

## THE IMPACT OF SUNDAY OPENING ON THE RETAIL TRADE SECTOR

Benoît Quenneville, Pierre Cholette and Marietta Morry<sup>1</sup>

### ABSTRACT

This paper focuses on the impact of Sunday opening in the retail trade sector in New Brunswick and highlights some important aspects of that matter. One issue is whether Sunday opening of retail outlets increases total sales. A second issue is whether Sunday opening causes a redistribution of sales between trade groups in the retail trade sector. A third is whether Sunday opening causes a redistribution of the sales among the days of the week. This paper only summarizes our analysis; details can be found in our forthcoming paper to appear in the *Journal of Official Statistics*.

KEY WORDS: Easter effect; Trading-day variation; Intervention analysis.

### RÉSUMÉ

Cet article traite de l'impact de l'ouverture des commerces de détail le dimanche au Nouveau-Brunswick et tente de répondre à trois questions à ce sujet. Premièrement, est-ce que l'ouverture des commerces le dimanche augmente le niveau provincial des ventes de l'ensemble des commerces de détail? Deuxièmement, est-ce qu'il y a une redistribution du total des ventes parmi les groupes de commerce lorsque les commerces ouvrent le dimanche? Finalement, quel est l'effet de l'ouverture des commerces le dimanche sur la distribution hebdomadaire des ventes? Cet article ne fait que résumer notre analyse; plus de détails peuvent être obtenus dans notre article à paraître dans « *Journal of Official Statistics* ».

MOTS CLÉS: Effet de Pâques; effet des jours ouvrables; modèle d'intervention.

### 1. INTRODUCTION

In Canada, the provincial legislation used to prohibit the opening of retail trade stores on Sunday. This situation has changed substantially in recent years. For instance in 1991, the province of New Brunswick allowed Sunday opening for the first time in the months of November and December. In 1992, this province extended Sunday opening to the months of September and October; and in 1996, to August as well.

Three issues related to Sunday opening are considered. The first issue is whether or not the opening of stores on Sunday in selected months increased the level of retail sales in New Brunswick. The second issue examined is whether Sunday opening caused a redistribution of sales between trade groups. The third issue is whether Sunday opening induced a

redistribution of sales among the days of the week.

In this paper, we only summarize our findings: more details can be found in a forthcoming paper of Quenneville, Cholette and Morry to appear in the *Journal of Official Statistics (JOS)*. Section 2 describes the components of our model. Section 3 presents the interpretation of our results. Section 4 presents concluding remarks.

### 2. COMPONENTS OF THE MODEL

#### 2.1 Transformation of the data

We examine two time series, Total Retail Trade and Department Stores sales in New Brunswick from 1981 to 1996, using intervention analysis and trading-day regression. We use the series that were available in February 1997 in the Statistics Canada time series

<sup>1</sup> Benoît Quenneville, 3G-RHC-BSMD, Time Series Research and Analysis Centre, Statistics Canada, Ottawa Ontario, K1A 0T6, quenne@statcan.ca

database (CANSIM No. D658198 and D658182).

First, the data is adjusted for the length-of-month (lom) variation. Each monthly observation of a sales series corresponds to the sum of the daily sales in that month. Since months have a variable length of 28, 29, 30 or 31 days, the lom-adjusted observation represents sales of a month of 30.4375 days. A logarithmic (log) transformation is also used to stabilize the variation around the yearly averages, which are larger at higher levels of the series. Finally, because the data has an upward trend as well as a strong seasonal pattern, both regular and seasonal differencing are applied to remove local linear trends present in these components. The differenced series still contain other deterministic effects that require explicit modeling.

## 2.2 Deterministic components of the model

In the case at hand, the other deterministic components are the Sunday opening effect, the trading-day variations, the Easter effect, the GST effect and the effect of outlier observations.

The Sunday opening effect refers to the impact of allowing the stores to open on Sunday on the level of sales. The effect is modeled by means of an intervention. It consists of including in the model a variable that takes the value one for months when stores are open on Sunday and zero otherwise. In the discussion to follow, the periods when the stores are closed on Sunday will be referred to as the regulated regime/months; and those when they are allowed to open, as de-regulated regime/months.

Trading-day variation refers to the fluctuation in monthly sales caused by the fact that different days of the week have differing volume of sales and that months do not have the same composition of days. Thus a month containing five of the relatively important days tends to display more sales than a month having only four of them. Trading-day variations are estimated by regressing the observations on a set of variables that are related to the number of occurrences of the days of the week in that month. This trading-day regression allows us to calculate the percentage of weekly activity taking place on a given day.

The Easter effect refers to the increase in sales caused by Easter, which can fall between March 22 and April 25. Our specification assumes that Easter uniformly affects sales in the 15-day period before the Easter Sunday. It distributes the Easter effect between March and April proportionally to the fraction of the 15-day

period falling in the respective months.

The GST effect refers to the impact of the Goods and Services Tax on the recorded value of retail sales. Prior to January 1991, sales figures included the hidden Manufacturers' Sales Tax (MST), whereas they now exclude both taxes, resulting in a drop in the level of the series in January 1991. This change in the levels of the series is modeled with a step variable.

Finally, when looking for the effect of outlier observations, a level shift was found for both series in June 1983.

These various components are included in a regression model with autocorrelated errors: details are given in the forthcoming JOS paper.

## 3. INTERPRETATION OF THE RESULTS

Our results show that the Sunday opening effect is not significant for Total Retail Trade, but it is significant for Department Stores. In other words, de-regulation did not affect total sales in New Brunswick, but did positively affect sales in department stores. These results suggest Sunday opening did not increase total sales in the province, but instead redistributed the sales among trade groups to the benefit of department stores, at the expense of the rest of the retail trade sector. This settles the first and second issues raised in the introduction.

As for the third issue, our analysis suggests a substantial impact of de-regulation on the daily pattern, especially for Department Stores. For Total Retail Trade, de-regulation increased the importance of Tuesday, Wednesday, Saturday and Sunday and decreased the importance of the other days. For Department Stores, de-regulation increased the importance of Tuesday, Thursday, Saturday and Sunday and decreased the importance of the other days. For both series, the combined share of Saturday and Sunday increased and that of Thursday and Friday declined.

Finally, a few more conclusions emerge from this analysis concerning the GST and the Easter holiday effect: details are given in the forthcoming JOS paper.

## 4. CONCLUSIONS

This paper summarizes the main conclusions of our JOS paper on the impact of allowing Sunday shopping, on the retail trade sector, in the province of New Brunswick. The main conclusions of the analysis are

as follows:

- Sunday opening had no significant effect on the level of the Total Retail Trade sales but, a positive and significant effect on Department Stores sales.
- Consequently, a redistribution of sales between trade groups must have taken place within the retail sector to the benefit of Department Stores.
- For both series, Sunday opening caused a substantial change in the daily pattern of sales; although the change was more pronounced for some days other than Sunday, the share of Saturday and Sunday

increased and that of Thursday and Friday decreased.

#### REFERENCE

Quenneville, B., Cholette, P. and Morry, M. "Should Stores be Open on Sunday? The Impact of Sunday Opening on the Retail Trade Sector in New Brunswick." **Journal of Official Statistics**: Accepted for publication.