

Patterns of purchase loyalty for retail payment methods

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Abstract

While retail payment instruments generate more revenue than many fast moving consumer goods (FMCG) categories, surprisingly little is publicly known about market structure and purchase loyalty. This paper reports a study of shoppers' use of payment methods in three New Zealand retail categories ($n = 310$). The study identified shoppers' "main" and "other" payment methods, and examined relative penetration, patterns of purchase loyalty, and repertoire size. The results showed that well-known patterns of FMCG purchase loyalty also applied to retail payment methods. These patterns were stable across categories, implying retail payment methods are a mass market rather than a segmented market. The results also showed that, despite New Zealand being one of the most advanced cashless societies in the world, the market for electronic funds transfer at point of sale (EFTPoS) is far from saturated. This knowledge should prove useful for practitioners seeking to understand patterns of competition in retail payment methods, and for academics hoping to apply models of consumer behaviour to financial services.



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Introduction

A great deal is known about the patterns of loyalty and competition present in fast moving consumer goods (FMCG) markets (e.g. Ehrenberg, 1988; Ehrenberg *et al.*, 1990, 2000). By contrast, little is known about the patterns of loyalty and competition amongst the payment methods used to make these retail purchases. Yet the selection of a retail payment method is one of the most common choice situations faced by consumers, and the results of that choice have considerable implications for bank revenues.

For example, in the year 2000, New Zealand had 483 million electronic funds transfer at point of sale (EFTPoS) transactions accounting for around 60 percent of retail sales, and a further 194 million credit card transactions. When both merchant and card holder transaction fees are considered, it is clear that retail payment instruments represent hundreds of millions of dollars in revenue, larger than many traditional packaged goods categories (e.g. textile washing products earned NZ\$157 million in 2000, packaged ice cream NZ\$147 million, and ready meals NZ\$101 million).

The mix of payment methods used also has considerable implications for bank revenues and costs. A single cash withdrawal may be replaced by multiple EFTPoS transactions, giving greater opportunities for transaction fee income. On the other hand, EFTPoS networks have high fixed costs but low transaction costs, creating both barriers for entry and economies of scale. This may restrict the range of payment instruments that can be offered by small financial institutions. Consequently, it would be very useful for both large and small financial institutions to develop a greater understanding of how shoppers choose

payment methods, and whether this choice varies in different retail situations.

The financial services literature has long studied the adoption of the various new banking technologies and retail payment instruments. One strand of research has focussed on issues such as aggregate debit and credit card usage, the elimination of cash, and cross-country comparisons on these issues (Worthington, 1995, 1998; Worthington and Edwards, 2000). Another has been more interested in describing, understanding, and predicting the adoption of particular technologies, such as ATMs and EFTPoS (e.g. Swinyard and Ghee, 1987; Marr and Prendergast, 1990; Alexander *et al.*, 1992; Prendergast, 1993; Ho and Ng, 1994; Abdul-Muhmin, 1998; Abdul-Muhmin and Alzamel, 2001).

However, neither of these major strands of literature provides a complete picture of consumer behaviour. The aggregate analyses are restricted by the fact that they conflate data from different choice situations, and cannot analyse variations in usage between different retail categories or different shoppers. The technology specific studies are restricted by the lack of breakdown into different choice situations, and the failure to develop a comparison with other retail payment methods, or at the very least to analyse changes in usage against variations in the general level of retail activity.

Yet for practitioners competing for payment transaction fees, it is very important to examine factors such as the level of competition in key retail categories (including untapped potential for electronic payment methods), whether usage levels vary by retail category, the structure of shoppers' payment instrument repertoires, and whether there are predictable patterns of payment loyalty. Without a thorough understanding of such existing behaviour,

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any attempts to change behaviour must rely on luck rather than logic. Fitzgerald (1988) did address some of these issues, examining individual payment method preferences; but this now somewhat dated research is a rare exception, and still only examined the aggregate case without considering variations in payment preferences across retail categories.

As noted earlier, Ehrenberg and his colleagues (e.g. Ehrenberg, 1988; Ehrenberg *et al.*, 1990, 2000) have developed considerable knowledge of market structure and purchase loyalty in FMCG markets from the analysis of consumer panel data over many decades, leading to the development of the NBD-Dirichlet model (Goodhart *et al.*, 1984) to describe and predict a range of patterns in purchase loyalty. Amongst the generalisations they have established are the following:

- Differences in brand size are largely due to differences in the number of buyers/users.
- Measures of loyalty all move together. If a brand has high loyalty on one measure, it will have high loyalty on all measures.
- Notwithstanding this point, the differences in loyalty between the brands in a category are relatively minor, and follow the well-known double jeopardy pattern – small brands not only have fewer buyers, but these buyers are slightly less loyal.
- A brand's customers, on average, buy other brands more often.
- Sole (100 percent) brand loyalty is rare and solely loyal buyers are also lighter buyers.

Although these patterns were first identified in FMCG markets, they have since been found to hold for television channel choice, some industrial goods, doctor's prescribing behaviour, store choice, and a variety of other contexts (Ehrenberg *et al.*, 2000). The question therefore arises, does this prior knowledge of FMCG markets also apply to retail payment methods? If so, it would be of great interest to practitioners who are attempting to understand the patterns of competition and loyalty in this area, and also of great interest to academics who are concerned with the development, application, and generalisability of models of consumer behaviour.

Consequently, this paper reports the results of a dis-aggregate study into the use of a range of retail payment methods. The three objectives of the study were to explore:

- 1 levels of payment instrument penetration in different retail categories;

- 2 levels of payment instrument loyalty in different retail categories; and
- 3 the presence or absence of standard patterns of customer loyalty for retail payment instruments.

The first two objectives were primarily required as inputs for the third objective. However, as there is very little publicly available dis-aggregated work in this area, they also are of interest in their own right.

The context for the study was New Zealand, one of the most advanced cashless societies in the world. In 1996 New Zealand already had one EFTPoS terminal for every 78 people, with 200 million transactions across a then population of 3.5 million. By 2000, EFTPoS penetration had grown to one terminal for every 46 people, with 483 million transactions accounting for 60 percent of retail sales. By contrast the UK, with 17 times the population of New Zealand, had just 1,270 million EFTPoS transactions in 1996, accounting for 20 percent of retail sales (Worthington, 1998). Australia, with five times the population of New Zealand had just one terminal per 82 people and 534 million EFTPoS transactions overall in 1998 (Worthington and Edwards, 2000). Non-Western countries show much lower levels of penetration; for example, while Saudi Arabia has a similar population to Australia, it had just one terminal per 1,000 people in 1999, with just 16 million transactions (Abdul-Muhmin and Alzamel, 2001).

Consequently, the patterns of payment method usage found in New Zealand may be of predictive value for other economies, such as the UK and Australia, in which EFTPoS penetration is currently lower, but is expected to grow (Worthington and Edwards, 2000).

Data and method

The study was undertaken as part of a general population consumer omnibus survey ($n = 310$). The survey was conducted face-to-face at respondents' households by trained student interviewers in a single New Zealand city. Respondent selection was made using a random walk methodology from specified mesh block starting points. Equal numbers of males and females over the age of 15 years were interviewed, following the standard procedure of three attempts at interview before substitution.

After being screened for category usage, respondents were asked about monthly purchase frequency and payment methods for three different retail choice situations: retail fuel purchases ($n = 267$), the main

supermarket shopping trip ($n = 227$), and other, "top-up" trips to the supermarket ($n = 190$), a different choice situation from the main supermarket shopping trip. For payment methods, respondents were asked first about their usual payment method, and then about all other payment methods used in the last six months.

While questions of this type do not provide detailed or accurate estimates of purchase behaviour, they do provide reasonable estimates of long-term penetration levels (i.e. the proportion who use a particular method at all), first method loyalty (analogous to first brand loyalty), and repertoire size, and sole loyalty. These variables are sufficient to describe many of the key NBD-Dirichlet generalisations.

Results

Penetration and loyalty

Prior knowledge of FMCG markets suggests that penetration (proportion of users in the time period) and loyalty (first method loyalty and sole loyalty) should be strongly related. However, this prior knowledge is silent when considering whether the payment method dominant in one category will be dominant in all categories.

Table I shows the penetration for each of the three categories investigated, together with an unweighted average across the three categories.

The order and magnitude of the payment method penetration is largely the same across categories, with EFTPoS being most widely used (average 72 percent) followed by cash (average 67 percent), credit card (12 percent), cheque (10 percent), and others (6 percent). The values for the individual categories are all close to these averages, showing that penetration of the payment methods does not vary much between the categories.

There are some minor exceptions to this general pattern:

- cheques are less widely used for retail fuel purchases, while credit cards are less

widely used for "top-up" supermarket trips;

- as might be expected, cash becomes substantially more popular for "top-up" trips to the supermarket; and
- a broader range of payment methods is used for retail fuel, notably fuel cards and corporate credit cards.

However, in general the data demonstrate the dominance of EFTPoS, but also the ongoing and widespread use of cash, despite the very high level of EFTPoS usage in the New Zealand economy.

Table II examines the penetration of each payment method as the main payment method, effectively a measure of first method loyalty.

Again, we see a similar pattern, with few differences in the order and magnitude of first method loyalty between categories, except for those minor variations already noted for Table I (i.e. less use of cheques for retail fuel purchases, less use of credit cards for "top-up" supermarket purchases, greater use of cash for the "top-up" trips to the supermarket, and greater use of other payment methods for retail fuel). However, in this case the data show that, not only is cash still widely used, but it still remains a favourite payment method of many people, and is not just a minor or backup payment method. This demonstrates potential for further expansion of EFTPoS use in New Zealand, despite the extensive current use of this payment method.

Prior knowledge of loyalty to FMCG markets suggests there may also be a strong relationship between penetration and first method loyalty for payment methods. This is dramatically confirmed by analysing the relationship between data from Table I and Table II. The correlations of penetration and first method loyalty are $r = 0.96$ or greater in all three categories, confirming the double jeopardy pattern so well known in FMCG markets (Ehrenberg *et al.*, 1990). Furthermore, the "average" columns are also highly correlated ($r = 0.99$), implying that the retail

Table I
 Penetration of each payment method (%)

	Retail fuel	Supermarket - main trip	Supermarket - "top-ups"	Average
EFTPoS	66	77	73	72
Cash	63	58	78	67
Credit card	16	14	7	12
Cheque	4	13	12	10
Others	16 ^a	1	0	6

Note: ^a Includes fuel cards and corporate credit cards

Table II
First method loyalty (%)

	Retail fuel	Supermarket - main trip	Supermarket - "top-ups"	Average
EFTPoS	45	57	45	49
Cash	31	28	48	36
Credit card	11	7	4	7
Cheque	1	7	3	4
Others	11 ^a	0	0	4

Note: ^a Includes fuel cards and corporate credit cards

payments are a mass market, with few category specific differences.

So if we want to know why some payment methods enjoy higher loyalty than others the answer seems to be, as it is in FMCG markets, because they are more widely used.

This relationship translates into a simple numerical generalisation via OLS regression:

$$\text{Main method penetration} = 0.64 * \text{total penetration} \quad (\text{Adj } R^2 = 0.95, p < 0.001).$$

When this formula is used to predict main method penetration, the resulting estimates have a mean absolute error of just 0.02 (or 2 percentage points).

Repertoires

Table III shows the size of the payment method repertoires across the three categories. It is clear that there is again little variation between categories. In each case about 40 percent of respondents use only one method, while about 50 percent use only two methods. These are small repertoires, indicating a high degree of loyalty - much more so than is usually found in FMCG markets, where solely loyal consumers (i.e. those with a repertoire of one) are more likely to make up only 10 percent to 20 percent of users over an extended number of purchases. On the other hand, this may be due to the smaller number of choices available compared to FMCG markets, which typically have dozens of alternatives rather than just four or five. Despite this, the average repertoire size is still over two; that is the users of a particular retail payment method still, on average, use other payment methods more often.

Nonetheless, given the relatively high number of solely loyal shoppers (i.e. a repertoire of one) in each category, the question arises whether they are different in any way? For example, are those who are solely loyal still using older payment methods, such as cash or cheques? Alternatively, are they fully converted to the new instrument of EFTPoS? Either scenario would have important marketing implications. This is explored in Table IV, which examines the distribution of sole loyalty across the different payment methods.

Table IV shows that solely loyal customers are not concentrated in any particular payment method. In fact, the average figures for each method are extremely close to the average figures for first method loyalty in Table II, and again correlate highly with the average penetrations in Table I ($r = 0.99$). The individual category correlations between sole loyalty (Table IV) and penetration (Table I) are also all $r = 0.97$ or greater.

The high individual category correlations confirm the double jeopardy pattern, while the high correlation for the average values shows once more that retail payment methods are a mass market, at least as far as these three categories are concerned. Thus, the presence of solely loyal buyers is in proportion to the normal operation of the market, rather than being a result of the history of the development of payment methods.

This is reinforced by the fact that there are only 26 respondents who are solely loyal to the same payment method across all three categories - 11 to EFTPoS and 15 to cash. This

Table III
Repertoire size (%)

	Retail fuel	Supermarket - main trip	Supermarket - "top-ups"	Average
1	42	44	36	41
2	52	50	58	53
3	6	5	5	5
4	1	1	1	1
5	0.4	0	0	0

Table IV
Sole loyalty to payment methods (%)

	Retail fuel (n = 111)	Supermarket - main trip (n = 99)	Supermarket - "top-ups" (n = 69)	Average
EFTPoS	36	59	42	46
Cash	31	29	48	36
Credit card	16	7	3	9
Cheque	3	5	7	5
Others	14	0	0	5

is double the number expected by chance alone (given average sole loyalty of 41 percent, cubed for three categories, times the smallest category sample size of 190). However, they still only represent 14 percent of the sample, and thus are relatively unimportant.

Finally, are solely loyal buyers lighter buyers? If the choice of payment methods follows the purchase loyalty patterns found in FMCG markets, we would expect this to be the case. Table V reports the results of an independent samples *t*-test for differences in number of visits per month between solely loyal shoppers and those with larger repertoires.

Table V shows that the only significant difference is for retail fuel. The other categories would not show a significant difference even if a one-tailed test were used. On the other hand, the differences are all in the correct direction. At this stage the evidence that solely loyal buyers are lighter buyers can best be described as weak.

Conclusion

This research has shown that the use of payment methods by shoppers is very stable across different retail categories, suggesting that retail payment methods are a mass market, rather than one that is segmented by retail category. There are still some fairly predictable differences between categories (e.g. greater use of corporate payment methods for retail fuel). However, these differences do not disturb the overall pattern of purchase loyalty to any great degree.

The overall structure of the retail payment methods market is also of some interest.

EFTPoS is widely used and dominates cheques and credit cards. The primary competition for EFTPoS comes from cash payment, and this cash does represent considerable further potential for penetration of EFTPoS use. However, it is worth noting that EFTPoS and cash usage is sometimes related, for example when EFTPoS is used to obtain cash during a purchase, so an increase in cash purchase may lead to a small compensating increase in EFTPoS use, and vice versa.

Most importantly, the evidence suggests that the standard patterns of purchase loyalty found in FMCG markets are also found for retail payment methods. First method loyalty and sole loyalty were highly correlated, and were in turn highly correlated with penetration (the number of users). A clear double jeopardy pattern applied, as payment methods with fewer users also had lower levels of loyalty. Repertoire sizes were smaller than is usual in FMCG markets, but users of a particular payment method still, on average, used other methods more often. Sole loyalty was more common than in FMCG markets, but still represented the minority case. There was weak evidence to suggest that solely loyal users were also lighter users. At every point at which they could be tested, the generalisations associated with the NBD-Dirichlet model, and with the work of Andrew Ehrenberg, have been found to hold for retail payment methods. This is an important extension of this work for academics and practitioners alike.

Further research could usefully expand this work in two directions. First, it would be helpful to examine a wider range of retail

Table V
Shopping frequency for solely loyal shoppers

	Retail fuel	Supermarket - main trip	Supermarket - "top-ups"
Difference	-0.54	-0.11	-0.23
T-statistic	-3.12	-0.61	-1.42
p (two-tailed)	0.002	0.509	0.151

categories and choice situations, using a survey methodology similar to the one employed here. Second, it would be desirable to gather panel data on retail purchases – the challenge here is to obtain data from different banks and also from cash purchases – and to undertake a more comprehensive analysis of purchase loyalty using the full NBD-Dirichlet model.

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