

Entrepreneurial Response to Changes in Spatial ChoicePatterns : An Experimental Assessment

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INTRODUCTION

The dynamics of retail structures are very complicated. They are the result of a complex interplay between changes in consumer spatial behaviour and preferences, (reactive) behaviour of retailers and different institutional factors. Only few studies, if any, have addressed the problem of retail change. To some degree, this may be due to the fact that the current research apparatus poses some problems when one attempts to study the relationships between changes in spatial consumer behaviour and associated turnover and reactive behaviours of retailers. A statistical analysis of this relationships presupposes the availability of a time series on retail turnover and subsequent changes in the attributes of the shopping centres. Such data is typically difficult to obtain in applied research, partly due to the costs involved. However, even if these data would be available, the analysis would be hindered by the problems of isolating causes and effects from time series analysis.

Both these problems may be resolved if it can be assumed

that retailers, when faced with hypothetical conditions and courses of action, can provide reliable data with regard to their behaviour. Such an experimental procedure has produced satisfactory results in many studies of consumer choice and judgments (see Timmermans, 1984 for a review). Examples of such an approach in the context of assessing retailers' response to changes in turnover levels are to the best of the authors' knowledge not available at present.

The main aim of this brief paper therefore is to present the main findings of a pilot research project, which was conducted to gain some insight into reactive behaviours of retailers who are faced with changes in their turnover. The paper is organized as follows. First, the study design and measurement procedure will be outlined. This is followed, in section 3, by a description of the main findings. The paper is concluded by discussing the implications of the present study and some avenues of further research.

STUDY DESIGN AND ANALYSIS.

The study was conducted in the city of Eindhoven.

The data for the analysis were obtained from a randomly selected sample of 141 retailers. The respondents were drawn from 4 different shopping areas in the city; 38 of these retailers mainly sell daily goods, the remaining 103 retailers mainly sell non-daily goods.

The main aim of the analysis was to study retailers' reactions to changes in their turnover levels. This implies that it is first necessary to define several possible courses of action. 21 Types of reactive behaviour were defined on the basis of a literature survey and a few in-depth interviews with representative retailers. Each respondent was confronted with 6 different levels of change in turnover levels within a single year (minus 5, 10, 15 percent and plus 5, 10, 15 percent) and asked to express his subjective probability of conducting each of the 21 different courses of action. 'Doing nothing' was the 22th possibility.

The data were aggregated across respondents and several analyses were performed. First, the mean probabilities of conducting a particular course of action, given some level of change in retail turnover in a single year, were calculated for the group of retailers, who mainly sells daily goods, and the group, who mainly sells non-daily goods, separately. The results of this analysis are given in Tables 1 and 2. Both these two tables clearly indicate that retailers evidently discriminate between alternative types of reactive behaviour. Some types of reactions are more favoured than others. For example, both groups tend to concentrate on the easier to accomplish types of behaviours. The subjective probabilities for change of assortment, number of employees, advertisement, price of goods and service are more important than changes in the physical characteristics of the shop. In addition, Tables 1 and 2 indicate that in general the group of retailers,

Table 1. Mean probabilities for retailers selling daily goods.(n=38)

| Type of reaction | Percentage change in retail turnover in a year. | | | | | |
|---------------------------------|---|------|------|------|------|------|
| | -15% | -10% | - 5% | + 5% | +10% | +15% |
| Increase in total floorspace | 3.4 | 1.8 | 0.6 | 3.4 | 7.2 | 10.0 |
| Decrease in total floorspace | 4.4 | 3.6 | 3.0 | 0.3 | 0.2 | 0.2 |
| Increase in sales floorspace | 3.9 | 2.4 | 1.3 | 4.4 | 11.0 | 15.8 |
| Decrease in sales floorspace | 5.4 | 3.7 | 1.1 | 0.2 | 0.1 | 0.1 |
| Increase in number of employees | 0.3 | 0.1 | 0.1 | 7.1 | 13.3 | 25.8 |
| Decrease in number of employees | 34.7 | 25.1 | 14.5 | 0.4 | 0.3 | 0.3 |
| Extension of assortment | 21.4 | 16.0 | 11.3 | 9.0 | 18.2 | 31.3 |
| Reduction of assortment | 8.1 | 3.3 | 2.2 | 0.4 | 0.4 | 0.4 |
| New shop elsewhere | 11.3 | 4.9 | 1.5 | 0.7 | 2.1 | 7.5 |
| Raise price level | 1.8 | 1.2 | 0.2 | 1.9 | 2.3 | 3.7 |
| Lower price level | 12.3 | 8.9 | 5.9 | 1.8 | 2.5 | 4.5 |
| Liquidate shop | 13.6 | 7.2 | 3.4 | 1.1 | 1.4 | 1.2 |
| Start multiple shop | 7.4 | 5.4 | 3.5 | 0.8 | 1.9 | 7.7 |
| More advertisement | 24.8 | 17.4 | 9.9 | 2.8 | 5.6 | 12.1 |
| Less advertisement | 1.4 | 1.7 | 2.0 | 0.6 | 3.0 | 4.7 |
| Invest in shop layout | 20.3 | 15.2 | 10.2 | 12.6 | 20.6 | 34.0 |
| Cheaper employees | 13.3 | 9.6 | 8.5 | 0.8 | 0.8 | 0.8 |
| Sell more expensive goods | 7.8 | 7.5 | 4.1 | 6.2 | 12.1 | 20.9 |
| Sell more cheaper goods | 20.9 | 14.4 | 8.2 | 3.9 | 3.8 | 4.9 |
| Extension of service | 49.3 | 38.1 | 32.4 | 19.1 | 24.8 | 34.8 |
| Reduction of service | 2.5 | 1.6 | 1.1 | 1.6 | 1.9 | 2.6 |
| Doing nothing | 5.5 | 15.6 | 25.4 | 45.2 | 27.2 | 10.5 |

Table 2. Mean probabilities for retailers selling non-daily goods.(n=103)

| Type of reaction | Percentage change in retail turnover in a year | | | | | |
|---------------------------------|--|------|------|------|------|------|
| | -15% | -10% | - 5% | + 5% | +10% | +15% |
| Increase in total floorspace | 0.5 | 0.8 | 0.9 | 2.0 | 3.7 | 6.7 |
| Decrease in total floorspace | 5.6 | 3.4 | 2.0 | 0.3 | 0.2 | 0.1 |
| Increase in sales floorspace | 2.8 | 1.9 | 1.6 | 3.2 | 6.3 | 11.3 |
| Decrease in sales floorspace | 6.7 | 3.9 | 2.7 | 0.2 | 0.2 | 0.1 |
| Increase in number of employees | 0.8 | 0.7 | 0.5 | 3.6 | 11.0 | 24.2 |
| Decrease in number of employees | 35.7 | 20.6 | 11.1 | 0.2 | 0.1 | 0.1 |
| Extension of assortment | 21.0 | 15.2 | 8.5 | 6.3 | 13.0 | 20.3 |
| Reduction of assortment | 11.7 | 6.8 | 4.2 | 1.0 | 1.1 | 1.1 |
| New shop elsewhere | 5.8 | 3.4 | 1.6 | 1.3 | 1.9 | 3.5 |
| Raise price level | 2.5 | 1.6 | 0.8 | 0.8 | 0.9 | 1.1 |
| Lower price level | 10.6 | 7.2 | 4.3 | 0.4 | 0.8 | 1.3 |
| Liquidate shop | 4.6 | 1.8 | 1.0 | 0.1 | 1.0 | 0.1 |
| Start multiple shop | 3.2 | 2.1 | 1.0 | 2.4 | 3.9 | 6.8 |
| More advertisement | 19.8 | 12.7 | 7.3 | 3.1 | 6.5 | 10.4 |
| Less advertisement | 2.4 | 1.9 | 1.2 | 1.2 | 1.8 | 3.4 |
| Invest in shop layout | 21.2 | 13.5 | 6.7 | 6.8 | 14.2 | 23.9 |
| Cheaper employees | 11.7 | 7.0 | 5.4 | 1.4 | 1.6 | 1.6 |
| Sell more expensive goods | 9.2 | 6.0 | 3.6 | 4.1 | 7.9 | 13.3 |
| Sell more cheaper goods | 16.2 | 11.7 | 6.5 | 1.5 | 1.9 | 2.0 |
| Extension of service | 30.6 | 21.8 | 13.7 | 5.1 | 9.7 | 13.8 |
| Reduction of service | 1.5 | 1.2 | 0.7 | 0.4 | 0.4 | 0.3 |
| Doing nothing | 7.4 | 16.7 | 36.4 | 56.2 | 31.4 | 17.5 |

selling mainly non-daily goods have higher subjective probabilities of 'doing nothing' than the other group of retailers. Moreover, the subjective probabilities of extending the service are higher for the latter group of retailers. These findings may reflect the fact that competition among this group of retailers is already important and that service is a very important factor, influencing market share in the sector of daily goods.

A second analysis concerned an attempt to test for the consistency in the subjective probabilities. The following equation was fitted to the mean subjective probabilities associated with the levels of change in retail turnover and the goodness of fit of the equation was assessed.

$$Y_r = a + b_1X + b_2X^2 + b_3X^3$$

Although, strictly speaking, this is not a probability function, it has the advantage of flexibility and can accommodate different multimodal functions. Hence, this equation can be validly used as long as no predictions are made beyond the domain associated with the fitting of the equation. Again, this analysis was performed for the group of retailers selling daily goods and the group of retailers selling non-daily goods separately.

The results are provided in Tables 3 and 4. These tables clearly show that a third order polynomial is capable of reproducing the mean subjective probabilities to a high degree.

Table 3. Parameter values for retailers selling daily goods.

| Type of reaction | Parameter value | | | | % expl |
|---------------------------------|-----------------|----------------|----------------|----------------|--------|
| | a | b ₁ | b ₂ | b ₃ | var |
| Increase in total floorspace | 1.7286 | 0.3008 | 0.0229 | -0.0004 | 98.84 |
| Decrease in total floorspace | 1.5714 | -0.1579 | 0.0032 | 0.0000 | 95.71 |
| Increase in sales floorspace | 2.5000 | 0.3922 | 0.0340 | 0.0000 | 98.43 |
| Decrease in sales floorspace | 0.5857 | -0.1403 | 0.0102 | -0.0002 | 97.91 |
| Increase in number of employees | 2.2286 | 0.5789 | 0.0476 | 0.0012 | 99.82 |
| Decrease in number of employees | 5.3050 | -1.3671 | 0.0898 | 0.0010 | 99.97 |
| Extension of assortment | 8.8886 | -0.1203 | 0.0783 | 0.0020 | 99.91 |
| Reduction of assortment | 0.6929 | -0.1026 | 0.0152 | -0.0007 | 98.43 |
| New shop elsewhere | -0.2429 | -0.1275 | 0.0421 | 0.0000 | 99.04 |
| Raise price level | 0.8643 | 0.1036 | 0.0085 | -0.0002 | 93.60 |
| Lower price level | 3.3429 | -0.2879 | 0.0226 | 0.0000 | 98.34 |
| Liquidate shop | 1.6571 | -0.1978 | 0.0257 | -0.0010 | 99.98 |
| Start multiple shop | 1.2500 | -0.3156 | 0.2743 | 0.0014 | 99.10 |
| More advertisement | 5.1000 | -0.7325 | 0.0600 | 0.0014 | 99.85 |
| Less advertisement | 1.2500 | -0.0529 | 0.0084 | 0.0008 | 88.96 |
| Invest in shop layout | 9.5429 | 0.1759 | 0.0809 | 0.0011 | 99.91 |
| Cheaper employees | 4.2000 | -0.4486 | 0.0123 | 0.0000 | 96.21 |
| Sell more expensive goods | 4.4500 | 0.1285 | 0.0451 | 0.0014 | 99.12 |
| Sell more cheaper goods | 5.4000 | -0.4822 | 0.0339 | -0.0002 | 99.76 |
| Extension of service | 23.5357 | -0.0663 | 0.0818 | 0.0027 | 98.30 |
| Reduction of service | 1.1179 | 0.0372 | 0.0060 | -0.0002 | 98.41 |
| Doing nothing | 37.1429 | 1.4410 | -0.1335 | -0.0059 | 94.42 |

Table 4. Parameter values for retailers selling non-daily goods.

| Type of reaction | Parameter value | | | | % expl |
|---------------------------------|-----------------|----------------|----------------|----------------|--------|
| | a | b ₁ | b ₂ | b ₃ | var |
| Increase in total floorspace | 1.1786 | 0.0966 | 0.0108 | 0.0005 | 99.99 |
| Decrease in total floorspace | 0.9429 | -0.1524 | 0.0085 | -0.0001 | 99.93 |
| Increase in sales floorspace | 1.8000 | 0.1592 | 0.0233 | 0.0006 | 99.98 |
| Decrease in sales floorspace | 1.1150 | -0.1966 | 0.0099 | -0.0001 | 99.32 |
| Increase in number of employees | 0.6929 | 0.2818 | 0.0524 | 0.0022 | 99.98 |
| Decrease in number of employees | 4.1643 | -0.9702 | 0.0612 | -0.0009 | 99.93 |
| Extension of assortment | 6.4857 | -0.2060 | 0.0648 | 0.0008 | 97.78 |
| Reduction of assortment | 2.0929 | -0.2653 | 0.0191 | -0.0004 | 99.81 |
| New shop elsewhere | 1.0500 | -0.0534 | 0.0160 | -0.0001 | 99.60 |
| Raise price level | 0.7071 | -0.0128 | 0.0049 | -0.0002 | 98.62 |
| Lower price level | 2.0286 | -0.3186 | 0.0178 | 0.0000 | 99.52 |
| Liquidate shop | 0.2071 | -0.0533 | 0.0092 | -0.0004 | 98.99 |
| Start multiple shop | 1.3143 | 0.1129 | 0.0165 | 0.0000 | 99.16 |
| More advertisement | 4.2571 | -0.3200 | 0.0489 | 0.0000 | 99.32 |
| Less advertisement | 0.9929 | -0.0228 | 0.0085 | 0.0002 | 99.32 |
| Invest in shop layout | 5.2500 | 0.0643 | 0.0786 | 0.0000 | 99.16 |
| Cheaper employees | 3.0286 | -0.3336 | 0.0162 | 0.0000 | 99.61 |
| Sell more expensive goods | 3.0643 | 0.0525 | 0.0368 | 0.0004 | 99.77 |
| Sell more cheaper goods | 3.6500 | -0.4707 | 0.0247 | 0.0000 | 99.66 |
| Extension of service | 8.4643 | -0.7460 | 0.0627 | 0.0009 | 98.87 |
| Reduction of service | 0.5571 | -0.0354 | 0.0017 | -0.0000 | 98.24 |
| Doing nothing | 46.4357 | 1.5168 | -0.1615 | -0.0054 | 90.29 |

The explained variance for many types of reaction is well above 99 percent, a major exception being "less advertisement" in the case of retailers selling daily goods. These findings suggest that retailers' reactive behaviour shows a high degree of consistency with increasing or decreasing levels of change in turnover. This finding may have important implications in the context of predicting the dynamics of retail structures, because such predictions rely upon regularities in underlying processes. The present analysis suggests that such regularities may be prevalent in entrepreneurial responses to changes in levels of retail turnover.

A third analysis concerned the issue whether the subjective probabilities were related to the type of shopping centre in which the retailers were located. The respondents were drawn from four shopping centres. Shopping centre A was the city centre. Centre B was an older shopping street, which had experienced continuous change over the years. Shopping centre C is a relatively new, planned major shopping centre and shopping centre D, finally, is a typical neighbourhood centre. Robinson's agreement measure, which expresses the degree of deviation from the $x=y$ regression line, was calculated for all pairs of shopping centres. That is to say, the strength of the relationship between the mean subjective probabilities associated with all 22 different types of reactive behaviour was calculated for all 6 pairs of shopping centres. The results are shown in Table 5, which indicates that the degree of correspondence is rather high. The lowest scores are obtained

Table 5. Correspondence in subjective probabilities between shopping centres.

| Shopping centre | A | B | C | D |
|--------------------------|------|------|------|------|
| A (city centre) | ---- | 0.95 | 0.96 | 0.91 |
| B (shopping street) | ---- | ---- | 0.96 | 0.87 |
| C (planned centre) | ---- | ---- | ---- | 0.88 |
| D (neighbourhood centre) | ---- | ---- | ---- | ---- |
| | n=61 | n=36 | n=32 | n=12 |

for shopping centre D, the neighbourhood centre, but this may be largely due to the small number of respondents for this centre (n=12) and the corresponding high variances in subjective probabilities. This finding suggests that the type of shopping centre has only a limited influence on retailers' reactive behaviours. Apparently, retailers' reactive behaviour is more dictated by some very general strategies, concerning marketing, rather than by some geographical factors.

CONCLUSION AND DISCUSSION

The main aim of the present paper has been to conduct an experimental assessment of retailers' reactive behaviour on changes in their level of retail turnover. The rationale behind this study is twofold. First, we were interested to see whether

the experimental approach may be a viable alternative to time series analysis in portraying reactive behaviour of entrepreneurs. Second, we were interested to learn the nature of such behaviour in general and in particular, whether geographical factors play an important role in this respect.

The findings of the present study generally support the approach. The decision making task was easy to implement. The retailers' responses show a high degree of consistency and regularity. However, a true validity test of course necessitates an analysis, which examines whether the respondents' responses under hypothetical conditions are systematically related to their real-world choice behaviour. In addition, the measurement itself may be improved considerably. For example, in the present study it has been assumed implicitly, that only change in level of retail turnover influences retailers' reactive behaviour. However, such behaviour may also be influenced by the absolute level of a retailer's turnover and, if so, the measurement should include this variable as well. Another possibility for advancing the methodology is to present combinations of strategies, using fractional factorial designs, whereas now the alternative types of behaviour are presented each in turn. Such a procedure would have the advantage that the researcher no longer has to make rather stringent assumptions, concerning the independence between the types of behaviours, and that he can analyse the respondents' responses straightforwardly.

From a substantive viewpoint, the presents analyses have

shown that the influence of geographical factors on retailers' reactive behaviour to changes in turnover levels is rather limited. The picture that emerges from the present analyses is that retailers first attempt to address the problem of decreasing turnover by adopting a different marketing strategy. Only if such strategies fail, they may attempt to change what may be called geographical factors, that is search for another location, or increase/decrease their floorspace. This is not to say that geographical factors are not important at all. Evidently, the spatial distribution of spending power, the accessibility of a shopping centre and the spatial distribution of competing centres all influence the level of turnover that may be expected in a particular shopping centre. However, all of these factors are beyond the control of an individual retailer.

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