

# Managing Marketing Multi-Channel Conflict to Maximize Profit in The Egyptian Consumer Electronics market

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## Abstract

In today's global competition, companies are obliged to go to market using multiple channels strategy for various reasons. However, channel conflict is inevitable in multi-channel structures causing sharp decreases in the demand of one or more channels. In this article, a system dynamic model was developed to simulate the complex multiple channel structure and various factors that affect the demand and channel conflict. The model aims to simulate the real situation of the supplier decision maker who has to take fast decisions in one of the various variables that he controls to achieve maximum profits and minimum channel conflict. The model was validated using real data of a major consumer electronics supplier in Egypt that has traditional distributors and Hypermarkets as two different channels. Various policies of inventory allocations in each channel and different promotion rates were tested in order to achieve the objective of maximizing supplier profit and minimizing channel conflict. It was found that the policy of allocating the inventory with the equal quantity in both channels with a promotion rate of one promotion per month in the hypermarkets is the optimal policy.

Key-wards: Multi-Channel, Channel conflict, System dynamics, Simulation, Consumer Electronics, Distribution, wholesales, Hypermarkets

## 1. Introduction

Today, intense global competition is pushing companies to go to market using a multichannel strategy in which they sell their products through two or more channels of distribution (Gassenheimer et al., 2006; Webb and Hogan, 2002). The popularity of the multichannel strategy can be witnessed through the increasing number of companies adopting it for different reasons; to increase market share, to cut costs down, to cover different marketing segments, or to meet difference in consumer behaviors (Gassenheimer et al., 2006; Sa Vinhas and Anderson, 2005).

In their attempt to do so, however, decision makers are trapped in a dilemma. From one side, they are obliged to introduce new channels or new channel members that meet new trends in consumer buying behaviors and, from the other side, they are faced with 'channel conflict' generated as a result of adding of these new channels, especially from old traditional distributors. In such a complex situation, decision makers must take fast decisions concerning many variables to achieve an optimal channel structure that will generate maximum profit and the minimum channel conflict. The difficulty of doing so increases due to the complicated network of interactions among these variables. Thus, the need for a means to simulate such complex structure and that allows decision makers to test the effect of different alternatives on channel conflict and the total profits become apparent.

This article presents a reliable generic system dynamics model that helps decision maker in a supplier company to optimize their company channel structure; to achieve maximum profit with minimum channel conflict. The model is designed to act as a simulator where the decision maker can test any new policy and any decision that is thought of in the organization, to see all its effects, before applying that decision in reality. Then the model is tested to make sure of its reliability. Finally different polices were applied on the model to find out which is the scenario that will achieve the objective of maximizing total profit and minimizing channel conflict for a consumer electronics supplier in Egypt that has the traditional distributor responsible for distributing the products to traditional retailers, and a new hypermarket channel, targeting the customers who purchase from the hypermarkets, enjoying the privilege of buying all their needs from one store.

# 1. Literature Review

Adopting a multichannel strategy has become a must-be for companies to have different advantages that include: increased reach (Moriarty & Moran, 1990), maximized profits (Montoya-Weiss, Voss, & Growl, 2003), increased customers' exposure and access to a marketer's offerings (Rangaswamy & Van Bruggen, 2005), increased sales volume (Kumar & Venkatesan, 2005), and increased market presence (Sharma and Mehrotra, 2007). The payoff of such advantages, however, can be highly affected due to the appearance of the so-called 'channel conflict' leading to decreased sales. Due to their crucial effect on organizations, issues related to channel management and channel conflict became the topic of a large number of research articles. The majority of these articles followed a qualitative approach in which no robust quantitative model that support decision making was developed. (Rosenbloom, (2007) and Ranagan, (2006)) are examples for such works.

Moriarty and Moran (1990) proposed a model that helps companies identifying their optimal multichannel strategy by answering the question of what mix of channels can best accomplish the assortment of tasks required. Their proposed solution was to break the demand generation tasks both within and across a marketing system. They noted that channels are not the basic building block of a marketing system, but marketing tasks are. They, further, suggested breaking the demand-generation into tasks starting from lead generation, then qualifying the sales, presales, sales closing, post sales services, and account management.

A formula for measuring conflict was introduced by (Coughlan et al., 2001). This formula measures channel conflict as the sum-product of conflict importance, frequency of occurrence, and intensity of dispute. The formula became the base for several researches such as (Bradford et al., 2004) and this research.

Webb (2002) addressed the problem of channel distribution in the e-commerce age and described strategies for proactively managing conflict both externally among channel partners and internally among the subunits responsible for managing the channels. Twelve propositions were developed by which suppliers can influence the level of channel conflict, eight of which relate directly to channel mix and four focuses on channel communication and coordination.

A framework to effectively design and manage multichannel was introduced by Rangan (2006).

Sharma and Mehrotra (2007) proposed a model for "Choosing an optimal channel mix in multi-channel environments". They proposed a multi-channel strategy process of six steps :( 1) Develop strategic multi-channel objectives. (2)Understand customer and channel touch points to leverage advantage.(3)Undertake a review of industry structure and channel options.(4)undertake channel usage pattern.(5)review channel economy.(6)develop an integrated channel management strategy.

The model is a good mathematical model based on the profits of each channel. It determines the optimum number of channels and accounts per channel to maximize profit. But it is a business to business model, designed for services companies. It cannot be applied on a consumer product

and wholesales business because the case in consumer products is very different. The researchers highlighted the need to have profits in companies determined per each channel rather than product.

Rosenbloom (2006) highlighted the dimension of having the E-commerce as a new channel for manufacturers and the impact that it has on channel conflict. He raised a lot of issues like whether all products of the company should be sold through the internet, and if the online channel will lower the cost. He mentioned that the customer also benefit from multi-channel as he has the choice in purchasing from the most convenient channel. He also mentioned a very good advantage of multi-channels that others did not, which “Synergy” is meaning one channel reinforcing the effectiveness and efficiency of other channels and of the overall sum. And He also mentioned that the online channel can be utilized to give customer information before purchasing through conventional channels.

Rosenbloom (2006) claimed that sustainable competitive advantage can no longer be achieved only by cost leadership or product differentiation due to the globalization and ease of copying any new technology or cost leadership. He argues that they are important but not sufficient, and that the channel strategy and particularly the multi-channel strategy will continue to enjoy increased attention as a means for gaining a sustainable competitive advantage. This is because a well established channel strategy is more difficult for competitors to copy quickly. It requires long time commitment and investment in infrastructure involving capital and human skills. He gave the example of Caterpillar worldwide dealer network as something that competitors could not easy copy.

From the above mentioned literature it is widely shown that most of the literature that tackled the channel conflict issue is qualitative in nature. They end up with conclusions in the form of propositions, frameworks and recommendations. Very few were quantitative in nature, like (Sharma and Mehrotra, 2006) but their research is only applicable for service companies, and cannot be useful for consumer product suppliers.

Due to the complex nature of the channel structure, involving many variables that interact with each other, and also having effects on each other, there is a great need for a simulation model, that quantify the decision makers problems and gives them an accurate, reliable, and fast feedback for any decision that will be taken, and its effect on all the complex channel variables. The goal of this study is to build a reliable generic system dynamics model helping the decision maker in the supplier company to optimize the channel structure, to achieve maximum profit with minimum channel conflict. The model is designed to act as a simulator where the decision maker test any new policy and any decision that is thought of in the organization, to see all its effects, before applying that decision in reality. Then the model was tested to make sure of its reliability, and finally it was applied on the case of the company under study to determine the optimum channel structure and policies that will generate maximum profits with minimum channel conflict.

## **2. Proposed Simulation Model**

The simulation model presented and analyzed in this paper aims to support strategic and tactical decision making situations related to managing multichannel environment. Model equations and parameter values used in this model are available from the author.

The research was designed based on best practices locally and globally. Experts opinions (Suppliers and channel owners) were taken through semi-structured interviews, followed by structured ones. It was obvious at the early beginning for all concerned parties that the channel structure in the consumer electronics product is very complex and changing a variable can have implications affecting other variables in the structure thus there is a need for a system dynamic model that can be as a decision making tool helping the supplier company take fast and accurate decisions concerning any of the channel variables. The final model and output were presented to the company CEO and top management of the supplier company for their feedback which was very positive.

Based on the meetings and interviews, a simulation model with six modules was designed. Each of the building modules (production, inventory, price, consumption, profit, and conflict) was represented in a separate model, these modules were modeled in several steps, at each step a new feedback loop was added and its impact on other variables was analyzed. In addition, basic verification tests (dimensional consistency, extreme conditions, and sensitivity tests) were conducted at each step. The chief marketing officer of the supplier company took a part in the development of the model whenever there is doubt regarding model behavior.

The channel conflict module is based on the equation of channel conflict presented by (Coughlan et al., 2001). The demand of the supplier product and the profits are generated from straight forward calculations as will be shown.

The complete model was tested using fourteen tests to assure it is a reliable model before start testing different policies and scenarios. Finally different scenarios were applied to the model and the results were shown to the company top management to have their feedback.

### **2.1 Model Structure**

The presented model consists of four major building blocks: (1) Production- Inventory- Price; (2) Consumption; (3) Profit; and (4) Conflict. This section will provide details on each on these building blocks and on the model as a whole.

#### **2.1.1 Production- Inventory- Price**

This paper adopts the Adam Smith supply and demand system dynamic representation (shown in Figure 1) which is a very good theory describing the interdependency of the supply, price, and consumption of products from raw materials to differentiated products, From Zinc to Air Crafts (Sternan, 2000).

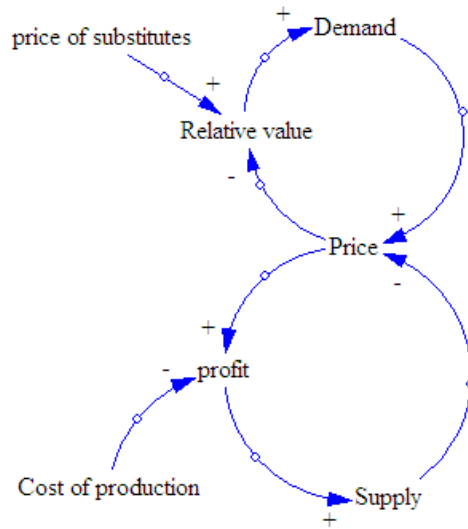


Figure 1.

The basic idea of the model is that the increase in the demand of a certain product, causes the price of that product to increase, and so the profits, while the cost is remained constant. In turn, the increase of profits attracts suppliers and other new investors to increase product supply to gain portion of these profits. In doing so, by their own hand, they cause the prices to go down. Because the increase of supply will lead to the decline in price of the product.

As the price of the product increases compared to the price of the substitute products the relative value of the product decreases in the eye of the consumer. The decrease of the relative value of the product causes the demand on the product to decrease which in turn decrease its price. And so the two loops work and affect each other because of the supply and demand dynamic interdependency.

Using Adam Smith as the corner stone, a generic model for a supplier with the four channels (Wholesalers, Hypermarkets, E-commerce, and Direct sales) was developed as shown in Figure 2. The total inventory is divided between the four channels with different inventory allocation for each channel. For each channel, the consumption is the minimum of either the demand for such specific channel per month or the inventory allocated to such channel. Inventory allocation (the percentage of inventory allocated for each channel) is a decision variable in the hand of the supplier decision maker.

An important variable that causes the price to change is the inventory coverage; that is the balance between the supply and the demand. The current supply is the available stock or inventory while the current demand is the order rate or consumption rate. So, the equation of the inventory coverage is equal to the inventory divided by the consumption, and it has the units of time (month).

High prices reduce the relative value of the product in the eyes of consumer compared to competitive products causing demand to fall. On the supplier side higher prices urges top management to allocate more inventory to the high price channel to gain more profits.

Also, increasing production shortly by maximum capacity utilization and in long term by capacity acquisition loop. As each channel serve different market segment from E-commerce, to hypermarket, wholesalers, and direct sales, so there is a price difference for the same product in different channels. The price difference between channels is because the difference in value adding that each channel have on the product compared to the other channels.

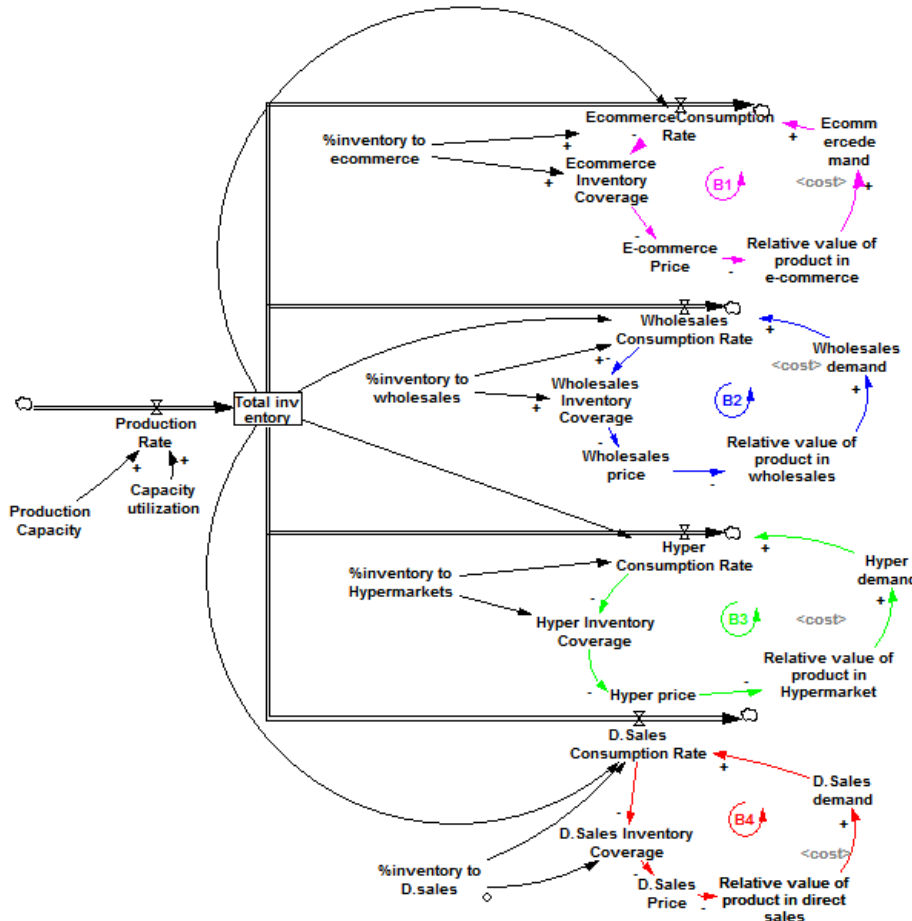


Figure 2.

### 2.1.2 Consumption

The second building block, the consumption, is concerned with the demand on the product, that will initialize the whole dynamics, demand on the product (the supplier product and all its equivalent competitors) is represented by the total industrial demand (TID).

TID is divided between various channels with the market share of each channel which can be determined from marketing research reports. The supplier demand in each channel is equal to the total demand in that channel multiplied by the supplier market share in that particular channel.

The demand of each channel is decreased by channel conflict, and increased by promotional activities done in such channel. Also the number of channel members increases the demand, but also increase conflict which decrease demand as it will be shown in the conflict module. Because E-commerce and direct sales are both fully controlled by the supplier and there is no involvement of other organization in the sales process in such channels, so channel conflict that appears in such two channels are only due to internal reasons that is very controlled by the organization so can be neglected. Also the promotion activities and channel conflict in the other two channels do not have any effect on the demand in the E-commerce nor direct sales, because they serve different segments that are not affected by such two causes of variation in demand because of the nature of the market segments that both these channels serve (E-commerce and direct sales customers).

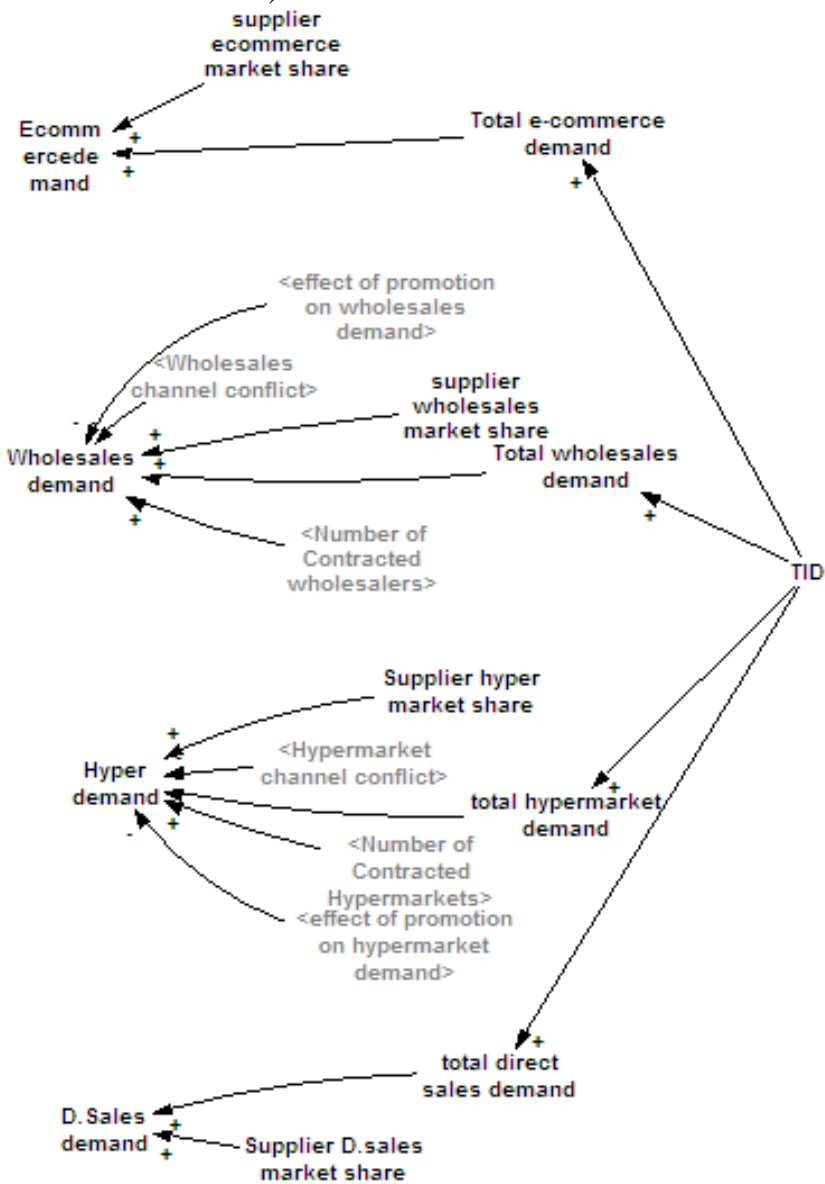


Figure 3.



### 2.1.3 Profits

As shown in Figure 4, total profit is calculated from a straight forward formula as the sum of profits generated from all four channels. In turn, single channel profit, as shown in Figure 5, is the price of the product in that channel minus the cost multiplied by the quantity (consumption rate in that particular channel).

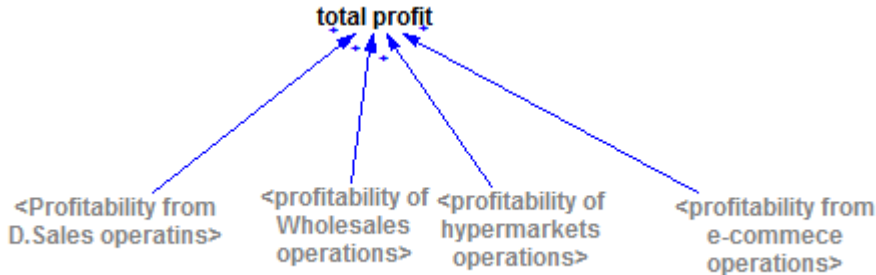


Figure 4.

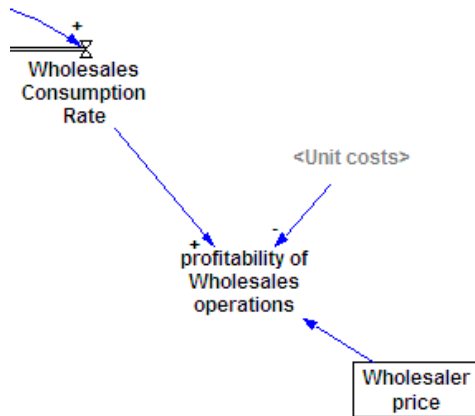


Figure (5)

### 2.1.4 Conflict

The channel conflict is based on the following equation of channel conflict presented by (Coughlan et al., 2001):

$$\text{Conflict} = \sum_{i=1}^N \text{Importance}_i \times \text{Frequency}_i \times \text{Intensity}_i$$

The measurement is done by gathering four types of information: (1) counting up the issues: what are the major issues of relevance to the two parties in their channel relation; (2) importance: each issue is assessed to determine its importance to the parties - this can be done judgmentally or by asking the parties directly; (3) frequency of disagreement: for each issue we need to assess how often the two parties disagree over each issue - this can be done judgmentally or by collecting data; and (4) intensity of dispute: for each issue we need to assess how intensely the two parties differ on the issue (how far apart the two parties position are) - this can be done judgmentally or by asking the parties directly.

Figure 6 presents the part of the overall model which accounts for channel conflict in two channels; wholesales, and hyper markets. As these two types of conflicts are external to the supplier organization, the supplier has weak control over their occurrence compared to the e-commerce or direct sales channels; also the company under study does not have the e-commerce or the direct sales as channels.

The wholesales channel conflict is increased by adding a new wholesaler (number of contracted wholesalers), the promotions done by the hypermarkets, the price discrepancy, and parallel trading, the number of wholesales conflicts per single event, and the number of hypermarkets contracted. While the hyper market channel conflict is caused by adding a new hypermarket (number of contracted hypermarkets, hypermarket conflict per single promotion, and the promotion rate done by the hypermarkets).

According to interviews with all parties involved, all the channel conflict incidents mentioned above are assumed to be of high importance and high intensity.

The channel conflict resolution rate in each channel is depending on three factors; the number of sales persons assigned to handle the channel, the number of simultaneous conflicts that a sales person can handle, and the average time taken by the company to resolve the channel conflict.

Each channel conflict (either wholesales or hypermarkets) have a negative effect on the demand in such channel, so the higher the channel conflict level the lower will be the demand in such channel.

It is obvious that the promotions done in the hyper market will have a positive effect on increasing the demand in the hypermarket channel. So increasing the promotion rate will increase the demand in the hypermarket channel from that particular hyper that runs the promotion, but it will increase channel conflict in both channels, affecting the demand in both channels. So the overall demand can increase or decrease by the promotion rate. Thus the decision maker should adjust a lot of variables to reach the goal of maximizing the profit and minimizing the channel conflict.

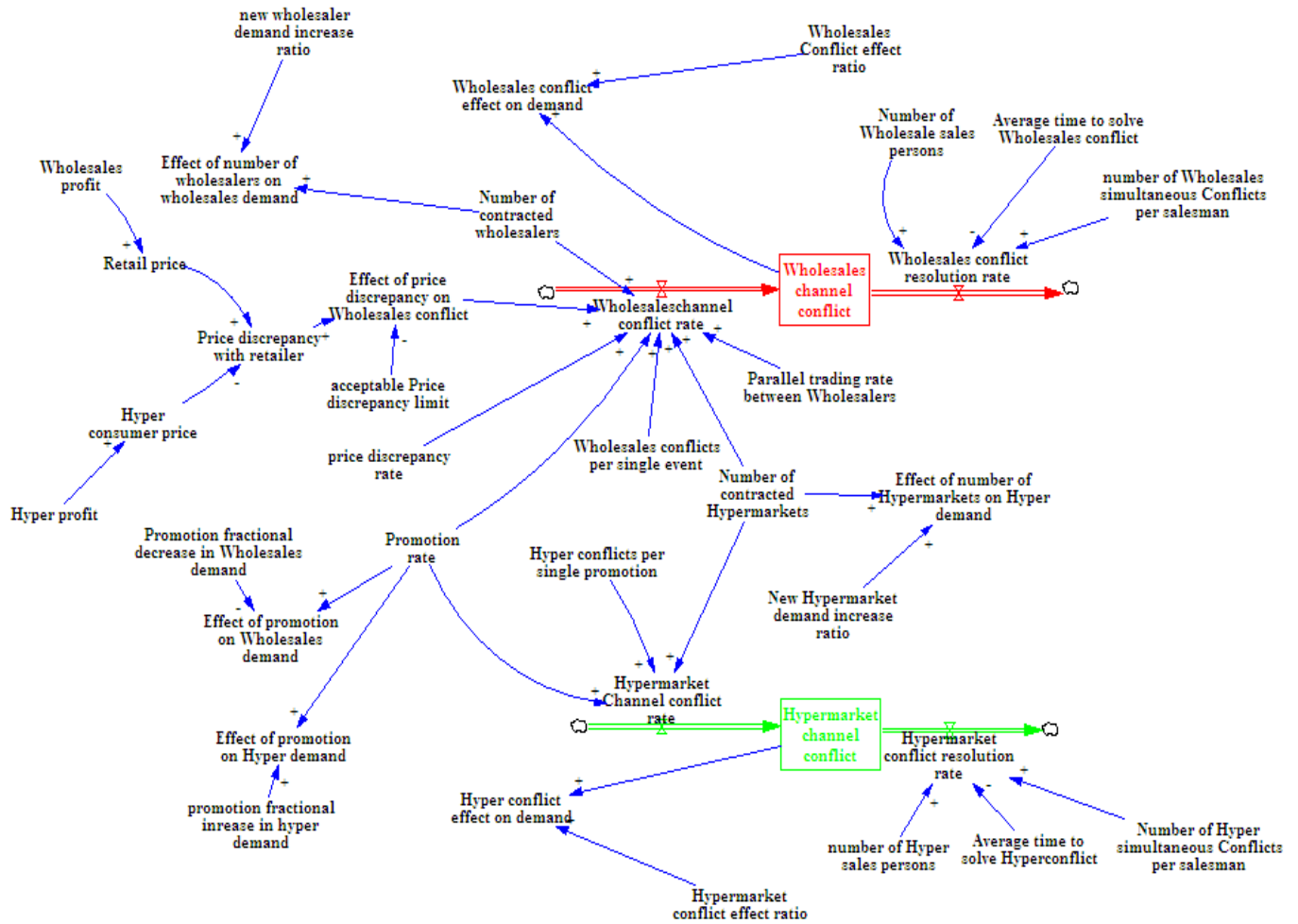


Figure 6.

## 2.2 About the Company

The company for which this study is conducted is an Egyptian company that produces a consumer electronics product which is well known for a long time in the local market and enjoys a 20% market share.

The company does not have direct sales nor does it sell through the web site, selling is only through traditional wholesalers and hypermarkets. Traditional wholesalers are responsible for reselling to retailers, while hypermarkets sell the products directly to end consumers.

The company has four hypermarkets, and two wholesalers, hypermarkets are new in Egypt but attracting a huge number of customers. A lot of channel conflict takes place due to price discrepancies and goal incompatibility between wholesalers and hypermarkets, the wholesalers are always targeting maximizing their profit, while the hypermarkets are sometimes using the promotional activities on the products of the company to attract customers who want to buy the discounted product to purchase also other items.

The hyper markets are looking for maximizing total profit from the overall sales in the hyper. In the promotion events especially they are using a consumer product price reduction that they put

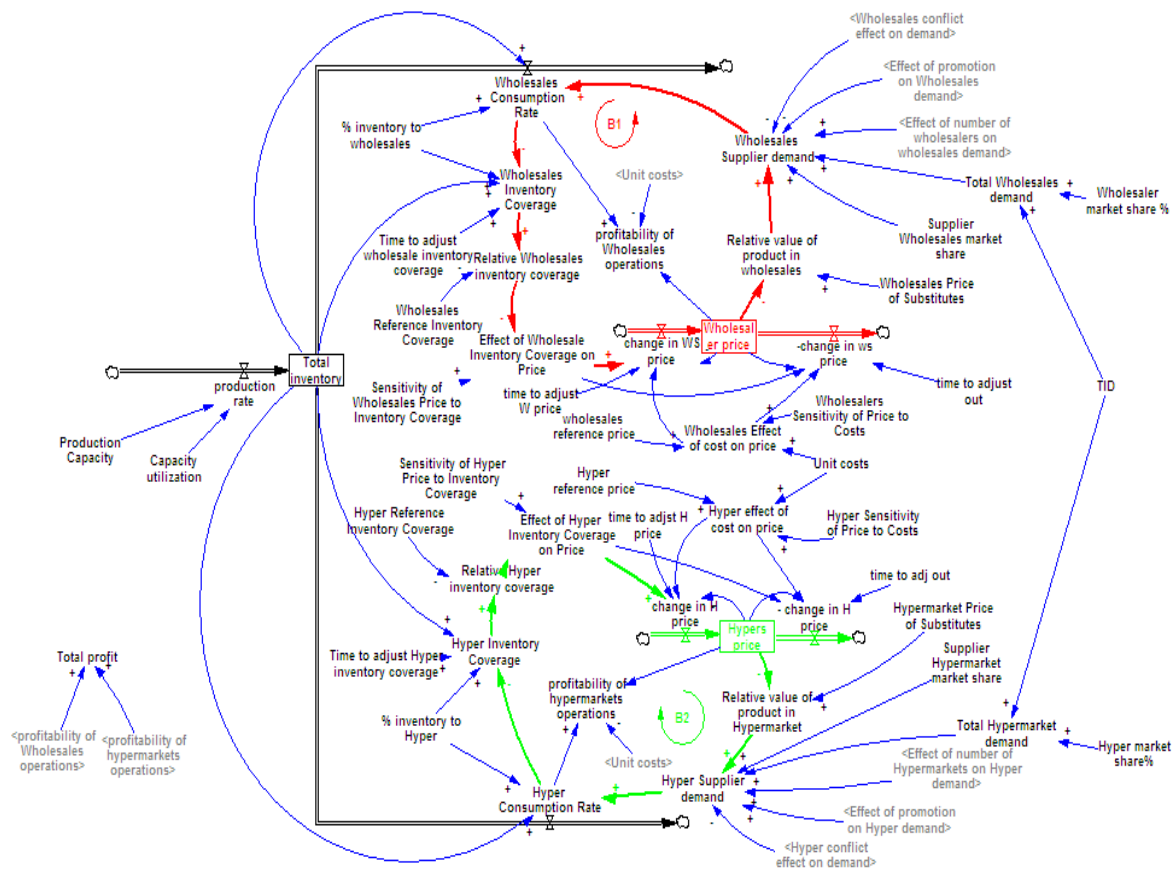
in their advertisement to attract the maximum number of customers to the hyper to purchase the discounted item as well as other items.

These hypermarket promotional activities, leading to price discrepancies, and so channel conflict.

As the company under study has only two channels (wholesales, and Hypermarkets) the dynamics model in figure (2) is simplified to only two channels.

An error is generated when any dynamic model is run with a closed loop with all variables without a stock. So the price is changed from a variable to a stock with the rate of increase and decrease is the same, but with different adjusting times, which is a logical issue for price behavior.

Finally, Figure (7) presents the full dynamic model for the case of two channels the Wholesales and the hypermarkets



### 3. Model Validation

Fig(7)

The Model was validated using fourteen tests with extreme initial values to assure reliability. Values of “production capacity”, “TID”, and “promotion rate” were changed from a minimum to a maximum values. The results of such tests agreed with the logic with which the model was built, these tests assured that the model is reliable and can be used by the decision makers in the consumer supplier company to simulate the complex channel structure, also they can rely on the model in finding the best policy that will generate the maximum profit and minimum channel

conflict. For the real life condition (base case or reference mode), TID was set to 120,000 unit/month and production capacity was set to 30,000 unit per month.

The following tests were performed:

Production capacity set to a minimum of 10,000, then to 30,000 and finally to a maximum of 120,000

1. Effect of varying "Production Capacity" on "Wholesales price".
2. Effect of varying " Production Capacity " on "Hypermarket price".
3. Effect of varying " Production Capacity " on "Relative value of product in wholesales".
4. Effect of varying "Production Capacity" on "Relative value of product in Hypermarkets ".
5. Effect of varying "Production Capacity " on "Wholesales supplier demand".
6. Effect of varying " Production Capacity " Hyper supplier demand”

The following tests were performed at production capacity =30,000 unit/month and TID varies from 10,000 to 250,000 unit /month

7. Effect of varying " TID " on "Wholesales price".
8. Effect of varying "TID" on "Hypermarket price".
9. Effect of varying "TID" on "Relative value of product in wholesales".
10. Effect of varying "TID" on "Relative value of product in Hypermarkets ".
11. Effect of varying "Promotion rate" on the "Whole sales channel conflict ".
12. Effect of varying "Promotion rate" on the "Hyper market channel conflict ".
13. Effect of varying "Promotion rate" on the "Whole sales Demand ".
14. Effect of varying "Promotion rate" on the "Hypermarket demand ".

When the model was tested its equations responded with reliable outputs that agree with the rational by which the model was built. As the production was increased from a minimum of 10,000 unit/month to a maximum of 120,000 unit/month both the whole sales price, and the hypermarket prices decreased as shown in figure(8),and Figure(9) respectively . also the relative value of the product in the eyes of the consumer increased compared to competitive products in both the wholesales channel and the hypermarket channel as shown in figures (10,11) respectively which agrees with the supply and demand dynamic model.

The model responded with a response that agrees with the Adam Smith invisible hand that by increasing the production from a minimum of 10,000 unit/month to a maximum of 120,000 unit/month the demand of both channels will be increased as shown in figures (12,13) due to the simultaneous decrease in prices.

The model was then tested when varying the total industrial demand (TID) from 10,000 to 250,000 unit /month while fixing the production capacity to 30,000 unit/month. The model also responded with outputs that agreed with the Adam Smith basic of supply and demand. As shown in figures (14, 15, 16, and 17) when increasing the total demand of the product supplied the prices increase, while the relative values decrease, for both channels.

The model was finally tested when changing the promotion rate in the hypermarkets which is the main cause of channel conflict in the case of consumer electronics supplier.

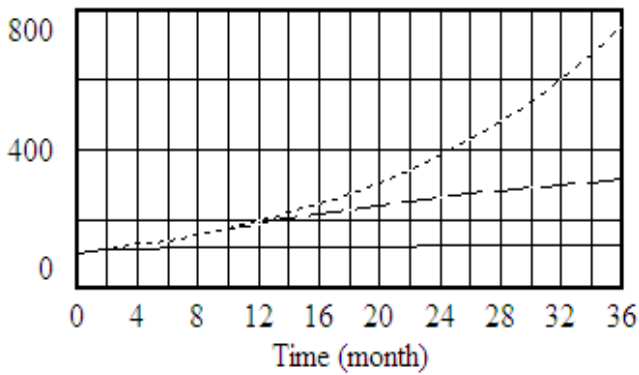
First, when increasing the promotion rate from a single promotion to four promotions per month the channel conflict in the wholesales channel and the hypermarket channel will increase as shown in figures (18, 19)

The demand in both channels will have different response when increasing the number of promotions in the hypermarkets which is rational. The demand will decrease in the wholesales channel while it will increase in the hypermarket channel as a response to the increase in the promotion rate in the hypermarkets as shown in figures (20, 21).

As a consequence, the profitability will follow the same trend of the demand in both channels which is a very rational response. The profitability in the wholesales will decrease in the wholesales channel, and it will increase in the hypermarket channel when increasing the promotion rate from one to four promotions per month as shown in figures (22,23).

As shown in figure 24 when increasing the number of contracted wholesalers the channel conflict will increase. It should be mentioned that the demand and profits is very slightly changed as the conflict generated removes any increase in demand. So the decision of increasing the number of wholesalers will cause more problems than the profits generated from it.

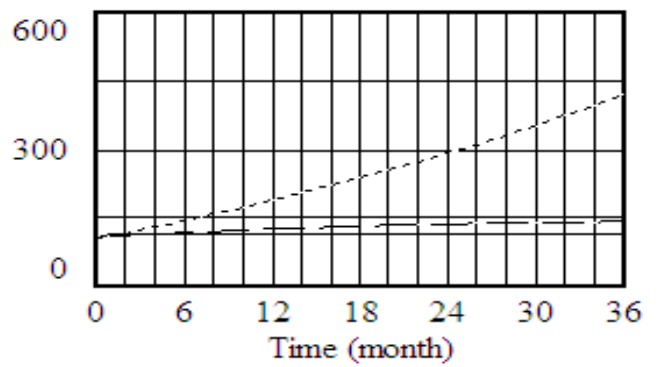
Wholesaler price



Wholesaler price : production 120k ———— \$/Unit  
 Wholesaler price : production 10k - - - - - \$/Unit  
 Wholesaler price : production 30k - - - - - \$/Unit

Fig(8)

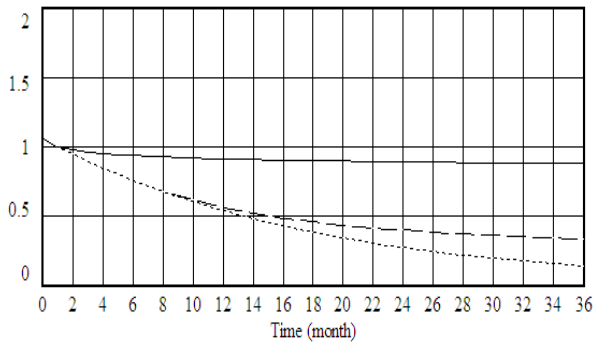
Hypers price



Hypers price : production 120k ———— \$/Unit  
 Hypers price : production 10k - - - - - \$/Unit  
 Hypers price : production 30k - - - - - \$/Unit

Fig(9)

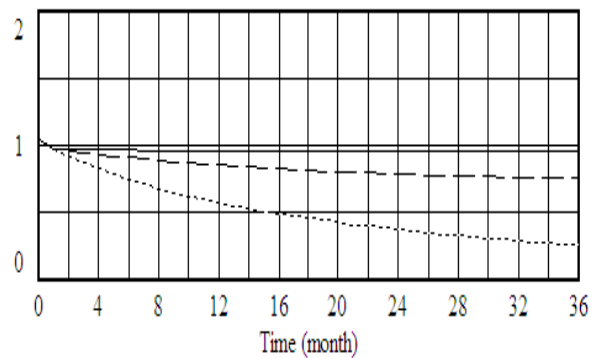
Relative value of product in wholesales



Relative value of product in wholesales : production 120k ———— Dimensionless  
 Relative value of product in wholesales : production 10k - - - - - Dimensionless  
 Relative value of product in wholesales : production 30k - - - - - Dimensionless

Fig(10)

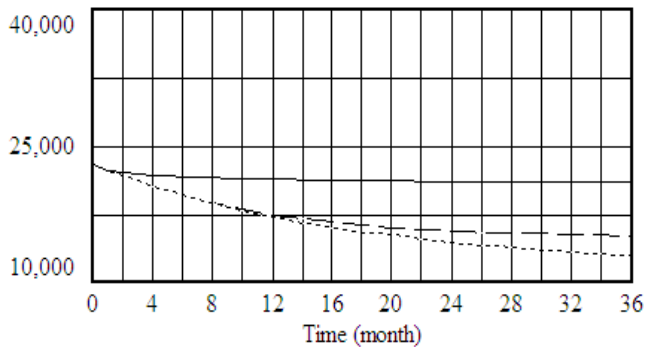
Relative value of product in Hypermarket



Relative value of product in Hypermarket : production 120k ———— Dimensionless  
 Relative value of product in Hypermarket : production 10k - - - - - Dimensionless  
 Relative value of product in Hypermarket : production 30k - - - - - Dimensionless

Fig(11)

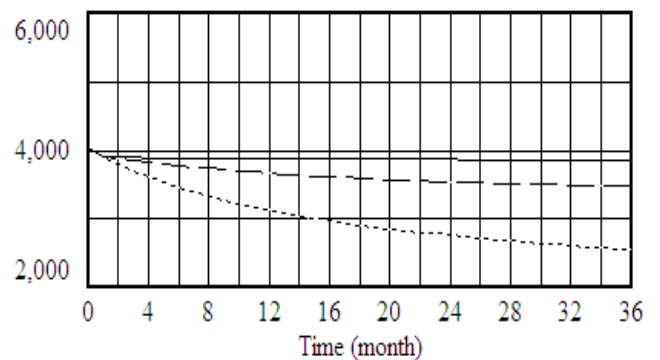
Wholesales Supplier demand



Wholesales Supplier demand : production 120k ———— Unit/month  
 Wholesales Supplier demand : production 10k - - - - - Unit/month  
 Wholesales Supplier demand : production 30k - - - - - Unit/month

Fig(12)

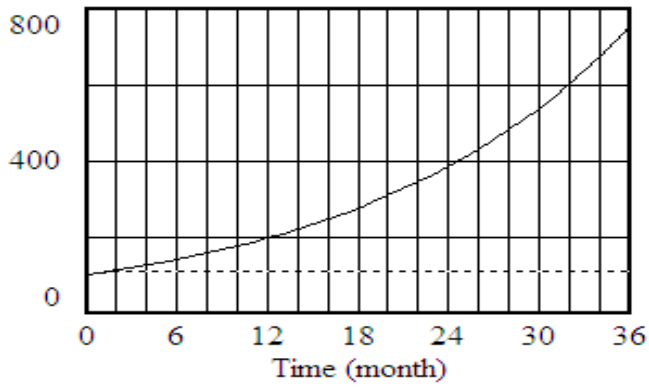
Hyper Supplier demand



Hyper Supplier demand : production 120k ———— Unit/month  
 Hyper Supplier demand : production 10k - - - - - Unit/month  
 Hyper Supplier demand : production 30k - - - - - Unit/month

Fig(13)

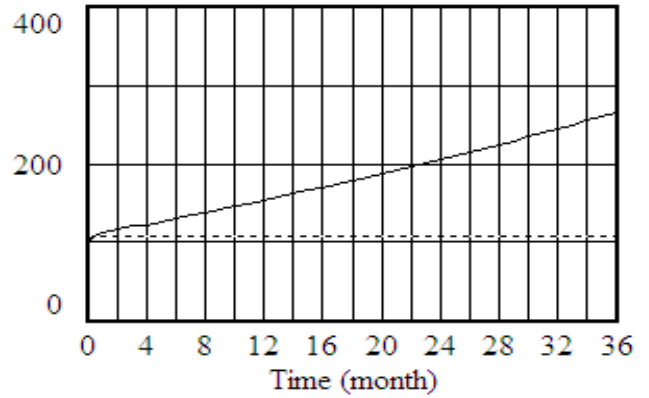
Wholesaler price



Wholesaler price : TID 250k — S/Unit  
 Wholesaler price : TID 10k - - - S/Unit

Fig(14)

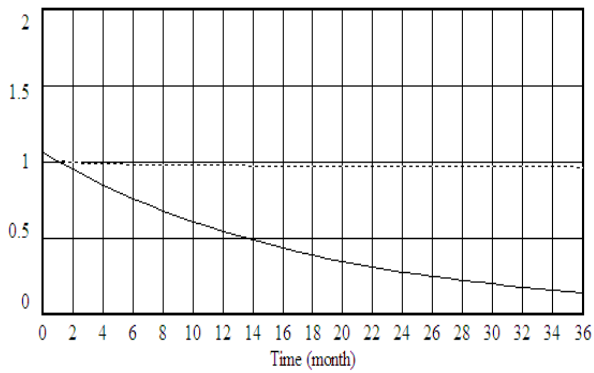
Hypers price



Hypers price : TID 250k — S/Unit  
 Hypers price : TID 10k - - - S/Unit

Fig(15)

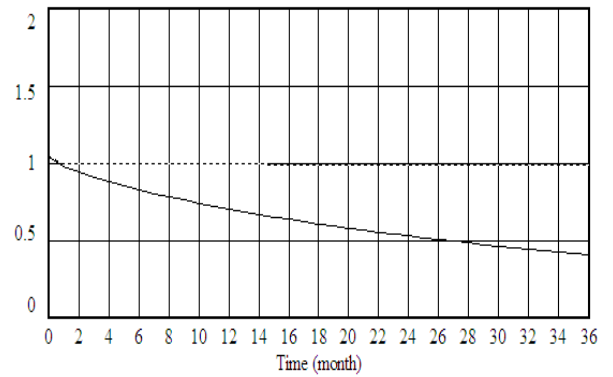
Relative value of product in wholesales



Relative value of product in wholesales : TID 250k — Dimensionless  
 Relative value of product in wholesales : TID 10k - - - Dimensionless

Fig(16)

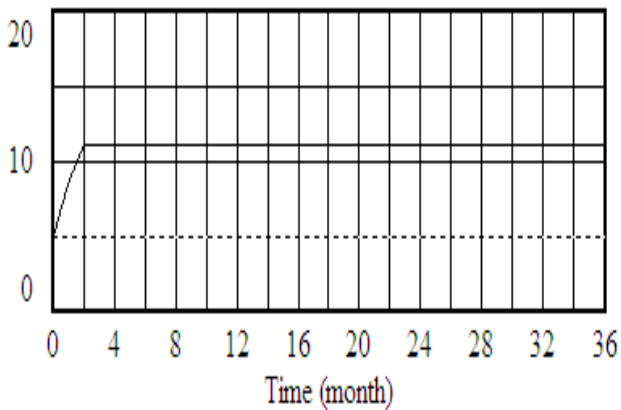
Relative value of product in Hypermarket



Relative value of product in Hypermarket : TID 250k — Dimensionless  
 Relative value of product in Hypermarket : TID 10k - - - Dimensionless

Fig(17)

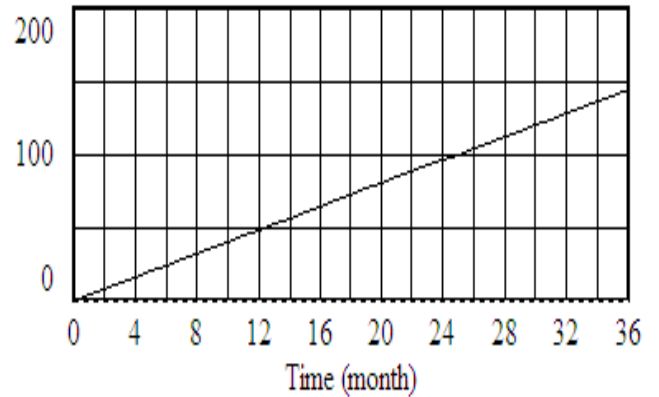
Wholesales channel conflict



Wholesales channel conflict : 4 promotion per month — conflict  
 Wholesales channel conflict : 1 promotion per month - - - conflict

Fig(18)

Hypermarket channel conflict

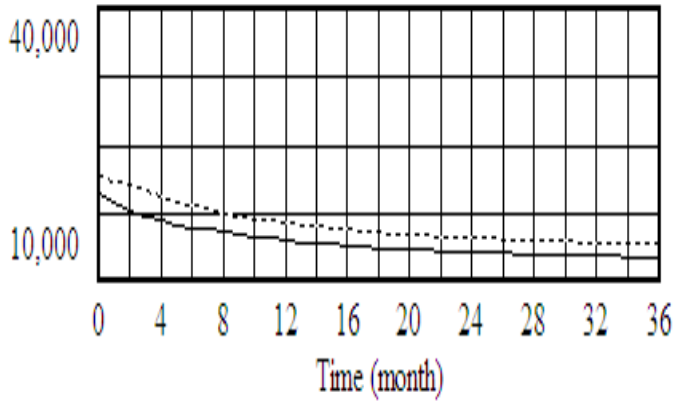


Hypermarket channel conflict : 4 promotion per month — conflict  
 Hypermarket channel conflict : 1 promotion per month - - - conflict

Fig(19)



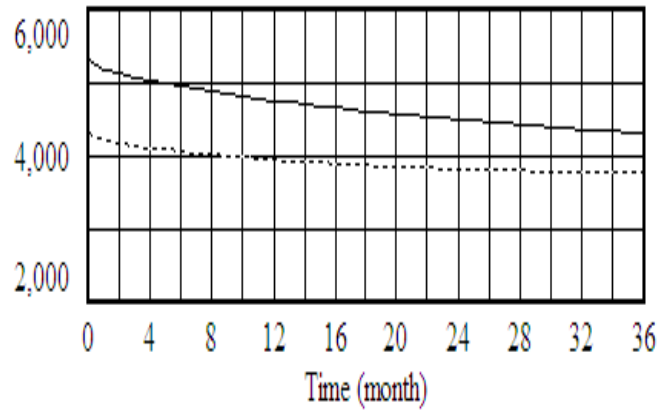
### Wholesales Supplier demand



Wholesales Supplier demand : 4 promotion per month — Unit/month  
 Wholesales Supplier demand : 1 promotion per month ..... Unit/month

Fig(20)

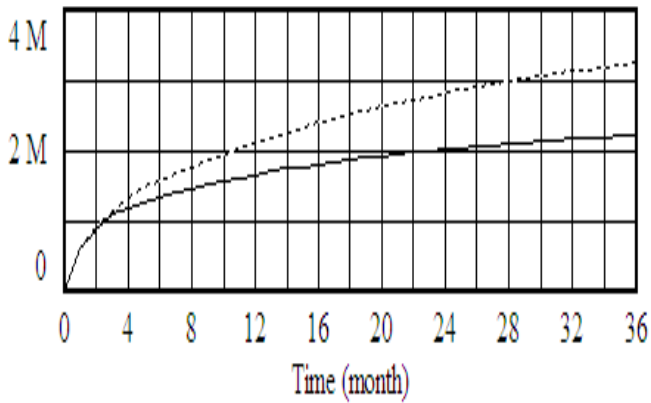
### Hyper Supplier demand



Hyper Supplier demand : 4 promotion per month — Unit/month  
 Hyper Supplier demand : 1 promotion per month ..... Unit/month

Fig(21)

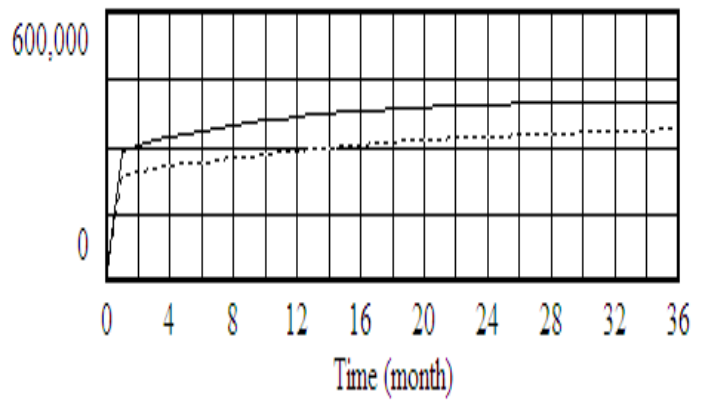
### profitability of Wholesales operations



profitability of Wholesales operations : 4 promotion per month — \$/month  
 profitability of Wholesales operations : 1 promotion per month ..... \$/month

Fig(22)

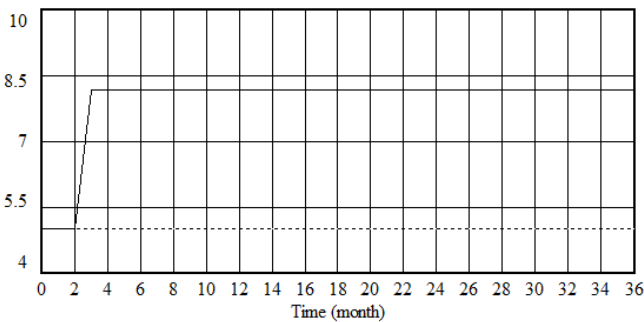
### profitability of hypermarkets operations



profitability of hypermarkets operations : 4 promotion per month — \$/month  
 profitability of hypermarkets operations : 1 promotion per month ..... \$/month

Fig(23)

### Wholesales channel conflict



Wholesales channel conflict : 4 wholesalers — conflict  
 Wholesales channel conflict : 2 wholesalers ..... conflict

Fig(24)

### 3.2 Policy Analysis

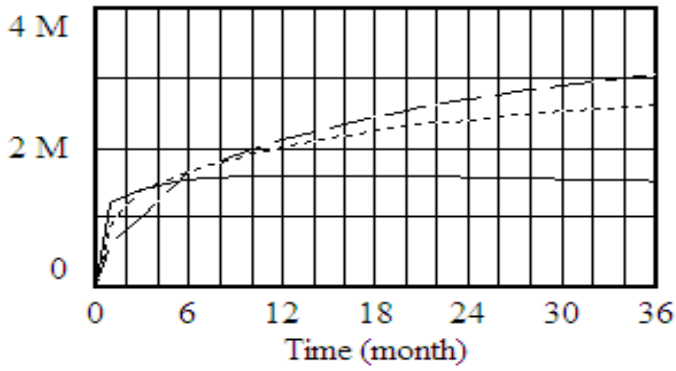
Six scenarios were then applied to the dynamic system with different inventory allocation percentages between the two channels, and different promotion rates in the hyper market channel to determine the optimum combination that will generate the maximum total profit with the minimum channel conflict to answer the research questions.

It was found that the applying a single promotion per month in the hypermarket channel and allocating the inventory with a ratio of 50% for each of the two channels will generate the optimized situation of maximum profit and minimum channel conflict.

After testing the model and assuring its reliability, six different scenarios with various inventory allocations and promotion rates were applied to the simulation model to test which scenario will lead to the maximum profit and minimum channel conflict the total profit is the sum of the profits from both channels. The different scenarios are shown in (table 1).

Run	% Inventory to wholesales	% Inventory to Hypermarkets	Promotion rate
1	25	75	1 per month
2	50	50	1 per month
3	75	25	1 per month
4	25	75	4 per month
5	50	50	4 per month
6	75	25	4 per month

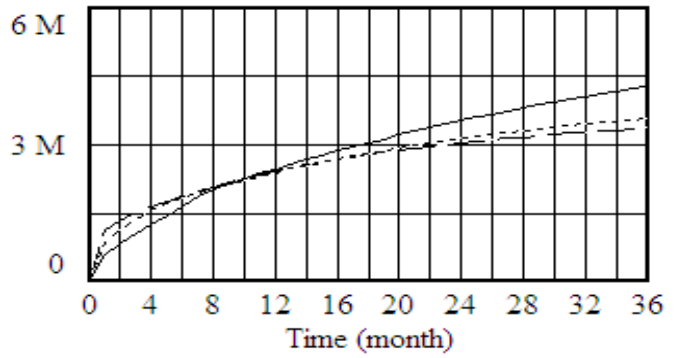
Total profit



Total profit : 4 promo 75W 25H — S/month  
 Total profit : 4 promo 50W 50H - - - S/month  
 Total profit : 4 promo 25W 75H - . - S/month

Fig(25)

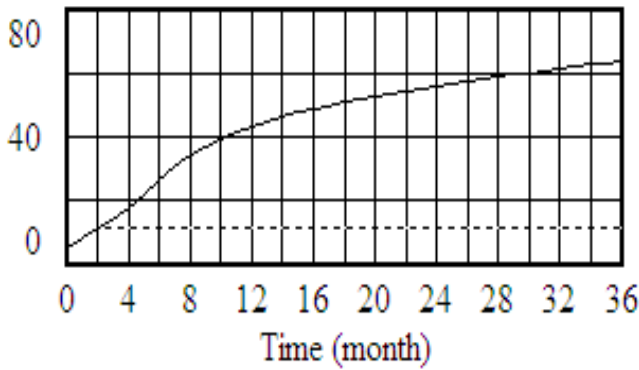
Total profit



Total profit : 1 promo 25W 75H — S/month  
 Total profit : 1 promo 50W 50H - - - S/month  
 Total profit : 1 promo 75W 25H - . - S/month

Fig(26)

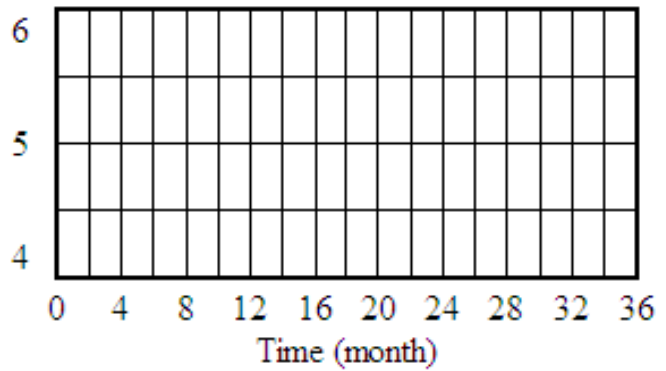
Wholesales channel conflict



Wholesales channel conflict : 4 promo 75W 25H — conflict  
 Wholesales channel conflict : 4 promo 50W 50H - - - conflict  
 Wholesales channel conflict : 4 promo 25W 75H - . - conflict

Fig(27)

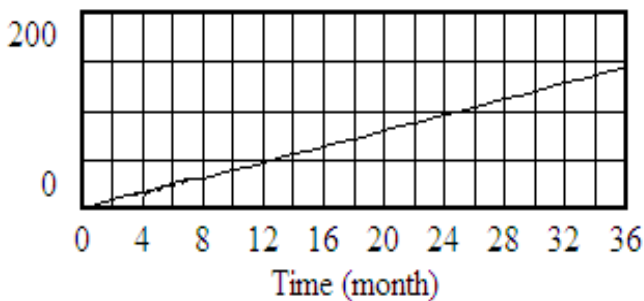
Wholesales channel conflict



Wholesales channel conflict : 1 promo 25W 75H — conflict  
 Wholesales channel conflict : 1 promo 50W 50H - - - conflict  
 Wholesales channel conflict : 1 promo 75W 25H - . - conflict

Fig(28)

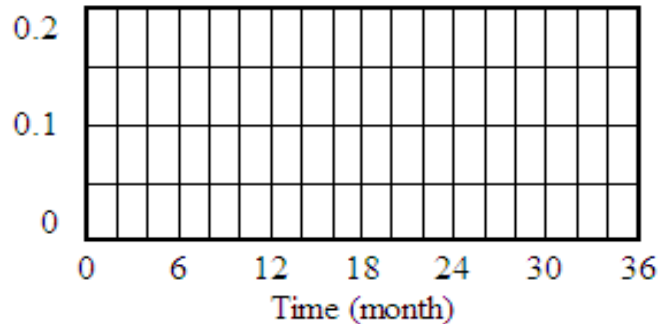
Hypermarket channel conflict



Hypermarket channel conflict : 4 promo 75W 25H — conflict  
 Hypermarket channel conflict : 4 promo 50W 50H - - - conflict  
 Hypermarket channel conflict : 4 promo 25W 75H - . - conflict

Fig(29)

Hypermarket channel conflict



Hypermarket channel conflict : 1 promo 25W 75H — conflict  
 Hypermarket channel conflict : 1 promo 50W 50H - - - conflict  
 Hypermarket channel conflict : 1 promo 75W 25H - . - conflict

Fig(30)

As shown in figure (25,26) applying a single promotion per month will lead to higher profits compared to applying four promotions with various ratios of inventory allocations. This is obviously due to the negative effect that the channel conflict will have on the demand. The channel conflict in both channels is minimized when having a single promotion compared to the four promotions per month scenario. As shown in figures (27, 28, 29, and 30) as a conclusion the single promotion per month is the chosen promotion rate.

Concerning the inventory allocation as shown in figure (26), the profits is the highest when applying an inventory allocation of 75% to hypermarket and 25% to the wholesales. In spite of the fact that 75% of the inventory was allocated in the hypermarket, most profits come from wholesales as the price there rises so high to reach a value of 353 \$/unit because of the huge demand and low supply in that scenario, returning back to the stake holders this scenario (25% for wholesales) is not so favored to happen , as the price cannot rise so high in the wholesales, because the competition activity will fulfill such demand, and also parallel trading will take place, also there is a huge demand in the wholesales that make it not realistic for the hyper market to take 75% of inventory with only one promotion per month. So the 50% allocation to each channel is the second best choice as it gives better profits than the 75% allocation for the wholesales.

As a conclusion the chosen scenario is to allocate 50% to each channel with a single promotion in the hyper market.

#### **4. Discussions and Conclusions**

The main purpose of the research was to develop a system dynamic model to help the decision maker in the consumer electronic supplier companies to take fast and accurate decisions concerning the many variables that build the complex channel structure. Then applying that simulator model to find out the optimum inventory allocation and hypermarket promotion rate that will generate the maximum profit with the minimum channel conflict. It was found through the model that applying a single promotion per month in the hypermarkets and splitting the inventory in a 50% inventory allocation is the optimum scenario that will generate the highest profit and minimum channel conflict.

Goal incompatibility, Domain Dissensus, and differing perception of reality are the three different types of channel conflict (Coughlan et al, 2001). In the case of the company under study the goal incompatibility is very obvious between the two channels hypermarkets, and wholesalers, the hypermarkets can reach the extent of selling some products with the same price with which it purchased or put a minimum profit in the promotion period in its attempt to attract customers to visit it, these customers when they purchase the promoted item they most of the time also purchase other items that the hypermarkets makes high profits from. So the hypermarket is using the supplier product as a tool to attract the customer to visit and purchase the item, as well as other items which will make high profits to it.

If we compare the hypermarket mentioned goal of attracting consumers to the wholesales goal of maximizing profits, we will find goal incompatibility which will result in channel conflict in wholesales that increases by the hypermarket promotion rate. This agrees with the findings in the model Figure (27) that at the rate of four promotions per month the wholesales channel conflict reaches the value of 63 simultaneous conflicts, compared to an acceptable level of only five simultaneous conflicts in the case of a single promotion.

One of the important findings is that the supplier can reduce the channel conflict, as shown in the model by reducing the time taken to resolve the conflict, increasing the number of sales persons assigned to serve the channel, or increasing the skills and abilities of sales persons to handle more than one conflict in the same time.

The time taken to resolve a channel conflict is a very critical factor as conflict resolving normally requires top management involvement to approve a compensation, or extra discount. The top management should have fast response when having a complaint from a channel member. Giving compensation and incentives to the wholesalers is a decision that requires approvals and paper work signatures. This process should be as fast as possible in order not to leave the level of conflicts high for long period which will decrease the channel demand till the conflict is resolved.

Another method to decrease the conflict is to increase the number of simultaneous conflicts that the salesman can handle, by increasing the salespersons skills and capabilities to handle multiple tasks. Time management courses, channel conflict courses and other training courses will be of great result in this field, also giving the channel managers and senior sales personal some authority to take decisions concerning compensation and discounts in the case of conflict resolving.

Webb (2001) divided the domain dissensus to four elements: the population to be served, the territory to be covered, the functions or tasks to be performed, and the technology employed. Adding a new wholesaler will without doubt increase channel conflict as it is shown in figure (24), because this new channel member will compete with the old members on the population to be served. Which will lead to variation in the demand that can be of negative effect, rather than the intended positive effect. So the decision of adding a new channel or a channel member should be taken after an intensive study, and simulating the model to see if this new channel member will end up adding profits, and the conflict generated from his adding is not so huge to decrease demand.

As the population to be served in Egypt is price oriented, a recognized price discrepancy between the hypermarket consumer price and the price with which the wholesalers sell to the retailers can cause a huge conflict. Also conflict is due to the fact that the population to be served is mainly the wealthy 8% that all of the hypermarkets are targeting and also sometimes elite traditional retailers that purchase the products from the wholesalers.

The model built its conflict calculation based on (Coughlan et al., 2001) formula for measuring conflict that is widely used, all types of conflict mentioned (adding new channel member, hypermarket promotions, price discrepancy, and parallel trading) are of high importance and high intensity. The frequency of promotion is measured by the promotion rate.

The decision maker should put in his consideration a lot of factors involving demand in both channels, total profitability, the price, and channel conflict before taking any strategic decision that will change the channel design. The problem is that these decisions should be taken very fast, and there is no time for a deep study of the situation, and the consequence of such decisions is of great effect. The model is a very useful tool that should give the decision maker a great support in taking the right decision in a small time period.

Although channel design and management are two roles of the channel sales and marketing managers, it is always having interference from the top management, because of the importance of the issue, a mistake in this area is very costly from the financial point of view. Top management involvement in the channel decision making process is not always of good outcomes (Rangan, 2006). They are not fully aware of the details of the channel structure prices, demand, consumption, competition, conflict, and other important issues, so the model is a very useful tool that can help decision makers in taking critical channel decisions like adding new channel member, or even adding a new channel like E-commerce or direct sales.

Also the model can help top management in brainstorming sessions before taking strategic decisions concerning channel design, because the expected impact of such strategic decision on all the channel structure will be shown, and this enables the company to reach the right decision.

Thus tactical and strategic decisions to be taken by the channel manager and top managers in the supplier organization concerning channel structures, pricing, adding new channels or channel members, inventory allocations, and hiring more sales people, can be assessed using the model to see the impact that such decision will have on the equilibrium of the channel structure, and if it will generate the required benefit that the organization wants.

A future work need to be done to include a dynamic model for the competitor activity to be integrated with the existing model, as the model assumed the price of substitutes a constant. The model was verified and tested form the consumer electronics prospective, and the researcher suggests that a future work could be done in different areas of marketing channels rather than the consumer electronics.

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