

# DYNAMIC DECREASING PRICING METHOD

Metin AKBULUT<sup>1</sup>

Prof.Dr.Cemal OKUYAN<sup>2</sup>

<sup>1</sup>Balıkesir University, Turkey,metinaktr@yahoo.com.

<sup>2</sup>Balıkesir University.Turkey,cemalokuyan@hotmail.com.

Online trading firms have to get involved in some kinds of marketing and promotion activities in the new World that appears with electronic trade. Increasing and decreasing pricing is a new kind of dynamic pricing method. In this study it is explained that Dynamic Decreasing Pricing (DDP) benefits both psychologically and strategically as a method of pricing. With this method, buying decreases the prices, even the costumers are forced to buy or advice the product. It is going to be formulated mathematically, designed with stored procedure and it is going to be practicable in database.

Key Words: e- commerce, dynamic pricing, stored procedure.

## 1. INTRODUCTION

Nowadays the firms trading on the internet have to get involved in different marketing and promoting activities .The firms that aim to profit and sell more products use different pricing methods. Dynamic pricing is one of these methods;Dynamic pricing refers to the process of controlling product prices over the salesseason to maximize expected revenue.(Lydeka, Zigmaş, and Indrè Deksnyté,2013)

There isn't only one description of Dynamic pricing. Because as Lydeka and others refer there are different academic branches and so different definitions. But in this article dynamic pricing is discussed in terms of its advantages as it makes the customers buy and the customers make the other customers buy.

Both psychological and strategically pricing methods that force the customers to buy, even to

advice are used when the prices decrease.The psychological effect of the price is an important factor on the decision to buy or the sense of quality. The decision to buy an unnecessary product can motivated a customer to buy it by means of the price experience of another customer. The price is an important factor when the product feature is satisfactory; price comparison is fast and easy on the internet.

The shopping robots which can be used by means of technological developments on the internet can be discussed as an element that strengthens the customer's price decision and enables the customer's price comparison.

In terms of application the dynamic pricing issues turns out satisfactory in industries with high initial cost, consuming capacity, short term selling, price sensitive demand.

Some internet pricing aspects are shown in Table I

Pricing Aspect	Pricing strategy
Consumer Aspect	Price differentiation Dynamic pricing
Seller Aspect	Individual pricing Adaptation pricing Package pricing
Competitive Aspect	Price differentiation depending on brand

	Optional pricing
Relational (Value focused) Aspect	Lifelong pricing Alternative channel pricing

Gurgen expresses the classifying quantitative models in literature as in the below:

1. Deterministic demand model in terms of discussing the demand.
2. Fixed or uncertain price in terms of discussing the price distribution of customer's paying desired.
3. Pricing in terms of considering or dis regarding the sales returns.
4. Pricing in terms of discussing the price set.

## 2. RELATED LITERATURE

Hong Yuan and Song Han discuss that for general demand functions in price and quality, two effects work in different directions. The sales effect is negative, that is, if the price increases, the sales decrease. The markup effect is positive, that is, if the price increases, the markup increases. Hence, the impact of quality on pricing is ambiguous. For separable additive demand functions, the sales effect vanishes and the markup effect holds. Any improvement in quality increases the product price. Finally, both process investment and product investment determine the dynamic pricing policy. (Yuan, Hong, and Song Han, 2011).

Paul B. Ellickson, and the others make three contributions in their Repositioning Dynamics and Pricing Strategy article. First, they draw attention to three salient features of repositioning decisions in marketing: that they involve long-term consequences, require significant sunk investments, and are dynamic in their impact. They illustrate that positioning decisions can be empirically analyzed as dynamic games to measure structural constructs such as firm's repositioning costs. Second, they cast empirical light on an age-old question in the marketing of consumer packaged goods: the costs and benefits of using EDLP versus PROMO. Despite the significant interest in this topic, a full accounting of the long-term costs and benefits of these strategies remains lacking in the literature. Their estimates add to the evaluation of either strategy and also identify the sources of heterogeneity in the relative attractiveness of either across markets. This increases understanding of the economics of the supermarket industry and the determinants of long-term market structure. Third, they illustrate how observed switches combined with auxiliary postgame data (e.g., revenues, prices, sales) are useful in cleanly articulating the costs and benefits of repositioning in an environment with

strategic interaction. (Ellickson, Paul B., Sanjog Misra, and Harikesh S. Nair, 2012)

Y. Narahari, and others discuss that there are different models that have been used in dynamic pricing.

Dynamic pricing includes two aspects: (1) price dispersion and (2) price discrimination. Price dispersion can be spatial or temporal. In spatial price dispersion, several sellers offer a given item at different prices. In temporal price dispersion, a given store varies its price for a given good over time, based on the time of sale and supply-demand situation.

The other aspect of dynamic pricing is differential pricing or price discrimination, where different prices are charged to different consumers for the same product.

A variety of mathematical models have been used in computing dynamic prices. Most of these models formulate the dynamic pricing problem as an optimization problem. Depending on the specific mathematical tool used and emphasized, we provide a list of five categories of models.

- *Inventory-based models*
- *Data-driven models*
- *Game theory models*
- *Machine learning models*
- *Simulation models*

. (Narahari, Y., others, 2005.)

## 3. MODEL DESCRIPTION AND FORMULATION

The formulas needed to price a product sold online in Dynamic Decreasing Method are given below.

$$rate = \text{sell price} - \text{lower limit}$$

$$rate_n = \text{rate} / \text{number of stock}$$

$$\text{sell price}_n = \text{sell price}_{n-1} - rate_n$$

Sell price is the price that the product is sold first. lower limit is the last limit price in decreasing pricing. The price difference of sell price and lower limit gives the rate.

Rate is divided into total number of stocks to be sold, in order to get rate<sub>n</sub>. The difference between sell price<sub>n-1</sub> and rate<sub>n</sub> gives sell price<sub>n</sub> of n price.

cost	800	lowerlimit	900	sell price	1000
number of stock	10	rate	100	rate <sub>n</sub>	10

	Sum Sell		
1.	Price	990	10
2.	Price	980	10
3.	Price	970	10
4.	Price	960	10
5.	Price	950	10
6.	Price	940	10
7.	Price	930	10
8.	Price	920	10
9.	Price	910	10
10.	price	900	10

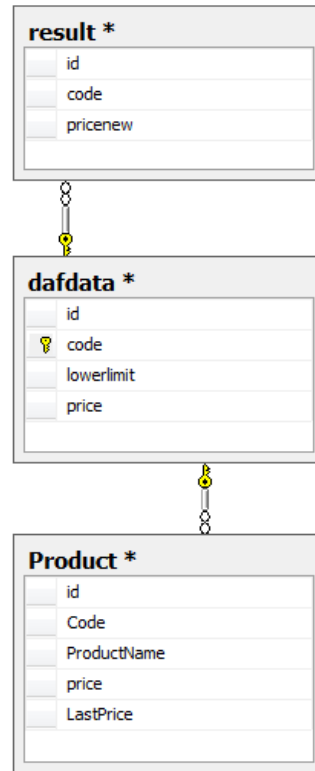


Figure 1

	id	code	lowerlimit	price
	1	blk2014	900	1000
	2	blk2015	450	500
*	NULL	NULL	NULL	NULL

Ddp-M profit	550	Standard profit	2000	1450	Ignored loss
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The stored procedure is shown in the database design below.

```

procedure [dbo].[Daf-M]
@code nvarchar(50)

as
declare @lowerlimit int
declare @productcount int
declare @price decimal(18,0)
declare @rate int
declare @rate_n int
declare @price_n decimal(18,0)
declare @pricenew decimal(18,0)

DECLARE @counter INT

set @lowerlimit=( select
lowerlimit from dafdata where
code=@code)

```

When the example is discussed in terms of the firm and customer, there are two results.

1. The decreasing price has a positive effect on the customer by advising to buy the product with the positive affect of this method.
2. The firm can sell product rapidly till its limits, loss of profit can be ignored as the selling in target time interval is high.

The database design is shown in Figure 1 below.

```

    set @price=( select price  from
dafdata where code=@code)
    set @productcount=(select
COUNT(*) from Product where code
=@code)
    set @rate_n=@price-@lowerlimit
    set @rate
=(@rate_n/@productcount)

DECLARE CRS_sayhesapla CURSOR FOR

SELECT code,lowerlimit FROM
dafdata where code =@code

OPEN CRS_sayhesapla

FETCH NEXT FROM CRS_sayhesapla
INTO @code,@pricenew
set @sayac =0

WHILE @@FETCH_STATUS =0
BEGIN
SET NOCOUNT ON;

        while
@counter<@productcount
        begin
            SELECT @counter =
@counter + 1

            set @rate
=(@rate_n/@productcount)
            set @rate=@rate
            insert into result
(id,code,pricenew)values
(@counter,@code, (@price-@rate))
            end

            SET @pricenew = @price
            UPDATE result SET
@pricenew = pricenew = @pricenew -
@rate where code=@code

                FETCH NEXT FROM
CRS_sayhesapla INTO
@code,@pricenew

                    end

CLOSE CRS_sayhesapla

DEALLOCATE CRS_sayhesapla

```

#### 4. CONCLUSION

In this article it is discussed that dynamic decreasing pricing (DDP-M) can be used as a method on internet trading. Formulas are defined and applied. It is proved that DDP-M can raise the selling rates. Both psychological and strategically pricing methods that force the customers to buy, even to advice are used when the prices decrease. The psychological effect of the price is an important factor on the decision to buy or the sense of quality. The decision to buy an unnecessary product can motivate a customer to buy it by means of the price experience of another customer. But this study is only focused on firm. Customer focused researches, real world modelling of markets, buying behavior, dynamic pricing strategies can be researched.

#### 5. REFERENCES

- Bilişik, M. T., & Gürgen, O. (2012). Perakendecilik sektöründe Dinamik Fiyatlandırma: geniş bir literatür taraması-Dynamic Pricing in retailing industry: a wide literature survey. *Öneri dergisi*, 10(37), 111-119.
- Torlak, Ömer. "İnternette Pazarlamada Fiyatlandırma Stratejileri: Kavramsal Bir Çalışma." [www.geocities.com/ceteris\\_tr/o\\_torlak3](http://www.geocities.com/ceteris_tr/o_torlak3). do c.(Erişim Tarihi: 18.06.2008) (2007).
- Sibdari, Soheil, and David F. Pyke. "Dynamic pricing with uncertain production cost: An alternating-move approach." *European Journal of Operational Research* 236.1 (2014): 218-228.
- Yuan, Hong, and Song Han. "The effects of consumers' price expectations on sellers' dynamic pricing strategies." *Journal of Marketing Research* 48.1 (2011): 48-61.
- Ellickson, Paul B., Sanjog Misra, and Harikesh S. Nair. "Repositioning dynamics and pricing strategy." *Journal of Marketing Research* 49.6 (2012): 750-772.
- Lydeka, Zigmars, and Indrė Deksnytė. "Dynamic pricing models and its methodological aspects." *Taikomoji ekonomika: sisteminiai tyrimai* 7/2 (2013): 143-153.
- Narahari, Y., et al. "Dynamic pricing models for electronic business." *Sadhana (Academy Proceedings in Engineering Sciences)*. Vol. 30. No. 2-3. Indian Academy of Sciences, 200