

The Other Side of the Sunday Shopping Regulation: Congestion Costs and Loss of Efficiency*

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Abstract

The Sunday shopping regulation in Korea forces megastores to close every other Sunday. While it aims to protect traditional markets and small and medium retailers, this paper shows the sum of the congestion costs borne by consumers and efficiency loss borne by megastores is around 2.3% of the megastores' annual sales. This estimate, which is a portion of the total costs, is quite large relative to the margin of the megastore industry, 7.7%. This result requests for an overall cost and benefit analysis of the regulation. Unless the benefits of the regulation outweigh the costs, alternative measures are needed.

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Keywords : Sunday Shopping Regulation, Congestion Costs, Efficiency, Megastores

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I. Introduction

The Sunday shopping regulation that enforced the ‘megastores’ to close on every other Sunday has been effective since April 22, 2012 in Korea.¹⁾ While its purpose is to protect the traditional markets and small retailers, it has brought much controversy and series of law suits between the megastores and the local governments. The regulation directly affects the sales of megastores and traditional markets. At the same time, many parties such as consumers, employees and wholesalers related to megastores are also affected. All those effects need to be taken into account for any policy implementation.

Since the implementation of the Sunday shopping regulation, megastores have experienced a significant sales decrease while the traditional markets’ sales have not increased as expected (Choi and Jeong, 2013).²⁾ It implies that the larger proportion of the welfare change comes from the megastore side. However, the purpose of the Sunday shopping regulation in Korea to boost traditional markets and small and medium size retailers rather seems to put aside all the issues regarding consumer welfare as well as efficiency loss of megastores. One portion of welfare changes results from some consumers being forced to choose not the first best in their shopping options such as shopping day or place. These consumers, even though buying the same product, need to pay higher shadow prices as they need to adjust other activities in order to change shopping day or place. The consumers who still choose the first best may also

1) A megastore is defined as a large-scale chain retailer such as Wal-Mart in the U.S. Those megastores in Korea include Emart, Homeplus, LotteMart, Megamart, etc.

2) Based on their estimates, the amount of the decreased sales at the megastores is around 2.9 trillion Korean won, but the increases sales at the small and medium-sized retail outlets and traditional markets is around 510-570 billion Korean won if the regulation continues for a year.

suffer from congestion as the shopping places become more crowded. The other portion of welfare changes results from the efficiency in the retail industry. The transfer of sales from megastores to traditional markets may decrease the efficiency of megastores and increase the efficiency of traditional markets. However, the implementation, halt and re-implementation of the Sunday shopping due to series of lawsuits makes it difficult to do an overall cost and benefit analysis yet.

Therefore, this paper attempts to assess consumers' congestion costs and megastores' efficiency loss due to the Sunday shopping regulation, which would be small parts of the total welfare change and provide a policy implication.

II. Consumers' Congestion Costs

In response to the Sunday shopping regulation, consumers may either change when, where or how much to shop. All of these imply a decrease in consumer welfare since they need to switch from the first best to the second best under the constraint. Before the regulation, the percentages of consumers shopping at megastores on Monday through Saturday and on Sunday were around 79.5% and 20.5% of the total number of consumers, respectively (KOCA, 2006-2009). According to the A.C. Nielson survey (2007), around 78.3% of the Sunday shopping consumers say that they will change their shopping day to the other days of the week while shopping at the same place. On the other hand, the TNS survey (2012) showed that 34.5% of the Sunday shopping consumers will do so.³⁾ That is,

3) The TNS surveyed 994 customers at 18 megastores nationwide in 2012 and the AC Nielson surveyed 1,000 customers at megastore in 2007. The switching ratios in these two surveys are quite different. One possible reason is that customers in 2012 have more alternatives especially since the on-line shopping

86.6%-95.6% of the pre-regulation weekly sales will be sold from Monday to Saturday under the regulation.⁴⁾ Therefore, the consumers' change of the shopping day is likely to bring additional congestion and hence longer waiting time at the counters and/or parking lots. We estimate an increase of the congestion costs by calculating the value of the additional waiting time. To do so, we need to know how long is the additional waiting time caused by the regulation and how much value consumers place on additional waiting time at megastores.

2.1. The value of time

The value of time has been frequently estimated in a cost-benefit analysis of the transport investments to calculating the money value of a reduction of travel time.⁵⁾ There are two types of travel time: travel time during working hours and travel time during non-working hours. Saving of the former can convert non-productive time to productive use and the value of an individual working time to the economy is reflected in the wage rate paid (Department of Transport, 2004). Hence, the value of travel time during working hours is calculated based on the wages and working hours of the manufacture, and wholesale and retail industries (KDI, 2008). The value of travel time during non-working hours is assumed to be 32.7% of that of work-related travel time as people tend to trade a cheaper journey against a faster and more expensive one (KRIHS, 1999).

Following the Korea's standard guideline and using the statistics on wages from Statistics Korea, we calculate the value of time. In

sales have been dramatically increasing.

4) 34.5%-78.3% of the Sunday shopping consumers (20.5%) will switch to Monday to Saturday.

5) For more detail, refer to Gwilliam (1997) and Mackie et al. (2001).

2011, the values of travel time related to work and others per hour were estimated to be around 19,784 Korean and 6,470 Korean won, respectively. However, consumers may feel more inconvenient and/or uncomfortable when they need to wait for transport or walk to the station. Gwilliam (1997) suggests that the value of saving time related to walking to or waiting for transport is 1.5 times larger of the value of saving travel time within a vehicle. Mackie et al. (2003) find that people in the U.K value the saving of such time twice larger than the saving of travel time within a vehicle. Concas and Kolpalov (2009) and Litman (2008) say that the value of the waiting time is 1.7 times of an hourly wage. The U.K. Transport Analysis Guidance (TAG) unit 3.5.6 places the weight of 2.5 times on the value of the waiting time relative to the value of travel time during non-working hours. Following the TAG rule, the value of waiting time per minute is estimated to be 269.6 Korean won.⁶⁾

2.2. The waiting time

Lee et al. (2009) using a simulation approach show that if the closing time restriction is enforced at 8 p.m. at megastores in Korea, the average waiting time is around 19 minutes per consumer. They also predicted that the increase of waiting time may result in the loss of consumer welfare, 1,683 billion Korean won. On the other hand, Williamson et al. (2006) in the analysis of the U.K. Sunday shopping restriction assume 5 minutes of additional waiting time at counters and 5 minutes of additional waiting time at parking lots with the probability of experiencing additional waiting time, 0.3.⁷⁾ Under that assumption, they showed the deregulation of the Sunday shopping

6) The value of travel time during the non-working hours is 6,470 Korean won per hour. So the value of waiting time per minute is $6,470 \times 2.5 / 60 = 269.6$.

7) The U.K. Sunday shopping regulation restricts the operation hours on Sunday to 6 hours during 10 a.m. - 6 p.m.

restriction in U.K. will result in the decrease of congestion costs of around 0.9 billion pounds.⁸⁾ Following the assumption of Williamson et al. (2006), we assume 5 minutes of waiting time at counters and parking lots, in total, 10 minutes with the probability of a consumer experiencing waiting at counters and parking lots, 0.3. Then the average waiting minutes are 3 minutes. But not every consumer uses a car to megastores in Korea. The percentages of consumers driving a car to megastores based on the A.C. Nielson survey (2007) and the TNS survey (2012) are 62.2% and 72.0%, respectively. For a conservative measure, if we assume 60% of consumers using a car and possibly experiencing additional waiting time at the parking lot, the average waiting minutes becomes 2.4 minutes.⁹⁾ If we use the lower probability of a consumer experiencing waiting, the average waiting minutes become shorter.

2.3. The Congestion costs of the Sunday Shopping Regulation

As of September 6 2012, the Sunday shopping regulation forced 383 megastores (85 % of megastores) to close every other Sunday. According to the yearbook of the retail industry (2012), around 13 million people in Korea shops at megastores regulated by the Sunday shopping restriction.

Suppose that out of megastore shoppers, 86.6%-95.6% shops from Monday to Saturday based on the TNS and AC Nielson surveys. If these consumers experience the additional waiting time of 3 minutes, the congestion costs borne by these consumers are calculated by multiplying the waiting time of 3 minutes by the value of time, 269.6 Korean won per minute (estimated in section 2.1). Some consumers

8) This assumption is based on the congestion occurring at the last 2 hour sales on Sunday.

9) $5\text{minutes} \times 0.3 + 5\text{minutes} \times 0.3 \times 0.6 = 2.4$ minutes.

will wait longer and others will wait shorter. Here we spread the waiting time uniformly cross consumers. On the other hand, if consumers who wait longer place more values on time, the congestion costs estimate would increase. Table 1 shows that the congestion costs are 9.1-10.5 billion Korean won from a closed Sunday. If the regulation continues for a year, the congestion costs is estimated to be 247 billion Korean won per year.

【Table 1】 Congestion costs from the Sunday shopping regulation

	Based on	
	TNS	AC Nielson
(A) Percentage of megastore shoppers from Monday to Saturday (%)	86.6%	95.6%
(B) Value of waiting time caused by one closed Sunday (=13million × (A) × 3min × 269.6 Korean won)	9.1	10.5
(C) Total value of waiting time for a year (=(B) × 26 closed Sundays a year)	247	273

Note: The consumers switching ratio from a Sunday to the other days of week is 34.5% and 78.3%, based on the TNS survey and AC Nielson survey, respectively.

III. Retailers' loss of efficiency

The cost efficiency is likely to decrease from the underutilization of the capital investment such as equipment and facility as retailers are forced to close every other Sunday. So in this section, we calculate the changes in the unit cost: the ratio of total costs to total sales.

3.1. Costs structure of megastores

Retailers' total costs consist of the wholesale costs of the products sold and the costs of sales management including the cost of labor and other activities. According to the census of the wholesale and

retail industry by Statistics Korea, the average sales from 2006 to 2009 is around 30.33 trillion Korean won. The percentage of total costs to sales is around 92.29%, which is significantly higher than that of other industries. Hence the margin is quite low. Table 2 shows the cost structure of the megastores. The costs of goods sold and the costs of labor are 74.6% and 7.0% of the total costs, respectively. The other costs, 18.4% of the total costs, consist of the general and administrative expenses and the sales expenses. The former includes utility expense, rent, depreciation expense, taxes and dues, and repair costs. The latter includes advertising costs, sales promotion expenses, sales network maintenance costs and etc.

3.2. Changes in the unit cost due to the regulation

The unit cost is the costs incurred in selling one unit of a good. We define the unit cost as the ratio of total cost to total sales. Suppose the total sales change from S to $S(1+s)$ and the total costs change from C to $C(1+c)$. Then the unit cost changes from C/S to $[C(1+c)/S(1+s)]$. Therefore, the change in the unit cost is $(1+c)/(1+s)$.¹⁰ If it costs more in selling the same amount, i.e., the unit cost increases, we interpret it as efficiency loss.

How the Sunday shopping regulation affects megastores' unit costs and therefore efficiency? If megastores' sales decrease due to the Sunday shopping regulation, megastores will reduce the purchase from wholesalers. So costs of goods purchased from wholesales are likely to decrease. In addition, if less number of store employees is needed, costs of labor will also decrease. However, even on a closed Sunday, the store needs to be maintained. So the general and administrative costs and other sales and management expenses tend

10) $\frac{C(1+c)/C}{S(1+s)/S} = \frac{(1+c)}{(1+s)}$.

to have little changes. So we assume that costs of goods sold and labor costs change by the same proportion as sales while the other costs do not change.

Then we simulate the changes in unit costs when total sales decrease by 7%, 8%, and 9% shown in Table 2.¹¹⁾ For instance, suppose sales decrease by 8% when total costs are 1. Under the assumption of the same percentage change, costs of goods sold decrease by 8% and become 0.686. Costs of labor become 0.064.¹²⁾ If the rest costs do not change, total costs decrease from 1 to 0.935. Then the unit cost increases by 1.6%.¹³⁾¹⁴⁾ The unit cost increase of around 1.4-1.8% shown in Table 2 implies that due to the regulation, megastores need to spend 1.4-1.8% of the costs additionally to maintain the same amount of sales. For instance, megastores' average sales and average costs of 2006-2009 were 30.33 trillion and 27.99 trillion Korean won. The 1.6% unit cost increase means additional costs of 448 billion Korean won for the same amount of sales, which we may interpret as efficiency loss.

11) Choi and Jeong (2013) as well as the retail industry report to the Korean National Assembly showed that sales at megastores decreased by around 8% due to the Sunday shopping regulation.

12) We used this assumption suggested by Williamson et al. (2006). However, if the decrease in the cost of goods and labor is relatively smaller (or larger) than the decrease in sales, our estimate for the unit cost change is underestimated (or overestimated). If so, our estimate for the efficiency loss can be considered as a conservative or lower bound.

13) The unit cost change ratio is $1.016 = (1 + c)/(1 + s) = (1 - 0.0653)/(1 - 0.08)$.

14) The estimates for the changes in the unit cost depend on how much change in costs of goods, labor and others is assumed when sales change. If costs of goods and labor decrease relatively smaller than sales decrease, it will increase the unit cost estimates. On the other hand, if some portion of the rest costs decrease as the number of opening days and the number of customers decrease, the unit cost estimate will decrease.

[Table 2] The cost structure and the unit cost change of megastores

		Sales decrease		
		7%	8%	9%
Total costs	1.000			
(a) Costs of goods sold	0.746	0.694	0.686	0.679
(b) Costs of labor	0.070	0.065	0.064	0.064
(c) Rest costs	0.184	0.184	0.184	0.184
Changed total costs		0.943	0.935	0.927
Changes in total costs (%)		-0.0571 (5.71%)	-0.0653 (6.53%)	0.073 (7.34%)
Changes in unit costs (%)		1.014 (1.4%)	1.016 (1.6%)	1.018 (1.8%)

Notes: 1. The source for the proportion of each cost to total costs is the Census of the wholesale and retail industry (2006-2009), Statistics Korea. These values are the average of the 2006-2009 data.

IV. Concluding Remarks

The previous research pointed out that the Sunday shopping regulations have ignored consumers' needs and preference for Sunday shopping and increased the costs borne by consumers, retailers and employees of the retail industry (Australian Productivity Commission, 2011; Williamson et al., 2006). Further they suggested that the deregulation would boost productivity and consumption, and further promote retail competition in many countries where they had started regulations mostly due to the religious reason or protection of employees.¹⁵⁾

This paper estimates the congestion costs borne by consumers, which is one part of consumer welfare changes due to the regulation, to be around 9.5-10.5 billion Korean won from a closed Sunday and

15) Many countries such as Belgium, Finland, Luxemburg, the Netherlands, Sweden, Spain, the U.K. and the U.S. have taken steps to relax or liberalize Sunday shopping regulations largely in response to consumer demand (EC, 2000).

247 billion Korean won per year. The unit cost increase of around 1.4-1.8% may result in loss of 448 billion Korean won. Further this cost increase may be passed to consumers by retail price increase. The sum of congestion costs and loss of efficiency is around 695 trillion Korean won, which is about 2.3% of the megastores' annual sales. While these costs are only a part of changes in welfare, it can be considered quite large since the margin of megastores is only 7.7%. This implies that the costs of the Sunday shopping regulation may have been underestimated while policymakers have emphasized the benefits of boosting traditional markets and small and medium size retailers. This requests an overall cost and benefit analysis for the Sunday shopping regulation. Unless benefits outweigh costs, alternative measures are needed.

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대형소매점 일요일 영업제한 규제의 혼잡비용과 유통효율성

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논문초록

한국의 대형소매점 일요일 영업제한 규제는 재래시장과 중소 슈퍼마켓의 활성화에 그 목적을 두고 있다. 반면, 규제로부터 영향을 받는 대형소매점을 이용하는 소비자와 대형소매점의 후생 및 관련 당사자들의 후생은 간과되고 있다. 본 논문의 시뮬레이션 결과에 따르면, 일요일 영업제한 규제가 1년간 지속되는 경우 일요일 대형소매점 이용 소비자들이 다른 요일로 쇼핑시간을 전환함으로써 발생하는 혼잡비용이 대형소매점 일년 매출액의 약 2.3%에 달한다. 그리고, 영업시간 감소로 인해 단위비용 (총매출 대비 총비용)이 증가하여 유통효율성이 저해되는데 이는 대형소매점 일년 매출액의 약 7.7%에 해당한다. 따라서, 규제의 편익이 비용보다 작아 사회후생을 저해한다면 제도의 목적을 달성하기 위한 다른 합리적인 대응 방안이 제시되어야 한다.

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