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## Charges on Parking In Shopping Malls: Evidence From Turkey

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### Abstract

Shopping Malls are diffusing in Turkey because it provides comfortable shopping opportunities to consumers. It is accepted that shopping malls show special kind of network externalities and because of that reason it is an example of two-sided markets. Merchants in shopping mall benefit from the numerical value of visitors in shopping mall and so management of this shopping mall utilize from numbers of consumers, too. Therefore, rational managers should encourage consumers to visit their malls. However, management of some shopping malls charge parking so that this fee will be discouraging factor for consumers. The purpose of this study is to search the decision of rational managers of shopping malls about parking fee by using profit functions. Can the charges be profitable or not for rational managers? In which conditions it can be preferred?

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### 1. Introduction

Rapid development of retailing has led to expansion of shopping malls in Turkey. Malls bring functional benefits to consumers and increase their satisfaction (Khare, 2011:110), for example; convenient shopping, shopping without traffic and crowded, activities other than shopping etc (Erkip, 2005:100). Also they provide consumers' access to global brands, facilitate social interactions and entertainment

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(Khare, 2011:110). Jackson (et al, 2011:1) studied about mall attributes which drive customers to visit shopping mall.

Last studies show shopping malls as an example of two-sided markets in which cross network externalities exist (Rochet and Tirole, 2003: 993-994; Dilek et.al 2012:579; Dilek and Top, 2012:778; Dilek, 2012:125). Hildebrand (2012) tried to measure network effects in two-sided markets. Three actors exist in shopping malls including merchants, consumers (visitors) and mall management. Benefits of merchants rely on numbers of consumers and also benefits of consumers rely on numbers of merchants. As the number of merchants increase, consumers find more alternatives to choose. In other side, as the number of visitors of mall increase, merchants can sell more products and so get more profit. This dependence is interesting reality of two-sided markets (Bolt and Tieman, 2005:3; Dilek, et.al, 2012; Dilek, 2012; Dilek and Top, 2012). Shopping mall managers generally want to increase the number of visitors because their profits depend on profits of merchants in shopping mall. Charging visits of consumers to shopping mall is not good for mall managers because of high demand elasticity of consumers. If demand elasticity of consumers is high enough, they can give up visiting shopping malls. Generally, demand elasticity of consumers is higher than the demand elasticity of merchants. Therefore, generally shopping mall managers prefer to price merchants instead of consumers (Armstrong and Wright, 2007:355; Dilek, et.al, 2012:534; Rochet and Tirole, 2003:992). In France, consumers don't pay for parking and also they can buy gasoline at a substantial discount (Rochet and Tirole, 2003:991). It is just for encouraging visits of consumers. This behaviour is similar to newspapers or magazines, which charge advertisements but not charge readers (Kaiser and Wright, 2006:2). Consumers can prefer to visit malls with their cars, so they need auto park services. Erkip (2005:100) told that one reason of preferring malls is easy parking. Though pricing parking services discourage consumers from visiting shopping malls, managers can charge it. According to the decision of Istanbul Metropolitan Municipality Transport Coordination Centre (UKOME) and Council of State, shopping malls can't price parking up to three hours (<http://ulasim.ibb.gov.tr/KararArsivi/UKOME/2007/UKOME-2007-1.pdf>). Though network effects of two-sided markets as told above, shopping malls are reluctant to let consumers parking free of charge (Sabah, 2012). The purpose of this study is to search reasons of shopping malls and economical results of their decisions. Though in economic literature there can be found many studies interested with shopping malls and two-sided markets (Bolt and Tieman, 2005; Dilek and Top, 2012; Dilek et al 2012, Dilek, 2012) we can't reach any research that studies behaviour of managers of shopping malls based on two-sided market except Hasker and Eren (2011). Hasker and Eren (2011) analysed why shopping malls decide to provide parking for free and embed the parking costs in prices of goods. This study will try to fill this gap.

## **2. Profit Function Of Shopping Mall Managers**

Though in two-sided markets platforms can earn money from seller and buyer side, their pricing decisions can be changed because of the demand elasticity. Platforms can decide to price one side (buyer or seller)

of market and subsidize the other side. They must choose price structure addition to price level (Rochet and Tirole; 2003: 990). The models of Armstrong (2006), Caillaud and Julien (2003) revealed that platform managers might set negative prices on one side of market. Amelio and Julien (2012:436) set a model in which platforms use tying strategies as a tool to introduce implicit subsidy. Shortly, platforms set negative prices on the side which has higher demand elasticity while they get profits from the other side which has lower demand elasticity. Income of shopping mall managers has two sources including sources from merchants and consumers. Assume that shopping mall have no cost. So, their profit just depends on revenue of them from merchants and consumers.

$$\begin{aligned} \text{TR} &= \text{Revenue from merchants} + \text{Revenue from consumers} \\ \text{TR} &= \text{TR}_1 + \text{TR}_2 \end{aligned} \quad (1)$$

Revenue from merchants is product of rent and number of merchants. In two-sided markets cross network externality works and therefore utility of merchants increase as the number of visitors increase. So, number of merchants is an increasing function of visitor numbers. Equation (2) denotes revenue of mall management sourced from merchants. In this equation  $P_r$  is the value of rent price and  $n_v$  is the number of visitors in mall.  $Q(n_v)$  is a function which denotes number of merchants and it increases as number of visitors increase.

$$\text{TR}_1 = P_r * Q(n_v) \quad (2)$$

Generally managers of mall don't charge visits in Turkey, however most of shopping malls price parking. Hasker and Eren (2011:35) found that society wants parking to be free and more than the profit maximizing amount of parking provided by shopping malls. According to Hasker and Eren (2011:36), parking fee should be absorbed in the price of the good. However, we supposed that prices of parking are not embed in rents or prices of goods for just simplicity. Parking is important for visitors who come to shopping mall by their vehicles. As a result, revenue of mall from shoppers depends on parking fee and number of visitors. We suppose that all consumers have cars and they are willingfull to pay parking fee. Also parking area is used only people who are visiting and shopping in mall. In Equation (3) which shows revenue of mall from visitors,  $P_p$  denotes parking fee. Also  $n_v(P_p)$  is a decreasing function of parking fee.

$$\text{TR}_2 = P_p * n_v(P_p) \quad (3)$$

Thanks to equation (2) and equation (3) we can rewrite equation (1) as below.

$$\text{TR} = [P_r * Q(n_v(P_p))] + [P_p * n_v(P_p)] \quad (4)$$

### 3. Number of Visitors Function:

If  $n_v(P_p)$  is a linear function such that  $n_v(P_p) = k_0 - k_1 P_p$  and  $k_0, k_1 > 0$  then we can rewrite total revenue function of shopping mall management as below (5).

$$TR = [P_r * Q(k_0 - k_1 P_p)] + [P_p * (k_0 - k_1 P_p)] \quad (5)$$

Also if  $Q(k_0 - k_1 P_p)$  is linear function then equation (5) become like (6) such that  $Q(nv) = k_2 n_v + k_3$ ,  $k_2, k_3 > 0$ .

$$TR = [P_r * (k_2(k_0 - k_1 P_p) + k_3)] + [P_p * (k_0 - k_1 P_p)] \quad (6)$$

$$= P_r k_2 k_0 - P_r k_2 k_1 P_p + P_r k_3 + P_p k_0 - k_1 P_p^2 \quad (6a)$$

### 4. Profit Maximizer Mall Managers

What will be the parking fee if mall managers are profit maximizer? To find this we can use first order conditions. We recall (6a) to calculate it.

$$\begin{aligned} TR(P_p, P_r) &= P_r k_2 k_0 - P_r k_2 k_1 P_p + P_r k_3 + P_p k_0 - k_1 P_p^2 \\ \frac{\partial TR}{\partial P_p} &= (k_0 - P_r k_2 k_1) - 2k_1 P_p = 0 \quad (7) \\ P_p &= \frac{(k_0 - P_r k_2 k_1)}{2k_1} \end{aligned}$$

So, parking fee is negatively related to rent. How do we explain this mechanism? Suppose that mall management increase rents. Because of higher rents, some of merchants will leave business (exit) in shopping mall. If mall managers don't want merchants to leave the mall, they will help them to increase their profits. Rational merchants are generally interested in profits and they are not willing any decrease in their profits. Generally, increase in visitor number means increase in profits for merchants. Because some of visitors will come to their shop and most probably purchase something. So, if mall managers do something to increase the number of visitors, merchants will benefit from this. Parking fee is a kind of cost for visitors; therefore they are not willing to pay this cost. If parking fee decreases, the number of visitors will increase.

### 5. In A Situation Of Fixed Rents

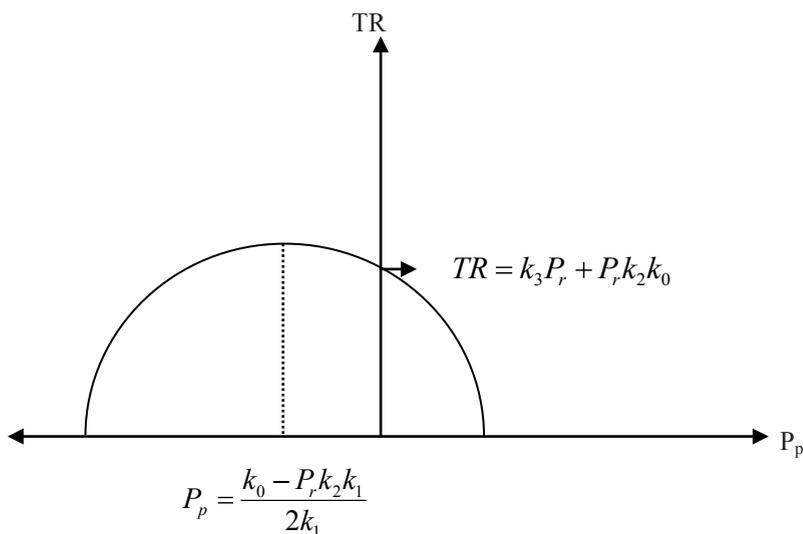
If merchants are very sensible to rents, mall managers can't change rents. Suppose that rents are fixed. In this situation Total Revenue function of mall managers has only one independent variable parking fee. We recall (6a) again.

$$TR(P_p) = P_r k_2 k_0 - P_r k_2 k_1 P_p + P_r k_3 + P_p k_0 - k_1 P_p^2$$

$$TR(P_p) = -k_1P_p^2 + (k_0 - P_r k_2 k_1)P_p + (K_3 P_r + P_r k_2 k_0) \quad (8)$$

The equation (8) is simply quadratic equation. This equation is just a parabola which can be seen in graph 1. It is seen that  $P_p$  axis of vertex pint is negative. The reason of it is high value of rent ( $P_r$ ). It is so high that value of  $P_p = \frac{k_0 - P_r k_2 k_1}{2k_1}$  is negative. Maximum profit for mall management can be reached if only parking fee is negative. However, it is obvious that negative value for fees can't be applied by mall managers in real life. Mall managers must consider parking fees bigger than 0 TL.

**Graph 1. Total Revenue and Parking Fee.**



Mall managers search for optimum alternative in the interval in which parking fee is at least equal to zero. It is obvious that maximum total revenue is reached when parking fee is zero. However, in reality some malls prefer to set price bigger than zero. We assumed that all of the customers are also visitors and shoppers of mall. However, there are some people who do not care about shopping but want to use parking area of mall. Mall managers may prefer positive parking fees to distinguish consumers with cars and people who just look for parking place for their cars.

If mall managers set up zero fees for parking some people who don't care about shopping or visiting mall will prefer to use parking area of shopping mall. It is valid especially for malls which are settled in centre of cities. Generally parking area of shopping malls are limited, so many potential customers with cars may not find space for their cars in shopping mall's parking area.

**6. Parking Fee Discrimination**

To distinguish customers and others, mall managers may use parking fees as tools. For example; most of shopping malls don't take parking fee from customers who spend more than x TL (more expensive than

market parking fee) while others pay positive parking fee. Also when you have parked your car longer than 2 or 3 hour you will pay though you buy something from mall. We can call this as parking fee discrimination. Parking fee discrimination has some similarities with second degree price discrimination. As it is known, second degree price discrimination exists when larger quantities can be bought at a lower unit price. Firm offers a menu of bundles to choose from. (Tirole, 1989:142-143). In parking fee discrimination you can both buy something from mall and benefit from parking services. Addition to this, you will pay lower unit fee if your parking time increase. It should be discussed that if parking fee discrimination is an example of second degree price discrimination.

When shopping mall managers use this parking fee discrimination there will exist three results: First, people who do not want to shop will not use parking area of shopping mall and look for other parking areas which are cheaper than shopping mall parking area. Second, potential customers will find parking area for their cars easily. Third, though some people, who do not think about shopping, will both decide to use parking area of shopping mall and shop in that mall. Because of second and third effect, shoppers and visitors of mall increase. So, income and profits of merchants increase and they will be ready for paying more for rents. Rents are more important income sources for mall managers than parking fees. Shopping mall managers generally use parking fee discrimination not for income from parking but for rents.

Parking fee discrimination can be mandatory choice for some of mall managers. Especially, in the centre of cities there are many people who are looking for parking area for their cars, but not want to buy something from shopping malls. The numbers of such people can be so high that shoppers of mall can't find parking area for their cars. If mall managers do not distinguish shoppers and people just looking for parking area merchants will lose money and rents will decrease.

We supposed that all people, who are using parking area, are also visitors and shoppers of the mall. What will be if half of them are only looking for parking area for their cars? First recall (5). The revenue of the mall is defined by the function of  $TR = TR_1 + TR_2$ . If some of parkers give up shopping and visiting mall, revenue from rents will decrease. Because less consumer means less sale and income for merchants and therefore they will be unwillingful to pay rent. Revenue from parkers does not change because the numbers of parkers do not change. Though their number is fixed, some of parkers are not shopping and visiting mall now.

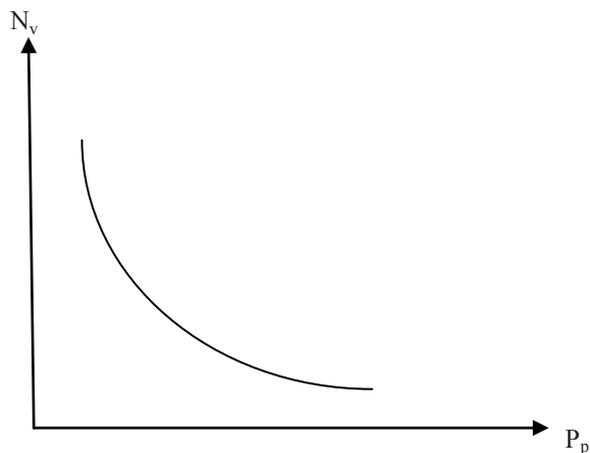
**Definition: Parking Fee Elasticity of Visiting Shopping Mall.**

Consumers' response to increase in parking fee changes the behaviour of shopping mall managers. If consumers are driving cars they will interest in parking fees. As parking fee increase their willingness to visit shopping mall decreases. We can use parking fee elasticity of visiting for measuring the visiting number responds to a change in parking fee. It is calculated with a similar formula to price elasticity of demand. It is defined to be the percent change in visiting number divided by the percent change in parking fee.

$$\epsilon = \frac{\Delta n_v / n_v}{\Delta P_p / P_p} = \left| \frac{\Delta n_v P_p}{\Delta P_p n_v} \right| \quad (8)$$

This elasticity is generally negative. Therefore it is convenient to use absolute value. The change in number of visitors and the change in parking fees are negatively related. We can show the relation between them in Graph 2. As parking fee increase, fewer customers want to visit shopping mall. So, number of visitor function has negative slope. This relationship is the reason for negative parking fee elasticity.

**Graph 2. Number of Visitor Function**



If  $\epsilon \leq 1$  number of visitors function are inelastic. If it is equal to one it is unit elastic and if it is bigger than one it is elastic. Elasticity is important, because if number of visitors function is inelastic, mall management will increase parking fee easily. When the function is inelastic, the increase in price does not have large effects on number of visitors. Otherwise, the small increase in parking fee will create ultimate decrease in number of visitors. Therefore, shopping mall managers give importance to the parking fee elasticity.

Most important factor which effects number of visitors' elasticity is competition or other shopping malls. As the market power of shopping mall increases, elasticity decreases. Assume that there are many shopping malls which have similar facilities for visitors. In that situation an increase in parking fee will discourage many potential visitors to visit. They will easily give up visiting this shopping mall and go to other shopping mall. Shortly, if shopping mall has many close substitutes elasticity will be smaller.

Other important factor which effects elasticity is attributes of shopping mall. Some studies found that convenience, accessibility, the presence of services such as banks and restaurants, recreational attributes, pleasure, social aspects are important in choice of shopping mall (Jackson, et. Al, 2011:3). If shopping mall meets such kinds of needs for consumers changing decisions about shopping mall will be difficult

for customers. They will pay costs if they want to visit another shopping mall. In other words attributes of shopping mall effect elasticity.

## Conclusion

Shopping malls are important part of urban life in modern cities. In Turkey they are diffusing as it does in other developing countries. In economic theory they are evaluated as an example of two-sided markets. Profit maximizing mall managers should interest in the nature of two-sided markets that exhibits cross network externalities. Utility of merchants increase as number of visitors increases and vice versa. In other words, utility of visitors increase as number of merchants increases. In Turkey policy makers and society have given importance to parking fees of shopping malls. Our study interested in rational behaviour of mall managers about parking fees. We revealed the reason of parking fee discriminations and infrastructure of charging parking in malls. In one side parking fees are income for visitors of mall, on the other side it decreases the number of visitors and therefore merchants become unwillingfull to pay higher rents. Mall managers should make decisions by considering these two facts. This study enlightens the reasons of profit maximizing mall managers because of that reason we hope that it will open path for further studies in economic theory.

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