Short-term Impact of Shopping-hour Deregulation: Welfare Implications and Policy Analysis*

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Les effets de court et de long terme doivent être pris en compte par les décideurs publics lorsqu'il s'agit de mettre en vigueur de nouvelles politiques économiques. Dans cet article, on démontre que malgré des gains d'efficience potentiels à long terme, la vague de déréglementation des heures d'affaires au Canada peut aussi entraîner, à court terme, des coûts sociaux et des effets redistributifs de bien-être. Ces effets semblent avoir été négligés dans les discussions concernant l'introduction de lois sur les heures d'affaires dans les diverses provinces canadiennes. On présente aussi dans cet article des résultats empiriques pour le Québec afin d'illustrer le désenchantement qui risque d'affliger les consommateurs suite à la libéralisation des heures d'affaires.

The trade-off between the short- and long-term effects of the deregulation of shopping hours must be taken into account by policy-makers when introducing new legislation. In this paper, we argue that while long-term efficiency gains can be expected from relaxed shopping hours in Canada, deregulation also involves short-term social costs and a potential short-term redistribution of social welfare among Canadians. These issues seem to have been neglected in the debates over whether the provinces should permit Sunday shopping. This paper also presents empirical evidence on the immediate aftermath of deregulation in Quebec (July 8, 1990) in order to give policy-makers in the other provinces a better understanding of the risk of consumer disenchantment following deregulation.

I Introduction

The trend in most American states and Canadian provinces toward longer business hours in the retail industry finally reached Quebec in the late 1980s. After much debate and numerous last-minute changes to the law, the Quebec government allowed retailers to extend shopping hours on certain weeknights and on Sundays, under certain conditions.[1] Most other provinces, following the lead of British Columbia (1975) and Ontario (1970), had already adopted legislation giving municipalities the right to decide whether stores under their jurisdiction should be allowed to extend shopping hours. Still, provincial legislatures have recently come under strong pressure from various interest groups to adopt uniform, province-wide regulations allowing shops to open on Sundays. Ontario has already acquiesced to this demand: since early June 1992, stores throughout the province have been allowed to open on Sundays. New Brunswick, Manitoba, and other provinces are expected to

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Table 1
Regulation of business hours in Canada level of jurisdiction

I. Monday to Saturday	:	Municipal
Sunday	:	Municipal
Holiday	:	Municipal
ALBERTA	:	*Municipal Government Amendment Act* (1985)
BRITISH COLUMBIA	:	*Holiday Shopping Regulation Act* (1980)
PRINCE EDWARD ISLAND	:	*Day of Rest Act* (1985)
SASKATCHEWAN	:	*Urban Municipality Amendment Act* (1988)
Remarks	:	In Alberta, only a few small municipalities have regulated opening hours. In Vancouver, most stores are open on Sundays. Food stores in Regina and Saskatoon are open on Sunday afternoons, while most other stores are closed.
II. Monday to Saturday	:	Municipal
Sunday	:	Provincial
Holiday	:	Provincial
MANITOBA	:	*Retail Business Holiday Closing Act* (1987)
NOVA SCOTIA	:	*Retail Business Uniform Closing Act* (1985)
NEWFOUNDLAND	:	*Shops Closing Act* (1977)
Remarks	:	In Manitoba, stores may open on Sundays if they close on Saturdays.
III. Monday to Saturday	:	Municipal
Sunday	:	Municipal
Holiday	:	Provincial
NEW BRUNSWICK	:	*Days of Rest Act* (1985) and *Act to Amend the Days of Rest Act* (1988)
ONTARIO	:	*Retail Business Holidays Act* (1990) and *Act to Amend the Retail Business Holidays Act in respect of Sunday Shopping* (1992)
Remarks	:	Municipalities in both provinces have a certain amount of flexibility (e.g., they may pass by-laws to permit all retail businesses within their boundaries on Sundays).
IV. Monday to Saturday	:	Provincial
Sunday	:	Provincial
Holiday	:	Provincial
QUEBEC	:	*Act respecting commercial establishments business hours* (1990) and *Act to amend this law* (1992)
Remarks	:	All stores can now open on Sundays.

SOURCE: Ministère de l'Industrie et du Commerce du Québec, 1989, plus information collected by the authors.

follow suit quickly with their own legislation on Sunday and weeknight shopping. Table 1 summarizes the recent developments in each of the ten provinces.

Whether this move toward provincial deregulation is economically efficient has generated much debate in the literature and in the press. Such liberalization is viewed by its proponents as necessary to accommodate changing lifestyles (increases in the numbers of working women and of families in which all adults work) and increasing time constraints, which limit Canadians' access to stores and shops. Many also argue that liberalization would create jobs and improve efficiency by in-

creasing competition among retailers. Opponents argue just the opposite.

The potential long-term effects of deregulation are well documented theoretically and empirically (e.g., Nantel et al., 1990). We discuss these in the next section of the paper. However, the short-term effects of the liberalization of store hours appear to be more persistent than initially expected and seem to have been neglected in most analyses. In Quebec, two years after the deregulation of shopping hours, a proportion of the population remains strongly opposed to the new law (Cloutier, 1992). It is hard to say whether this opposition is growing, but it is certainly not subsiding as soon as was expected. Even if one believes that the long-term impact of deregulation will be positive, it is important for policymakers to be aware of its short-term effects. An assessment of the costs of deregulation is necessary in order to properly inform the population of the changes it will bring, to limit the negative effects, even if short-lived, and to manage an efficient transition toward a more stable unregulated environment. Although some of the short-term effects of deregulation, particularly on small stores,[2] have been acknowledged by policymakers, other potential effects have been left out of the discussion.

In this paper, we argue that the introduction of relaxed shopping hours in Canada can lead to short-term social costs, as well as to the potential for a short-term redistribution of social welfare among Canadians. Our aim is to make policymakers in the other provinces more aware of the possibility of the public's disenchantment with extended shopping hours in the immediate aftermath of deregulation. To the extent that Quebec's experience in the matter could prove useful, we use it as a background for discussion. Empirical findings on how the prices and product profit margins (markup) of large food-industry retailers were affected following deregulation in Quebec are also presented to substantiate our discussion and comments. As far as we know, the short-term effects of deregulation on profit margins have not been the subject of an empirical study in the economic literature, and the only other study to examine its effects on prices is a previous paper by the present authors.

We first review the debate surrounding the Canadian regulation of business hours in the retail industry by presenting, from an economic perspective, the views of both advocates and opponents of regulation. This section is followed by a brief description of our analytical framework, a presentation of our empirical results and a discussion of their implications for public policy. The last section provides concluding remarks.

II The Debate in Canada

Arguments for Regulation

Abstracting from social, demographic, and cultural issues, some economists have built a case for the regulation of shopping hours. In fact, the effects of extended hours on the behaviour, structure and efficiency of the retail industry have been the subject of much debate in the economic literature. A first set of papers, mainly theoretical, discusses the impact of deregulation on costs. These arguments can generally be grouped under the banner of excessive competition. Tullock (1975), Ingene (1986) and Ferris (1990) argue that deregulation leads to higher operating costs and lower efficiency. Tullock argues that lifting restrictions on opening hours increases operating costs (energy, labour) more than sales, since consumers merely reschedule the same weekly purchases over more shopping hours. In the short run, profits decrease. In the long run, some firms may leave the market. Ferris's argument is more complex: according to him, store owners' inability to price discriminate between buyers on the basis of distance or time of day gives owners the incentive to compete for marginal consumers by increasing shopping hours, if these are not restricted. The owners then increase prices to cover the higher costs associated with longer hours and thus, force captive

infra-marginal consumers to subsidize extended services to marginal customers. In the long run, the result of deregulation is overproduction of shopping hours and too few stores.

On *empirical grounds*, there is no strong support for these theoretical predictions. Kay and Morris (1987) use simulations and find that costs would not increase after deregulation. Using interviews, Désormeaux et al. (1988) reach the same conclusion for supermarkets operating in Quebec. In this respect, an interesting issue is the impact of deregulation on the total number of hours worked (especially overtime hours). In a companion paper (Tanguay et al., 1993), we show that the pattern of overtime hours remained constant in Quebec food stores after the deregulation of July 1990. Similarly, further discussions with specialists in the food retail industry confirm that stores which stay open on Sundays do not necessarily incur extra costs. In fact, quite the contrary is true. For instance, stores are better able to manage their stocks: there is less waste of perishable goods like fruits and vegetables, and smaller inventories can be held, since sales are better distributed over shopping hours.

Moreover, there is no strong empirical evidence to support Ferris's conclusion that the number of stores decreases with deregulation. In another paper, Ferris (1991) supplies evidence that municipalities in Ontario with restricted shopping hours have a larger number of stores holding constant average store sales and population density. However, these results are contradicted by Moorehouse (1984), who finds that, in American states which restrict Sunday shopping, the number of stores is lower.

Arguments in Favour of the Recent Deregulation

The proponents of deregulation advance strong economic arguments along the same lines. They claim that, if all stores were allowed to open on Sundays, competition between retailers would increase efficiency and lower the total price paid for goods (which includes the cost of access and transportation). All consumers would benefit in the end, since more flexible shopping hours would lead to lower prices. This relatively straightforward argument is presented formally in Morrison and Newman (1983) and extended in Tanguay et al. (1992). Since the value of time is likely to decrease with deregulation – as it becomes more convenient (i.e. less costly) to shop on Sundays rather than during restricted hours – demand is expected to increase at large stores (which are cheaper but farther away) and to decrease at convenience stores (which are closer but more expensive). Indeed, because of possible economies of scale for large retailers (Nooteboom, 1982), and the fact that small stores benefit from local monopoly power during the hours when large stores are closed, it seems reasonable to assume that large stores have lower prices.[3] This demand shift leads to an increase in nominal prices and profits for large stores, and a decrease in prices and profits for small stores, since the flexibility provided by the liberalized opening hours induces some consumers to switch from small to large stores.[4]

Although the formal model predicts that the nominal price will increase in large stores, it also implies: (1) that it will remain lower than at small stores; (2) that the total price (including the cost of access) will decrease as the cost of access falls after deregulation. Moreover, in the long run, new large firms (or new branches of existing firms) may be expected to enter the market, attracted by the prospect of higher profits so that, on average, there will be more large stores, thereby lowering even further the total price paid by consumers.

Empirically, Morrison and Newman (1983) show that there is a redistribution of sales from small stores to large stores after deregulation. Moorehouse (1984) and Laband and Heinbuch (1988) also find that American states with strictly regulated business hours for large stores have a smaller proportion of large stores. These

Table 2
Market shares of stores selling food products: Canada (without Quebec), Quebec and British Columbia percentages for 1974, 1982 and 1986

	Canada (without Quebec)	Quebec	British Columbia
		1974[a]	
Supermarkets	82.69	83.3	82.1
Specialized stores	2.1	2.93	1.67
Pharmacies	0.047	0.1	0.18
Department stores	4.02	2.09	7.19
		1982	
Supermarkets	78.12	74.2	78.8
Specialized stores	8.26	13.6	9.5
Pharmacies and others	3.82	4.37	6.1
Department stores	3.25	1.72	6.1
Convenience stores	6.52	6.1	5.6
		1986	
Supermarkets	80.26	75.0	81.5
Specialized stores	8.42	11.9	9.5
Pharmacies and others	4.0	5.1	4.9
Department stores	2.7	1.59	4.9
Convenience stores	4.59	6.4	4.2

[a]In 1974, the Statistics Canada survey used to produce this table (62–554) did not gather information on convenience stores.
SOURCE: Désormeaux et al. (1988).

results are confirmed to some extent by the data presented in Table 2, taken from Desormeaux et al. (1988).

The data in Table 2 indicate that, in Quebec's food industry (which had strict shopping laws until 1990), the market share of supermarkets has fallen over time, while that of smaller stores has risen. Sunday sales of food products by small retailers (allowed to open on Sundays) were $320 million in 1988 and were increasing at a rate of 8 per cent a year in real terms before deregulation, while overall sales were stagnant (see Nantel et al., 1990). In British Columbia, where deregulation has been widespread since the early 1980s, supermarkets have regained some lost ground. In the rest of Canada, where shopping hours have been only partially deregulated, the gains are not as substantial as in BC. It should be noted that, while Quebec's supermarkets had a larger share of Quebec's food market in 1974 than did supermarkets in Canada (without Quebec) and BC in their food markets, they had a lower share in 1986.

III Evaluating Short-Term Effects of Deregulation

As yet, no research has been conducted on the short-term impact of deregulation on prices (with the exception of Tanguay et al., 1992; 1993). In this section, we present some empirical evidence on this matter based on weekly data collected in a sample of Quebec food stores before and after the recent deregulation. These findings provide the background for a discussion of the short-term effects of deregulation on social costs and welfare redistribution. First, however, the framework in which the discussion will take place is presented in greater detail.

As discussed above, Tanguay et al. (1992) extend the model of Morrison and Newman

(1983) in order to identify the effects of deregulation on the demand, prices and profits of retailers of different sizes. We find that an increase in shopping hours, which provokes a reduction in the cost of access time, leads to an increase in nominal prices and profits (markup) of large stores (the prediction that we will test empirically), and to a decrease in the nominal prices and profits of small stores.

Furthermore, although this point was not addressed in our model, it is possible to test whether liberalized shopping hours affected discount prices as well as regular prices.[5] We discuss the implications of this issue in more detail before presenting the results.

That certain items are offered at a discount over a certain period is evidence that stores engage in price discrimination between different groups of consumers. It is useful for our discussion to identify two types of consumers: high-valuation buyers (double income families) and low-valuation buyers (welfare recipients, retired or unemployed people). Price discrimination is imperfect, since high-valuation consumers may also sometimes benefit from goods offered at discount prices. Still, the discrimination scheme works because not all goods are offered at discount prices at the same time. All buyers go to the store if the trip is justified by the amount of goods they wish to purchase. However, this amount is expected to be lower for low-valuation buyers. They are therefore likely to make more trips to the store (although the money costs of travel will have a negative impact on the frequency of shopping trips). Thus, *on average*, we should expect low-valuation consumers to walk out of the store with a high proportion of goods bought on sale and to postpone purchases of other items. On the other hand, on average, we should also expect high-valuation consumers to benefit less from rebates and to buy more goods at their regular prices.

Price discrimination can be perceived as unfair by consumers, because it allows producers to reap a larger portion of the consumer surplus than they would with a uniform pricing scheme. Nonetheless, most economists will argue that price discrimination enhances efficiency. Stated simply, the argument is that it allows low-valuation purchasers to buy at discount prices, whereas, under a uniform pricing scheme, where the unique price is somewhere between the regular price and the discount price, many buyers would not find it advantageous to purchase the good. The problem is that stores appropriate the high-valuation buyers' surplus by charging them a higher price. However, this is an equity issue, not one of efficiency.

The equity issue does not arise in a perfectly competitive world. Competition limits the ability of stores to practice price discrimination and leaves all consumer surpluses in the hands of buyers, and yet it is perfectly efficient. However, the fact that some form of price discrimination persists is evidence that the retail industry is not evolving in such a perfectly competitive environment. Individual stores which are located in different geographical areas, and which are not identical, offer differentiated products and have a degree of monopoly power over consumers, particularly over high-valuation buyers. Alternatively, price discrimination can also be explained by the existence of certain costs associated with searching for the best prices. Consequently, bargain hunters are less likely to suffer from monopoly power since their search costs are lower, allowing them to benefit from lower prices. Discriminating by offering rotating sales and coupons makes sense since it renders the search costly, but more so for high opportunity cost of time and high-valuation consumers than for low opportunity cost of time and low-valuation consumers. These considerations will be useful in interpreting the results of our tests of whether or not deregulation has led to price increases and discount falls.

Description of the Sample

We collected data between April 30, 1990 and November 26, 1990 at three large food

retailers in a Montreal neighbourhood (deregulation occurred on July 8, 1990). Although the number of stores in the area is small, it should be noted that these are chain stores and that their pricing behaviour reflects that of other stores in the same chain, as is evidenced by the fact that every week, each chain distributes its own leaflet across Quebec. Furthermore, we intentionally chose a short period of analysis in order to be able to capture short-term effects, rather than changes in the industry structure, such as the entry of new firms. The price series for each good is the weekly averages of prices in effect at the three different stores. We chose five popular items: red delicious apples, yellow onions, bananas,[6] lean ground beef, and fresh chicken (Category A, under 2 kg). We chose these goods based on their availability over the whole study period, on their large sales volume,[7] and, as suggested by Glazer (1981), on the fact that their prices could be changed easily. We want to stress that the characteristics (i.e. product category and variety) of each of the five products were homogeneous throughout the relevant period and across stores.[8] Our sample comprises 155 observations: five goods over a period of 31 weeks.

Empirical Results

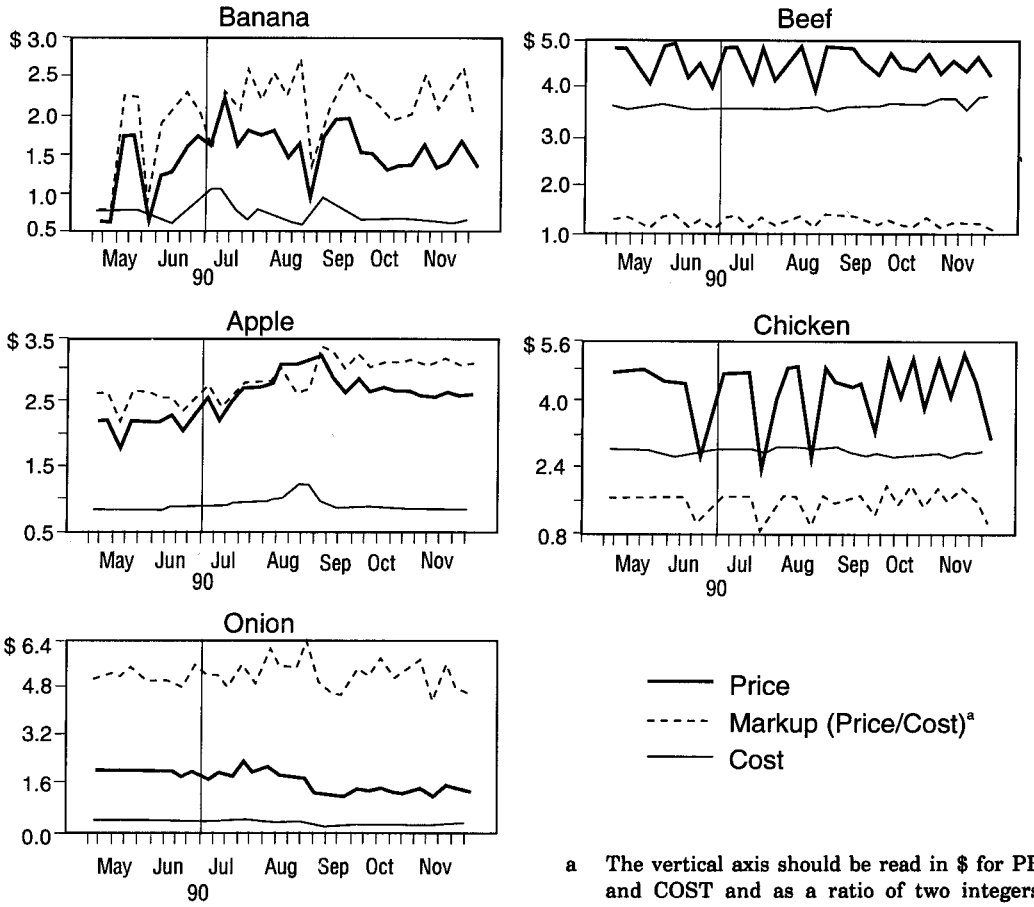
We used the natural logarithms of prices or markups (the ratio of prices to costs) as the dependent variables in the six different specifications of the price and markup equations presented in Appendix I. Figure 1 presents the evolution of the price, cost, and markup for each good over the period. In the following lines, we will, in turn, identify the independent variables used in the regressions, state our expectations about the sign of the coefficient associated with each variable and discuss the results obtained.[9]

In the markup equations, COST, as measured by the logarithm of the cost per kilogram for each product, is used to calculate the markup and in the price equation it enters as an independent variable. It measures the wholesale cost of each product and does not include any operating or handling costs.[10] This variable is particularly useful because it captures seasonal effects that could affect the evolution of prices (especially those of fruits and vegetables). It is important to control for these effects if one is to clearly isolate the impact of deregulation.[11] In the price equation, the sign of the coefficient of COST is positive, as expected. It is also statistically significant and stable across the various price specifications, suggesting that this result is robust to the inclusion or exclusion of additional variables. It is worth noting that a change in cost is not passed on in full to consumers, since the coefficient of COST is consistently and statistically significantly smaller than one.

The REBATE variable measures the percentage of stores in the sample which offer the good at a discount in a given week. The sign of the coefficient of this variable is negative, as one would expect, and statistically significant, indicating that prices are lower during sales.

The dummy variables, BANANA, APPLE, ONION, and BEEF have been included in the different regressions to capture product-specific effects (CHICKEN is the default). The product dummies indicate that there are product-specific effects, and that these are very stable.

It is reasonable to expect stronger negative specific effects on prices, the more perishable the product. This phenomenon is possibly explained by the nature of the rebates for the different products: for more perishable products (apple, onion, banana), sales occur when the products arrive in great quantities and need to be sold quickly; for more durable products (refrigerated or frozen goods, for example), sales would be more strategic to entice lower-valuation consumers. This is confirmed by the negative and significant coefficient of the interaction term between the BANANA and the REBATE variable, and the positive and significant coefficient of the interaction term between the BEEF



a The vertical axis should be read in $ for PRICE and COST and as a ratio of two integers for MARKUP.

* The vertical line in each figure indicates the time of deregulation.

Figure 1 Price, cost and markup of the products*

and the rebate variable.

To account for increases in the regular and discount prices after deregulation, we added two variables into the regression. The first variable is a dummy variable, H_1, equal to one for each observation after July 8, 1990, and zero otherwise; the sign of the coefficient of this variable is expected to be positive. The second variable is an interaction term, H_1 •REBATE, which accounts for changes in discount prices after deregulation. Its coefficient is expected to be positive if the size of the rebates diminishes after deregulation.

The results indicate that prices and markups have actually increased since the deregulation of shopping hours in Quebec. The increases in both prices and markups are about 3 to 4 per cent, but these increases are not evenly distributed between regular and discount prices. In the price equations, even though the coefficient on the dummy variable, H_1, is positive and significant when it is included alone in the regressions, it loses its statistical significance when H_1 • REBATE is included as well. Moreover, when H_1 •REBATE is present in the specification, regardless of the presence of H_1, the coefficient of H_1 •REBATE is positive and statistically significant. This

suggests that the increase in prices after deregulation (mainly) took the form of a reduction in the size of rebates rather than a change in regular prices. Whether the form of the new pricing scheme was politically motivated to conceal price hikes (so the government would not change its mind about the recent deregulation), or the result of optimal profit maximization behaviour by store managers is debatable.

In the *markup* equation, the coefficients of both H_1 and H_1 •REBATE are positive and significant when included together. This indicates that markups have increased since deregulation, and that the increase is partly due to a reduction in the size of rebates.

The coefficient of the interaction term H_1 •REBATE in the price equations indicates that the size and/or the frequency of rebates has decreased since deregulation (i.e. discount prices are higher than they were before deregulation). Assuming that only prices are affected, the estimated coefficients on REBATE in the various price regressions show that, before deregulation, discount prices were about 30 to 35 per cent below regular prices. Since deregulation, rebates appear to have been less generous and to average only about 25 to 30 per cent. This is a fairly substantial drop in the size of the rebates (about 15%). Moreover, this result suggests a welfare distribution from bargain hunters to high-valuation/time-constrained buyers (buying at regular prices or formerly buying at small stores at higher prices).

The decision of large stores to decrease the size of rebates can be justified economically. We offer the following explanation. Deregulation might change the clientele composition of large stores and provoke an adjustment in relative prices. We already expect the proportion of high opportunity cost of time consumers to increase for large stores. However, large stores may find it optimal to increase rebate prices relative to regular prices for the following reason: the marginal gain from attracting more high-opportunity cost of time consumers (with a low price elasticity, since they move away from convenience stores), which results from the slight increase in the average price they are charged, may be higher than the marginal loss from losing low-valuation buyers who are victims of a higher average price increase.

The *welfare consequences and the distributional aspects* of such findings still deserve careful study. At first glance, the results suggest that, on the consumer side, the losers are low opportunity cost of time consumers who shop more frequently during sales. For them, the increase in discount prices has not only caused an increase in their food budget, but has also likely meant changes in their pattern of consumption and in their shopping habits. Indeed, the time required to locate discount items (their search costs) has probably increased in the short-term. These costs are difficult to evaluate because they require knowledge of the time value of these consumers, the number of such consumers, the time it takes for them to adjust their shopping habits, their disutility from changes in their consumption pattern and whether they are now able to find comparable discounts by buying larger quantities and by carrying out a more careful search for discounts. Still, it is reasonable to presume that deregulation has, at least temporarily, increased these buyers' search costs.

High opportunity cost of time shoppers will gain the most because they can now shop at convenient hours. Since, presumably, they do not buy a large proportion of their goods 'on special,' the price increases on these goods will marginally affect them, especially for those who will offset these losses by increasing the frequency of their visits to large stores to try to benefit from more frequent rebates.

However, these effects may disappear in the long run since these costs may eventually return to their previous levels and/or because higher profits are likely to attract new large firms in the industry. Unfortunately, our results do not allow us to be more precise on this issue.

Whether the government wishes to favour bargain hunters or time-constrained consumers involves a normative choice, since deregulation favours the latter at the expense of the former. The choice is a difficult one because time-constrained consumers are heterogeneous: they are likely to include low-income households, such as single-parent families, large families with several children or young professional couples with two incomes and no children. Bargain hunters are also likely to present an heterogeneous profile: they include low-income households on welfare, social security or unemployed workers as much as they include households in which one of the spouses is not working and has no children.

The results also have certain implications for cross-border shopping. Deregulation favours those stores in Quebec which are now open on Sundays. Before deregulation, American shops were at an advantage because their prices were lower, and because their competitors, large stores in Quebec, were closed on Sundays. Nevertheless, the impact on cross-border shopping remains unclear. On the one hand, some consumers who used to shop at small stores will switch to large Canadian stores. On the other hand, some bargain hunters (those who used to shop at large stores in Quebec during the week) may now decide to shop in the United States because large stores have increased their discount prices. Thus, small shops are definite losers in the deregulation process, and large Canadian shops may not gain much from it.

IV Conclusion

Prices and markups in large food stores increased in the few weeks following the liberalization of Quebec's shopping laws in July 1990. This implies that, at least in the short run, consumers must pay for greater shopping flexibility (the implicit improvement in services provided by extended shopping hours). It is noteworthy that rebate prices seem to have increased more than regular prices. This suggests that bargain hunters are the shoppers who have been hurt the most by deregulation. On the other hand, buyers with a high opportunity cost of time have benefited from the extension of opening hours through a greater flexibility in their choice of shopping hours, without having had to support substantial increases in prices.

Further research should concentrate on the longer-term impacts of deregulation. The potential entry of new large firms (if any) attracted by higher prices and higher markups, the reaction of small stores to the new competitive environment and the long-term effects of such strategic behaviour on prices and profits are all relevant research issues. Other studies should try to evaluate the impact of the deregulation on the implicit optimal store size. While the greater affluence at large stores points in the direction of even larger stores, a better distribution of the clientele throughout the week might provide incentives to rationalize operations.

Notes

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1 Food stores were allowed to extend Sunday shopping hours in July 1990, while other retailers were allowed to do so in December 1992.

2 The effect of deregulation on small stores was expected to be limited. Nantel et al. (1990) argued that they would adapt quickly to the new deregulated environment.

3 The available empirical evidence also tends to support this view: according to Désormeaux et al. (1988), prices at convenience stores are substantially higher than those at supermarkets. The three surveys quoted in their study show that prices are, on average, 13 to 18.5% higher at Quebec's convenience stores than at supermarkets.

4 Of course, this argument only really applies to certain types of stores, like convenience stores and supermarkets. It does not really apply to a broad range of comparison shopping stores that would not be located in smaller convenience centres.

5 See also Tanguay et al. (1992) for a discussion of the impact of deregulation on discount frequency.

6 Food industry specialists do not distinguish between different types of bananas.

7 Lean beef and fresh chicken are the two most popular types of meat in Canada, and apples are the most popular fruit (STAT-CAN 62-554). Four of our five products (all except apples) are used in the computation of the consumer price index (CPI).

8 Initially, other products (lettuce, potatoes and oranges) were selected, but we had to eliminate them from the study because the exact same type of each of these products was not available over the entire period.

9 To estimate our equations, we used the generalized least squares (GLS) procedure based on the cross-sectionally heteroscedastic and time-wise auto-regressive model presented in Kmenta (1986:616–25). In a previous study, one regression was run for each product, using the SURE method suggested by Zellner (1962), and the results were very similar to those presented here.

10 The information was obtained from a wholesale retailer for fruits and vegetables, and from one of the food chains for beef and chicken. There is no reason to believe that these wholesale costs vary across stores.

11 To the extent that seasonal effects are not fully reflected in costs, our results may include an unknown seasonal effect. However, examination of Figure 1 suggests that seasonal effects (if any) do not coincide with the time of deregulation.

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Appendix 1

Empirical Results

LnPRICE and LnMARKUP equations (N = 155): GLS estimates: Coefficients (t-statistics)

Variables	Price			Markup		
CONSTANT	1.153**	1.169**	1.137**	0.467**	0.494**	0.465**
	(12.88)	(13.59)	(12.94)	(13.97)	(18.22)	(14.58)
COST	0.331**	0.334**	0.348**	---	---	---
	(3.99)	(4.10)	(4.29)			
REBATE	-0.294**	-0.338**	-0.335**	-0.295**	-0.347**	-0.341**
	(-9.29)	(-9.31)	(-9.37)	(-8.76)	(-8.15)	(-8.33)
BEEF	-0.036	-0.037	-0.042	-0.221**	-0.220**	-0.222**
	(-0.93)	(-1.02)	(-1.12)	(-5.88)	(-6.86)	(-5.97)
APPLE	-0.237**	-0.238**	-0.233**	0.429**	0.428**	0.427**
	(-2.56)	(-2.56)	(-2.44)	(10.80)	(9.81)	(10.69)
ONION	-1.078**	-1.072**	-1.043**	0.352**	0.352**	0.351**
	(-5.84)	(-5.96)	(-5.81)	(9.68)	(10.73)	(10.44)
BANANA	-0.468**	-0.465**	-0.450**	0.412**	0.411**	0.406**
	(-4.11)	(-4.16)	(-4.04)	(8.46)	(8.94)	(8.93)
REBATE * BEEF	0.109**	0.120**	0.121**	0.110**	0.129**	0.128**
	(3.33)	(3.62)	(3.75)	(3.14)	(3.46)	(3.56)
REBATE * APPLE	0.053	0.073	0.069	0.045	0.081	0.072
	(1.07)	(1.59)	(1.47)	(0.83)	(1.59)	(1.37)
REBATE * ONION	-0.017	-0.020	-0.017	0.014	0.008	0.010
	(-0.28)	(-0.35)	(-0.29)	(0.23)	(0.14)	(0.18)
REBATE * BANANA	-0.632**	-0.609**	-0.602**	-0.601**	-0.573**	-0.563**
	(-10.63)	(-11.04)	(-10.82)	(-7.40)	(-7.63)	(-7.45)
H_1	0.03*	---	0.029	0.041**	---	0.046**
	(1.83)		(1.46)	(2.13)		(2.02)
H_1 * REBATE	---	0.057**	0.048**	---	0.064**	0.051*
		(2.43)	(2.10)		(2.10)	(1.84)
$\bar{R}^2$	0.97	0.97	0.97	0.89	0.88	0.87

*Significant at 10% level (two-tailed test).
**Significant at 5% level (two-tailed test).