Institute of Management

University of St.Gallen

Institute of Management Discussion Paper ISSN 1662-2715

Group Buying Schemes

A Sustainable Business Model?

Sebastian Köpp

Aliaksei Mukhachou

Markus Schwaninger (Supervision)

Nr. 58 - October 2012

University of St. Gallen, Switzerland

Graduate School of Business, Economics, Law and Social Sciences

Chapter Outline

1. Introduction 1
1.1. Problem Articulation 2
1.2. Boundary Selection 3
2. Business Model 4
2.1. Legal Issues with Group Buying Business Models 6
3. Dynamic Hypothesis 8
4. Building the Model 12
4.1. Causal Loop Diagram 12
4.1.1. The Basic Loop 12
4.1.2. The Loyal Customers 13
4.1.3. Earnings Tree 14
4.2. Stock and Flow Diagram 14
4.2.1. The Main Stocks and Flows 14
4.2.2. Main Balancing and Reinforcing Loops 17
4.2.3. The Simulation Model 19
5. Simulations 21
6. Policy Formulation & Evaluation 25
6.1. Sensitivity Tests 30
7. Conclusion 32
Acknowledgement 34
List of references 34
Appendices 36
Appendix 1. Formulas 36
Appendix 2.Testing & Validating the Model 41
1. Direct Structure Tests 41
A. Structure and Parameter Examination Tests 41
B. Direct Extreme Condition Tests 43
C. Dimensional Consistency Test (Unit Check) 44
2. Indirect Structure Tests 44
A. Indirect Extreme Condition Tests 44
B. Behavior Sensitivity Tests 44
C. Integration Error Tests 44
3. Tests of Model Behavior 46
4. Further Aspects of Model Quality 47
A. Refutability of Theory 47
B. Importance 47
C. Precision and Clarity 47
D. Parsimony and Simplicity 48
E. Comprehensiveness 49
F. Operationality 49
G. Validity 49
H. Reliability 49
I. Fruitfulness 49
J. Practicality 49

List of Figures

Figure 1: Market Trend of Groupon Share Prices (Reuters) 2
Figure 2: Groupon Business Model (below) Compared to Traditional Business Model (above) 4
Figure 3: Groupon Revenue model 5
Figure 4: Sample System Generating an Overshoot and Collapse-Pattern Sterman (2000), p. 123 9
Figure 5: Group Buying System Generating an Overshoot and Collapse-Pattern 10
Figure 6: Overshoot and Collapse Pattern 11
Figure 7: CLD - The Basic Loop 12
Figure 8: CLD - The Loyal Customers 13
Figure 9: CLD - Earnings and Costs in the CLD 14
Figure 10: The Three Types of Customers 16
Figure 11: The Dependence of the Merchants on the Expected ROI 16
Figure 12: The Interrelation between Employees and Number of Merchants 17
Figure 13: The Connection of Merchants and Loyal Customers 17
Figure 14: The Effect of the Number of Groupon Employees on the Coupons Sold. 18
Figure 15: The Saturation Point of the Participating Merchants 18
Figure 16: The Complete Vensim Model 20
Figure 17: Number of Merchants Participating and Groupon's Accumulated Earnings 21
Figure 18: Simulation (Discount and Fee are fixed rates) 23
Figure 19: Simulation (Endogenizing the Groupon Fee) 26
Figure 20: Simulation (Endogenizing the Discount and the Fee) 29
Figure 21: Fractional Groupon Fee and Discount Rate Comparison 29
Figure 22: Sensitivity Analysis (Groupon Earnings) 30
Figure 23: Sensitivity Analysis (Accumulated Groupon Earnings) 31

List of Tables

Table 1: Formulas 36
Table 2: List of Exogenous Variables 41
Table 3: List of Start Values of Stocks 43

1. Introduction

Group Buying Schemes (GBS) represent a business model that has emerged over the last few years. That business has been pioneered by Groupon, one of the famous internet start-ups. Founded in 2008, that enterprise pursues the idea of exploiting the phenomenon of group buying: The rationale is that merchants can expand their customer bases, while customers thrive on bargains offered by the merchants, the trigger being discount prices linked to a system of coupons which give access to these perks.

Since the internet start-up Groupon was founded, it has gained massive attention. This swift take-off derived first from eager shoppers in search of the next great bargain and soon thereafter from the business world due to the firm's reports of enormous revenue growth. This beginning encouraged the emergence of numerous Groupon copycats in different countries, such as DeinDeal in Switzerland. Takeover bids from prominent internet companies such as Yahoo and Google in late 2010 followed, with offers of three billion dollars and 5.3 billion dollars respectively. Groupon, however, rejected both bids and aggressively pushed forward its IPO. On November 4, 2011, Groupon went public, offering 5% of its shares and raising 700 million dollars. Groupon's valuation at that point was estimated at around $13 billion.

The purpose of this contribution is to examine the question of whether group buying schemes are a sustainable business model, in the sense of the long-term economic viability of the respective companies. To do this, we have chosen a reference case, the Groupon Corporation, because of both its prominence and its role in spearheading the new model. In addition, Groupon's case is highly visible. As the publicly available data are limited, we also use DeinDeal, a comparable company, as a backup case, to ensure full understanding of the business model. We conceive of a business model as the rationale of how an organization creates, delivers, and captures value (Osterwalder/Pigneur 2011).

We are going to realize a model-based inquiry, building a dynamic model by using the System Dynamics methodology (Forrester 1961, Sterman 2000), which is the ideal vehicle for modeling complex, dynamic issues such as the case under study. System Dynamics also provides a mature set of procedures for the validation of dynamic models (Barlas 1996; Schwaninger/Groesser 2009).

We proceed as follows. In this chapter, we introduce the issue which gave rise to our study, and then define the focus of that study, defining its boundaries. In Chapter 2 the business model of group buying schemes is outlined. Then, starting from a dynamic hypothesis (Chapter 3) a dynamic simulation model is developed (Chapter 4). Certain basic simulations are carried out thereafter to test our dynamic hypothesis (Chapter 5), then we proceed to policy formulation and evaluation (Chapter 6). Finally, the conclusions of the study are presented (Chapter 7). We also devote substantial effort to assuring a high-quality model, which prompts us to carry out extensive model tests. As these aspects are technical and not crucial for understanding the substantive aspects of the paper, we place the validation chapter in the Appendix (Appendix 2).

1.1. Problem Articulation

Group buying schemes have soared, at least in the case of Groupon. However, since the first takeover bids and throughout the whole IPO process, some voices in the media have been raising doubts about the long-term viability of Groupon's business model. The critics have pointed to the slowing growth of the customer base, the failure of LivingSocial, the main competitor, and Groupon's use of aggressive accounting practices, all factors which raise doubts about the economic viability of the company.

In this situation, we pursue a model that sheds light on the evolution of the company in its market. We explicitly take on a Groupon owner position, bringing our research down to the following question:

"Can Group-Buying-Scheme business models such as Groupon's be viable economically, in the long run, and, if not, what must be changed to achieve sustained viability?"

Our findings potentially could offer a critical challenge to Groupon's current business model and suggest a change in policies that could make that business model work in the long run. Mr. Adrian Locher, the founder and COO of DeinDeal, a group buying scheme in Switzerland, kindly answered some questions about the business models of both DeinDeal and Groupon in Switzerland (Locher 2012). We will take into account all such additional information, adapting and comparing it to what is known about Groupon's business model. As Groupon has not been publicly reporting its financial data until recently, it was difficult to access the relevant information. For the purpose of modeling and simulation, data gaps are filled with information from DeinDeal, which has followed a less aggressive expansion[1]. Adrian Locher has confirmed that there is a close similarity between the two companies' business models.

Currently the stock market is indicating that investors, too, are in doubt about the sustainability of Groupon's business model. This factor may account for the market trend of Groupon shares, whose stock-price volatility grew tremendously over the past six months (Figure 1).



Figure 1: Market Trend of Groupon Share Prices (Reuters)

[1] Groupon is accelerating its global growth in a more aggressive way compared to DeinDeal, thus exacerbating the boom and bust cycle Therefore, if our findings show that the business model with a conservative growth policy is unstable, then Groupon's Business Model can be expected to be even more so (transitive relation).

1.2. Boundary Selection

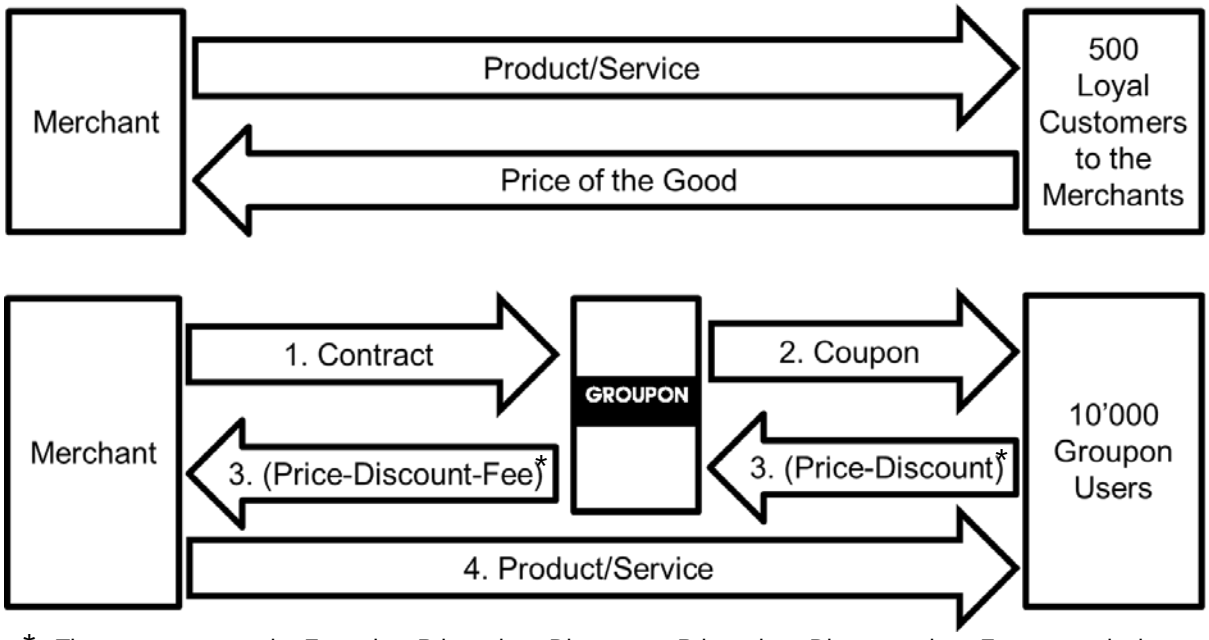
In order to handle the problem in an elegant yet rigorous way, we make certain model-specific simplifications of the real-world Groupon phenomenon.

The first simplification in the model treats Groupon as a unitary organization as opposed to the real-world segmentation by cities. Furthermore, the model does not include all of Groupon's factor markets. This means that the potential pool for sales employees, merchant partners and customers is taken as available at any time and unlimited. Nor do we model potential Groupon competitors and the related questions of strategic advantage, e.g., competition for discount levels amongst different competitors (group buying schemes) or the quality of the services behind the coupons offered. Another aspect that we exclude is the financing of Groupon's capital requirements. Even with these reductions of complexity, we assume that our model can provide new insights into the dynamics of the business model adopted by the company (see Appendix 2: Testing & Validating the model for further insights).

2. Business Model

Groupon credits itself with making group buying a lucrative business model (Figure 2). This group buying starts when contracting with a local business and arranging for the sale of its discounted product or service through Groupon's website. For consumers, this sale takes the form of a coupon – a heavily discounted offer of a good or service. This deal is executed only if a certain minimal number of people buy it. If this minimal number of buyers for a certain deal is not reached within a defined timespan, the purchasers get back their money and the coupons become useless. In this way, local businesses get the chance to promote themselves directly while ensuring cost-efficient scale. The consumer, on the other hand, gets a chance to save money with the discount. Groupon receives the payment and then transfers it to the business, deducting a certain fee, which is agreed upon in the contract with the local business.

Groupon makes its revenue by charging the merchants a fee against the *discounted price* for the coupon. At DeinDeal, this fee is fixed at 40 percent, whereas Groupon has been very flexible in its fees after individual negotiation with the merchant, according to Adrian Locher.



* : These are meant to be Formulas: Price minus Discount or Price minus Discount minus Fee respectively.

Figure 2: Groupon Business Model (below) Compared to Traditional Business Model (above)

The following Figure 3 shows some examples of Groupon's pricing policy depending on different levels of discounts and fees:

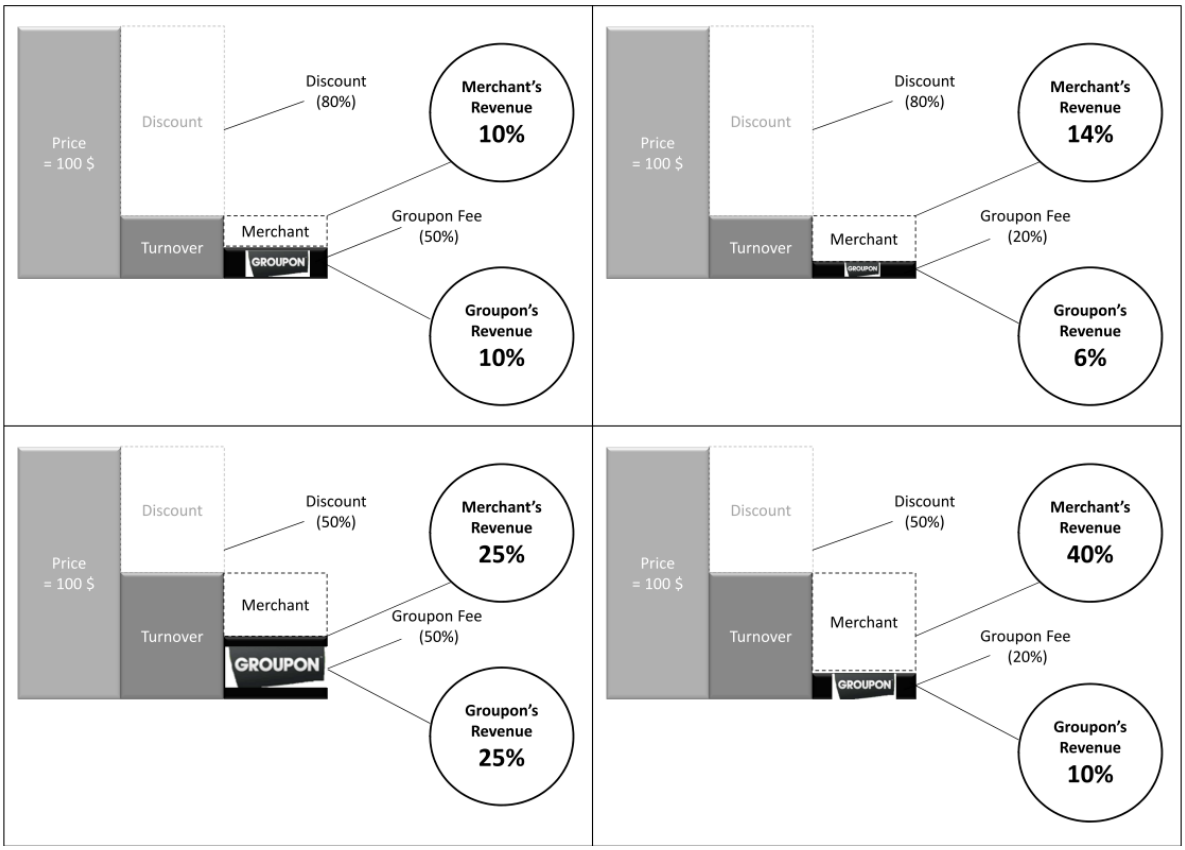


Figure 3: Groupon Revenue model

The first picture shows the standard case where starting with an original price of $ 100, a Discount[2] of 80% and a Groupon Fee of 50% on the turnover[3] are subtracted, which leaves the Merchant and Groupon equally with earnings of 10% of the original price. In the second picture on the top right, the Discount is left at 80% but the Groupon Fee is reduced to 20%, which reduces Groupon's Revenue to 6% of the original price. In the third picture, lower left, the Groupon Fee is again set at 50%, but so is the Discount as well. This increases Groupon's Revenue tremendously, to 25% of the original sales price of the service or product. On the other hand, when Groupon's Fee is reduced to 20% with a Discount of 50%, Groupon's Revenue is only 10%, as can be seen in the last picture.

A first important insight into a group buying scheme business model concerns the trade-off between discount and the group buying scheme's revenue. Its realized revenue is composed inversely of the discount and proportionally of the group buying fee (see Groupon Fee). The Groupon Fee is a percentage for splitting the Turnover between the group buying scheme and the merchant.

Therefore the higher the discount, the greater is the attractiveness of the offered service or product, but at the same time the lower is Groupon's revenue and therefore

[2] Terms in capital letters refer either to variables in the model or in figures.
[3] We define turnover as the total cash inflow from selling coupons, whereas Groupon's revenue is defined as the share (Groupon Fee) of this turnover as in figure 3. According to Groupon's balance restatement (WSJ September 23, 2011 and September 24, 2011) it previously reported turnover as revenue.

also the lower Groupon's absolute margin per coupon. The discount influences the customer's purchasing decision and thereby indirectly affects Groupon's revenue.

It is obvious that the Groupon Fee behaves variably. The Groupon Fee tackles the relationship between Groupon and the Merchants, directly influencing Groupon's Earnings. If the Groupon Fee is reduced, then, ceteris paribus, Groupon's Earnings are lowered (and the merchants' revenue is increased); but this loss can be easily compensated by slightly lowering the Discount offered on the services, since the Discount has a greater leverage effect on Groupon's Revenues. Therefore we have to look at the Discount and the Groupon Fee together as a pricing package.

Adrian Locher asserts that in the past Groupon has shown very aggressive procurement behavior in making deals, in order to provide revenue growth and lay the groundwork for a quickly-attained, high-value IPO (Initial Public Offering). This behavior includes pushing deals to the detriment of the Merchant's long-term interest, so as to accustom clients to deeply discounted prices. DeinDeal's company policy, in contrast, looks toward building a more long-term relationship with merchants, seeing them as partners for synchronizing operations and jointly ensuring a quality experience for coupon customers.

2.1. Legal Issues with Group Buying Business Models

DeinDeal uses a special procedure for transferring the merchants' share in coupon turnover. Only 70% of the Merchant's Revenue (turnover minus fee) is paid out 20 days after closure of the coupon deal. The closure of the deal means that all coupons offered in a deal were sold and the coupons become valid. The kept-back remainder of 30% is transferred only after the merchant can prove that more than 70% of the coupons sold have been cashed in. It is sensible to assume that the 30% conditional on the merchant's revenue is reduced by only a minor amount, and therefore could be accounted for as additional earnings.

At first glance this legal trick to raise revenues, by splitting up once more the Merchant's Revenue over time and over the condition that more than 70% of the coupons are cashed in, is of minor importance. On closer examination it creates an incentive for DeinDeal's merchants not to exceed their operative capacities by offering too many coupons, since the merchants will get the additional 30% of their revenue if they can prove coupons have been cashed in (see above).

Recently a cost-free Swiss daily newspaper wrote on its webpage about problematic service to customers trying to redeem their coupons from group buying schemes – mentioning Groupon explicitly. Coordination between merchants and their group buying partner was badly organized, hampering the capacity of merchants to deliver the acquired service. Customers endured long wait-times due to capacity problems, in some cases proving unable to cash in their acquired service. The service provider was overbooked until after the expiration date, which is fixed at one year after closure of the coupon deal. In addition, many customers reported deficits in service quality,

finding the discount too high and the remaining revenue for the merchant too low (Sturzenegger 2012). The issue of legal accountability remains unsolved.

3. Dynamic Hypothesis

As shown in the previous chapter the unique selling proposition and the core incentive driver of Groupon's business model is the increase of contact rate between customers and merchants through coupons. Even though the merchants do not benefit from the coupons directly, they expect to gain loyal customers and consequently a long-term rise in revenue and earnings.

Adrian Locher, COO of the Swiss Groupon competitor DeinDeal, stresses that the intention of Groupon and DeinDeal is not a classical direct-sales promotion, but a marketing instrument whose advantage is that it gets people right into the store.

We expect that this kind of business model, aligned with the current policy inputs, cannot be sustainable in the long-run. First, the aggressive fee policy together with great expectations of merchants for positive returns (Locher 2012) can potentially cause substantial inflation of both the customer and merchant bases at the outset. This initial inflation is followed by a sudden collapse of both bases, once merchants' expectations are suddenly reduced, i.e. adjusted to the reality, whereupon they stop the promotion. Moreover, we believe this adjustment would be further aggravated by the effects of service quality and discount competition on the profitability of the scheme[4]: The more merchants offer coupons, the greater the incentive of customers to avail themselves of the discounts, quality, and variety of the offer; the fewer loyal customers whom merchants acquire, the fewer merchants who will offer coupons. Therefore our dynamic hypothesis is that the business volume of Groupon, if the company pursues an unchanged business model, will show an *overshoot and collapse pattern.* In other words, Groupon's current business model will prove to be economically unviable and unsustainable in the long run.

This dynamic behavior pattern is captured in the classical model which shows how the erosion of carrying capacity, stemming from consumption, drives the state of the system into the overshoot and collapse trajectory (Figure 4).

[4] Service quality and discount competition, two competitive factors when comparing different group buying schemes among each other, are for the sake of simplicity not included in the model; see section 1.2 Boundary Selection.

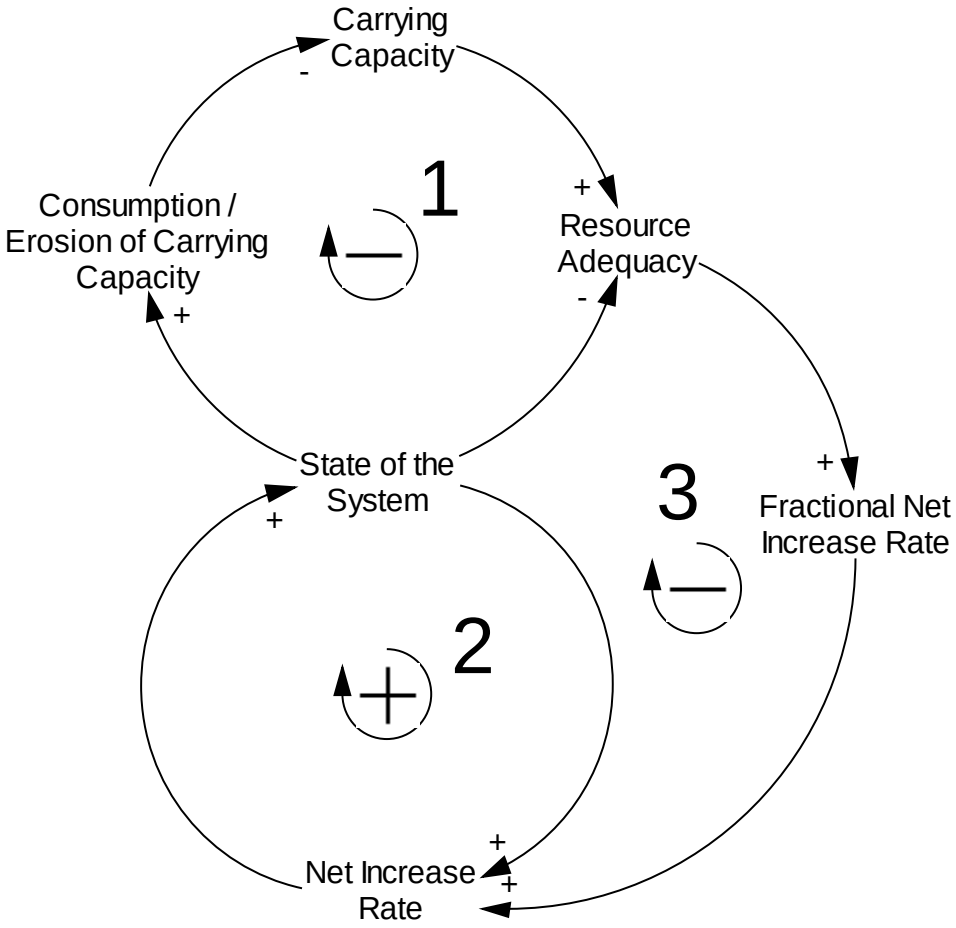


Figure 4: Sample System Generating an Overshoot and Collapse-Pattern Sterman (2000), p. 123

The reinforcing loop (loop 2) leads to a growth within the system which triggers the increase, since the bigger the State of the System the bigger the Net Increase Rate. But the State of the System also drives the Consumption/Erosion of the Carrying Capacity, which leads to a balancing loop (loop 1). This loop lessens the Resource Adequacy via reduction in Carrying Capacity. Since the bigger the system the worse the Resource Adequacy, growth of the system inherently leads to a decrease in the Fractional Net Increase Rate (loop 1 & 3). This is the diminishing counterforce on the Net Increase Rate, which at the outset is driven by the increase in the State of the System, since this loop is direct, whereas the negative impact from the other two is indirect, on the Fractional Net Increase Rate through deteriorating Resource Adequacy. With a continuously increasing State of the System, the two balancing loops (1 & 3) outweigh the reinforcing loop 2 and foster the collapse of the system after some time.

This pattern is also applicable to the Groupon business model (Figure 3).

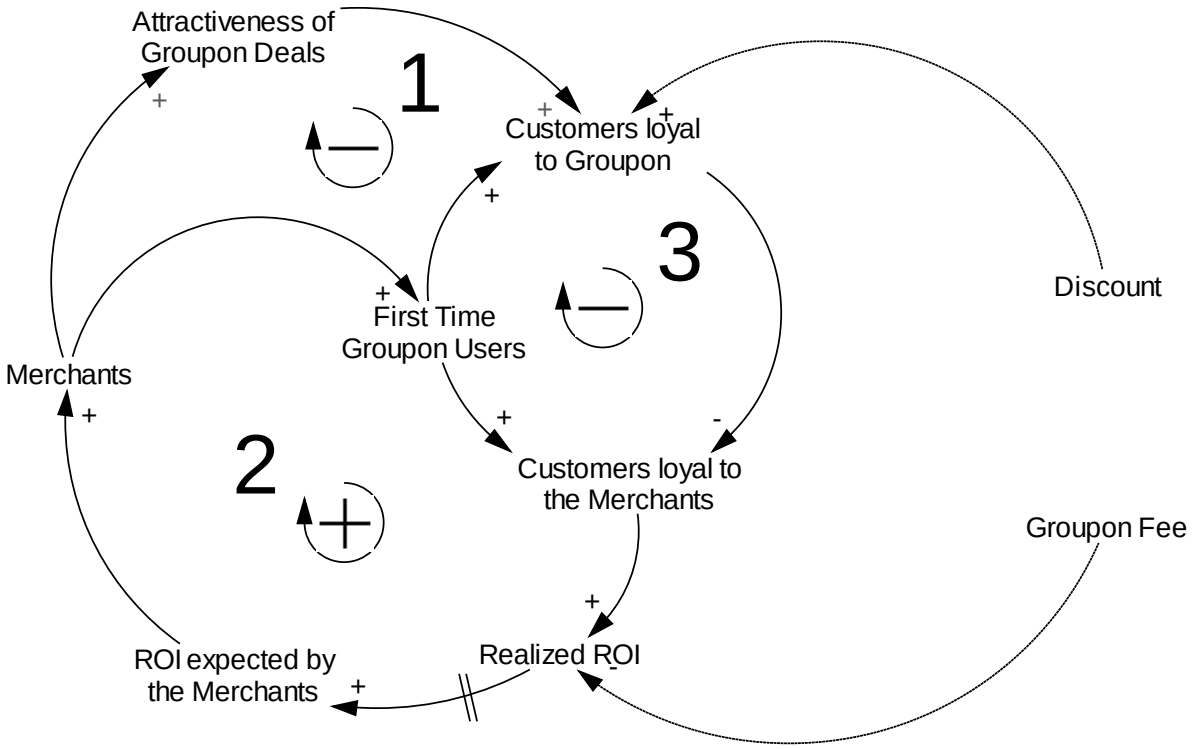


Figure 5: Group Buying System Generating an Overshoot and Collapse-Pattern

For a given number of participating merchants, the system's inherent growth is determined by the return on investment (ROI), which is expected by the Merchants when offering a Groupon deal[5] (loop 2). The measure of Return on Investment is used here as a general proxy for the profitability of a Groupon deal anticipated by the Merchants. This expectation, after a time-delay, is adjusted to the actual ROI achieved by the Merchant with the Groupon deal (Realized ROI). The value of the Realized ROI depends on how much money has been generated through newly acquired customers loyal to the Merchants in excess of the original expense for participating in the deal (see section 2. Business Model). These First-Time Groupon Users are split up between Customers loyal to the Merchants and Customers loyal to Groupon. When Groupon's deals become more attractive, i.e. through higher Discounts, this implies a higher percentage of customers becoming loyal to Groupon. By definition, Customers loyal to Groupon and Customers loyal to the Merchant are independent and disjunct. Therefore an increase in Customers loyal to Groupon reduces - for a finite number of Customers - the number of Customers loyal to the Merchants (loop 3).

The economic basis for this definition is that customers who are loyal to Groupon keep seeking discounts, as well as similar services they have consumed already through a Groupon coupon. These so called free-riders are highly price-sensitive and develop no loyalty towards any specific merchant. This means that for each merchant there remains a smaller potential customer base which could turn loyal.

At the same time, the higher the number of Merchants, the higher the probability becomes that different Merchants offer similar products and services. This itself increases the amount of Groupon free-riders since the attractiveness of Groupon's deal offers increases (loop 1).

[5] We treat the terms Groupon deal and Groupon promotion as synonyms.

Finally, the expected ROI collapses after the feedback delay expires. Consequently, the number of participating merchants declines and the retained earnings of Groupon diminish.

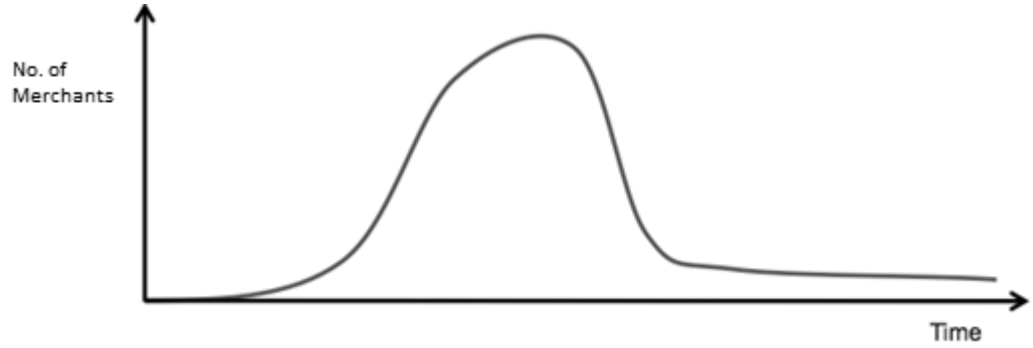


Figure 6: Overshoot and Collapse Pattern

4. Building the Model

We build the simulation model by starting with a qualitative mapping of the issues under study. For that purpose we use the CLD – Causal Loop Diagram. Based on this qualitative structure, we proceed at formulating a quantitative System Dynamics model: The CLD is transformed into a stock-and-flow diagram, the variables of that diagram are quantified, and equations are formulated that represent the connections between the variables. A simulation model results.

4.1. Causal Loop Diagram

4.1.1. The Basic Loop

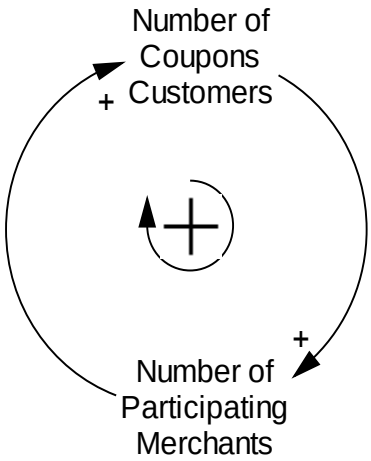


Figure 7: CLD - The Basic Loop

As identified in the second chapter, the core process under study is the formation of Groupon's B2C (business-to-customer) and B2B (business-to-business) customer bases. We start by drawing a causal loop diagram (CLD), an important tool for representing the feedback structure of systems (Sterman 2000). In context, the simplest yet crucial feedback loop represents the mutually reinforcing causal relationship between the number of merchants working with Groupon and the number of customers buying coupons (Figure 7)[6]. The economic explanation is that the more merchants offer coupons, the more people whose needs they can cater to. The more people join such a system, the more eager are merchants to participate, as they can expect greater interest from potential loyal customers.

[6] All coupons offered are also assumed to be sold.

4.1.2. The Loyal Customers

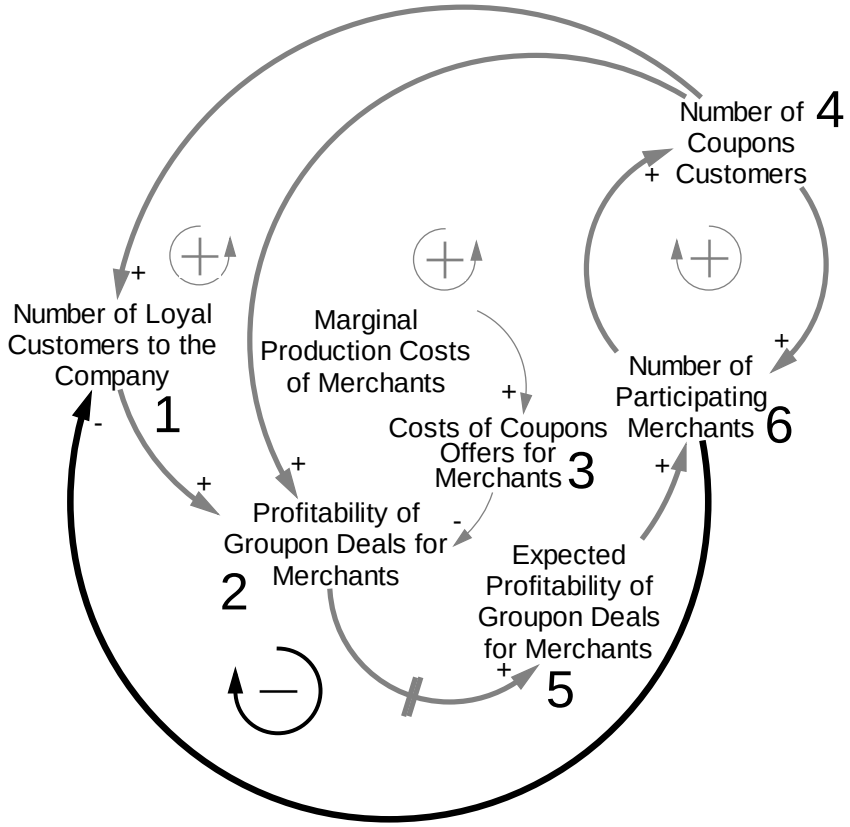


Figure 8: CLD - The Loyal Customers

As the argument above suggests, it is not just any customer whom new merchants are looking for when offering a deal through Groupon. In the long run, merchants seek to boost their earnings through the new revenue generated by an increased number of loyal customers. Therefore, while in the short run—and in more simplistic terms—merchants are motivated by the large pool of *potential* customers, what matters in the long run is the generation of earnings from new *loyal* customers, represented by the longer loop (6 → 4 → 1 → 2 → 5). Ceteris paribus, the more customers there are in the pool, the more loyal customers who will be created by a Groupon promotion and the greater the earnings generated (revenue minus the total costs for promotion). At the same time, one must keep in mind that ex-ante the earnings volume is not known by the participating merchants, but determined only in the long run (2 → 5, black loop) – hence the sign of delay between the realized earnings and its impact on expectations. This is the first feature that allows one to predict an overshoot and collapse pattern in the modeled dynamics of this system. Another feature of a balancing nature is the erosion effect that the number of merchants in the Groupon promotion has on the new loyal customers (6 → 1). The economic explanation of this causal loop is the effect of quality and competition: the more merchants there are in the model, the more likely they are to compete on discounts and quality, therefore increasing the interest among coupon buyers in living off the benefits of discounted offers from Groupon instead of loyally paying higher prices while trying nothing new. Moreover, as trivial accounting logic would suggest, the fee and discount policy (3) of Groupon has a direct influence on the profitability of its merchant customers.

4.1.3. Earnings Tree

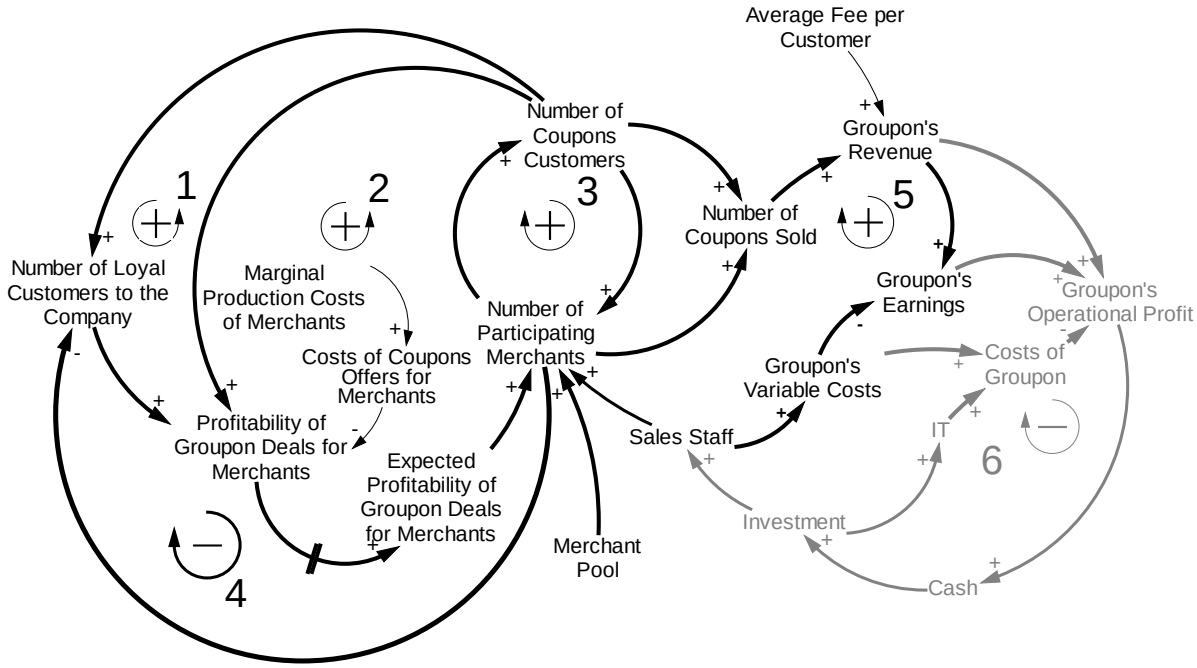


Figure 9: CLD - Earnings and Costs in the CLD

Despite these key elements which allow for overshoot and collapse/balancing features, previous causal loops (Fig. 7 – loops 1, 2 and 3) did not feature variables representing the dynamics of Groupon's balance sheet (Fig. 7 – loops 5 & 6). Therefore, besides the existing loops one needs to build up a cash diagram, featuring all the basic cash flow generated from the fractional fees on the coupons sold and expense on overheads and sales B2B force. Later in this paper, the earnings factor will emerge as the final scorecard. Thus this part of CLD should necessarily be carried forward to our stock-and-flow diagram and used in drawing final conclusions. The grey part including Groupon's fix costs are not considered of importance for evaluating the long-term sustainability of Groupon's business model. Therefore we will not speak about Groupon's profits but rather its earnings, which are defined as revenue minus variable costs (not total costs). The balancing loop number 6 will go from Groupon's Earnings directly to sales staff (in the model it is generalized to Employees).

4.2. Stock and Flow Diagram

Before presenting the full System Dynamics model[7] it is necessary to explain the main stock and flow variables. Based on these variables, it is then possible to develop the reinforcing and balancing loops which will finally lead to the fully-fledged model.

4.2.1. The Main Stocks and Flows

In the following subchapter we present the main stocks and flows relevant for our model. The heart of the model consists of the interrelation between the customers

[7] We use System Dynamics simulation software by Ventana Systems Inc, called Vensim.

and the merchants via Groupon coupons. Most important is our distinction between three types of customers.

The Customers

As Groupon is still a very young company with a tremendous growth rate, a large fraction of customers will be Groupon First Time Customers. Therefore it is a good starting point to take a closer look at the possibilities of a random first-time customer. He buys a coupon at Groupon for the first time and has an individual experience with Groupon and the merchant. Based on his shopping and service experience, the first-time customer will then have three different future actions among which to choose. **Option 1:** He neither likes Groupon nor the merchant. He won't buy any coupons in the future and therefore walks away - a customer lost for Groupon. However, this segment of customers is not crucial for the behavior of the business model. Much more important are options 2 and 3. **Option 2:** The consumer's main motivation is to absorb the excess utility from the discounts, variety, and quality of products offered as coupons. He therefore decides to keep on being a permanent Groupon user. He does not generate any future revenue for the merchant, because this kind of customer is normally interested only in discounts and the chance to experience a variety of similar products offered through the coupon scheme (Customers loyal towards Groupon). **Option 3:** The customer finds that the product offered by the merchant is outstanding in its quality and distinctiveness. Therefore this customer becomes loyal to the respective merchant, and does not take advantage of any substitute products offered as coupons by Groupon (Customers loyal towards Merchants). In this way, the merchant gets rewarded for his promotion expenses (Discount + Groupon Fee) by additional revenue and a positive return on investment.

To show this in a more comprehensible example, let us walk through the following stock-and-flow diagram (Figure 10). In this diagram, stocks are represented by boxes (e.g., the stock of Groupon First Time Customers), and flows by valves (e.g., Increase in New Customers). We start with a Customer called Anna: A hairdresser in Zurich called Max-Hair offers a Groupon deal for a women's haircut for 40 CHF instead of 100 CHF, resulting in a 60% discount. Anna, a Groupon First-Time Customer, buys the Max-Hair coupon and then has the three options as above: 1. She never buys any more similar coupons or merchant's products (Beginner Loss); 2. Anna carries on buying coupons, but does not care for buying merchants' products (Increase in Free-riders); 3. She can carry on buying the shampoo from the merchant at full price, becoming a Customer loyal towards Merchant. If the offer is very attractive and the hairdresser is doing a good job, she will not choose option 1. Whether she chooses option 3 or 2 depends mainly on the differentiation level of the hairdresser, the utility effect of the discount, and the number of similar offers at Groupon. If Groupon offers a similar coupon from a different hair dresser called Min-Hair the following month, Anna will probably buy the Min-Hair coupon and not go back as a regular customer – a loyal customer – to Max-Hair. In order to make Anna come back, Max-Hair has to deliver a service for which Anna is willing to pay the regular 100 CHF next time. This service also has to be on the same high quality level in the future, otherwise resulting in the erosion of a loyal clientele, as shown in Figure 10.

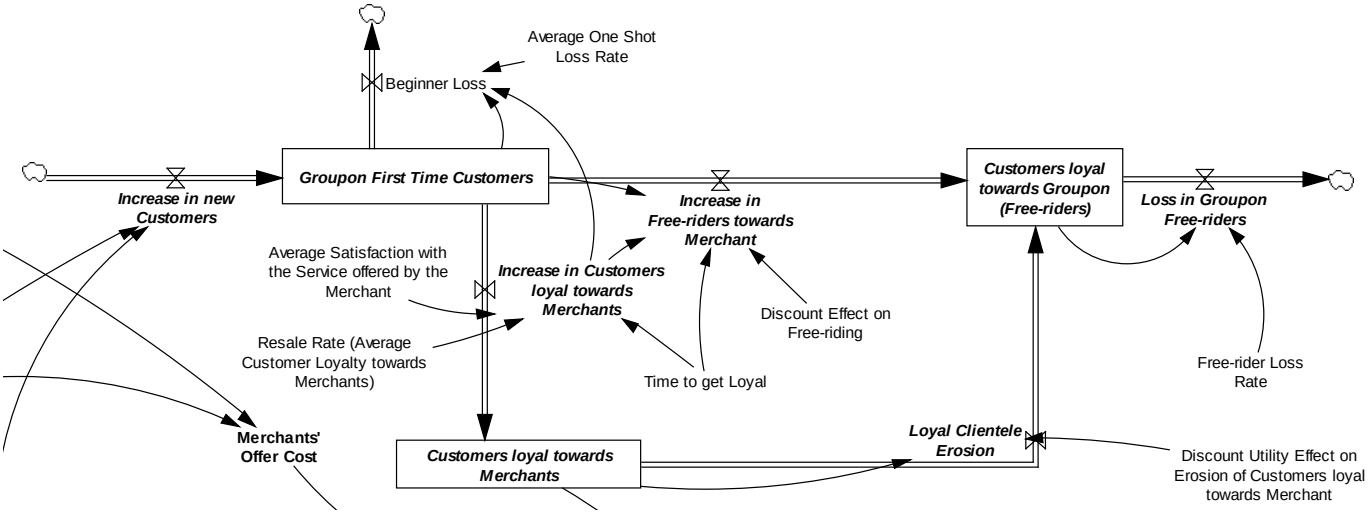


Figure 10: The Three Types of Customers

Merchants and the Dependence on the ROI

The number of merchants participating is crucial for the success of the business model (Figure 11), as they are the primary suppliers of coupons. The change in the number of Merchants depends mainly on the ROI expected by the Merchants in a Groupon deal. If this expected ROI stays positive in the long run, the number of merchants will grow (Increase in Merchants). However, as soon as customers do not return to merchants, instead becoming permanent Groupon coupon users searching for best bargains (Free-riders), the expectation on the ROI will tend to decrease, Merchant Loss being the consequence.

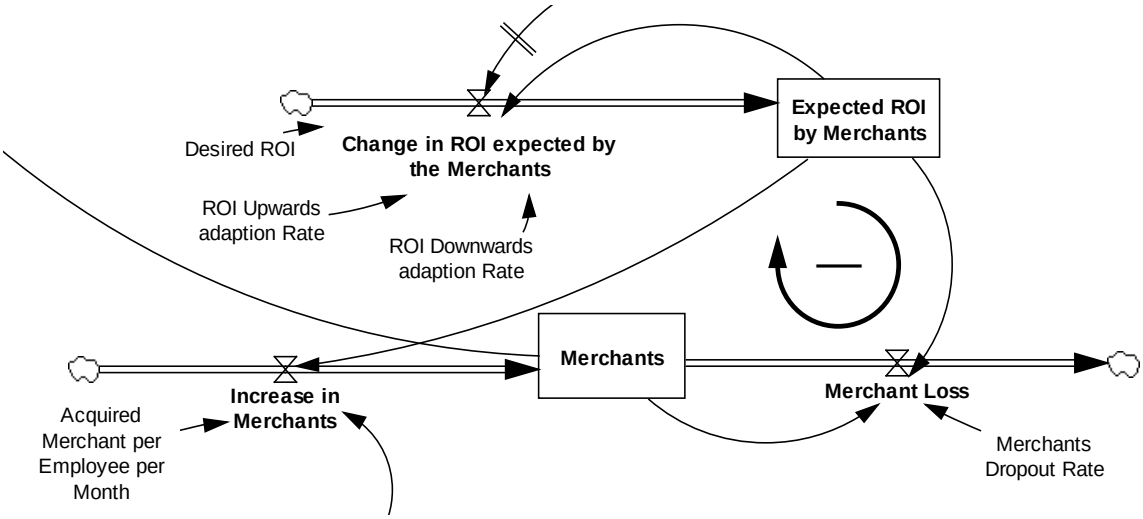


Figure 11: The Dependence of the Merchants on the Expected ROI

Employees

From Groupon's perspective, the number of merchants also depends on the number of Groupon employees (Figure 12). Only if Groupon has the capacity in terms of employees to deal with the interested merchants will it be able to transform a potential merchant into an actual merchant.

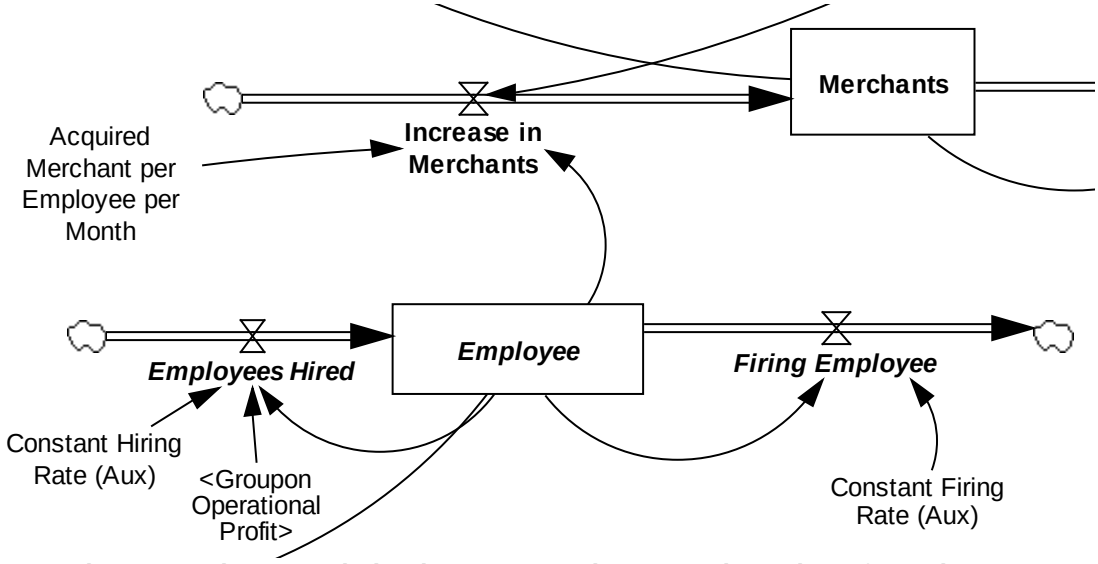


Figure 12: The Interrelation between Employees and Number of Merchants

Other Stocks and Flows

- Fractional Groupon Fee
- Discount
- Accumulated Groupon Earnings
- ROI expected by the Merchants

See Vensim model formulas in the appendix for further details.

4.2.2. Main Balancing and Reinforcing Loops

Due to the complexity of the model, the best way to show the main balancing and reinforcing loops is to present them one by one. As already presented in the CLD, the main reinforcing loop is the connection of the number of loyal customers and the number of merchants shown in figure 13. A positive polarity on each of the arrows indicates an overall reinforcing behavior.

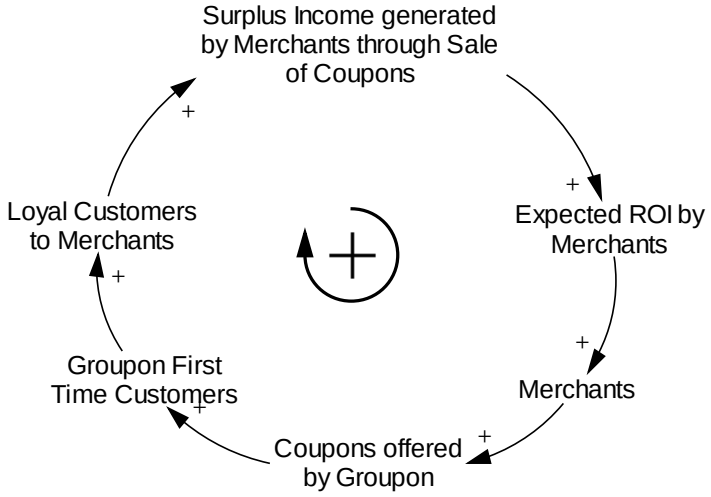


Figure 13: The Connection of Merchants and Loyal Customers

This loop is also supported by the number of Groupon employees (Figure 12).

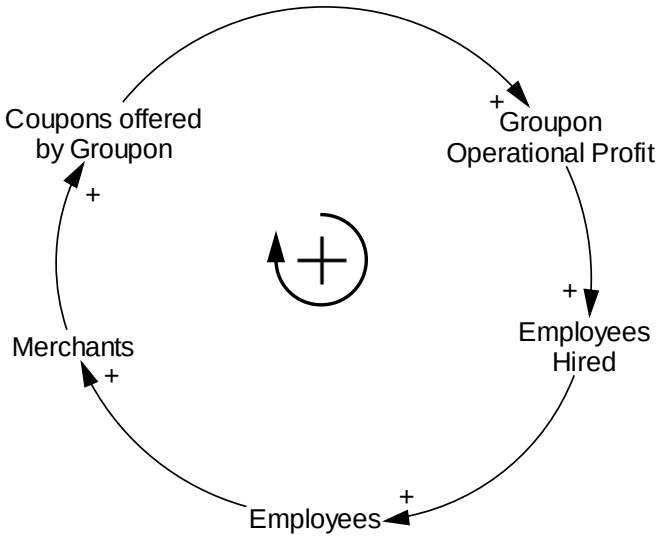


Figure 14: The Effect of the Number of Groupon Employees on the Coupons Sold

However, these reinforcing loops are decelerated by another loop, thereby creating a saturation point: The more merchants who participate with similar offers at Groupon ,the less pronounced will be the marginal impact of additional coupon offerings, resulting in a lower surplus income for each of the merchants participating (Figure 15). In other words, the market is probably still growing, but each merchant's share is getting smaller and smaller. This is even more dangerous in already saturated markets, where a price war undercutting actual costs may start.

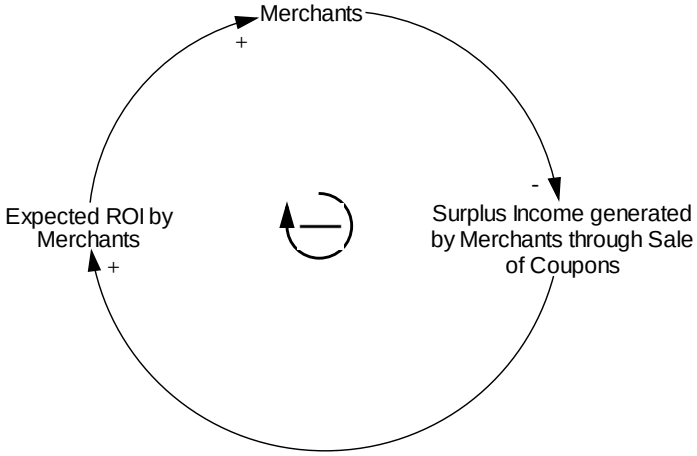


Figure 15: The Saturation Point of the Participating Merchants

There are still more loops in the model. However, the three shown above are the most important ones in determining the behavior of the model. On this level of the model, the fractional discount and Groupon fee are exogenously defined and thereby not yet part of a balancing or reinforcing loop.

4.2.3. The Simulation Model

Combining and interlinking the different stocks and flows leads us to the full simulation model (Figure 16). It was implemented by means of the Vensim software.[8]

[8] The Vensim software is available from Ventana Systems, Inc.

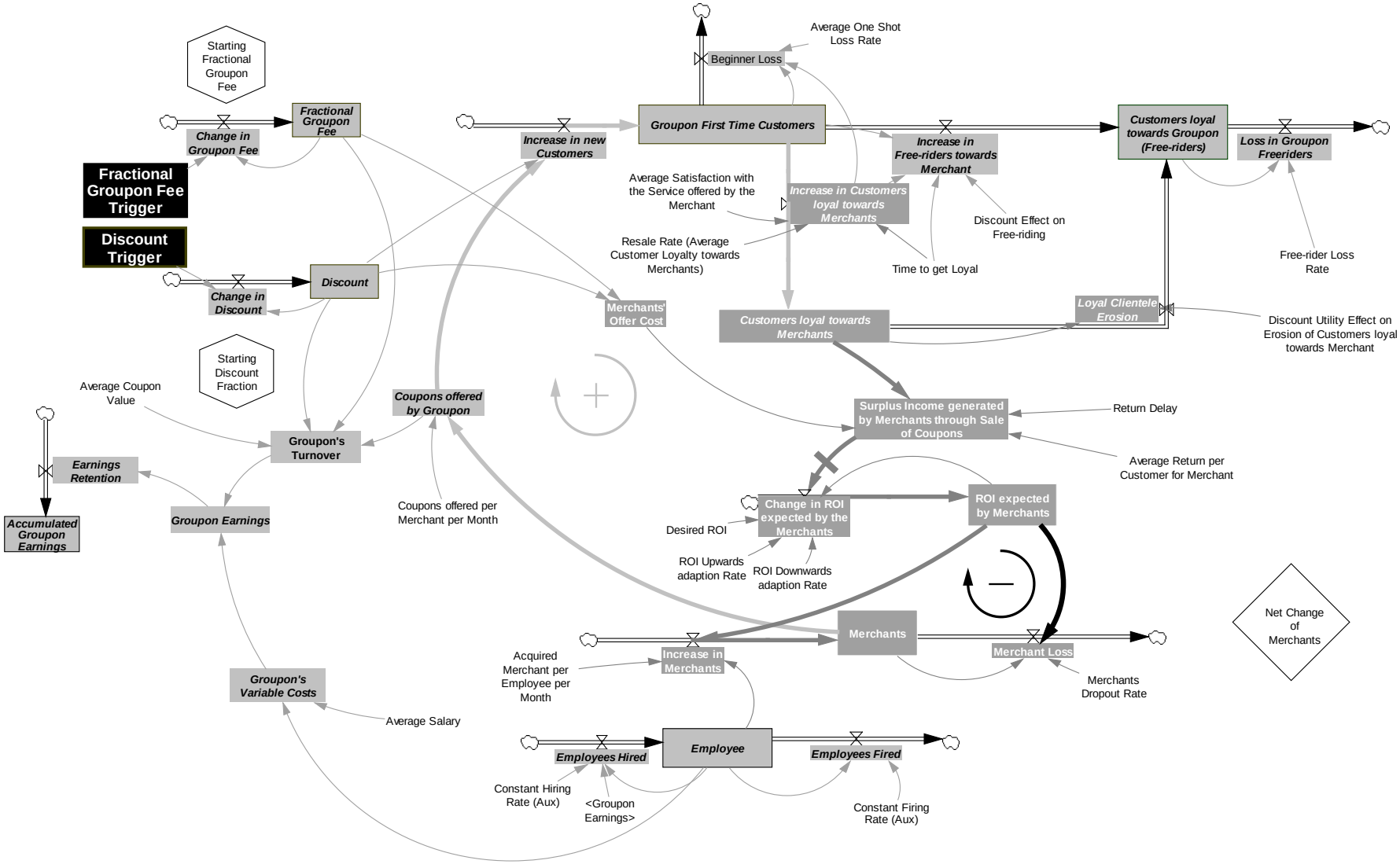


Figure 16: The Complete Vensim Model

Black background and white font are the two main decision variables' triggers. Stocks with black border are Groupon's Stocks. Groupon-related flows are in black fonts. No borders, grey background and white font (stock and flows) are the merchant-related variables. Hexagons stand for the starting values of the decision variables. The fatter arrows describe the two core loops. The initial dominance of the reinforcing loop creates overshoot behavior, while collapse is created through the transition to the dominance of the balancing loop.

5. Simulations

In the chapter above, the structure and mechanics of the model have been explained. Within this section the aim is to estimate the behavior of the key variables of the system. The most important financial indicator of the sustainability of Groupon's business model is Groupon's Earnings (monthly and accumulated).

This approach works only as long as the ROI expected by the Merchants (here and below we refer to the variables in Figure 16) is positive, that is, when the surplus income of the new customers loyal to the merchants won by Groupon overcompensates the costs paid by the merchant. These costs are defined by two variables: the Discount rate of the product offered to the final customer and the fee Groupon charges for providing the distribution platform. These two variables reduce the Surplus Income generated by merchants through Sale of Coupons; the higher the discount rate and the Groupon fee, the lower the actual ROI, which, with a delay, affects the ROI expected by the Merchants through the flow variable Change of ROI expected by the Merchants. As long as the Surplus Income generated by the Merchants through coupon sale is greater than their desired ROI, their expected ROI increases. In all the other cases it decreases. Therefore we could also measure the sustainability of Groupon's business model indirectly by looking at the ROI expected by the merchants.

Considering the high discount rates and service fees from Groupon and starting with high expectations among the merchants, an overshoot and collapse pattern will slash the Groupon Earnings due to the fact that merchants will no longer engage in Groupon, since they expect that this sort of promotion can neither generate profit nor earnings for the merchant in the long-term. Therefore, Groupon will not be able to offer any more coupons. Thus the variables of Groupon's Accumulated Earnings and the Merchants participating will show an overshoot and collapse pattern (see figure 17).

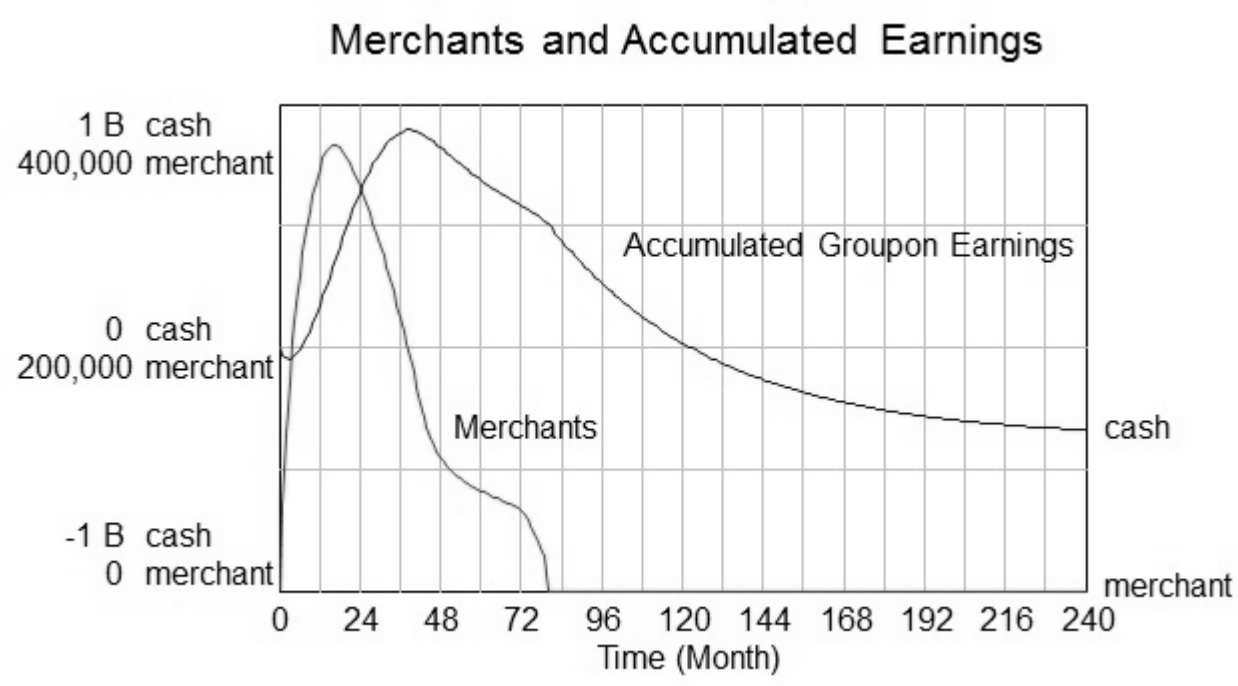


Figure 17: Number of Merchants Participating and Groupon's Accumulated Earnings

We ran a simple simulation over a 240 month period to see whether our model was reproducing an overshoot and collapse pattern as anticipated in our dynamic hypothesis. We compared the model behavior according to the dynamic hypothesis with the results of our simulation.

Our simulation delivers the following outputs (Figure 18):

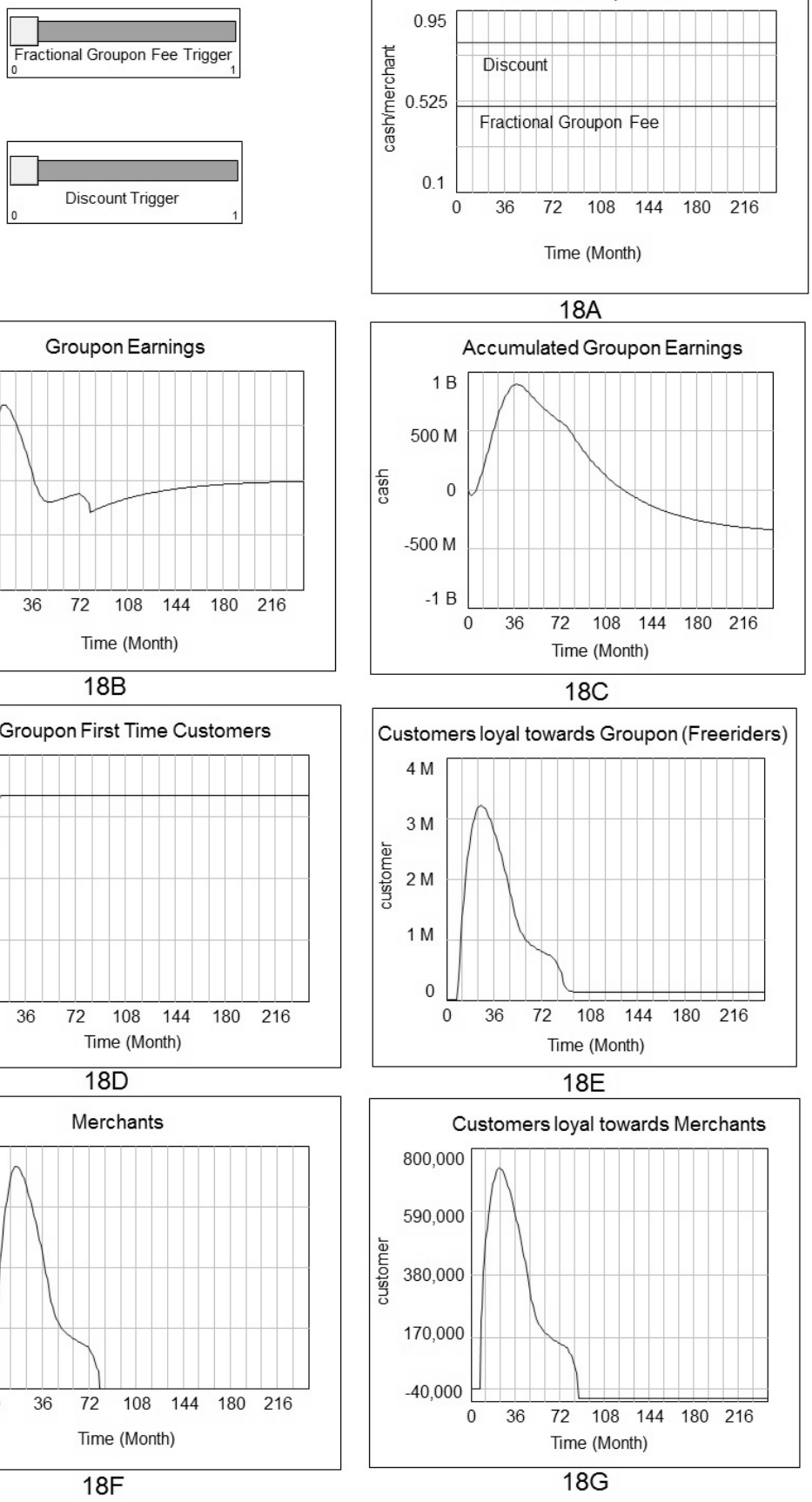


Figure 18: Simulation (Discount and Fee are fixed rates)

The graphs in Figure 18 show an overshoot and collapse pattern in the model simulation for all major stocks that let the model function. We see that as the key exogenous variables stay constant (Figure 18A) at rates of 0.8 (Discount) and 0.5 (Fractional Groupon Fee), Groupon Earnings (18B) and Retained Earnings (or Accumulated Groupon Earnings 18C) initially boom and then collapse. The cause for this collapse is the fall in participating merchants (18F), which brings down the number of Loyal Groupon Users (18E) and First Time Users (18D) – all because there simply are not enough coupons to go around. The number of Customers Loyal to Merchants (18G) follows the same pattern, but, as we can observe, their number never really matches that of free-riders – one of the reasons why Merchants become less enthusiastic in the first place.

Summing up the observations in the previous paragraphs, we conclude that in the case of the stock and flow model (Figure 16) that we designed according to the commonly accepted perception of the economic and market causal relations that make up the group-buying business model, high expectations of participating merchants coupled with aggressive discount and fractional fee policy inevitably lead to an overshoot and collapse pattern in retained earnings.

The bumps one can see before the stocks tend to zero (i.e. Merchants) come from the fact that the offensive employment rate depends directly on the ROI expected by the Merchants, and reacts as a leveraged factor. Since the number of Employees has a direct incluence on the amount of newly acquired Customers in general and at the same time on Groupon's Variable Costs, these bumps result from the change in the employment rate of new Sales Staff.

The main conclusion that follows from our simulation analysis is clear and straightforward: Groupon's business model in its current shape is not going to be sustainable in the long run. Consequently, Groupon cannot maintain its current business model unchanged if it wants to survive the next five years or more successfully.

.

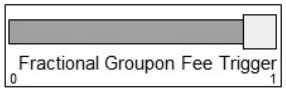
6. Policy Formulation & Evaluation

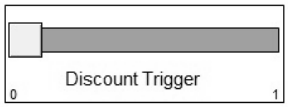
As the previous chapter has explained, the business model of Groupon appears to be unsustainable in the long run. In this chapter we will try to discover if there are ways to attain a path of economic sustainability, i.e. a level of positive earnings in the long run which ensures Groupon's survival. For this the current business model must be altered. As we explained earlier, Groupon earnings are driven mainly by the discount fraction and the fractional Groupon fee. In the original model these two variables are exogenous parameters. An examination of possible policy choices available to Groupon, choices that would govern how these exogenous variables are to be determined, may yield a resolution to the problem of long-term non-sustainability. Such a policy choice would target the lagged excess expectation (ROI expected by the Merchants) to keep earnings at a higher level. One of the important factors affecting the ROI is the participation costs for the merchant (Fractional Fee and Discount). Lowering these costs (e.g. the discount) could remove the overshoot and collapse pattern completely and turn the business model into one of continuous and sustainable growth. At the same time, relative fees could be lowered as well, because Groupon's revenue goes up automatically in absolute terms if discounts go down[9]. Practical implementation would mean to endogenize both variables Discount and Fractional Groupon Fee and to check what implication this will have for the expected earnings and accumulated earnings of Groupon in the long term. One method of endogenizing which we study below relies on a policy lowers the Fractional Fee, Discount, or both every time Groupon observes the participating number of Merchants decreasing (Increase in Merchants<Merchant Loss). Below we examine by simulation the effects of such a policy on the long-term sustainability and economic viability of Groupon's business model.

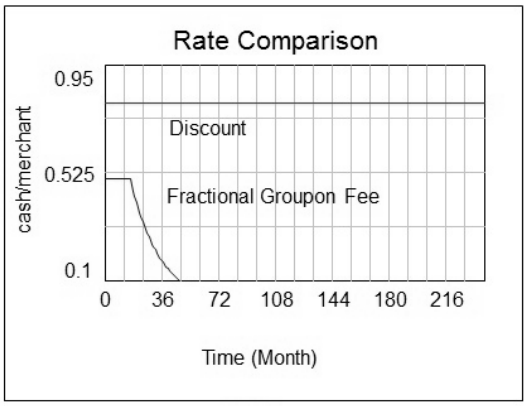
Endogenizing only the fractional Groupon fee still does not turn the business model sustainable[10]. On the contrary, it even worsens performance, as accumulated earnings become negative after only three years. In a word, a large reduction of Groupon earnings would have no substantial impact on the ROI expected by merchants. What drives the expected ROI is not earnings alone but the combination of earnings and discount. After earnings become negative, Groupon Earnings approaches a value of about $ -300 million, but with no operational room left, because all merchants have opted out. The final customer and merchant stocks show an overshoot and collapse pattern, and the Groupon fee goes down to zero. (See the charts in Figure 19.) One gets a similar unsustainable pattern for the contrary, endogenizing only the Discount and fixing the Fractional Groupon Fee.

[9] The reason for this is that fees are applied to the remaining revenue, regular price minus discount. If discount is lowered, this remainder increases. A constant fee means increasing returns to Groupon.

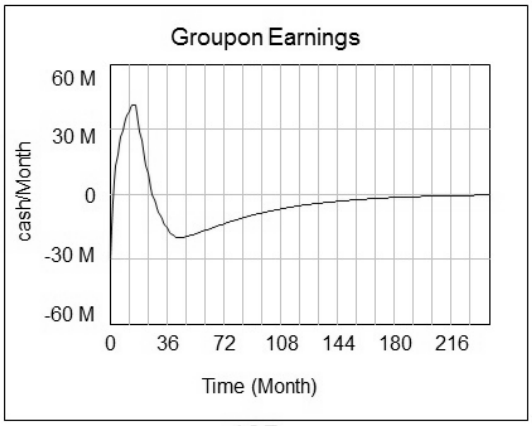
[10] Endogenization here means that optimal values for Discount and/or Fractional Groupon Fee are determined inherently by the model. This is implemented through a trigger, each oh which is set to 0 if the respective value stays constant at its starting value, or is diminished according to the condition in case Increase in Merchants is smaller than Merchant Loss.







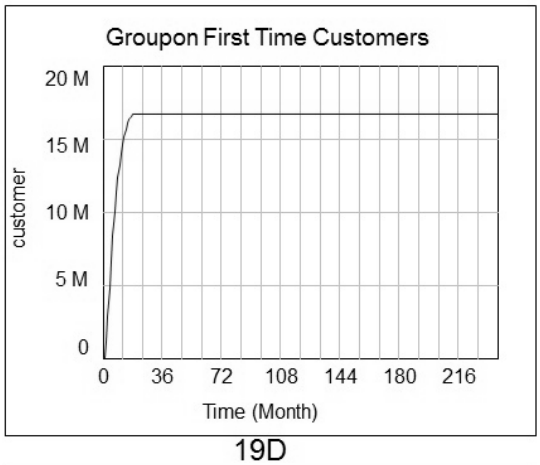
19A



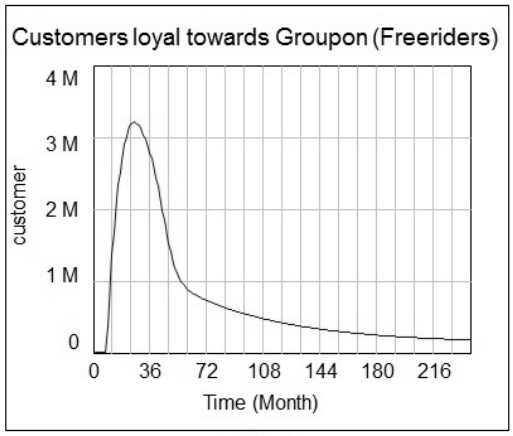
19B



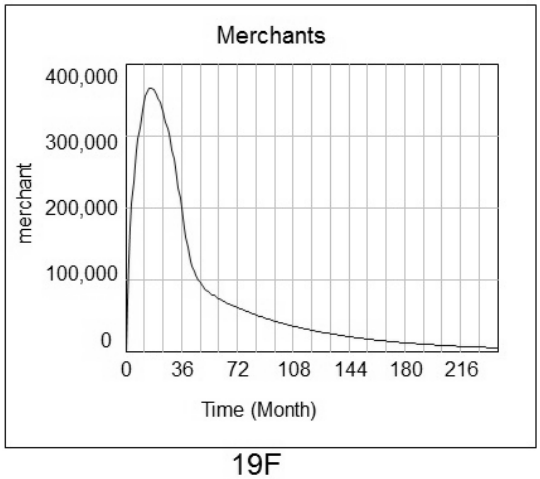
19C



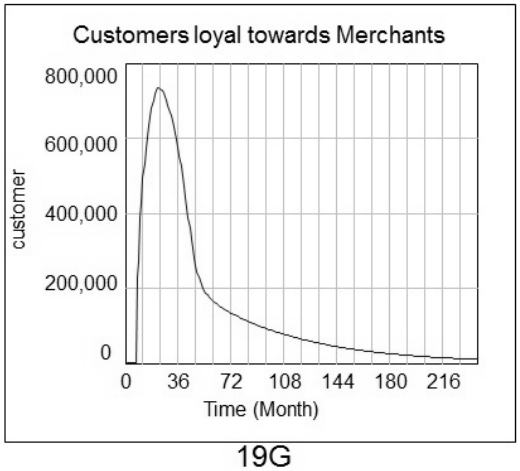
19D



19E



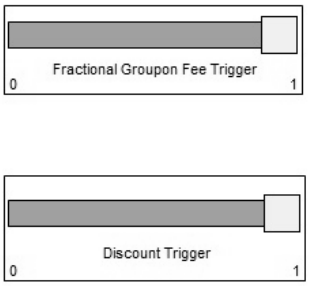
19F

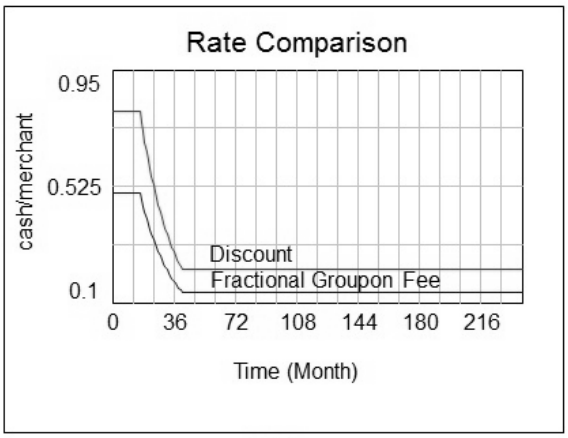


19G

Figure 19: Simulation (Endogenizing the Groupon Fee)

Endogenizing both variables results in a different pattern. Earnings and accumulated earnings show an unlimited exponential increase. The same is true for all customer stocks including merchants. In addition, there remains a small boom and bust bump at the outset, which comes from a 12-month delay; even though we endogenize Discount and Groupon Fee, they are still not adopted for the first 12 months (Charts in Figure 20).





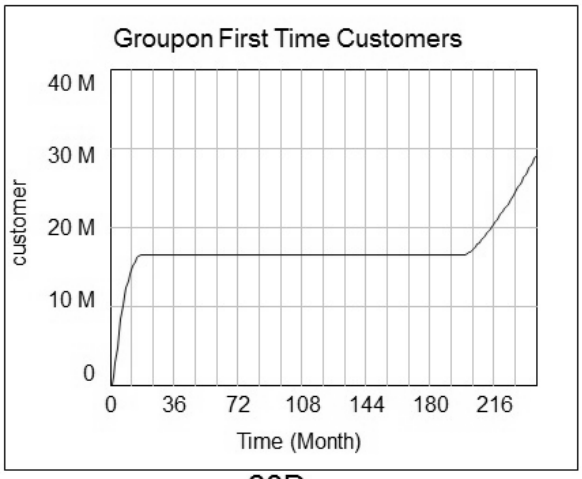
20A



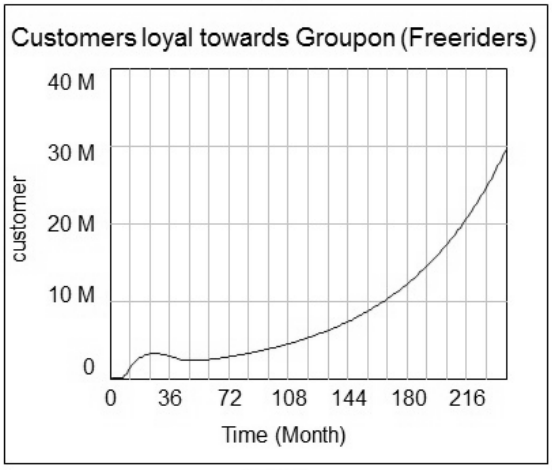
20B



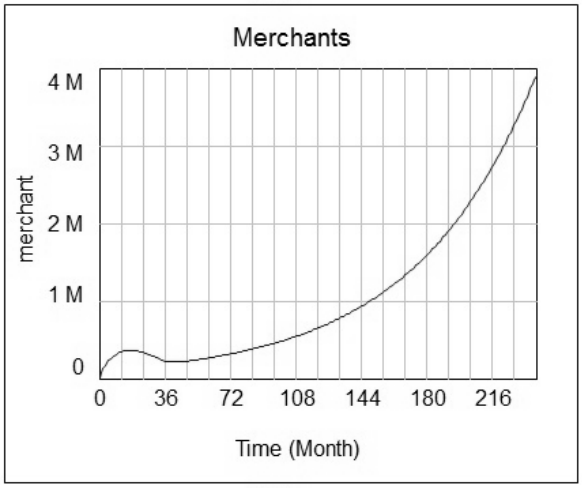
20C



20D



20E



20F



20G

Figure 20: Simulation (Endogenizing the Discount and the Fee)

These results show that Groupon expects to hit the 20 billion Accumulated Earnings frontier 19 years from now. Therefore Groupon's valuation appears to be extremely far-looking, as the time horizon used in the valuation of companies usually falls in the range of 5-10 years.

For the Discount rate and the Fractional Groupon Fee, when both are regulated according to our policy, the Groupon Fee approaches 22% and the Discount rate becomes sustainable at 14% (Figure 21). These equilibrium values result on the basis of setting the remaining parameters with the help of educated guesses. We assume that even if we had access to real-world data from Groupon, the results would be more precise but the basic pattern would remain the same. The difference between the real-case outcome and the study simulation would be one of degree but not of kind.

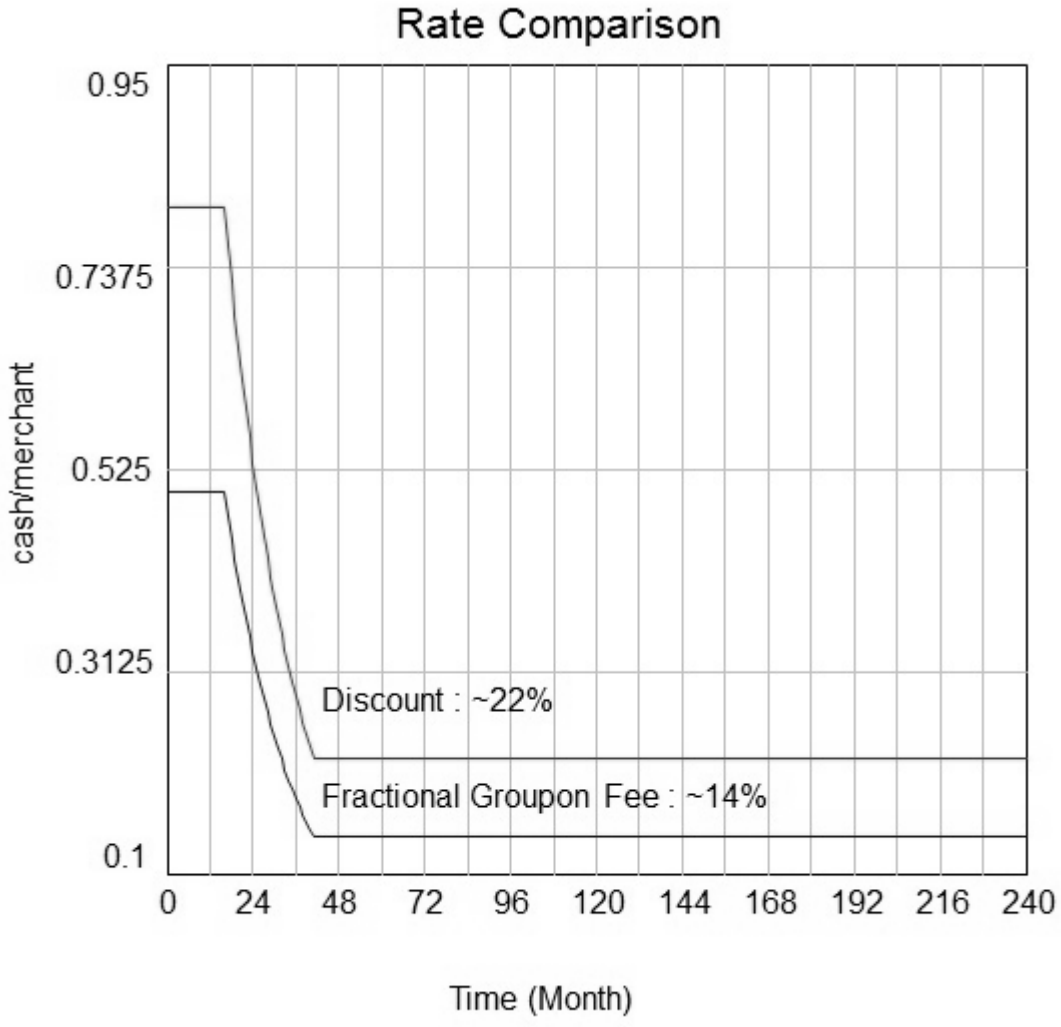


Figure 21: Fractional Groupon Fee and Discount Rate Comparison

This result suggests three main things.

1. Groupon's business model can be turned sustainable.
2. Fractional Groupon Fee and Discount Rate are way too high and must be lowered to become sustainable in the long run. According to this result, values of no more than about a third of the starting rates of the pricing package lead to a sustainable business model.
3. Fractional Groupon Fee and Discount Rate cannot be treated as individual levers, but viewed and handled only as a pricing package. Changing one of them alone does not lead to the intended changes, as the two parameters affect Groupon's earnings in opposite directions. An exogenous change in one parameter most probably means adapting the other one to keep the sum sustainable (see Figure 3).

6.1. Sensitivity Tests

In the following, we set up a sensitivity analysis to study the reactions of our model to changes in the two most important parameters. We persist with the endogenization of the Fractional Groupon Fee and the Discount Fraction[11]. In other words, the following simulations are based on a changed business model, which would in fact be sustainable.

From a Monte Carlo simulation with 200 runs, we reap the following result for Groupon Earnings per month (Figure 23).

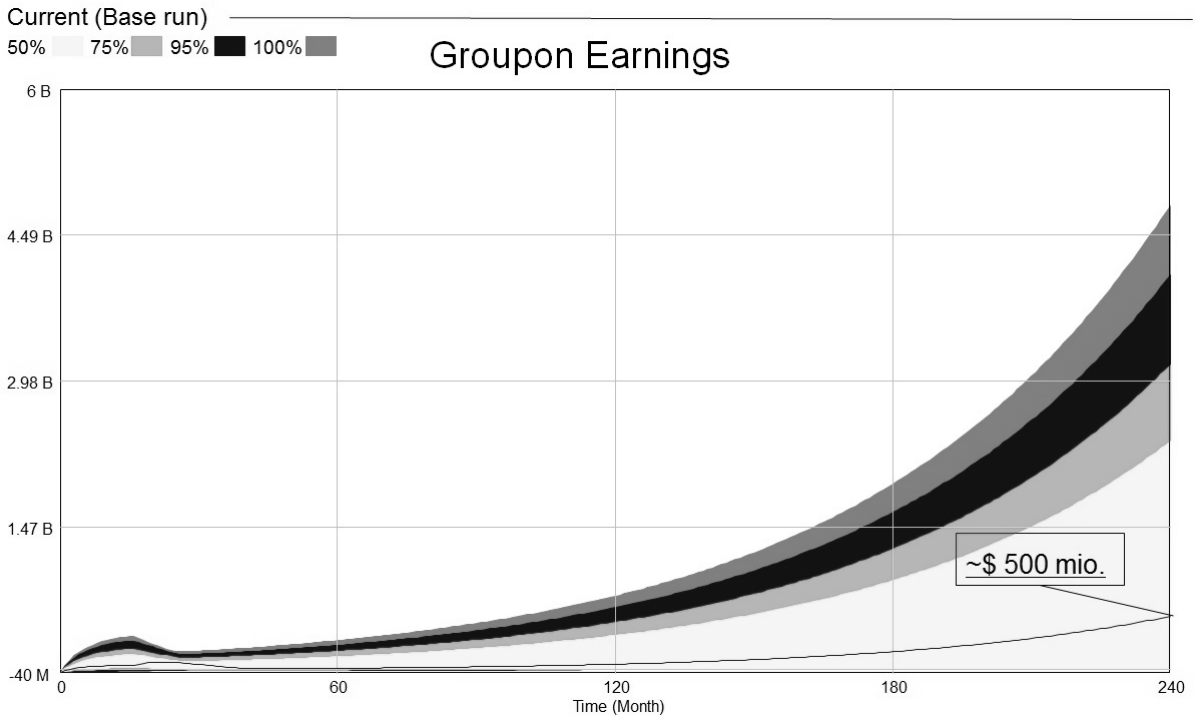


Figure 22: Sensitivity Analysis (Groupon Earnings)

[11] We assume the Fractional Groupon Fee to be uniformly distributed between zero and their starting value of 50%. The same distribution is also assumed for the Discount Fraction, which starts at 80% and can fall until zero.

The graph indicates that our estimates in the base run (Figure 22) are realistic. The general pattern is one of exponential growth. Even within the bounds of 50%, the likelihood of monthly earnings being far above the base run (see Current) is given. The long horizon of inspection drives this sensitivity analysis to its limits. Nevertheless we can saythat earnings above 3 billion per month seem unrealistic.

A look at accumulated earnings gives us the following picture (Figure 23).

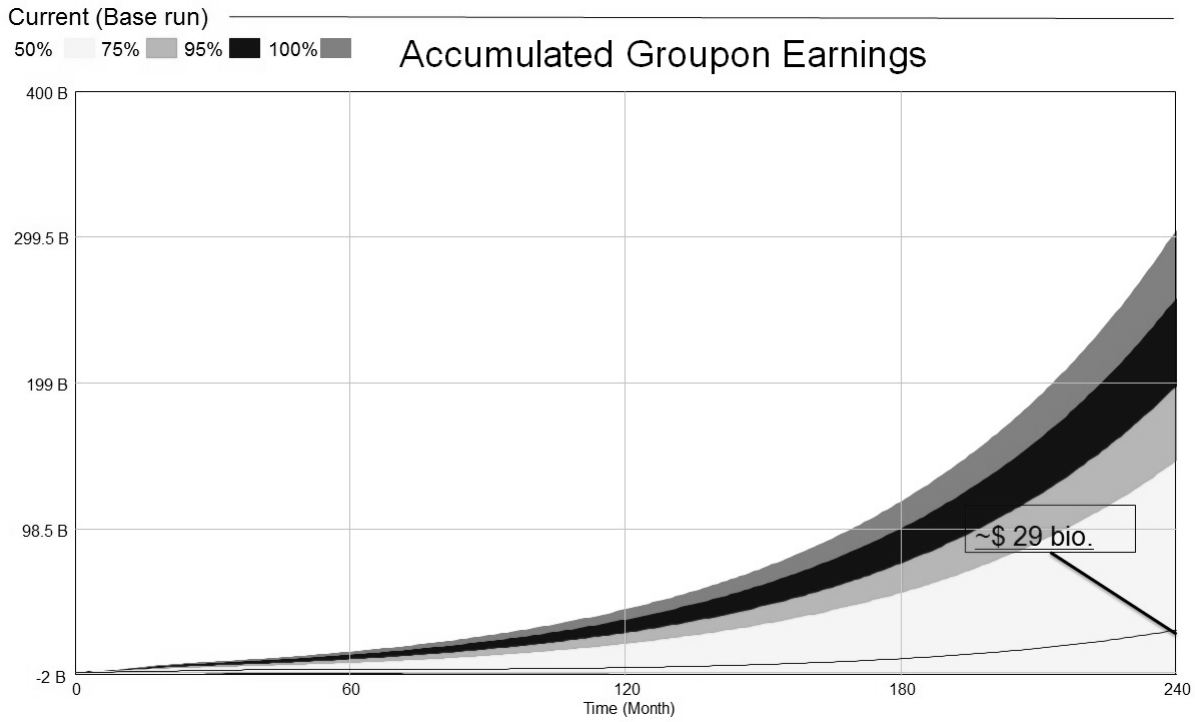


Figure 23: Sensitivity Analysis (Accumulated Groupon Earnings)

What has been said about the evolution of earnings applies equally to the valuation of the company. The magnitude of the calculated company value (Accumulated Earnings) as shown in Figure 23 seems huge and more long-term oriented than customary valuations (see Ovide [2011], Wall Street JournalOnline, 24 September 2012).

Therefore what could be achieved is enormous, although that possibility remains contingent on a strict adoption and consistent application of this revision of Groupon's business model.

7. Conclusion

The aim of this research was to study the long-term economic viability of the business model used by group buying companies in general and Groupon in particular. We approached this problem by looking for an answer to the following question: "Can Groupon be viable economically in the long run, with its current business model intact?" Moreover, if the model turned out to be unsustainable, we would need to search for the factors that should be changed in order to achieve a sustainable operation for this group buying scheme.

To answer these questions, we built a relatively complex system dynamics model. Our initial dynamic hypothesis was that a boom and collapse pattern would occur in the generic coupon business model with its aggressive discount and fee policies. Simulations within the framework of our model led to a confirmation of our initial hypothesis that the earnings generated by Groupon's business model would follow an overshoot and collapse pattern, and that such a group buying scheme is not viable economically in the long run. All relevant performance indicators, including participating merchants, revenue, and earnings, show a pattern of overshoot and collapse within a five-year time period. This pattern is driven by two mechanisms – 1.) the competition and discount effects leading to customers not becoming loyal to a merchant, after trying its products through a coupon deal, but rather ending up as Groupon Free-riders, and 2.) the ROI expectation as a delay function of discount and residual earnings on coupons sold (Variable *Earnings Retention*).

In order to find a solution to these deficiencies in the existing business model, we study the effects that policy variables (fee and discount) can have on growth dynamics. We find that endogenizing fee and discount level in an adapted model helps to correct the growth pattern, making it sustainable. In our particular case, the optimal values for Discount and Fee are lower than the originals, at 22% and 14% respectively. We believe that this reduction shows that Groupon is not offering any unique added value as compared to conventional promotion tools, and that its efficiency depends solely on the number of new customers attracted to a merchant. Thus, the way the company is operated at the moment, with an emphasis on high discounts and Groupon taking a high fee for offering its services, is unsustainable because it is not economically justifiable. At the same time, as our modified model employs less restrictive assumptions, it is probable that in reality competition and resource limits may undermine even this solution to the sustainability problem.

We believe that the worries about the long-term prospects of group buying are to a large extent reflected in Groupon's stock prices, which have been depressed ever since the company's IPO. These findings also confirm, in some respects, the market outlook put forward by Adrian Locher of DeinDeal for Switzerland. Even though he considers long-term forecasts a futile endeavor, he believes that the group buying market will be saturated within five years. At the same time, he does not anticipate the drastic overshoot and collapse pattern our model suggests, if fees and discount levels are not lowered. However, his case may be different due to differences in quality, depending on how Groupon and DeinDeal deal with merchant partners. They differ firstly in the type of deals (in terms of attractiveness, fees, and discount) that they encourage Merchants to offer, and secondly their consistency or long-term perspectives in dealing with different partners are opposite. DeinDeal in comparison to Groupon presents itself as an alternative marketing instrument which focusses on the

loyalty of its customers who offer the service or good behind a product (Merchants), rather than as a short-term revenue-generating opportunity for merchants. From the perspective of our study, DeinDeal's approach seems more suitable, honest, and sustainable over the long term for group buying schemes in general. Groupon in comparison is a high-flyer that tries to get the highest discounts, the most publicity (good or bad), and the biggest share in terms of fees, and does not seem to care about the long term at all. This qualitative competition for deals could be another aspect to investigate in a more sophisticated model.

In closing, we would like to add that Groupon, since we wrote this paper (October 2011), has included direct sale as a complement to the established group buying business model. Also, Groupon's stock price has sunk tremendously during the time we were revising our paper. This indicates that Groupon has begun to encounter the problems that, from our point of view, are inherent in its group buying scheme.

Acknowledgement

The authors thank Christopher Amador, Thomas Rottmoser, and Nicolas Wohlwend for their initial contributions, on which this paper is based.

List of references

Agrawal, R. (15. 08 2011). *The terrible numbers that Groupon doesn't want you to focus on*. Retrieved on 24. 12 2011 from Agrawals: http://blog.agrawals.org/2011/08/15/the-terrible-numbers-that-groupon-doesnt-want-you-to-focus-on/

Barlas, Y. (1996). Formal Aspects of Model Validity and Validation in System Dynamics. System Dynamics Review 12(3): 183-210.

Barr, A., & Baldwin, C. (04. 11 2011). *Groupon's IPO biggest by U.S. Web company since Google*. Retrieved on 20. 11 2011 from Reuters: http://www.reuters.com/article/2011/11/04/us-groupon-idUSTRE7A352020111104

De La Merced, M. J. (08. 06 2011). *Is Groupon's Business Model Sustainable?* Retrieved on 27. 12 2011 from New York Times: http://dealbook.nytimes.com/2011/06/08/is-groupons-business-model-sustainable/

Forensic Accounting, Investigation, and Expert Services. (25. 09 2011). *Groupon: Restaded Numbers Reveal Failure of Business*. Retrieved on 04. 01 2012 from The Fraud Files Blog: http://www.sequenceinc.com/fraudfiles/2011/09/groupon-restated-numbers-reveal-failure-of-business/

Forrester, J. W. (1961). Industrial Dynamics. Cambridge, MA: MIT Press.

Kincaid, J. (23. 09 2011). *Groupon Loses Second COO This Year - And Restates Revenue*. Retrieved on 28. 12 2011 from Techcrunch: http://techcrunch.com/2011/09/23/groupon-loses-second-coo%C2%A0this-year-%E2%80%94-and-restates-revenue/

Locher, A. (05. 01 2012). Questions to the founder of DeinDeal. (C. Amador, Interviewer)

Lofdahl, C. (2002). *Environmental Impacts of Globalization and Trade: A Systems Study.* Cambridge, MA: MIT Press.

Madslien, J. (28. 12 2010). *Social buying boom attracts big-name investors*. Retrieved on 23. 12 2011 from BBC News: http://www.bbc.co.uk/news/business-12053015

Magee, D. (24. 09 2011). *Groupon in Turmoil: COO Leaves, Compnay Restates Revenue*. Retrieved on 26. 12 2011 from International Business Times: http://www.ibtimes.com/articles/219270/20110924/groupon-ipo-coo-georgiadis-andrew-mason-securities-exchange-commission.htm

Osterwalder, A. and Y. Pigneur (2011). Business Model Generation: ein Handbuch für Visionäre, Spielveränderer und Herausforderer. Frankfurt am Main: Campus.

Ovide, S. (23. 09 2011). *Groupon IPO: Revenue Corrected for 'Error'*. Retrieved on 19. 12 2011 from The Wall Street Journal: http://blogs.wsj.com/deals/2011/09/23/groupon-ipo-revenue-corrected-for-error/

Raice, S. (24. 09 2011). *More Trouble for Groupon IPO*. Retrieved on 03. 01 2012 from The Wall Street Journal: http://online.wsj.com/article/SB10001424053111903791504576589211214409214.html

Sterman, J. D. (2000) Business Dynamics: Systems Thinking and Modeling for a Complex World, Irwin/McGraw-Hill.

Schwaninger, M. and S. Grösser (2008). System Dynamics as Model-Based Theory Building. Systems Research and Behavioral Science 25(4): 447-465.

Schwaninger, M. and S. Grösser (2009). System Dynamics: Modeling for Quality Assurance. In R. Meyers, *Encyclopeida of Complexity and System Sience* (P. 9000-9014). Berlin: Springer.

Sherman, E. (23. 09 2011). *COO Runs, Doesn't Walk, as Groupon Restates Revenue*. Retrieved on 04. 01 2012 from CBS News: http://www.cbsnews.com/8301-505124_162-43453022/coo-runs-doesnt-walk-as-groupon-restates-revenue/

Sherman, E. (27. 09 2011). *Groupon restates its numbers, IPO timing hazy*. Retrieved on 28. 12 2011 from Business Insider: http://www.businessinsider.com/groupon-restates-its-numbers-ipo-timing-hazy-2011-9

Sterman, J. D. (2000). Business Dynamics. New York: Irwin McGraw-Hill.

Sturzenegger, S. (2012). Geprellte Kunden, überforderte Anbieter – Ärger mit Groupon & Co., 20 Minuten Online, 20. September 2012, http://www.20min.ch/finance/news/story/Geprellte-Kunden--ueberforderte-Anbieter-21981916

Timmers, P. (1998). Business Model for Electronic Markets. *Electronic Markets, Vol. 8 No. 2* , p. 3-8.

Appendices

Appendix 1. Formulas

Table 1: Formulas

Variable	Equation	Initial Value	Dimension	Type	Origin
Accumulated Groupon Earnings	= INTEG (Earnings Retention,0)	0	cash	Level	Internal
Acquired Merchant per Employee per Month	12		merchant*merchant/cash/employee/Month	Constant	External
Average Coupon Value	100		cash/customer	Constant	External
Average One Shot Loss Rate	0.3		1/Month	Constant	External
Average Return per Customer for Merchant	0.6		cash/Month/customer	Constant	External
Average Salary	3000		cash/employee/Month	Constant	External
Average Satisfaction with the Service offered by the Merchant	0.8		dmnl	Constant	External
Beginner Loss	=MAX((Groupon First Time Customers-Increase in Customers loyal towards Merchants*Time1)*(Average One Shot Loss Rate),0)		customer/Month	Auxiliary	Internal
Change in Discount	=IF THEN ELSE(Discount Trigger=1, IF THEN ELSE(Increase in Merchants<Merchant Loss, -0.05*Discount, 0), 0)/Time1		cash/(merchant*Month)	Auxiliary	Internal
Change in Groupon Fee	=IF THEN ELSE(Fractional Groupon Fee Trigger=1, IF THEN ELSE(Increase in Merchants<Merchant Loss, -0.05*Fractional Groupon Fee , 0), 0)/Time1		cash/merchant/Month	Auxiliary	Internal
Change in ROI expected by the Merchants	=-IF THEN ELSE(Desired ROI<Surplus Income generated by Merchants through Sale of Coupons, -ROI Up-		cash/Month/merchant	Auxiliary	Internal

	wards adaption Rate*Desired ROI*ROI expected by Merchants, ROI Downwards adaption Rate*Desired ROI)				
Constant Firing Rate (Aux)	0.02		1/Month	Constant	External
Constant Hiring Rate (Aux)	0.03		1/Month	Constant	External
Coupons offered by Groupon	=MAX(Coupons offered per Merchant per Month*Merchants,0)		customer/Month	Auxiliary	Internal
Coupons offered per Merchant per Month	20		customer/merchant/Month	Constant	External
Customers loyal towards Groupon (Free-riders)	= INTEG ("Increase in Free-riders towards Merchant"-"Loss in Groupon Free-riders"+Loyal Clientele Erosion,0)	0	customer	Level	Internal
Customers loyal towards Merchants	= INTEG ((Increase in Customers loyal towards Merchants-Loyal Clientele Erosion),0)	0	customer	Level	Internal
Desired ROI	0.5		cash/Month/merchant	Constant	External
Discount	= INTEG (Change in Discount,Starting Discount Fraction)	Starting Discount Fraction	cash/merchant	Level	Internal
Discount Effect on Free-riding	=ZIDZ(0.3, Discount)		merchant/cash	Constant	External
Discount Trigger	0		dmnl [0,1,1]	Constant	External
Discount Utility Effect on Erosion of Customers loyal towards Merchant	0.2		merchant/cash	Constant	External
Earnings Retention	=Groupon Earnings		cash/Month	Level	Internal
Employee	= INTEG (Employees Hired-Firing Employee,10000)	10'000	employee	Level	Internal
Employee Fired	=Employee*"Constant Firing Rate (Aux)"		employee/Month	Auxiliary	Internal
Employees Hired	=IF THEN ELSE(Groupon Earnings<0, 0, "Constant Hiring Rate (Aux)"*Employee)		employee/Month	Auxiliary	Internal
Fractional Groupon Fee	= INTEG (Change in Groupon Fee,Starting Frac-	Starting Fractional	cash/merchant	Level	Internal

	tional Groupon Fee)	Groupon Fee			
Fractional Groupon Fee Trigger	0		dmnl [0,1,1]	Constant	External
Free-rider Loss Rate	0.3		cash/merchant	Constant	External
Groupon Earnings	=Groupon's Turnover-Groupon's Costs		cash/Month	Level	Internal
Groupon First Time Customers	= INTEG (MAX(Increase in new Customers-"Increase in Free-riders towards Merchant"-Increase in Customers loyal towards Merchants-Beginner Loss,0),5000)	130'000'000	customer	Level	Internal
Groupon's Turnover	=Average Coupon Value*Coupons offered by Groupon*Unitcheck*(1-Discount)*Fractional Groupon Fee		cash/Month	Auxiliary	Internal
Groupon's Variable Costs	=Average Salary*Employee		cash/Month	Auxiliary	Internal
Increase in Customers loyal towards Merchants	=DELAY FIXED(MAX(Average Satisfaction with the Service offered by the Merchant*"Resale Rate (Average Customer Loyalty towards Merchants)"*Coupons offered by Groupon,0), Time to get Loyal, 1)	0	customer/Month	Auxiliary	Internal
Increase in Free-riders towards Merchant	= DELAY FIXED (MAX(("Discount Effect on Free-riding"*(Groupon First Time Customers-Increase in Customers loyal towards Merchants*Time1)*Discount)/(100*(Time1)),0), Time to get Loyal, 1)	0	customer/Month	Auxiliary	Internal
Increase in Merchants	=MAX(Acquired Merchant per Employee per Month*Employee*ROI expected by Merchants,0)		merchant/Month	Auxiliary	Internal
Increase in new Customers	=Coupons offered by Groupon*Discount*unitcheck 2		customer/Month.	Auxiliary	Internal
Loss in Groupon	=MAX(ZIDZ("Free-rider Loss		customer/Month	Auxiliary	Internal

Free-riders	Rate"*"Customers loyal towards Groupon (Free-riders)",(Time1*Starting Discount Fraction)),0)				
Loyal Clientele Erosion	=MAX(10*Discount Utility Effect on Erosion of Customers loyal towards Merchant*Customers loyal towards Merchants*Starting Discount Fraction/(Time1),0)		customer/Month	Auxiliary	Internal
Merchant Loss	=IF THEN ELSE(ROI expected by Merchants<0, Merchants/Time1, Merchants*Merchants Dropout Rate/Time1)		merchant/Month	Auxiliary	Internal
Merchants	= INTEG (Increase in Merchants-Merchant Loss, 100)	6'500'000	merchant	Level	Internal
Merchants Dropout Rate	0.2		dmnl	Constant	External
Merchants' Offer Cost	= ((1-Discount)*Fractional Groupon Fee*unitcheck2+Discount)		cash/merchant	Auxiliary	Internal
Net Change of Merchants	#NAME?		merchant/Month	Auxiliary	Internal
Resale Rate (Average Customer Loyalty towards Merchants)	0.2		dmnl	Constant	External
Return Delay	12		Month	Constant	External
ROI Downwards adaption Rate	0.035		dmnl	Constant	External
ROI expected by Merchants	= INTEG (Change in ROI expected by the Merchants,0.6)		cash/merchant	Level	Internal
ROI Upwards adaption Rate	0.01		merchant/cash	Constant	External
Starting Discount Fraction	0		cash/merchant	Constant	External
Starting Fractional Groupon Fee	0		cash/merchant	Constant	External
Surplus Income generated by Merchants through Sale of Coupons	=DELAY FIXED ((ZIDZ(Average Return per Customer for Merchant*Customers loyal towards Mer-		cash/merchant/Month	Level	Internal

	chants,Merchants))-Merchants' Offer Cost/Time1, Return Delay , 2)				
Time to get Loyal	6		Month	Constant	External
Time1	1		Month	Constant	External
Unitcheck	1		mer-chant*merchant/cash/cash	Constant	External
unitcheck2	1		merchant/cash	Constant	External

Appendix 2.Testing & Validating the Model

This section is about enhancing model quality. We refer to the canon of tests for model validation, as provided in the literature (Forrester/Senge 1980; Barlas 1996; Sterman 2000; Schwaninger/Groesser 2009), and report on tests that have been applied. This account is more relevant to the technically interested reader than for the practitioner.

1. Direct Structure Tests

A. Structure and Parameter Examination Tests

We used the walkthrough logic in all tests, moving from one variable to the next, until we had covered them all. For Empirical Direct Structure Tests we performed various parameter examination tests.

The following list of exogenous parameters was taken over from real world data. Adaptations using DeinDeal data are mentioned where needed:

Table 2: List of Exogenous Variables

Parameter	Specification	Connected to …in the Model	Source/ Justification/ Definition
Average Satisfaction with the Service by the Merchant	80%	-Increase in Customers loyal towards the Merchants	Meaning 4 out of 5 customers are generally happy with the offered product from the merchant. From own estimations and online comparison. Also confirmed by Adrian Locher for DeinDeal.
Resale Rate (Average Customer Loyalty to Merchant)	20%	-Increase in Customers loyal towards the Merchants	Defined as the percentage of retained customers which are buying again within time to get loyal. Own estimations and online comparisons.
Time to get Loyal	6 months	-Increase in Customers loyal towards the Merchants -Increase in Customers loyal towards Groupon (Free-riders)	Loyal being defined as rebuying at least one coupon from Groupon within half a year.
Starting Discount Fraction	80%	--Increase in Customers loyal towards Groupon (Free-riders) -Merchant's offer Cost -Groupon Earnings	As taken from Groupon website and several Groupon commercials.
Free-Rider Loss Rate	30%	-Loss in Groupon Free-riders	This fallout rate means that if Groupon stops acquiring any customers to become loyal it would take Groupon 12 months to reach about 1% of their loyal customers at the time when the stop occurs.
Discount Utility Effect on Erosion of Loyal Customers to the Merchant	20%	-Loyal Clientele Erosion	This fraction of customers represents the ones who give up her loyalty to the merchant and this is the inverse of the Average Satisfaction with the service by the merchant.
Starting Fractional Groupon Fee	50%	- Discount (Starting Value)	Groupon communicates on its website that they usually share 50:50 the revenue generated from selling a coupon, see (Groupon/about). DeinDeal also uses a 40%

			fee (cf. interview with Adrian Locher).
Average Coupon Value	$\frac{\$100\ cash}{customer}$	-Groupon Earnings	We assume the average coupon value to be $100 as the average revenue generated per customer (=coupons sold) was about $20 reported by Groupon 2010 (see: De La Merced 2011) which results from subtracting the discount value.
Coupon per Merchant per Month	$20\ \frac{customer}{merchant*month}$	-Coupons offered by Groupon	We assume average coupons per merchant to be 20 coupons. This as well takes into account that a certain number some coupon deals are not realized due to missing demand.
Acquired Merchants per Employee per Month	$8*\frac{merchants}{month}$	-Increase in Merchants	We assume that every employee is capable of attracting 2 merchants per week, therefore making 8 additional deals per month and selling 160 Coupons per month generating additional $320 of revenue from coupon sale per month.
Average Salary	$\frac{\$3000\ cash}{employee * month}$	-Groupon Earnings	Is assumed to be $1500 per month which seems reasonable to us.
Constant Hiring Rate (Aux)	30%/month	-Employee	Every month 30% of the already employed staff is employed. This means a net growth rate of 10% in employee stock every month.
Constant Firing Rate (Aux)	20%/month	(Outflow)	Every month 20% of the employed staff is fired, representing the high fluctuation in a startup company.
Merchants Dropout Rate	50%	-Merchant Loss	This rate means that every month 50% of merchants decide not to offer another coupon.
Desired ROI	50%	-Change in ROI expected by the Merchants	The merchant expects in the beginning a 50% return on his investment meaning the costs he has from offering a coupon on Groupon. Therefore he expects additional revenue generated by loyal customers to be 150% of the costs of offering coupons.
ROI Upwards adaption Rate	1%	-Change in ROI expected by the Merchants	If the achieved ROI is higher than the expected the expectation goes up by 1%.
ROI Downwards adaption Rate	3.5%	-Change in ROI expected by the Merchants	If the achieved ROI is lower than the expected ROI, the expected ROI goes down by 3.5%.
Return Delay	12 months	-Surplus Income generated by merchants through Sale of Coupons	The delay with which merchants can check if their ROI actually equals their expectations is set to a year as usually coupons are valid for one year.
Average Return per Customer per Merchant	$60\frac{cash}{customer*month}$	-Surplus Income generated by merchants through Sale of Coupons	The average return per customer per merchant is set to 3/5 meaning that an additional loyal customer buys products from the merchant for $60 per month as long as he stays loyal. Therefore staying loyal for two months generates the merchant a surplus already.
Unit check	$\frac{merchant^2}{cash^2}$		Dimensional coherence
Unitcheck2	$\frac{merchant}{cash}$		Dimensional coherence
Time1	$month$		Dimensional coherence

For the plausibility of the different stocks we list all the flows and refer to their starting values:

Table 3: List of Start Values of Stocks

Stock Name	Start Value	Source/ Justification/ Definition
Fractional Groupon Fee	50%	See Starting Fractional Groupon Fee in Table 1.
Discount	80%	See Starting Discount Fraction in Table 1.
Accumulated Groupon Earnings	0	As we assume Groupon not to have made any earnings so far.
Groupon First Time Customers	30 Mio.	This number is taken from Groupon reporting.
Surplus Merchant Clientele	0	Due to missing data we assumed this stock to start at 0.
Customers loyal towards Groupon (Free-riders)	0	Due to missing data we assumed this stock to start at 0.
Customers loyal towards Merchants	0	Due to missing data we assumed this stock to start at 0.
ROI expected by Merchants	60%	This means the merchant expects to get all the money invested into the Coupon (Discount & Fractional Groupon Fee) paid & 60% from the investment sum as profit. Negative % means that the merchants would expect the Groupon deal to bear costs and therefore rather see it as an investment or marketing tool like DeinDeal is approaching its customers.
Merchants	750k	We assume every merchant to have participated twice in a Groupon deal. Therefore breaking down 30 million first time customers to 20 coupons per merchant, every merchant having participated twice, results in 750k merchants.
Employees	10'000	Source: Groupon website

B. Direct Extreme Condition Tests

To set both the values for starting discount fraction and the variable Starting Fractional Groupon Fee to the extreme values of 0% would obviously not turn the business model sustainable. As soon as the Fractional Groupon Fee is set to 0%, by definition it becomes impossible for Groupon's group buying scheme business model to generate any earnings. Setting the Fractional Groupon Fee to 0% is like offering the Coupon for free and at the same time selling the product for its original price – at a Discount of 0% - which cannot and does not create any added value. Therefore, as expected, Groupon's Accumulated Earnings from the beginning start to become negative, and Groupon's monthly Earnings start with a big Loss, which is then reduced by driving down operations to zero and firing all employees. Therefore, since we have not included the competitive environment of a group buying scheme in the business model - such as, e.g. the risk of potential clone-competitors - this kind of Extreme Condition Test is not very likely to yield sensible management implications, also for very low but greater than zero values of the two mentioned variables. Setting the Fractional Groupon Fee to an extremely low value in itself does not make the business model sustainable, since Groupon, by lowering their major income determining parameter, reduces its income and therefore causes a situation where it does not succeed in generating enough current earnings to sustain their expansionary and international market-penetrating strategy, which it has pursued from day one.

C. Dimensional Consistency Test (Unit Check)

Concerning dimensional consistency, the unit check function implemented in Vensim was used. It attests that inconsistencies have been ruled out. To solve some minor peculiarities regarding complex unit structure and multiplicative formulation structure in certain equations, the model contains two auxiliary variables named unitcheck1 and unitcheck2 in order to cancel out the superfluous units and reach unit consistency. Nevertheless, the main test was directly performed and afterwards checked via the Vensim unit check function.



Figure 24: Unit Check

2. Indirect Structure Tests

A. Indirect Extreme Condition Tests

Extreme Horizon Test

If we triple the already quite large horizon of 240 months (=20 years) to 720 months (=60 years), the model does not show irregularities. After about 20 years changes are minimal in all evaluated cases. With exogenous, constant values for Groupon Fee and Discount, after nearly 6 years all variables begin to approach zero, a state which holds for the entire extreme horizon. The earnings in the sustainable case become quite large as the exponential growth path is continued for 60 years. Earnings in this case hit the one billion dollar per month threshold several months before 60 years of Groupon's existence. Most probably this result is quite unrealistic, since from nature we know that sooner or later exponential growth necessarily has to come to an end and must be damped in order to avoid the collapse of the system. The model also behaves as it should for extreme horizons, but given its boundaries, the simulated results after 20 years horizons are unrealistic.

B. Behavior Sensitivity Tests

For Behavior Sensitivity Tests see chapter 6.1.

C. Integration Error Tests

To change time variation to values less than one does not change the behavioral pattern of the model. We can observe a smoothening and therefore a less generic (more artificial) form of the curves due to the more extensive calculation and the smaller

time step variation. Between Step 0.0625 and 0.015625 the difference is no longer visible, as one can see in the following graph (Figure 17):

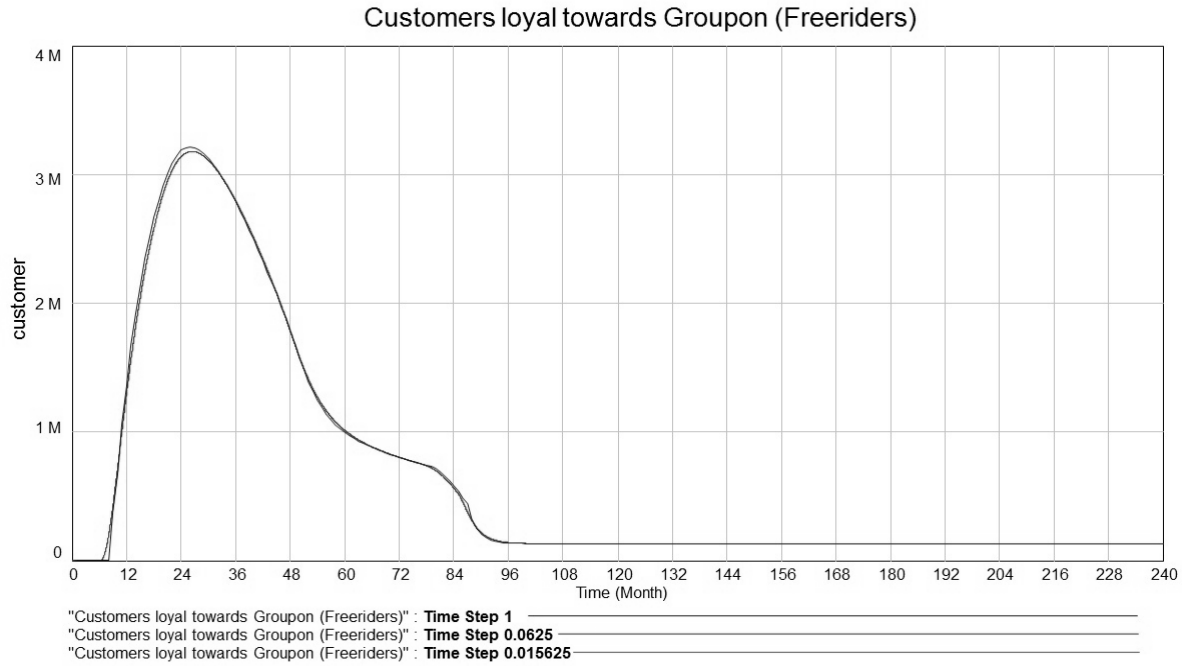


Figure 25: Differences in Time Steps

Given our research question, we are more interested in extreme values and in the sustainability of the business model for long time horizons. Therefore we rather look at extreme situations, robustness and plausibility, than for precision within our forecast, as this would be extremely sensitive and small changes would have an extreme impact on our estimation. Therefore short-run precision does not count in our model, but only the big picture and the integrated view of Groupon's business model regarding sustainability in the long-run.

To change integration method from Euler to Difference shows a one-period lag in the pattern. The fourth order Runge Kutta (RK) sometimes shows a slight overestimation of the Euler method. This gets intensified with the RK of second order, as this is a weaker approximation. All in all, the differences are minimal compared to the extended horizon. As an example, see the following figures intended to give an overview over some important variables (Figure 18):

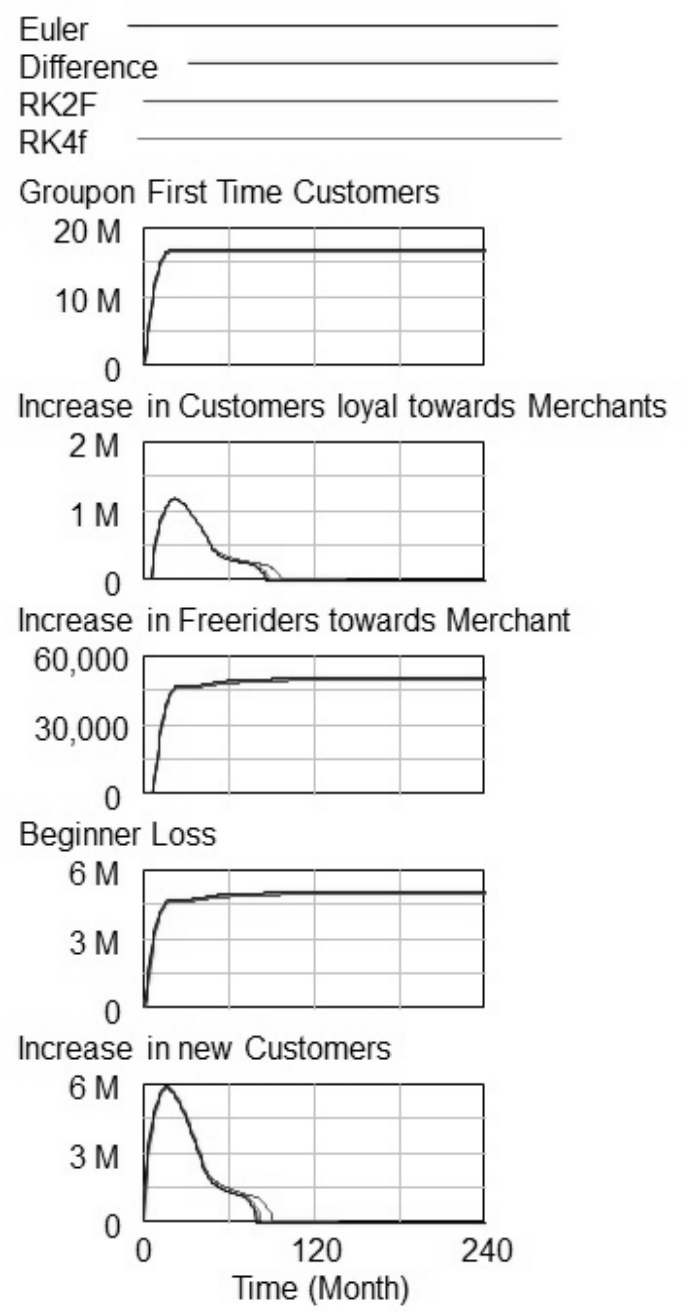


Figure 26: Comparison of Different Integration Methods

3. Tests of Model Behavior

For Behavior Reproduction Testing, see the simulation chapter (especially Figure 19). There we compare the model behavior according to the dynamic hypothesis with the results of our simulation.

4. Further Aspects of Model Quality

Validity is a crucial aspect, but there are further criteria of model quality (Schwaninger and Groesser 2008), by which we will now gauge our model.

A. Refutability of Theory

Simulation results allow rejection of the hypothesis that the earnings generated by Groupon's business model will follow an economically viable pattern in the long-run, and therefore we have seen that the current business model generates an overshoot and collapse pattern. Therefore our dynamic model does suggest that Groupon's share prices were overrated at the time of the IPO and may follow a similar pattern as the one known from the 2001 dotcom-bubble, or an even worse scenario if Groupon will not adapt or change its business model. This is basically a summary of the findings from Chapters 5 & 6.

B. Importance

Groupon was reprimanded by the NASDAQ Security and Exchange Commission, which demanded that they re-declare their revenues for 2010 down from about $700 million to a little more than $300 million. This was due to the fact that Groupon – as the company's Earnings and Loss Statement showed - had failed to stay with the 50% they earned from all the coupons sold, instead claiming the whole sum of coupons sold, which is split 50-50 usually between the merchant and Groupon (WSJ September 23, 2011 and September 24, 2011).

Answering the question about the sustainability of Groupon's business model is therefore indeed very important. Groupon's shareholders would definitely like to know how to take the current rumors that Groupon could vanish as quickly as it appeared. At least the accusations are severe: Groupon has been indicted for "falsification of balance sheet and fraud" (Grumpy Old Accountants 2011, Fraud File Blog 2011) by the internet blogger community.

C. Precision and Clarity

Concerning the precision and clarity of our model, our dynamic hypothesis about an overshoot and collapse pattern fulfills these criteria. Nevertheless, regarding real-world data there are no comprehensive data sets of revenues, earnings, profits, etc., which could have been directly implemented as complete data series in our model. This has two main reasons. Firstly Groupon Corporation has existed only since 2008 as a publicly held company. It had its IPO (Initial Public Offering) quite recently, in November 2011. Therefore only very little publicly available and reliable data exist so far about Groupon's business performance. Secondly even if there were data available, a time series of a maximum of four years would not allow for an in-depth time series analysis, while the time horizon of our study is 20 years. Therefore we tried to use all the publicly available data and inserted these bit by bit into our model, through auxiliary variables and parameters. For missing variables we carefully extrapolated from DeinDeal data. Also due to the rapid expansion and exponential growth of Groupon (extreme variance in revenue growth and controversial information regarding Groupon's business reporting), the predictions our model is going to make are cannot be very precise regarding short-time horizons. This model is designed to allow statements about the long-term overall sustainability of Groupon's business model, explicitly using a very long-term horizon.

D. Parsimony and Simplicity

According to its purpose, our model lays out the main mechanisms for understanding Groupon's business model thoroughly. This claim leads to the mentioned necessary simplifications which in our understanding do not impair the validity of our findings. We can summarize these simplifications into four main ones:

1. Groupon is treated as a centralized organization with homogeneous units.

   In reality Groupon is organized via local divisions, which might differ substantially, and therefore would adapt differently to changes in the environment or within the Groupon structure.

2. No external competition is taken into consideration.

   This assumption is an abstraction from reality as new competitors are popping up like mushrooms these days. DailyDeal and Citydeal are just two examples.

3. Markets are cleared, every coupon is sold.

   We have no information about what percentage of deals are not realized due to lack of demand. On the other hand, we do not know how many offers are extended for reasons of excess demand.

4. A large number of potential customers have not yet tried Groupon, and the discount per se has no influence on these new customers' acquisition rate.

   This assumption is not crucial for the business model either, as one-shot customers will usually not make any business model sustainable. In addition, our analysis starts by considering a very high discount rate of 80%. Taking into account the effect of discount rate on the increase of new customers in the model would only raise the volatility of revenues and earnings.

The chief reasons for these simplifications are reducing complexity, which would not deliver any further special insights, and keeping the model nice, simple, and comprehensible. On the other hand we believe that allowing for heterogeneity (1) would not change the fundamental behavior of the Groupon business model. Allowing for competition (2) would probably only speed up the process of adaptation, meaning that Groupon would, as we suggest, lower fees and discounts even faster. However Adrian Locher in our interview suggested that competition in Switzerland focuses not on price (i.e. fees in our case) but rather on quality of the service both vis-à-vis merchants and customers. Quality differences between Groupon and its competitors are a fact we cannot perfectly account for due to our unilateral perspective. Similarly for imperfect market clearing (3), even though relaxing this assumption would cause a reverse effect and make Groupon raise discounts in order to make offers more attractive, but probably not give us any additional information about the sustainability of Groupon's business model. Simplification (4) is a purely technical one and results from the fact we have completely left out any interactions with external agents.

E. Comprehensiveness

Our model covers all relevant fields of a business model according to the definition of Timmers (1998), according to whom a business model contains four main elements:

1. Architecture for the product or service
   The service architecture in the Groupon case is pure IT as Groupon is active in e-commerce. This market-maker function is of no specific interest for this paper, and improvements in the service itself are not targeted in particular.
2. Structure of information flows
   The structure of information flows regarding the business model are implemented in the feedback loops that explain the behavior of the three main actors in the model: the customers, the merchants, and Groupon itself.
3. Description of the benefits for the actors involved (Value proposition or Unique Selling Proposition [USP])
   The value proposition Groupon makes is defined by the discount (for the customer) and by the fee (for the merchant). Groupon's value proposition lacks uniqueness and can quite easily be copied. We suggest that this explains the immense speed with which Groupon is trying to penetrate global markets.
4. Sources of revenue
   The sources of revenue for Groupon are purely the end-customers buying coupons. In this model we had to include as well the revenue situation of the merchants to be able to explain their behavior. In the sense of business-model accounting, we compute Groupon Earnings and their accumulated earnings from coupons sold.

F. Operationality

The operationality of our model is visible from the detailed structure of the model. The next chapter, policy implementation, will be an additional illustration. There we will further discuss results from simulation with and without endogenous discounts.

G. Validity

The validity aspects have been examined in the preceding chapter.

H. Reliability

Even though we have extrapolated missing data from another company (DeinDeal) we assume that the same procedure drawn from another company of that type would deliver highly similar results. This is due to the extreme similarity of the business models of group buying companies.

I. Fruitfulness

The fruitfulness of our model can be attested, as substantial insights have been shared in the chapter about policy implementation.

J. Practicality

Practicality inheres in our main recommendations for changing Groupon's business model to a sustainable one. Also, practicality plays a role in the policy chapter, where we deliver some concrete and direct implementation advice for Groupon to make its business model more sustainable.

Liste der seit Januar 1993 am Institut für Betriebswirtschaft erschienenen Diskussionsbeiträge
Papers published since 1993

Nr. 1 Krüger, W./Müller-Stewens, G. - Matching Acquisition Policy and Integration Style, St. Gallen, Januar 1993

Nr. 2 Müller-Stewens, G./Spickers, J. - Akquisitionsmanagement als Organisation des Wandels, St. Gallen, Januar 1993

Nr. 3 Gomez, P./Rüegg-Stürm, J. - Controlling im Dienste der Wertsteigerung der Unternehmung, St. Gallen, Januar 1993

Nr. 4 Strasser, G. - Wissensmanagement - Forschungsprojekt zur Handhabung fundamentalen Wandels in grossen Unternehmen, St. Gallen, November 1993

Nr. 5 Strasser, G. - Die Bedeutung soziologischen Wissens bei der empirischen Analyse organisatorischer Lernprozesse, St. Gallen, Januar 1994

Nr. 6 Strasser, G. - Wandel, Lernen von Organisationen, Wissensmanagement, St. Gallen, Januar 1994

Nr. 7 Strasser, G. - The New Winners?-Project: Engendering, Enhancing and Measuring Fundamental Corporate Transformation Processes, St. Gallen, April 1994

Nr. 8 Malioukova, I./Strasser, G. - Bericht einer Interviewanalyse: Brauchen Unternehmen Revolutionen? St. Gallen, April 1994

Nr. 9 Weber, B. - Unternehmensnetzwerke aus systemtheoretischer Sicht, St. Gallen, Juni 1994

Nr. 10 Schwaninger, M. - Stand der Entwicklung und Tendenzen der Managementforschung. Ein Beitrag aus systemtheoretischer Sicht, St. Gallen, Juli 1994

Nr. 11 Schwaninger, M. - Control - A Systems Perspective, St. Gallen, August 1994

Nr. 12 Schüppel, J. - Organisationslernen und Wissensmanagement, St. Gallen, August 1994

Nr. 13 Strasser, G. - Wandel von Unternehmen und Revolution - Variationen über eine radikale Vorstellung von Veränderungen im grossen Unternehmen, St. Gallen, September 1994

Nr. 14 Schwaninger, M. - Die intelligente Organisation als lebensfähige Heterarchie, St. Gallen, September 1994

Nr. 15 Binder, V./Kantowsky, J. - Potentialorientiertes Management - Eine Standortbestimmung, St. Gallen, Februar 1995

Nr. 16 Schüppel, J. - Das „MB-Erfolgsprogramm“ bei der Mercedes-Benz AG - Fallstudie, St. Gallen, Mai 1995

Nr. 17 Schwaninger, M. - Lernende Unternehmungen - Strukturen für organisationale Intelligenz und Kreativität, St. Gallen, Oktober 1995

Nr. 18 Schwaninger, M./Espejo, R. - Recursive Management: A Key to Organizational Fitness, St. Gallen, November 1995

Nr. 19 Schwaninger, M. - Systemtheorie - Eine Einführung für Führungskräfte, Wirtschafts- und Sozialwissenschafter, St. Gallen, 2. Auflage Januar 1998

Nr. 20 Schwaninger, M. - Structures for Intelligent Organizations, St. Gallen, February 1996

Nr. 21 Müller-Stewens, G./Aschwanden C. - Überlegungen zur Rolle der Informationstechnologie im Aufgabengebiet von Führungskräften, St. Gallen, April 1996

Nr. 22 Schwaninger, M. - Integrative Systems Methodology: Framework and Application, St. Gallen, June 1996

Nr. 23 Kriwet, C./von Krogh G.F. - Corporate Ethnography, St. Gallen, November 1996

Nr. 24 von Krogh G.F./Mahnke, V. - Managing Knowledge in International Allicances, St. Gallen, April 1997

Nr. 25 Müller-Stewens, G./Radel, T. - Allianzensysteme als Spieler auf dem globalen Telekommunikationsmarkt: Kampf der Giganten oder emperors without empires?, St. Gallen, Juli 1997

Nr. 25 (e) Müller-Stewens, G./Radel, T. - Battle of the Giants: The Evolution of Global Alliances in the Telecommunications Industry, St. Gallen, revised and translated 2nd ed., May 1998

Nr. 26 Müller-Stewens, G./Radel, T. - Branchendynamik und Veränderungsnotwendigkeit: Das Beispiel der Telekommunikationsbranche, St. Gallen, Juli 1997

Nr. 27 Mahnke, V.- What is Knowledge-Intensive Business and What is not? Developing the base-case of a strategic theory of the firm that relates knowledge to above normal returns, St. Gallen, August 1997

Nr. 28 Aadne, J.H./Kleine, D./Mahnke, V./Venzin, M. - In Search of Inspiration: How managers, consultants and academics interact while exploring business strategy concepts, St. Gallen, October 1997

Nr. 29 Schwaninger, M. - Bausteine für ein Unternehmungsmodell, St. Gallen, November 1997

Nr. 30 Mahnke, V. - Knowledge-Intensive Business as Puzzlement for Contractual Theories of the Firm, St. Gallen, Dezember 1997

[Nr. 31 Schwaninger, M. - Intelligent Organizations – The Ecological Dimension, St. Gallen, October 1998 - nicht erschienen]

Nr. 32 Schwaninger, M. - Are Organizations Too Complex To Be Understood? - Towards a Framework for Intelligent Organizations, St. Gallen, October 1998

Nr. 33 Müller-Stewens, G./Lechner, Ch. - Strategische Prozessforschung: Zentrale Fragestellungen und Entwicklungstendenzen, St. Gallen, August 1999

Nr. 34 Szeless, G./Wiersema, M.F./Müller-Stewens, G. - Relatedness and Firm Performance in European Firms: A Comparison of Related Entropy and Resource-Based Relatedness, St. Gallen, January 2000

Nr. 35 Schwaninger, M. - Das Modell Lebensfähiger Systeme. Ein Strukturmodell für organisationale Intelligenz, Lebensfähigkeit und Entwicklung, Mai 2000

Nr. 36 + e Rüegg-Stürm, J. - Was ‚ist' eine Unternehmung? - nicht mehr als DB erhältlich, fand Eingang in die Publikation „Das neue St. Galler Management-Modell. Grundkategorien einer integrierten Managementlehre: Der HSG-Ansatz", Bern: Haupt 2002. ISBN 3-258-06534-9. Entglisch: The New St. Gallen Management Model. Basic Categories of an Approach to Integrated Management, New York: Palgrave McMillan, 2005 ISBN 1-4039-3631-5. Erhältlich in Buchhandlungen

Nr. 37 Schwaninger, M./Körner, M. - Managing Complex Development Projects: A Systemic Toolkit Based on the St. Gall Management Framework, November 2000

Nr. 38 Schwaninger, M. - A Theory for Optimal Organization, November 2000

Nr. 39 Spickers, J./Lechner, Ch. - Kernkompetenzen und organisationale Fähigkeiten als Management-Herausforderung. Diskussionsbeitrag Nr. 39, Dezember 2000 (nicht erschienen)

Nr. 40 *Spickers, J./Strasser, G. - Leitfaden zur systemischen Diagnose der Befindlichkeit von Organisationen - ein Beitrag zur Operationalisierung von „Unternehmenskultur". Diskussionsbeitrag Nr. 40, Dezember 2000 (nicht erschienen)*

Nr. 41 Schwaninger, M. - Implizites Wissen und Managementlehre: Organisationskybernetische Sicht, November 2000

Nr. 42 Rüegg-Stürm, J. /Gritsch, L. – Ungewissheit und Stabilitiät in Veränderungsprozessen. Zur Bedeutung von Ritualen in tiefgreifenden Veränderungsprozessen von Unternehmungen, März 2001

Nr. 43 Schwaninger, M./Körner M. – Systemisches Projektmanagement: ein Instrumentarium für komplexe Veränderungs- und Entwicklungsprojekte, September 2001

Nr. 44 Enkel, E./Gibbert M./Makarevitch, A./Vassiliadis, St. – Vol. 1: Innovation/Knowledge Creation, Customer Integration and Entering New Ventures (Editors: Back, A. and von Krogh, G.), July 2002

Nr. 45 Enkel, E./Gibbert M./Makarevitch, A./Vassiliadis, St. – Vol. 2: Boundaries of the Firm: Barriers within the company and at the integration of mergers and acquisitions (Editors: Back, A. and von Krogh, G.), July 2002

Nr. 46 Makarevitch, A./Enkel, E. **–** Vol. 3: New Ventures – important concepts and theories (Editors: Back, A. and von Krogh, G.), July 2002

Nr. 47 Grzegorz, G./Rumyantseva, M./Enkel, E. – Vol. 4: Customer Integration - Establish a constant bilateral knowledge flow (Editors: Back, A. and von Krogh, G.), July 2002

Nr. 48 Rumyantseva, M./Grzegorz, G./Enkel, E. – Volume 5: Knowledge Integration after Mergers & Acquisitions (Editors: Back, A. and von Krogh, G.), July 2002

Nr. 49 Rüegg-Stürm, J. – Kulturwandel in komplexen Organisationen, März 2003

Nr. 50 Schwaninger, M./Hamann, Thomas K.: Theory-Building with System Dynamics - Principles and Practices, May 2005

Nr. 51 Schwaninger M./Körner M. - Integratives Management von Organisations- und Veränderungsprojekten, Juni 2005

Nr. 52 Schwaninger M. - System Dynamics and the Evolution of the Systems Movement - A Historical Perspective, June 2005

Nr. 53 Schmidt, S.L.: Comparative Strategy Process Research: A Methodological Approach, July 2005

Nr. 54 Schwaninger, M. & Kaiser, Ch.: Tragfähiger organisatorischer Wandel: Eine empirische Analyse der Erfolgsfaktoren von Organisations- und Veränderungsprojekten, Januar 2006

Nr. 55 Grösser St.N. & Grösser J.R.: Bereicherung des Qualitätsmanagements: Komplexitätsbewältigung durch Modellbildung, Mai 2007

Nr. 56 Schwaninger M. & Janovjak M.: Model-Based Management: A Systemic Approch from the Pharmaceutical Industry, September 2008

Nr. 57 Schwaninger M.: Model Based Management (MBM): A Research Agenda, January 2009

Nr. 58 Köpp S., Mukhachou A., Schwaninger M.(Supervision): Group Buying Schemes – A Sustainable Business Model? October 2012