

Explaining Sunday shop policies

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Abstract

Dutch municipalities have the right to decide on Sunday shop opening hours since 1996. Despite positive effects on economic growth and employment, many municipalities restrict Sunday trading in one way or another. Based on 2003 data we show that especially religious and political affiliation, regional differences and the size of the municipalities explain the variation between municipalities. The number and size of shops and household characteristics are significant although their influence seems to be smaller. There is less evidence that excessive competition with neighbouring municipalities induces shop opening on Sundays, although cross-border shopping seems to play a role. Population density has no effect.

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1 introduction

At the end of the twentieth century especially in Europe there has been a debate about relaxing shop opening hours legislation. As an outcome of this debate some legal restrictions have been removed in for example Sweden, the Netherlands and Germany. Since 1972 in Sweden opening hours are unrestricted for all stores. Until June 1996 Dutch shops were not allowed to be open on evenings and on Sundays, today shops may be open from 6 to 22 and is Sunday trading allowed 12 times a year (and 52 times in touristic regions). In Germany a liberalisation took effect in November 1996 and changed closed time on weekdays from 18.30 p.m. to 20.00, and on Saturday from 14.00 p.m. to 16.00 p.m.

From an economic point of view strong arguments have been raised for a less tight regulation. The fast growing empirical literature about this issue stresses unequivocally out welfare gains for consumers and more employment due to relaxing shop opening hours legislation. Therefore, in many European countries this regulation is considered to be relevant for the policy debate concerning unemployment and job creation (e.g. Burda, 2000 and Gradus, 1996).

The economic literature show that the employment effects of longer opening hours are substantially and positive, mainly due to an increase of threshold labour, but possibly also as the result of increased sales (e.g. Gradus, 1996 and Skuterud, 2000). Moreover, the time constraints consumers have are markedly relaxed when opening hours are liberalised. Longer hours allow consumers more time to make their choice. The effect on prices is more doubtful. Average prices may increase or decrease, dependent on the sum of higher costs due to increased threshold labour (e.g. Nooteboom, 1983) and lower costs due to an increase in productivity (as a result of higher capital utilisation, e.g. Thurik, 1984). Evidence from the 1990 liberalisation of opening hours in Quebec suggest that mark-ups may increase and that rebates may be reduced (Tanguay *et al.*, 1995). However, this evidence is rather weak, because only short term effects are investigated. The evidence from Sweden and the US suggest that prices fell following deregulation (e.g. Civil department, 1991 and Burda and Weil, 2001). However, there is some evidence that average prices shall increase marginally if Sunday opening is allowed due to higher labour costs on Sundays (CPB, 1995).

Despite these positive economic effects most western European countries and many American and Canadian states still restrict hours for which shops can open on Sunday. In some countries such as Germany, Norway and Switzerland shops are not allowed to be open on Sunday at all. In other countries like Denmark and Finland restrictions apply for large stores, while in other countries like Belgium, Italy, Spain and the Netherlands there has been room for municipalities to decide about Sunday opening. In Canada and the US states may restrict opening on Sunday or trading of liquor during Sunday. Only in some countries, such as Ireland, Portugal, Sweden and the United Kingdom, there are (nearly) no legal restrictions for Sunday opening.¹

One reason explaining the occurrence of restrictive Sunday laws might be that in the discussion about Sunday opening not only effects on economic growth and employment play an important role, but also issues of social cohesion and religious aspects. In some Western European countries the regulation of Sunday shop opening hours is intended to create the Sunday as religious or pause day for going to the church or to rest, and the restrictions in some US states on Sunday trading, for instance on sales of liquor, seems to have a religious background (e.g. Burda and Weil, 2001). Moreover, others such as trade unions have supported this view and thereby prevent employees being forced to work excessive hours.

Therefore, in most countries Sunday regulations reflect an interesting trade-off. Government intervention may be required because markets do not always properly value benefits that citizens and workers may find important. On the other hand regulations may be restrictive by reducing consumer choice and employment. The empirical literature presents only two studies that evaluate some of the reasons for liberal or restrictive laws. Price and Yandle (1987) discuss for 25 US states the Sunday closing laws in 1970 and 1984. In 1970 they found evidence for a number of explaining variables for restrictive policies, including religious affiliation, political influence and the participation of women in the labour force. However, the 1984 results offer much less explanatory power. Ferris (1991) presents evidence for 45 Ontario cities that had the choice whether or not to adopt early closing hours. From the data it follows that higher female labour participation will decrease the probability of choosing early closing hours

¹This information is based on OECD (1997) and an update using website information of the responsible authorities in different countries.

and that cities with a greater density are predicted to have more liberal laws. In this article weak, mostly because of data problems, evidence is found for religious affiliation.

Therefore, until now the evidence on the reasons for liberal or restrictive laws are not very clear. Interestingly, the Dutch policy change, which gives ample power to local authorities deciding on Sunday opening, provides new insights into this problem. Based on 2003 data for all (489) Dutch municipalities we analyse the determinants for differences in local shop opening regimes. We show that variation between municipalities can be explained by differences in economic attractiveness, interests of small shop owners, social demand, ideology and regional differences.

The remainder of this paper is organised as follows. Section 2 presents the methodology and section 3 describes the data. Section 4 presents the estimation results. Section 5 concludes.

2 Methodology

A number of theories can be formulated that indicate which municipal characteristics might be related to the decision to open shops on Sundays. In this paragraph we introduce these theories and explain how these theories can be translated in a testable relation between municipality characteristics and the actual opening decisions.

The basis for our analysis is the explanation of the decision Dutch municipalities have made regarding the opening of shops on Sundays. As endogenous variable we have a variable (SO_i) describing the Sunday shop policy of municipality i . As the national law allows only a maximum of 12 Sundays with open shops (as long as the municipality is not an important touristic center in which case 52 Sundays are allowed) and the number of opening days differ within the municipalities, the main difference between municipalities is whether they allow Sunday openings or not. Therefore, our first specification is a binary probit model. In this model SO_i has the value zero for municipalities that do not allow open shops on any Sunday and one for municipalities with open shops on some Sundays. As an alternative we estimate an ordered probit model which

measures the extent of shop opening days on Sundays. In this model SO_i takes the value one for municipalities which do not allow open shops on Sunday, ten for municipalities which allow open shops on all Sundays and values within one and ten for municipalities that allow open shops on some Sundays, whereby the actual value depends on the number of Sundays for which shops are open (see section 3 and Appendix A).²

The reasons for the differences in local Sunday shop policies is analysed by regressing SO_i on a number of municipal characteristics. These characteristics are based on five theories, regarding the economic attractiveness, interests of (small) shop owners, social demand, ideology and regional differences.

The first theory is based on the **economic attractiveness** of shop opening on Sundays. The general idea is that shop opening on Sunday is more attractive for shop owners when more customers visit their shops. Municipalities differ with respect to the generated value added when shops would be opened on Sunday. Two mechanisms play a role here. First, it is well-known that a richer diversity of shops or more specialised shops exist in shopping centres with more shops. Therefore, people are more interested to shop in municipalities with a larger number of shops, especially for so-called fun shopping. As shopping on Sundays is used in particular for this type of shopping, municipalities with more shops will have a higher incentive to open shops on Sunday as they attract more customers. Second, given the diversity of shops, an increase in the number of customers will enlarge the possible gains of open shops on Sundays. Thus, larger municipalities will have a larger incentive to open shops on Sunday. To test this theory we include the number of inhabitants (IN_i) and the number of shops per inhabitant (SN_i).³ Furthermore, to check for non-linear scale effects the number of inhabitants squared is included as well.

The second theory is based on the **interests of (small) shop owners**. The real value added that can be generated by opening shops on Sundays is not only

²We estimated also a model with a less refined specification of the SO_i variable (five instead of ten categories) to test for partial ordering. The results for this estimation were not significant different from the refined version. Results are available upon request.

³Ferris (1991) also includes the number of inhabitants. He argues that free-rider problems can be expected to rise with the number of individuals to be coordinated and therefore larger municipalities have a smaller incentive to open shops on Sundays. However, in this article the empirical evidence for this thesis is rather weak.

dependent on attractiveness but also on (i) the possibilities customers have to shop elsewhere, (ii) the possibilities shop owners have to increase their workload and (iii) the value customers attach to longer shopping times.

- i If customers can shop on Sundays in surrounding municipalities the turnover of shop owners in municipalities with closed shops on Sunday will diminish. Ferris (1991) argues that retailers view shop hours as an effective instrument to appropriate customers from rivals. Kay and Morris (1987) show that competitive pressure may induce excessive opening at times when high costs would be incurred as on Sundays. Thus, competitive pressures may induce opening on Sundays to protect the position of local shops. We test this theory by including an impact factor measuring the extent of shop opening days in surrounding municipalities. This impact factor is calculated using the following equation:

$$EN_i = \sum_j SO_j \quad (2.1)$$

where EN_i is the impact factor of municipality i , i is a vector of all municipalities, j is a vector of the municipalities with a liberal shop opening policy in the neighbourhood of municipality i . Initially, neighbourhood municipalities are those municipalities that are no further away than 25 kilometres (17 miles).⁴ The impact factor is larger when: (a) there are more surrounding municipalities with liberal Sunday policies and (b) a surrounding municipality has more Sundays on which the shops are open (the impact of a surrounding municipality with a more liberal policy will be larger).

- ii Small shop owners have less possibilities to increase their workforce compared with large shop owners. More restrictive regulation of opening hours tend to favor small stores over large ones. Small shop owners often experience more difficulties when they expand opening hours due to the need to employ a certain “threshold” labour at all times (e.g. Nooteboom, 1983). Furthermore, liberalising shop opening hours regulation has the effect of lowering access cost and therefore the sales of large stores will increase (e.g. Morrison and Newman, 1983). There is some evidence that local politicians often react to this unequal competition between small

⁴Alternative assumptions with different maximum distances are also tested. See section 4.

and large shops. This reaction will of course depend on the presence of small shops versus large shops. Therefore, we include the average number of employees per shop for each municipality (SS_i).

- iii As argued by Ferris (1991) differences in population density across municipalities may also generate differences in the relative demand for Sunday opening. Customers in small population density areas will value distance higher than longer shopping times, increasing the possibilities for small shop owners to resist opening on Sundays. So, Sunday opening is predicted to be more likely in areas with larger population densities. To test this theory, population density (DE_i) is included as well.

The third theory is based on the **social demand** for shop opening on Sundays. The demand for more Sunday shopping may depend on the average household type in a municipality. Thum and Weichenrieder (1997) argue that the possibilities to shop during the week will be less for couples that work both. Thus, they will value unrestricted shopping hours higher than single income families as the real (opportunity) cost of time during weekdays will be higher for double income families. We include the incidence of household with a double income (HD_i) to test this theory. A second household characteristic that might influence social demand for shop opening on Sundays is the size of the household. According to Eurostat (2003) fathers and mothers in 13 European countries, including the Netherlands, spent more time with their families, if families are large. The higher level of domestic tasks results in less time available for leisure increasing the real (opportunity) cost of time on Sundays. Therefore we expect that households with larger families will value shop opening on Sundays lower and include the number of inhabitants per household (HS_i) to test this.

The fourth theory is based on the **ideological colour** of the municipality. It seems straightforward that voter ideology might influence the decision on shop opening hours (compare Posner, 1974). Hereby, it is assumed that the Sunday opening decision of a municipality is dependent on the degree of voters' convictions. The anti-Sunday opening argument is highly present by orthodox protestant parties like SGP and CU, and to a weaker extent by the more liberal Christian democratic party CDA. Based on the belief that, compared with the other six days, the Sunday has a special Christian function their local politi-

Table 1: Variables representing the theories

Theory	Representing variable	$p(SO_i)^a$
Economic attractiveness	Inhabitants (IN)	Positive
	Number of shops (SN)	Positive
Interests (small) shops	Policy surrounding municip. (EN)	Positive
	Size of shops (SS)	Positive
	Population density (DE)	Positive
Social demand	Size of households (HS)	Negative
	Double income households (HD)	Positive
Ideological colour	Aldermen (AL)	Varying
	Active church members (CH)	Negative
Regional differences	Provinces (RE)	Varying

a. Probability of less restrictive Sunday opening policy.

cians often try to keep the shops closed at Sundays. Also parties exist that try to achieve the same goal from a totally different perspective. They also strive to maintain the Sunday as day of rest, but now from a social and not from a religious point of view. Parties like the SP and PvdA, which are left-wing parties, sometimes play together with SGP, CU and (perhaps) CDA to reach a majority in the local political arena. As some other, mostly liberal, parties as VVD and D66 see the Sunday as a good opportunity to enlarge the possibilities to shop and to stimulate the local economy by extending the shop opening hours on Sunday, the possibilities to reach such a majority depends on the local balance of power. However, the policy outcome does not only depend on the direct balance of power, but also on the influence of church members on the political parties. Although church and state are separated in the Netherlands, local churches may try to influence the policy debate. Therefore, municipalities with more active church members may show more restrictive Sunday policies. Furthermore, a slightly different interpretation of the church attendance variable should be considered as well. When the number of people going to church increases, the market size of Sunday shoppers decreases. This means that shop owners will have less incentives to open their shop on Sundays when a higher part of the potential shoppers goes to Church. This view is also consistent with the assumption that the percentage of inhabitants that are active church members matters. To test the influence of ideological colour we include as explaining variables the percentage Alderman in the board of the municipalities of the different parties ($AL_{i,p}$) and the percentage of inhabitants that are active

church members (CH_i).⁵

The fifth theory is based on **regional differences**. According to this theory the Sunday opening hours are subject to considerable regional variation. In earlier work we find some evidence for the assumption that especially the provinces bordering Belgium (Brabant, Sealand and Limburg) with their more Burgundian tradition have a more liberal Sunday shop policy (see Gradus, 2001). Furthermore, as for a long time Sunday opening is allowed in Belgium for special stores as bakeries and furniture stores as well as for other stores in touristic municipalities, one can argue that cross-border shopping will speed up Sunday opening in these regions.⁶ This theory is tested by including a dummy for the provinces ($RE_{i,k}$).

Table 1 summarises the priors about the influence of variables representing the five theories on the probability of a less restrictive Sunday opening policy (see Appendix A for the exact definition of variables).

Table 2: Sunday opening in Dutch municipalities

Sunday policy (SO)	Municipalities	% of total
1. Zero Sundays open	155	32
2. Only special days (max 5) like Boxing day	18	4
3. Less than 12 Sundays per year	129	26
4. 12 Sundays per year	96	20
5. more than 12, less than 52 per year	70	14
6. 52 Sundays per year	21	4

3 Data

Data on SO_i are collected using a website which gives information for 282 Dutch municipalities for the situation in 2003 (www.koopzondag.com). Data for the other 207 municipalities are gathered using website information of this municipalities and an enquiry send to the remaining municipalities for which

⁵In the Netherlands a large part of church members never attend church services. The included variable is related to members that attend church services at least once per week. The literature about the relation between religion and economics regularly find different effects of religion and its intensity (see for example Barro and McCleary, 2003). In our case variables representing church membership are not significant.

⁶Ferris (2000) shows that intense cross border shopping between the US and Canada was a major stimulus to free Sunday shopping in Ontario.

not enough information was available on the Internet. Using direct contact between the authors and the municipalities we finally ended up with data for all municipalities.

Table 3: Descriptive statistics

	Aver.	Max	Min	St.dev.
Inhabitants (IN)	33114	736562	1000	55660
Number of shops per 1000 inhab. (SN)	6	18	0	2
Impact factor surrounding municip. (EN)	11	32	0	8
Size of shops in employees per shop (SS)	5	15	2	2
Population density (DE)	5	255	0	16
Size of households (HS)	2.5	3.6	1.8	0.2
Double income househ. per 100 inh. (HD)	16	21	10	2
Aldermen as % of total Aldermen (AL)				
- SGP	2	50	0	8
- CU	3	50	0	9
- CDA	30	100	0	18
- SP	1	60	0	5
- PvdA	17	67	0	18
- GL	2	50	0	7
- VVD	16	67	0	18
- D66	2	33	0	6
Active church members as % of inh. (CH)	13	28	5	5
Province (RE)				
- Groningen	5	100	0	22
- Friesland	6	100	0	24
- Drenthe	2	100	0	15
- Overijssel	5	100	0	22
- Flevoland	1	100	0	11
- Gelderland	15	100	0	35
- Utrecht	7	100	0	25
- Noord-Holland	13	100	0	34
- Zuid-Holland	19	100	0	39
- Zeeland	3	100	0	16
- Noord-Brabant	14	100	0	35
- Limburg	10	100	0	30

Table 2 shows how many municipalities allow for open shops on Sunday.⁷ Of all municipalities 32% allows shops never to be open on Sundays. The other extreme, 52 Sundays open shops, is allowed in 4% of the municipalities. In 66% of the municipalities Sunday opening is allowed in the range of only special Sun-

⁷The categories 2 till 5 presented in Table 2 are further divided in two subcategories in the ordered probit model, based on an opening regime for part of or the whole municipality (see Appendix A).

days like Boxing day (which is called second Christmas day in the Netherlands) to all Sundays.⁸

Data for EN_i are calculated using the information on SO_i and a table with the average distance between municipalities, based on a standard routeplanner. Data for the other explaining variables are from the CBS (the Dutch Central Bureau for Statistics).⁹ The variables are summarised in Table 3 (see Appendix A for a description of the variables).

4 Results

Table 4 presents the estimations results. The binary probit and the ordered probit results show both that all discussed theories are related to the municipal Sunday shop policy.¹⁰

Both inhabitants and the number of shops are significant indicating that **economic attractiveness** plays an important role. The coefficient of inhabitants squared in the binary probit estimation makes clear that the positive effect of the number of customers diminishes when municipalities become larger.¹¹ At first sight this results is contrary to that of Ferris (1991). Based on data for 45 large and medium-sized cities in Ontario he finds a positive but insignificant relationship between size and Sunday opening. However, if size does only matter when small and large municipalities are compared, our results may in fact be in accordance with those found by Ferris (1991). Indeed, when we exclude the 75 municipalities which have less than 9,500 inhabitants the coefficient for inhabitants squared is no longer significant. This intuition corresponds with the insignificant coefficient of the squared variable in the ordered probit estimation. Where a threshold effect can be assumed in the choice between zero

⁸Note that we use the term Sundays also for days like Easter Monday. Traditionally shops were not allowed to be open on Sundays and special days like Easter Monday and Boxing Day. Currently, municipalities may allow shops to be open on 12 Sundays and special days, except for Easter Sunday and Whit Sunday.

⁹All variables are available per municipality, except for the active church member variable. This variable is available for 42 regions.

¹⁰As multicollinearity may play a role estimations were done excluding some of the variables to analyse whether standard errors are influenced. These estimations did not result in evidence that multicollinearity does influence our conclusions.

¹¹According to our estimates the impact of size diminishes even when municipalities have more than 410,000 inhabitants. However, as only three municipalities have this size, this decrease is in fact an out of sample result. A Wald-test of the first derivative with respect to municipality size shows that the size effect is significantly different from zero (at 99%) indeed.

or some open Sundays, intuition suggests that the size of municipalities might be related to the number of Sundays shops are allowed to open their doors.

Table 4: Estimation results Sunday opening

	Binary probit		Ordered probit	
Inhabitants (IN)	2.79	(0.74)	0.94	(0.30)
Inhabitants squared (IN ²)	-0.34	(0.13)	-0.05 #	(0.07)
Number of shops (SN)	1.52	(0.46)	1.27	(0.34)
Impact surrounding municipalities (EN)	0.01 *	(0.01)	0.00 #	(0.00)
Size of shops (SS)	0.14	(0.05)	0.06 *	(0.03)
Population density (DE)	-1.63 #	(4.48)	2.83 #	(3.44)
Household size (HS)	-0.97 **	(0.41)	-1.07	(0.41)
Double income households (HD)	0.12 **	(0.05)	0.09 **	(0.04)
Alderman (AL):				
- SGP	-4.29	(1.54)	-5.91	(1.42)
- CU	-1.95 **	(0.91)	-1.79 **	(0.75)
- CDA	-0.30 #	(0.47)	-0.03 #	(0.30)
- SP	-2.48 #	(2.06)	-1.94 *	(1.04)
- PvdA	-0.70 *	(0.44)	-0.42 #	(0.32)
- GL	1.49 #	(1.22)	-1.11 #	(0.74)
- VVD	-0.13 #	(0.45)	-0.22 #	(0.31)
- D66	-2.56 **	(1.20)	-0.98 #	(0.82)
Active church members (CH)	-0.09	(0.03)	-0.08	(0.02)
Province (RE)				
- Friesland	0.27 #	(0.42)	0.16 #	(0.34)
- Drenthe	0.17 #	(0.54)	0.26 #	(0.40)
- Overijssel	0.77 #	(0.50)	0.88 **	(0.36)
- Flevoland	0.46 #	(0.87)	0.91 *	(0.55)
- Gelderland	0.00 #	(0.39)	0.55 *	(0.30)
- Utrecht	-0.63 #	(0.46)	0.12 #	(0.35)
- Noord-Holland	-0.50 #	(0.43)	0.32 #	(0.32)
- Zuid-Holland	-0.39 #	(0.43)	0.49 #	(0.32)
- Zeeland	1.19 *	(0.64)	2.48	(0.45)
- Noord-Brabant	0.76 #	(0.49)	0.79 **	(0.33)
- Limburg	0.90 *	(0.51)	1.17	(0.34)

Notes: Standard errors are given in parentheses. All coefficients are significant at the 99% confidence level, except for coefficients with */** which denotes significance at the 90/95% level and for coefficients with # which denotes non-significance at the usual levels.

The estimations show that the theory regarding **interests of (small) shop owners** might explain differences in shop policies between municipalities. When surrounding municipalities have liberal shop opening policies, the competitive

pressure increases, resulting in a lower probability that municipalities choose for zero Sundays on which shops are allowed to be open. However, in the ordered probit estimation this relation is not found. Apparently, the competitive pressure seems to have more influence in the decision to allow open shops or not and less in the decision how much Sundays shops may be open. Estimations with other values for the maximum distance defining neighbouring municipalities shows that for the binary probit estimations this variable is not always significant either. Thus, we conclude that there is weak evidence for competitive pressure. The results for interests of small shop owners, i.e. size of shops and population density, are more robust (which is in accordance with the 1970 results presented by Price and Yandle (1987)). Both estimations show a significant and positive relation between the average number of employees per shop and the number of open Sundays. The population density variable is not significant suggesting that Sunday opening is not more likely in a sparsely inhabited area. This result is contrary to Ferris (1991). A possible explanation is that the variation in the Netherlands is far less pronounced than for Canada.

The results for the household size and the number of households with double income show that differences in **social demand** explain part of the variation in shop policies. Municipalities with larger families and less households with a double income have a higher probability to have more restrictive Sunday policies. This is similar to Ferris (1991) and Price and Yandle (1987), where higher female participation stimulates Sunday opening.

The results for **ideology** are quite clear and are stronger compared with Ferris (1991) and Price and Yandle (1987). Municipalities with more orthodox protestant (SGP and CU) aldermen show a much larger probability to have policies with less open Sundays. Thus, orthodox protestant parties influence the municipal Sunday policy. Interestingly, the CDA-variable is insignificant. Although the Christian Democratic Party has a historical foundation in religion, the influence on this issue is apparently not present. Some evidence exist that some non-Christian parties might also stimulate a restrictive policy. The variables for PvdA (in the binary estimation) and for SP (in the ordered probit) show that considerations for a day or rest might play a role in the policy debate. The significant negative coefficient for D66 in the binary probit estimation cannot be explained on the basis of the liberal contents of this party. However, there

is no significance in the ordered probit. The second variable measuring the influence of ideology, active church members, is significant in both estimations. Municipalities where a larger part of their citizens is an active church member, have more stringent Sunday policies. Interestingly, inclusion of variables representing church members that are less active (in terms of the number of times they attend services) leads not to significant results.¹² Thus the influence of religion seems to be restricted to those religious people that actively participate in church services.

The data also show some reasoning for the **regional differences** argument. In the ordered probit the coefficients for the provinces Brabant, Sealand and Limburg are significant at 95%, while the coefficients for Limburg and Sealand are significant at 90% in the ordered probit. These regressions imply that there is some evidence that cross-border shopping is an important element for the opening hours policy in municipalities adjacent to Belgium. This is in accordance with Ferris (2000) who found that a period of intensive cross border shopping (due to a Canadian/US exchange rate that favoured US shopping) competition was a major stimulus in freeing Sunday shopping in Ontario. Thus, jurisdictional competition between regions seems to be more important than between municipalities.

The Andrews test statistic for goodness of fit of the binary probit model is significant at 99%. The expectation-prediction table shows that the increase in correct predictions compared with the constant probability predictions is large for both values of SO_i : respectively 42 and 43%. Both results indicates that the discussed theories do indeed explain a significant part of the variation between municipalities.

An interesting question is whether the estimation results give information about the relative weight of the theories. Calculation of the change in probabilities for SO_i when the variables representing the theories are varied by one standard deviation reveals that ideology, economic attractiveness and regional culture play a larger role than the other theories. Especially the number of inhabitants, the presence of SGP, CU and D66-Aldermen, the number of active church members and the regional culture have a large impact on the probability of a less

¹²Results are available upon request.

restrictive Sunday policy (see Table 5).¹³

Table 5: Effect on probability of less restrictive Sunday policy

Theory	Representing variable	$p(SO_i)^a$
Economic attractiveness	Inhabitants (IN)	0.22
	Number of shops (SN)	0.08
Interests (small) shops	Policy surrounding municip. (EN)	0.07
	Size of shops (SS)	0.08
	Population density (DE)	-0.01
Social demand	Size of households (HS)	-0.07
	Double income households (HD)	0.06
Ideological colour	Aldermen (AL: SGP, CU and D66)	-0.28
	Active church members (CH)	-0.16
Regional differences	Provinces (RE)	0.14

a. Probability of less restrictive Sunday opening policy.

5 Conclusions

In July 1996 some restrictions for Sunday shop opening were removed in the Netherlands and municipalities have got the right to decide on Sunday trading. Still, 32% of the Dutch municipalities shops are closed on every Sunday in 2003. Drawing on various theoretical arguments, two statistical (binary and ordered probit) models were developed to explain the occurrence of restrictive Sunday opening. It is shown that especially the number of inhabitants, political affiliation, religious affiliation and regional differences are important to explain the variation between municipalities. The number and size of shops and household characteristics are significant although their influence seems to be smaller. There is less evidence for excessive competition with neighbouring municipalities, although cross-border shopping seems to play a role. Population density has no significant effect.

The evidence is consistent with the hypothesis that municipal control over Sunday shopping hours results in a considerable variation in policies. Therefore, deregulation to the local level allows municipalities to take account of local characteristics.

In this paper we only investigate the policy decision by the municipality. Less

¹³These figures are calculated using the average for all variables and varying significant variables with one standard deviation.

restrictive policies do not necessarily imply that shops are also open at Sundays. There is some evidence that especially food and furniture stores make use of a more liberal policy. In large cities also shopping centres and special stores are open. It seems that liberal opening hours enables stores to align their opening hours with consumers demand. Future research might generate more insight in the opening decision of show owners when data are available about the opening hours of individual shops.

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Appendix A. List of variables

SO	Sunday shop policy of municipality i
- binary	Value = 0 for municipalities which allow no sunday opening Value = 1 for municipalities which allow sunday opening
- ordered	Municipalities which allow sunday opening: <ul style="list-style-type: none">- never: value = 1- only on special days (like Easter Monday): value = 2- less than 12 times per year (only part of municipality): value = 3- less than 12 times per year (for the whole municipality): value = 4- 12 times per year (only for part of the municipality): value = 5- 12 times per year (for the whole municipality): value = 6- more than 12 times per year during a specific part of the year: value = 7- between 12 and 52 times per year (for part of the municipality): value = 8- between 12 and 52 times per year (for the whole municipality): value = 9- 52 times per year: value = 10
IN	Number of inhabitants per municipality (divided by 100,000)
SN	Number of retail shops per municipality (divided by inhabitants)
EN	Impact factor measuring sunday policy in surrounding municipalities
SS	Size of shops (employees per shop for retail)
DE	Population density (hectares per 1000 inhabitants)
HS	Number of households (divided by inhabitants)
HD	Number of households with double income (divided by inhabitants)
AL	Number of Alderman (divided by total Aldermen) for
- SGP	- Orthodox protestants
- CU	- Orthodox protestants
- CDA	- Christian democrats
- SP	- Socialistic Party
- PvdA	- Social Democrats
- GL	- Green left
- VVD	- Conservative liberals
- D66	- Progressive liberals
CH	Number of inhabitants that attend church services at least once per week (divided by total inhabitants)
RE	Dummy with value 1 if municipalities is part of province (12 provinces)

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