1(q_1 = q_h | c = 1) > \Pi_1(q_1 = q_l | c = 1)$$

Consider, instead, a merchant with *self-control problems.*

Is it possible that this merchant changes its mind about the level of quality to implement? In other words, is it possible that:

$$\Pi_1^{\beta}(q_1 = q_h | c = 1) < \Pi_1^{\beta}(q_1 = q_l | c = 1)$$

Also in this case it is possible to understand the implication of the inequality by looking at its expanded version:

$$D(\tilde{q}, P_c)(\alpha P_c - C_{qh}) + \beta \left(D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql}) \right)$$
$$<$$
$$D(\tilde{q}, P_c)(\alpha P_c - C_{ql}) + \beta \left(D(q_l, P_2^*(q_l))(P_2^*(q_l) - C_{ql}) \right)$$

that can be solved for β in the following way:

$$\beta \left[\left(D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql}) \right) - \left(D(q_l, P_2^*(q_l))(P_2^*(q_l) - C_{ql}) \right) \right]$$
$$<$$
$$D(\tilde{q}, P_c)(\alpha P_c - C_{ql}) - D(\tilde{q}, P_c)(\alpha P_c - C_{qh})$$

$$\boxed{\beta < \frac{D(\tilde{q}, P_c)(C_{qh} - C_{ql})}{D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql}) - D(q_l, P_2^*(q_l))(P_2^*(q_l) - C_{ql})}}$$

Therefore, if β is sufficiently low, (i.e. if the self-control problem is sufficiently strong), the merchant will revise its quality decision towards a low quality.

To state that this reversal in the quality decision is a consequence of having joined the coupon platform, we need to make sure that, if the merchant had not joined the platform, it would have respected the anticipated high quality decision.

In other words, we have to make sure that:

$$\Pi_1^{\beta}(q_1 = q_h | c = 0) > \Pi_1^{\beta}(q_1 = q_l | c = 0)$$

that can be written as:

$$\lambda D(\tilde{q}, P_1^*(q_h))\big(P_1^*(q_h) - C_{qh}\big) + \beta\left(\lambda D\big(q_h, P_2^*(q_h)\big)\big(P_2^*(q_h) - C_{ql}\big)\right)$$
$$>$$
$$\lambda D(\tilde{q}, P_1^*(q_l))\big(P_1^*(q_l) - C_{ql}\big) + \beta\left(\lambda D\big(q_l, P_2^*(q_l)\big)\big(P_2^*(q_l) - C_{ql}\big)\right)$$

and solving it for β we obtain:

$$\beta\left[\left(\lambda D\big(q_h, P_2^*(q_h)\big)\big(P_2^*(q_h) - C_{ql}\big)\right) - \left(\lambda D\big(q_l, P_2^*(q_l)\big)\big(P_2^*(q_l) - C_{ql}\big)\right)\right]$$
$$>$$
$$\lambda D(\tilde{q}, P_1^*(q_l))\big(P_1^*(q_l) - C_{ql}\big) - \lambda D(\tilde{q}, P_1^*(q_h))\big(P_1^*(q_h) - C_{qh}\big)$$

$$\boxed{\beta > \frac{D(\tilde{q}, P_1^*(q_l))\big(P_1^*(q_l) - C_{ql}\big) - D(\tilde{q}, P_1^*(q_h))\big(P_1^*(q_h) - C_{qh}\big)}{D\big(q_h, P_2^*(q_h)\big)\big(P_2^*(q_h) - C_{ql}\big) - D\big(q_l, P_2^*(q_l)\big)\big(P_2^*(q_l) - C_{ql}\big)}}$$

Therefore, if β is within the interval between the two thresholds, there will be a reversal in the quality choice by the merchant, and this reversal has to be ascribed to the mere fact of joining the platform.

Finally, is it possible that the merchant, in one of the future period will regret having decided to join the platform at $t = 0$?

From the point of view of $t = 1$, what we wonder is if it possible that:

$$\Pi_1^{\beta}(q_1 = q_l | c = 1) < \Pi_1^{\beta}(q_1 = q_h | c = 0)$$

it can be verified, as the previous cases, by solving the inequality for β

$$\beta\left[\left(\lambda D\big(q_h, P_2^*(q_h)\big)\big(P_2^*(q_h) - C_{ql}\big)\right) - \left(D\big(q_l, P_2^*(q_l)\big)\big(P_2^*(q_l) - C_{ql}\big)\right)\right]$$

$$>$$

$$D(\tilde{q}, P_c)\big(\alpha P_c - C_{ql}\big) - \lambda D\big(\tilde{q}, P_1^*(q_h)\big)\big(P_1^*(q_h) - C_{qh}\big)$$

$$\boxed{\beta > \frac{D(\tilde{q}, P_c)\big(\alpha P_c - C_{ql}\big) - \lambda D\big(\tilde{q}, P_1^*(q_h)\big)\big(P_1^*(q_h) - C_{qh}\big)}{\left(\lambda D\big(q_h, P_2^*(q_h)\big)\big(P_2^*(q_h) - C_{ql}\big)\right) - \left(D\big(q_l, P_2^*(q_l)\big)\big(P_2^*(q_l) - C_{ql}\big)\right)}}$$

The result obtained above has two important implications:

- For any values of β which is above the threshold, at time $t = 1$ the merchant, who lowered the level of quality because of its self-control problems, will recognize that its profits would have been higher in case of not participation and it will regret its decision to join the platform already at $t = 1$.

- The value of this β strictly depend on the value of λ; in particular the lower the value of lambda, the higher will be the value of β.

Therefore, it is possible to state that there exist a strong relation between the value of λ and β and that, by **reducing** the a*dvertising effect* (increasing λ), the probability that merchants who suffer from self-control problems will regret the decision to participate in the coupon promotion **will be higher** (a lower β).

The last question we can ask ourselves is what could happen *ex-post,* in particular we can try to understand whether the merchant will be likely to regret the initial decision once "the game is finished".

At $t = 1$, the first round profits have been gained on the basis of the decision about the quality; whereas the $t = 2$ profits are no longer "future", this fact has as implication that in the calculation we do not use the parameter β any longer.

To verify if the merchant regrets its decision (taken at $t = 0$) it is sufficient to calculate the profits it really gained and compare them with what it could gain with different choices.

In particular, we are interested in the case where at time $t = 2$:

$$\Pi_0(c = 1, q_1 = q_l) < \Pi_0(c = 0, q_1 = q_h)$$

If this is the case, the merchant will regret having joined the platform, it decided to participate in the coupon promotion and because of its self-control problems reduced the level of quality at $t = 1$.

Ex-post (or already at $t = 1$ if the previous inequality holds) it recognizes that what it gained is lower that what it had gained if it would have not participated in the promotion.

3. A Numerical example

With the intention to give a concrete illustration of the theoretical model elaborated previously, we set up a numerical example that tries to replicate the functioning of the Coupon Sales Industry and, the Groupon Inc. company has been selected as representative of coupon sellers, whereas different local restaurants has been thought as the merchants' commercial activities.

The scope of the example is to verify how, starting from the identical environment, merchants who differ from each other only for different levels of self-control may take completely different decisions and regret them once the time considered expires.

The hypothesis behind the example is that merchants start form similar situations in terms of food offered and notoriety, which implies that prices, discount rates, expected demands and coupon prices can be considered equal for all the merchants.

The main elements of the example have been reported in the table below:

Elements	Values
Coupon price (P_c)	60€
Merchant's Coupon price portion (αP_c)	40€
Production cost for **high quality** service (C_{qh})	50€
Production cost for **low quality** service (C_{ql})	30€
Discount factor (δ)	1[41]

As we established in the theoretical section, in order to simplify the reasoning we hypothesize that there exist only two level of quality: high quality (q_h) and low quality (q_l) and that, at time $t = 1$, the level of quality expected is the average level ($\tilde{q}$).

For this specific example, we attributed the following values to the different quality levels:

Elements	Values
High quality level (q_h)	60
Low quality level (q_l)	30
Average quality level ($\tilde{q}$)	45

Merchants who will decide to participate in the Groupon promotion at $t = 1$ will automatically accept to sell their meals at the pre-defined price and to gain the established share: $\alpha P_c = 40€$.

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[41] A discount factor of value 1 has been selected for simplicity, but results don't change for different values of δ.

On the contrary, merchants who will not join the Groupon platform will sell their meals at their $t = 1$ optimal price P_1^*.

Regardless from the decision to participate or not, all the merchants will need to set their optimal prices P_2^* for the period $t = 2$, based on the quality expected by the customers.

Restaurants' owners set their optimal prices in order to maximize their profits, according to their demand function.

In the example, we hypothesize that the restaurants' demand function is linear and that it has the following expression:

$$D(q, P) = aq - bP$$

As enounced in the theoretical section, the demand $D(q, P)$ is increasing in the level of quality offered q and decreasing in the level of price set P.

In particular, we assumed the demand function to have the following expression:

$$D(q, P) = 15q - 5P$$

As stated before, merchants will set the optimal level of price in order to maximize their profits, represented by the function:

$$\Pi = D(q, P) * (P - c)$$
$$\Pi = (aq - bP) * (P - c)$$

The First Order Condition (F.O.C) rule ensures that the level of price P^* that maximizes the merchants' profits can be found by calculating the first derivative, with respect to P, and putting it equal to zero.

The optimal price we obtain is the following one:

$$P^* = \frac{aq}{2b} + \frac{c}{2}$$

Since all the elements in the expression are known, it is easy to compute the optimal prices for both $t = 1$ and $t = 2$, as well as the respective merchants' expected demands.

The calculations lead to the results reported in the table below

Optimal Price P^*	Expected Demand $D(q, P)$
$P_1^*(q_h) = 93€$	$D(\tilde{q}, P_1^*(q_h)) = 213$
$P_1^*(q_l) = 83€$	$D(\tilde{q}, P_1^*(q_l)) = 263$
$P_2^*(q_h) = 115€$	$D(q_h, P_2^*(q_h)) = 325$
$P_2^*(q_l) = 60€$	$D(q_l, P_2^*(q_l)) = 150$
$\alpha P_c = 40€$	$D(\tilde{q}, \alpha P_c) = 475$

At this point, merchants have all the elements they need at their disposal and, as explained before, they will decide to participate in the coupon promotion only if the *advertising* and the *quality effects* are sufficiently strong to justify the decision.

The elements considered lead to the following constraints:

Quality effect:

$$D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql}) - D(q_l, P_2^*(q_l))(P_2^*(q_l) - C_{ql})$$
$$>$$
$$D(\tilde{q}, P_c)(C_{qh} - C_{ql})$$

so,

$$325 * (115 - 30) - 150 * (60 - 30) > 475 * (50 - 30)$$
$$\mathbf{23.125 > 9.500}$$

The *quality effect constraint is respected*, it means that the benefits arising from serving high level of quality are larger than the costs of serving it.

Advertising effect:

$$\lambda < \frac{D(\tilde{q}, P_c)(\alpha P_c - C_{qh}) + D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})}{D(\tilde{q}, P_1^*(q_h))(P_1^*(q_h) - C_{qh}) + D(q_h, P_2^*(q_h))(P_2^*(q_h) - C_{ql})}$$

so,

$$\lambda < \frac{475 * (40 - 50) + 325 * (115 - 30)}{213 * (93 - 50) + 325 * (115 - 30)}$$
$$\mathbf{\lambda < 0.62}$$

The Advertising constraint shows that in order for the merchants to decide to join the coupon platform, the demand difference due to the coupon advertising effect (represented by the value of λ) must be sufficiently large.

It worth to remind that λ is a parameter $\lambda < 1$ that reduces the expected demand in case of not participation to the promotion because of the impossibility to reach the same audience that the coupon promotion allows to reach.

In this case, merchants will decide to join the Groupon promotion, provided that $\lambda < 0.62$.

So far we have seen how merchants have set their optimal prices and how they have elaborated the decision to participate or not in the coupon promotion.

Now on, we will focus only on those merchants that have decided to participate in the Groupon promotion and have signed a contract with Groupon's agents; these merchants cannot leave the promotion until it has expired.

As we said in the theoretical section, from the point of view of $t = 0$, merchants who decided to join the platform, also found that the best decision would be to provide a high level of quality (q_h) at $t = 1$.

The highest level of quality allows the merchants to gain from the benefits arising at $t = 2$, since we have seen that the *quality effect constraint* is largely satisfied.

At this point, we want to verify our assumptions on what might happen at $t = 1$ and in particular, we are interested in the possibility that some merchants will suddenly change their minds and will lower the level of quality because of the wrong impression to do the right thing. As it was elaborated theoretically, by taking into consideration merchants who suffer from *self-control problems,* we can introduce the parameter β in the model and we can calculate the levels of it determining whether a merchant will change his mind or not.

In particular, *we want to demonstrate that the irrational behaviour of some merchants that lead them to lower the quality (despite the $t = 0$ decision) takes place because of the participation in the coupon promotion and that merchants would not have such an irrational behaviour if they did not join the platform.*

Our purpose can be verified by calculating the β thresholds explained in a theoretical way before; as we have seen, we need to calculate the value of β_{ql}^{g} below which:

$$\Pi_1^{\beta}(q_1 = q_h | g = 1) < \Pi_1^{\beta}(q_1 = q_l | g = 1)^{42}$$
$$\boldsymbol{\beta_{ql}^{g} < 0.41}$$

For any values of $\beta < \beta_{ql}^{g}$ merchants who joined the platform will change their initial decision and, because of self-control problems, will behave irrationally lowering the level of quality from q_h to q_l.

The result obtained is not sufficient to demonstrate that the irrational behaviour is due only to the participation in the coupon promotion and, consequently, to state that the Coupon Industry may favour the birth of irrational behaviours.

To be sure about the undesired consequence of participating in coupon promotions, the previous result must be integrated with another β threshold, which give us the level of β_{qh}^{ng} above which:

$$\Pi_1^{\beta}(q_1 = q_h | g = 0) > \Pi_1^{\beta}(q_1 = q_l | g = 0)$$
$$\boldsymbol{\beta_{qh}^{ng} > 0.21}$$

For any values of $\beta > \beta_{qh}^{ng}$, merchants who have not joined the Groupon platform will not have irrational behaviours and will not lower the level of quality decided previously at $t = 0$.

Now it is possible to combine the two results, the insights we can get are particularly important for our thesis; in fact, we can observe that:

$$\beta < \beta_{qh}^{ng} < \beta < \beta_{ql}^{g} < \beta$$

- For $> \boldsymbol{0.41}$, merchants participating in the promotion have enough self-control to ignore the self-control problems, they will respect their initial decision nothing relevant will happen.

- For $< \boldsymbol{0.41}$, merchants participating in the promotion will suffer from self-control problems and will irrationally decide to lower the level of quality to q_l, because it will appear the most convenient solution at $t = 1$.

- For $> \boldsymbol{0.21}$, merchants not participating in the promotion will prefer to maintain the level of quality high and the possibility to lower it does not appear to be convenient for them.

- For $\boldsymbol{\beta < 0.21}$, merchants not participating in the promotion will change their decision and will lower the quality, serving q_l instead of q_h, because it appears to be the best alternative at $t = 1$.

We are interested in the solution that satisfy both the inequalities, or in other words, we are interested in the values of β:

$$0.21 < \beta < 0.41$$

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Merchants who have a value of β comprised between 0.21 and 0.41 will suffer from self-control problems and will lower the level of quality from q_h to q_l just because they decided to join Groupon; whereas they would have not done it if they had not participated in the promotion.

Since the decision to reduce the level of quality at $t = 1$ would not been taken in case the merchants had not participated in the Groupon promotion, we can affirm that the irrational behaviour (change in quality level) is mere due to the participation in the coupon promotion.

We have just seen how the structure of coupon promotions might lead, in case of enough strong self-control problems, to irrational behaviours that would not have taken place otherwise.
A further, and even more important, question that we asked ourselves is whether the merchants who take this decision will regret having joined the platform at some point in the future.
As we explained theoretically, in our model that takes into consideration only two future periods, it is possible to verify whether the merchants will regret in two moments: at $t = 1$ and $t = 2$
From the point of view of $t = 1$, we want to verify whether:

$$\Pi_1^\beta(q_1 = q_l | g = 1) < \Pi_1^\beta(q_1 = q_h | g = 0)$$

Before solving the inequality we must remember that, differently form the other inequalities, this one contains the parameter λ and that, as described before, the value of β strictly depends on the value of λ (i.e. the power of the advertising effect).
In order to complete the example, we need to give a value to the λ parameter; since we have already seen that λ must be < 0.62 in order for the merchants to join Groupon, we decided to assume a level of $\lambda = 0.35$.
At this point it is possible to solve the inequality for β, obtaining the threshold of β_r^g :[43]

$$\boldsymbol{\beta_r^g > 0.31}$$

For any values of $\boldsymbol{\beta > 0.31,}$ merchants' profits calculated at $t = 1$ would be higher in case of not participation to Groupon (and serving q_h) than in the case of Groupon participation (and serving q_l).

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[43] β_r^g: where c indicates the choice of Groupon and r indicates the merchants' regret

We can combine the three thresholds calculated above and look what happen when all the three inequalities are satisfied.

Our attention is focused on the case where, merchants decided to lower the level of quality just because of their participation to the Groupon promotion ($0.21 < \beta < 0.41$) and they recognize, already at $t = 1$, that their profits would have been higher operating outside the platform ($\beta > 0.31$).

In other words, we focus on:

$$0.21 < \beta < \color{red}{0.31 < \beta < 0.41}$$

For any values of β that satisfies the **red portion** of the expression, merchants participating in Groupon promotion *will lower* the level of quality served and *will regret* having joined the platform already at $t = 1$.

For any values of β that satisfies the **black portion** of the expression, merchants participating in Groupon promotion *will lower* the level of quality served, but they *will not regret* having joined the platform; at least not at $t = 1$.

Finally, we can verify whether merchants who do not regret their decision at $t = 1$, do it ex-post at $t = 2$, once the considered periods are expired.

We verify this hypothesis by simply comparing the profits gained by the merchants who lowered the quality, with the profits they would have gained without participating in the Groupon promotion (and so serving q_h):

$$\Pi_0(g = 1, q_1 = q_l) < \Pi_0(g = 0, q_1 = q_h)$$

Before solving the inequality, we need to choose a value of β; we decided to select three different values for β and to compute all the profits calculations; as reported in the table in the next page, all the expectations have been met by the numerical example.

$\lambda = 0.35$	**Profits**	$\beta_1 = 0.45$	$\beta_2 = 0.35$	$\beta_3 = 0.25$
	$\Pi_0(g = 1, q_1 = q_h)$	22.875 €	22.875 €	22.875 €
$t = 0$	$\Pi_0(g = 1, q_1 = q_l)$	9.250 €	9.250 €	9.250 €
	$\Pi_0(g = 0, q_1 = q_h)$	12.830 €	12.830 €	12.830 €
	$\Pi_0(g = 0, q_1 = q_l)$	6.398 €	6.398 €	6.398 €
	$\Pi_1(g = 1, q_1 = q_h)$	7.681 €	4.919 €	2.156 €
$t = 1$	$\Pi_1(g = 1, q_1 = q_l)$	6.775 €	6.325 €	5.875 €
	$\Pi_1(g = 0, q_1 = q_h)$	7.512€	6.545 €	5.578 €
	$\Pi_1(g = 0, q_1 = q_l)$	3.695 €	5.375 €	5.217 €
	$\Pi_0(g = 1, q_1 = q_h)$	22.875 €		
$t = 2$	$\Pi_0(g = 1, q_1 = q_l)$		9.250 €	9.250 €
	$\Pi_0(g = 0, q_1 = q_h)$	12.830 €	12.830 €	12.830 €
	$\Pi_0(g = 0, q_1 = q_l)$			

Notice that, for $\beta = 0.35$, merchants decide to lower the level of quality to serve at $t = 1$ and, at the same time they regret having joined Groupon's platform since they profits would have been higher in case of not promotion and high quality (6.545€ > 6.325€).

In the case where $\beta = 0.25$ instead, the merchants lower the level of quality, but do not regret at time $t = 1$ having joined the Groupon's platform; at that point in time, the best alternative is represented by the participation in the promotion and by serving low quality (5.875€ > 5.578€).

Finally, even if the level of β is not enough to regret the decision of having joined the promotion at $t = 1$, we can see that the merchants who lower the quality end up with regretting their initial decision ex-post, at $t = 2$; when they will discover to have gained less than what they would have gained otherwise.

In any case, merchants who regret the Groupon experience, both at $t = 1$ or $t = 2$, will be very likely to decide not to run a second coupon promotion.

To conclude the numerical example, we would like to verify the relation between the level of λ (the advertising effect) and the level of β_r^g (which indicated the merchants will regret their decision already at $t = 1$)

The above computation has been made by taking a value of $\lambda = 0.35$, which led to a value of $\beta_r^g = 0.31$.

Now we would like to see how the value of β_r^g changes by changing the value of λ; in particular we want to verify the fact that, by lowering the advertising effect, automatically merchants need a lower level of self-control problem (higher β_r^g) in order to regret having participated in the coupon promotion already at $t = 1$.
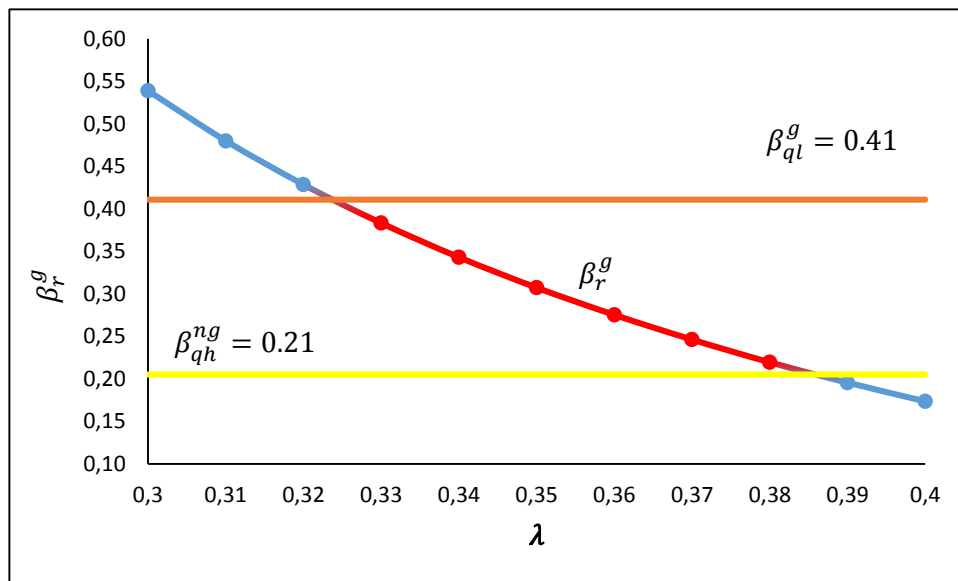
The relation has been tested by means of a sensitivity analysis and we have reported the results in the following table:

λ	0.30	0.31	0.32	0.33	0.34	**0.35**	0.36	0.37	0.38	0.39	0.40
β_r^g	0.54	0.48	0.43	0.38	0.34	**0.31**	0.28	0.25	0.22	0.20	0.17

For an easier representation, the following *Figure 19* has been elaborated.

Figure 19: Relation $\lambda - \beta_r^g$

Source: personal elaboration

Figure 19 shows the relation that there exists between the advertising effect and the parameter β_r^g; it shows that, keeping all the other elements constant, the higher the level of λ, the lower the value of β_r^g.

The consequence of such relation is that, if the advertising effect is reduced (represented by an increase in λ), the higher is the probability that a merchant that suffers from self-control problems (irrationality) regrets the decision of having joined the coupon promotion already at $t = 1$.

The space between the red and the yellow lines in the graph represents the value of β for which, in our example, the merchants will lower the level of quality because of the Groupon participation.

The blue line instead represent the values of β_r^g according to different values of λ; when these values are between the two lines (red dots), we have a fraction of merchants that regrets their decision at $t = 1$ and a fraction who does not.

The portion of merchants who, at time $t = 1$ regret the Groupon participation is represented by the distance between the red dots and the red line; notice that this distance increase as the value of λ increase, meaning that the probability to regret at $t = 1$ is higher.

The results obtained by means of the numerical example are perfectly in line with the theoretical model elaborated in the previous section; we have tried to propose an explanation to what has been underway in the Coupon Sales Industry, trying to address the issue on the merchants' side and in particularly on the presence of irrational human behaviours.

We have also tried to demonstrate that these irrational behaviours are facilitated by the structure of the business models adopted by companies operating in the Coupon Sales Industry and that they would not take place otherwise.

All the elements seems to be aligned with the results of surveys conducted by some of the most expert authors in this field and with the financial troubles most of the companies in this industry are facing during the last years.

Conclusions

The main insight of this thesis is that limited rationality may affect not only the behaviour of individuals as citizens or consumers, but may also have a relevant impact on the decisions made by firms.

After all, companies are run by managers, and managers are human beings; thus, even though managers should be trained to face complex decision problems and are subject to the rules of market, it is not guaranteed that they always take the rational decision.

In particular, in this thesis we focused on inter-temporal decisions, which, according to the rationality postulate, should always be time-consistent.

We analysed a pretty new sector: the Coupon Industry; in this industry, the decision by merchants to join the coupon platform or not is clearly an inter-temporal decision: joining the platform would entail accepting a very low price today, with the hope of having future benefits thanks to the advertisement obtained through the coupon platform.

We started from the observation that this industry, after an initial impressive boom, seems to be facing a slowdown in its expansion.

The majority of the literature with respect to the specific Coupon Industry ascribes this recent poor performance to the consumers' side, classifying the coupon' buyers as a sort of low-price hunters not interested in a stable relation with their sellers. Hence, according to this idea, sellers discover the limited usefulness of the coupon platform and, in the long-run, no seller will be willing to join it again.

We offer a different, not necessarily alternative, explanation, which looks at the merchants' side and tries to introduce the new concepts of time-inconsistency and self-control problems in the merchants' decision processes.

We propose the idea that merchants not always have rational behaviours, they are (with different intensity) affected by self-control problems and, consequently, their decisions might be time-inconsistent.

Because of this characteristic, the fraction of merchants with a sufficiently high level of self-control problems prefers to lower the quality of their service increasing the immediate profit but, on the other hand, reducing the probability of future (and bigger) benefits. These merchants end up with regretting their decision to participate in the coupon promotion.

The theoretical model by means of which we formalized the thesis and the results obtained in the numerical example seem to be in line with the initial expectations in case of presence of irrational behaviours in this industry.

All the elements came to light in the work lead us to the conclusion that, from our point of view, it cannot be excluded that the current poor performance recorded by the main companies operating in the sector of coupon sales is attributable to irrational decisions taken by the merchants who promote offers by means of coupon sellers companies.

It might be that, because of its particular structure, the business model adopted by most of the companies operating in this sector facilitates the rise of time-inconsistent choices (represented by the self-control problems) by the merchants who work with them.

The declining sales reported by the three biggest companies in this industry (Groupon, LivingSocial and Travelzoo) might be the consequence of the dissatisfaction of the merchants who do not see positive effect of the coupon promotion on their long term sales.

Consequently, merchants stop using coupon platforms, with immediate and negative effects also for companies working in this sector.

Coupons are good instruments to get a short-term profit, but the long-term goal of many merchants remains unachieved.

According to our explanation, this is not due to the coupons' characteristics themselves, but to an irrational behaviour of many merchants who, because of self-control problems, do not provide a high quality to coupon users, thus undermining the possible benefits of the coupon promotion.

Provided that what we said before it is true and that coupon sellers are likely to be exposed to irrational (and so, unpredictable) behaviours by merchants, *what actions can be taken by these companies in order to reduce the risk of undesired behaviours?*

Since most merchants are not able to recognize they are subject to self-control problems, the probability that they will correct their actions and reduce the irrational behaviours is very limited.

It would be in the interests of coupon sellers to act directly in order to address the merchants' behaviours, by inserting specific constraints in the contracts they stipulate with the merchants in order to limit the incentive to behave irrationally and to take wrong decisions.

A possible example of an initiative that these companies may take with respect to this problem, it to convert the system used to pay the merchants their portion of revenues.

As it is currently structured, merchants are asked to collect all the coupons that consumers bring to them during the coupon experience; at the expiration of the redeemable period the collected coupon are sent to the company, which will pay the merchants' price share.

An alternative to the current structure might be represented by a *"review payment system"*, based on customers' opinions on the experience and paying the merchants the full portion in case of positive feedbacks and penalizing them in case of negative ones.

The system would tempt less merchants to deviate from serving high quality because of the risk of being paid only partially; consequently, the possibility to change their initial decision does not appear so convenient any longer.

The implementation of a review payment system is not as simple as it would appear; despite the creation of such a structure will reduce the incentives to behave irrationally, it would give an enormous power to the consumers.

Different quality perceptions could lead to negative reviews by some customers with undesired consequences for some merchants, for this reason it must be avoided the error to move possible irrational conducts from the merchants to the consumers' side in the implementation of the system.

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