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Food shoppers' share of wallet: a small city case in a changing competitive environment

ABSTRACT

Australia's highly concentrated food retail environment is examined in the context of competitive entry in a small city. Based on a conceptual framework that draws on existing literature, food stores' customers' share of wallet (SOW) is measured in a survey (n=379) which brackets the opening of a new supermarket. A number of variables are recorded in the survey that are not available from other data collection methods. The drivers of SOW are determined using a 2-limit Tobit model which incorporates the direct and interactive aspects of the pathways identified in the Conceptual Framework. At one of the stores (Woolworths), the influence of loyalty schemes is found to vary with customers' perceptions of stores, with implications for enhanced customer targeting by food retail managers. The impact of loyalty programs is found to be mitigated by the entry of a competitor, particularly in the case of price-conscious customers. Senior citizens are found to allocate higher SOW to small rather than large stores, and there are small effects due to the sex of the customer. There are few indications of a bespoke small city model of the drivers of SOW, but a number of interactions are identified for future research.

Key words: share of wallet; loyalty program; supermarkets; grocery shoppers; Australia

1. INTRODUCTION

Food retail managers seek understanding of customers' decisions on household food budget allocation across competing stores. They seek to improve retail performance by capturing a larger share of customers' food budgets, or share of wallet (SOW)¹ (Babakus & Yavas, 2008; Kim & Lee, 2010). They also recognize that increasing an existing customer's SOW in the store is less demanding than is attracting new customers (Fornell & Wernerfelt, 1987; Fruchter & Sigué, 2009; Jørgensen, Mathisen, & Pedersen, 2016).

Research to identify the drivers of food customers' SOW is sparse (Meyer-Waarden, 2007) and offers mixed findings. Some studies examining the influence of loyalty programs provide strong

empirical evidence in support of a positive effect (e.g., Leenheer, van Heerde, Bijmolt, & Smidts, 2007; Taylor & Neslin, 2005), while others suggest that the effects are weak or even absent (e.g., De Wulf, Odekerken-Schröder, & Iacobucci, 2001; Mägi, 2003; Sharp & Sharp, 1997). The small volume of research on the influence of shoppers' characteristics on SOW also provides contradictory findings (Babakus & Yavas, 2008; Coil, Keiningham, Aksoy, & Hsu, 2007; Mägi, 2003). For example, Kim and Lee (2010) find no statistically significant relationship between customer's age or income and SOW, while Homburg and Giering (2001) suggest that both variables are important drivers of customers' loyalty to a store. This range of research findings suggests that the drivers of SOW are context dependent.

Context is apparent in much received research on SOW: most has been carried out in large cities or metropolitan areas (e.g., Leenheer et al., 2007; Leszczyc, Sinha, & Timmermans, 2000; Seenivasan & Talukdar, 2016), and this is also true of Australian studies² (Goodman & Remaud, 2015; Sharp & Sharp, 1997). Compared to large cities, small ones have fewer food stores and fewer food retail chains represented. Store to store distances are shorter in small cities than in large ones, and income differentials suggest that small city customers may have more time to shop. This suggests that the drivers of SOW in small cities may be different to those in large cities. As the number of supermarkets in smaller cities has been growing in Australia and elsewhere (Greenblat, 2015; Khare, 2011), drivers of SOW in the small cities are of increasing interest to retail managers.

The Australian food retail industry is currently experiencing disruptive entry by low priced supermarket chains (Mortimer, 2015). This marks the first such period of competitive entry in half a century characterized by steady accumulation of market share by two supermarkets (Coles and Woolworths). Australia's food retail market is one of the most concentrated in the world (Jacenko & Gunasekera, 2005; Mortimer, 2013), both in urban and regional locations across the entire country (Bariacto & Di Nunzio, 2014). The current study was conducted during the entry of ALDI to a small regional Australian city previously served by Coles, Woolworths and the much smaller IGA.

Entry of new food stores may influence SOW at incumbent stores, but previous studies have largely ignored the subject³ (Daunfeldt, Mihaescu, Nilsson, & Rudholm, 2017). It is quite plausible that competitors' entry is influential in SOW, and moreover that it generates different SOW effects in different incumbent stores and across customer types (Ailawadi, Zhang, Krishna, & Kruger, 2010). The current study sheds light on this subject for managers of both the incumbent stores and the new entrants, in exploratory research based on SOW behavior before and after the arrival of a new entrant.

This study contributes to the existing literature by testing important theoretical propositions about drivers of SOW. It identifies context in the analysis of SOW, particularly by examining a small Australian city that features a changing retail competitive environment due to new entry. In particular, we investigate the role of loyalty programs, customers' demographic characteristics and various psychological constructs (such as price-consciousness and variety-seeking) on SOW at the competing food supermarkets in a small city in Australia. The study employs a short questionnaire for customer interviews, which provides data on a number of variables not generally available from other sources and which help to establish context in the analysis.

Section 2 of this paper presents the conceptual framework for the research, and section 3 describes the data and the methodology. Results are presented in section 4, section 5 the discussion and section 6 the conclusions.

2. CONCEPTUAL FRAMEWORK

Figure 1 presents the conceptual framework of this study. The framework is grounded in prior research and it posits that customers' demographic characteristics; membership of loyalty programs, attitudinal loyalty (as measured by customers' response to a hypothetical stock-out situation); and customers' perceptions of their main grocery store⁴ have independent effects on the SOW allocations in the small city context. In addition, Figure 1 shows that change in the competitive environment by the entry of ALDI moderates the effects of these key drivers of SOW. We expect that entry of new food stores may influence SOW at incumbent stores because customers choose to purchase from a wider set of alternative food stores. The

associated bases for theoretical relations between SOW allocations and the drivers of SOW as specified in the conceptual framework are discussed in the following subsections.

[Figure 1, about here]

2.1) *Loyalty programs and share of wallet*

Participation in loyalty programs reflects available rewards such as savings or discounts offered to customers, particularly those spending large amounts and therefore exhibiting high SOW. Customers face a disincentive to switch stores in the form of loss of such savings or discounts. The magnitude of this switching cost is then likely to be positively related to customers' SOW at a particular store. Besides switching cost, the effectiveness of loyalty programs also depends on perceived reward attractiveness (e.g. financial incentive) and the effort required to enroll and participate in a program (Meyer-Waarden, 2015; So, Danaher, & Gupta, 2015). However, loyalty programs can be – and are - imitated by competitors, which implies increased marketing costs for retailers without the corresponding increase in customers' SOW (Meyer-Waarden, 2007).

2.2) *Customers' demographic characteristics and share of wallet*

A variety of results have been obtained on the relationship between customer characteristics (age, income, gender, household size) and SOW at a given supermarket. For example, Mägi (2003) suggests that older customers have a low SOW at a particular store because they have the available time to shop at multiple stores. In contrast, Lambert-Pandraud, Laurent, and Lapersonne (2005) provide four theoretical perspectives to explain why older customers restrict their purchase to a specific store (i.e. a high SOW), specifically biological aging, cognitive decline, socioemotional selectivity, and change aversion. Contextual issues related to the urban or regional locale such as lifestyle, social aspects of food shopping, and distances between stores have not been studied and will be examined further here.

Some authors suggest that high income customers exhibit low SOW because they can afford to make purchases at a variety of stores, while low income customers face financial barriers to shopping at upscale stores (Kim & Lee, 2010). A competing perspective is that affluent

customers attach high value to time, and thus restrict their shopping to a small number of stores (Cooil et al., 2007), implying a high SOW. Small cities may exhibit less variety in the type of store than do large cities, and also less diversity in population. No dominant hypotheses appear *a priori* about income's effects on SOW, which are also likely to be contextual in terms of urban and regional locations of the stores and the prevailing competitive environment.

The limited received research on the effect of customers' sex on SOW also offers a range of results. References to women's predisposition toward a small number of close relationships (Audrain-Pontevia, Audrain-Pontevia, Vanhuele, & Vanhuele, 2016) are thought to select for high SOW; while those to women's inherent abilities in information processing suggest that they patronize multiple stores (Babakus & Yavas, 2008). Large households may concentrate their shopping in a specific store (high SOW) due to time constraints, or may shop at multiple stores (low SOW) in search of lower prices (Mägi, 2003).

2.3) Customers' *psychological constructs-perception of their main grocery store and SOW*

Our Conceptual Framework includes customers' perceptions of stores, interpreted as psychological constructs that establish attributes such as stores' offered price levels, quality, and location. Received research suggests that price-conscious customers are likely to shop at multiple stores (i.e. low SOW), in order to find good deals or value for money (Ailawadi, Pauwels, & Steenkamp, 2008; Mägi, 2003). Similarly, it is reasonable to expect that variety-seeking customers are more likely to shop at multiple stores because their wants may not be satisfied by a single one (Homburg & Giering, 2001). Location-conscious customers are likely to concentrate their shopping at a particular store (i.e. high SOW), and received empirical evidence suggests that households' proximity to the main store is positively related to SOW (Meyer-Waarden, 2007). Similarly, as there are perceived differences in the quality of stores' own-brands, quality-driven consumers may concentrate their purchases at a specific store (Koschate-Fischer, Cramer, & Hoyer, 2014).

2.4) Customers attitudinal loyalty and SOW

Understanding of consumer behavior distinguishes between customers' behavioral and attitudinal loyalty. Behavioral loyalty refers to the customers' actual purchase behavior or their SOW at a particular store. Attitudinal loyalty refers to customers' positive attitude towards a particular store or their intention to repurchase at that store in the future (Homburg & Giering, 2001; So et al., 2015). It is reasonable to assume that customers with a favorable attitude towards a store exhibit a high SOW at that store, and vice versa (Wirtz, Mattila, & Oo Lwin, 2007). However, it is also possible that customers who do not have a psychological commitment to a specific store, may still have a high SOW at that store, perhaps because of factors such as convenience (So et al., 2015), or others discussed above. Most previous research focuses on examining the impact of loyalty programs on both the customers' behavioral and attitudinal loyalty. However, the relationship between customers' buying behavior (SOW) and intention-based behavior is largely unexplored in the academic literature, with the notable exception of Wirtz et al. (2007). In this research, we seek to examine whether customers' attitudinal loyalty translates into behavioral loyalty to a specific store (as measured by SOW). We measure customers' attitudinal loyalty by their responses to a hypothetical stock-out situation (on which, more in the methodology section).

3. METHOD

3.1) *Data*

The small Australian city of Armidale (population approximately 23,000 (ABS, 2016)) has in recent times featured three competing grocery stores: Coles, Woolworths, and IGA. A fourth store, ALDI, opened in Armidale in April of 2016. The stores are located (see fig. 2) in close proximity to each other, and the street layout indicates that customers can easily visit them in a relatively short period.

[Figure 2, about here]

Data were generated from a survey of food shoppers, using a combination of interview settings. The store intercept approach was used to collect data from food shoppers: randomly selected customers leaving grocery stores were requested to participate. Doorstep interviews were used at randomly selected residential street addresses. Random footpath interviews were used on

Armidale's streets and at outdoor markets. Data collection spanned stratified time periods during 3-week survey campaigns carried out by trained enumerators. Data were collected in two such campaigns administered six months before, and six months after, ALDI's entry to the Armidale market⁵. A total of 413 survey respondents participated in the study. After removing missing values, the final data set consisted of 379 observations. Descriptive statistics are provided in Appendix A.

Respondents were asked to indicate percentages of their grocery spending allocated to each of the supermarkets, generating SOW at each store. We constructed a dummy variable to indicate customer's main store (main store = 1 if customer's total grocery spending is $\geq 60\%$ at a particular store). Appendix 1 indicates that, in the full sample, average SOW was highest for Coles (38.71%) than was the case for Woolworths (36.60 %) and IGA (9.71%). However, this pattern does not hold post-ALDI: SOW is then higher at Woolworths than at Coles and IGA in that case. Respondents were also asked whether they held loyalty cards for Woolworths, Coles, and/or IGA. More customers, in both the pre- and post-ALDI samples, are members of Woolworths' than Coles' and IGA's loyalty programs. This pattern is consistent with previous research on loyalty program membership in Australia. For example, Morgan (2016) found that 49 percent of Australians above 14 years of age carry a Woolworth loyalty card and 45 percent a Coles one.

An interesting summary point is that a large proportion of the respondents (37%) nominated 'location of the store' to be the single most important reason for their choice of main store. This is consistent with previous research findings that 'proximity' or geographic location is more important in choice of grocery stores than in choice of leisure or durable goods stores (Brooks, Kaufmann, & Lichtenstein, 2004; Goodman & Remaud, 2015; Sinha & Banerjee, 2004). This indicates that the proximity of stores in small cities does not offset preferences around store location.

Most of the respondents in our sample are store loyal: 68% reported switching brands if they find their preferred brand is out of stock at a particular store. This is inconsistent with the findings of previous studies that suggest low store loyalty and high store switching (i.e. high

brand loyalty) particularly for grocery store purchases (Leszczyc et al., 2000; Puligadda, Ross, Chen, & Howlett, 2012).

Information on several demographic characteristics of grocery shoppers such as age, gender, income, household size, type of family (see Appendix A), were collected. We do not observe statistical differences across stores, in the mean values of most of these demographic characteristics in the pre- and post-ALDI samples. Moreover, the correlations between variables used in this study are predominantly low and are statistically non-significant (see Appendix B).

3.2) Analytical Model

For model selection, we considered the frequency distribution of the dependent variable i.e., customers' SOW. Figure 3 shows customers SOW at each supermarket in Armidale, before and after ALDI opening. Each bar in Figure 3 represents a unique value of SOW in our dataset. It is worth noting that SOW has lower and upper limits and it takes on the limiting value for a substantial number of food shoppers. For example, there are many customers who allocate either zero expenditures (lower limit) or 100 percent of their food budget (upper limit) to Woolworths. When a dependent variable in a regression model takes limit values, standard OLS estimation is inappropriate because the constraint on the range of the dependent variable violates the assumption of linearity between dependent and explanatory variables (Hill, Griffiths, & Lim, 2008). We might collapse all positive values of the dependent variable and treat this as a standard binomial probit model, but doing so would lead to loss of information about customers' percentage spending at a given store. Similarly, we might drop the observations on the dependent variable at the limits (i.e., truncate the distribution) and estimate the model with OLS, but this will generate biased and inconsistent parameter estimates because regression functions will become non-linear, i.e. expected values of y , conditional on the y -values being positive $E(y|x, y > 0)$ (Hill et al., 2008; Tobin, 1958).

[Figures 3 and 4, about here]

The required model provides an estimate of the probability that grocery shoppers allocate no share to a specific store, and the magnitude of that share if they chose to shop at that store (i.e.

non-limit values). The Tobit model (Tobin, 1958) is appropriate in this case as it uses the maximum likelihood method to combine the probability techniques with least squares (Díez-Vial, 2007).

We specify a two-limit Tobit model where observations on dependent variable Y_i are censored⁶ from below at 0 (i.e., lower limit $L_1 = 0$) and from above at 100 (i.e., upper limit $L_2 = 100$).

$$Y_i = \begin{cases} L_1, & \text{if } Y_i^* \leq L_1 \\ Y_i^*, & \text{if } L_1 < Y_i^* < L_2 \\ L_2, & \text{if } Y_i^* \geq L_2 \end{cases} \quad \text{Eq. 1}$$

where Y_i^* is a continuous latent variable that represents the i^{th} customer's SOW for Woolworths, Coles, or IGA⁷. Our goal is to estimate the unknown parameters of the following function;

$$Y_i^* = X_i\beta + \varepsilon_i \quad \text{Eq. 2}$$

where X_i represents the set of explanatory variables including interaction terms, β s denote the coefficients to be estimated, and ε_i reflects random error terms, which are distributed normally and independently with a zero mean and constant variance, that is, $\varepsilon_i \sim IN(0, \sigma^2)$.

As the Y_i in Eq.1 are independently distributed, the likelihood function L can be obtained by finding the product of the marginal distributions of observations as shown in Rosett and Nelson (1975) and Gouriéroux (2000);

$$L = \prod_{S_1} Q\left(\frac{Y^* - L_1}{\sigma}\right) \cdot \prod_{S_2} P\left(\frac{Y^* - L_2}{\sigma}\right) \cdot \prod_{S_3} \frac{1}{\sigma} Z\left(\frac{Y^* - Y}{\sigma}\right) \quad \text{Eq. 3}$$

where P is the normal cumulative density function, Q is $1 - P$, Z denotes normal probability density function, and σ is the standard deviation. Note that we have grouped our full sampled data into three categories: S_1 and S_2 denote group of censored observations that are at the lower and upper limit, respectively; S_3 represent all observations that are non-censored.

Equation 3 can be further simplified as follows;

$$L = \prod_{S_1} Q(I^* + \alpha_0 L_1) \cdot \prod_{S_2} P(I^* + \alpha_0 L_2) \cdot \prod_{S_3} (-\alpha_0 Z(I^* + \alpha_0 Y_1)) \quad \text{Eq. 4}$$

where, $I^* = \frac{Y^*}{\sigma}$, and $\alpha_0 = -\frac{1}{\sigma}$. The final likelihood function can be obtained by taking the natural log of Eq. 4 as follows;

$$\ln(L) = \sum_{S_1} \ln Q(I^* + \alpha_0 L_1) + \sum_{S_2} \ln P(I^* + \alpha_0 L_2) + \sum_{S_3} \left[\ln(-\alpha_0) - \frac{1}{2} \ln 2\pi - (I^* + \alpha_0 Y)^2 \right]. \quad \text{Eq. 5}$$

The log likelihood function in Eq. 5 consists of two parts: probit and linear. The probit part estimates the probability of censored responses and the linear part estimates the size of the non-censored responses. By summing $\ln(L)$ over the sample, we can get the likelihood function as the sum of the probit likelihood of the censored observations and the regression likelihood of the uncensored observations (Baum, 2006). We do not consider further the calculus associated with maximization of the log likelihood function in Eq. 5 as it is peripheral to our paper's purpose.

4. RESULTS

Tobit estimates of customers' SOW at Woolworths, Coles, and IGA are presented in Table 1 (pooled data) and Table 2 (pre- and post-ALDI samples). A positive coefficient estimate indicates that the variable is positively related with the customer's SOW at a particular store, and vice versa. Drawing on our conceptual framework (figure 1), results in Table 1 include both direct and interactive effects of ALDI's entry, and of the various drivers of SOW. Following previous studies (e.g., Kim & Lee, 2010), we apply the reduced form of the model by including only those interactions that show a statistically significant effect on SOW at any of the three supermarkets⁸.

[Table 1 and Table 2, about here]

In the bottom rows of Table 1 and 2, we report regression diagnostic values. The log likelihood value of the fitted model is used in the Likelihood Ratio Chi-Square test (LR test) of whether all regression coefficients in the model are simultaneously zero (null hypothesis). From the LR test, p-values <0.001 indicate that regression coefficients of the explanatory variables are not simultaneously equal to zero, hence our econometric models exhibit goodness of fit. R^2

reported is McFadden's pseudo R-squared. Sigma is the estimated standard error of the regression, and is analogous to the square root of the residual variance in OLS regression.

Results in Table 1 and 2 indicate that, for all stores, the respective loyalty program membership is associated positively and statistically significantly with customers' SOW at a particular store. However, a competitor's entry (ALDI's opening) moderates the positive loyalty-schemes' effect on customers' SOW at the incumbent stores, particularly at Woolworths. This is evident from the reduced magnitude of the coefficient of loyalty-program membership of Woolworths, post-ALDI scenario as compared to pre-ALDI, i.e., 5.64 and 28.37, respectively (Table 2). The negative sign on the interaction of competitor's entry (i.e., post-ALDI) and Woolworths' loyalty scheme (i.e., -15.45, Table 1), is further evidence that the positive influence of loyalty card on SOW is reduced after ALDI's opening. Results show that customers' possession of multiple competing loyalty cards is mostly negatively related to their SOW at Woolworths and Coles (Table 1 and 2). However, we do not detect a significant negative effect of customers' holding competing cards on their SOW at IGA.

The direct effects of customers' perceived store attributes such as location, price, quality and variety are mostly non-significant (Table 1). However, price-conscious customers do exhibit a lower SOW at Woolworths after ALDI opening. This is indicated by the negative coefficient (-15.45) of the interaction of *post*-ALDI and price-conscious customer (Table 1) [as an indirect effect](#). We also obtain a consistent negative and statistically significant coefficient (-11.19) of price-conscious customers in the case of Woolworths in the *post*-ALDI sample (Table 2).

[Figure 4, about here]

We also explore differences in customers' SOW disaggregated by their perceived store attributes and membership of loyalty schemes. Figure 4 presents the mean SOW, with 95 percent confidence interval around the mean, disaggregated by loyalty scheme membership and by reasons given for choice of main store. A bar chart with error bars is presented, in which overlap of any two error bars indicates that observed difference between the associated means is not statistically significant. We observe considerable such overlap of error bars for those who

are non-members of loyalty schemes, but much less overlap for those that are members. Overall and across all stores, Figure 4 indicates that customers' perception of main store matters more for members, than non-members, of loyalty schemes. For members of loyalty schemes, Woolworths customers seeking variety and location exhibit a higher SOW than those that are price conscious. Although these effects are less apparent for Coles and IGA customers, this suggests that any attempt to increase customer SOW through increasing membership of loyalty scheme will depend on which customer segment (e.g. variety vs price conscious) is being targeted.

Compared to low income households, medium and very high income households reported higher SOW at Woolworths before ALDI opening, than afterwards (Table 2). However, we do not observe statistically significant effects of income on SOW after ALDI opening. Figure 5 presents the distribution of customers' SOW, disaggregated by income and membership of loyalty schemes. The figure shows a considerable overlap of 95% confidence intervals for the different levels of customers' income, indicating that average SOW of different income groups, both for members and non-members of loyalty schemes, does not vary with income. However, as discussed above, the differences in SOW between members and non-members of loyalty programs are statistically significant, [notwithstanding the weak association between income and SOW](#).

[Figure 5, about here]

A number of our results suggest different relationships between SOW and customers' characteristics, at the various stores. We find, for example, that attitudinally loyal customers, identified as those that switch brand in response to stock-outs, have a higher SOW at Woolworths (Table 1) than they do at other stores. This result is not apparent in models estimated using pre and post-ALDI samples (Table 2). As a further example, our results show that older customers have lower SOW at Woolworths, but a higher SOW at IGA. Further still, we find that larger households had a lower SOW at Coles, after ALDI opened (Table 2). With regard to customers' sex, females reduce SOW at IGA after ALDI opened, as indicated by the negative coefficient (-14.18) of the interaction term in Table 1. Females however exhibited

lower SOW than males at Woolworths before ALDI opened, but this effect declines to statistical insignificance after ALDI opened (Table 2). Income effects on SOW are positive for some income levels for Woolworths' customers only, and it is notable that these effects appear to be reinforced by ALDI's opening. Household composition shows some disparate influences, with households including non-family members (e.g. in student flatting arrangements) showing higher SOW at Coles and lower SOW at Woolworths, and the result for Coles is [exacerbated](#) [accentuated](#) after ALDI opened.

5. DISCUSSION

This study proposed a conceptual framework for identifying and evaluating the influences on customers' decisions on SOW in food supermarket purchases. It employs a number of features of past research that warrant re-examination in the context of small cities, and in a changing food retail competitive environment. Accordingly the study was conducted in the small New South Wales city of Armidale employing two survey campaigns bracketing the opening of a new supermarket (ALDI) in competition with incumbents Woolworths, Coles and IGA. A number of hypotheses were tested, and in some cases exploratory approaches are maintained due to a variety of possible hypotheses which are captured within the conceptual framework.

Findings suggest that participation in loyalty schemes is highly influential in customers' SOW at a particular store. This is consistent with the findings of Taylor and Neslin (2005) and can be explained on the grounds of the 'point pressure effect' of a loyalty card: members of loyalty programs tend to allocate higher SOW at a given store to accumulate the points required to earn benefits. Thus customers remain committed to a particular supermarket because of cost (e.g., loss of points) of switching to a competing shop. There was a possibility that customers' participation in multiple loyalty programs might cancel out some effects (Mägi, 2003). However, our results show that loyalty cards create purchase concentration effects at a given store despite a significant negative effect of multiple competing cards that our results reveal. This finding suggests that, at least in the research settings considered in this study, retail managers may not need to take into account loyalty members' membership portfolios.

Retaining retailers' most loyal customers is vital for business survival as these customers generate higher sales and lower servicing costs per dollar of sales (Seiders & Tigert, 1997). Our findings suggest that changes in market environment, by the entry of a new competitor, dampens the effects of loyalty schemes, probably because of a wider set of alternative food stores. We infer that ~~Our results imply that~~ the arrival of ALDI brought differentiation to the Armidale market, which makes it more challenging for the incumbent food retailers to retain their customers, even those with loyalty cards.

We show that members of loyalty programs exhibit different SOW where they have different perceptions of a given store. In particular, Woolworths' customers seeking variety exhibit a higher SOW than those that are price-conscious. A possible explanation of lower SOW of price-conscious shoppers is that such customers are relatively more deal-prone and they are also more loyal to a certain price range instead of a particular supermarket (Sloot, Verhoef, & Franses, 2005). We do not see much influence of customers' demographic characteristics such as gender, income, and household size. However, senior citizens exhibit higher SOW at small, rather than large, supermarkets. One possible explanation of this result is that small stores create unique value (e.g., greater convenience) for this segment of consumers (Goodman & Remaud, 2015). Younger customers, on the other hand, may be more inclined to shop at large supermarkets because of entertainment, recreational, and social factors (Khare, 2011).

6. CONCLUSION

This study is one of the first to measure and attempt to explain SOW in Australian Food Retailing. To the authors' knowledge, it is the first to focus this research task on the small city environment and to take opportunistic advantage of a competitive entry event. Data collection entailed random stratified sampling of supermarket customers using a short, simple and intuitively appealing questionnaire, which captured reported behavior, attributes and attitudes as outlined in the Conceptual Framework. Tobit models were estimated which exhibited goodness of fit, and which were robust over alternative specifications.

Our results support those of much existing research on SOW, and temper and refine them with context. We confirm that loyalty schemes are important drivers of SOW, but also find that customers' perception of stores' value proposition modifies the nature of loyalty schemes' influence. We also find that membership of multiple loyalty schemes, and competitive entry by new supermarkets, erode loyalty schemes' impact on SOW. We identify few drivers of SOW that are indicative of a unique small city model based around prevailing customer characteristics.

Our results indicate that members and non-members of loyalty schemes exhibit different purchasing behavior. In general, there is significant variation in SOW amongst members, and generally little variation amongst non-members. Store managers can react to this with different promotional, marketing and pricing strategies for the members and non-members: we offer evidence that segmentation amongst the members is more productive than amongst non-members. The received finding that grocery loyalty programs are more likely to fail if they lack precise customer segmentation and targeting (Meyer-Waarden, 2007) indicates that such segmentation is productive. As food retailers possess rather more information on members of their loyalty schemes than on non-members, such a focus is also cheaper to achieve.

Resilience in SOW in the face of competitive entry offers a similar set of benefits to retailers as does increased customer SOW in response to increased marketing expenditure (Singh, Hansen, & Blattberg, 2006). Although defensive marketing strategies are intuitively appealing due to the lower cost of retaining, rather than attracting, customers (Fornell & Wernerfelt, 1987; Fruchter & Sigué, 2009; Jørgensen et al., 2016), our results show that the influence of loyalty schemes is diluted due to competitive entry. This indicates that such schemes may have limited and declining effectiveness in retention, especially in the face of repeated entry by new competitors. In a case such as Armidale where many customers hold multiple loyalty cards, the erosion of SOW may be larger than elsewhere. Future research might usefully examine such resilience, and again this would be best implemented using survey techniques.

A number of intuitively-appealing variables were found not to influence SOW greatly. These include most demographic features of customers such as customer income and household size.

For at least some of these variables, Armidale may offer narrow variation. Despite respondents' statements that location is a key driver of choice of main store, location was an insignificant factor in SOW probably due to Armidale's small city attribute of stores' being rather close together (Campo, Gijsbrechts, & Nisol, 2000). The findings that senior citizens prefer to shop at a small store rather than a large one implies that small stores can attract customers' SOW by tailoring their offering, and loyalty schemes, to the special and unique needs of customer segments: senior citizens' availability for shopping at certain distinct times of the day or days in the week, for example. [Our conceptual framework's](#) ~~The~~ relationship between drivers of choice of main store on one hand and SOW on the other represent an interesting avenue for future research, particularly where survey data is employed as in the current study.

A limitation of the study's pursuit of the effects of the changing competitive environment is that it does not employ a panel survey. Survey costs and logistics, the potential loss of respondent anonymity, and the short window of opportunity for the survey, were factors in this choice of method. The two survey campaigns which spanned the opening of ALDI are strongly indicative due to random sampling, and provide a strong base for future work on the subject. It is worth mentioning that the influence of loyalty programs in this study might be slightly overestimated. The reason for this is that customers' participation in a loyalty scheme is not random. Rather, customers self-select into a loyalty scheme by comparing its expected costs and benefits (Leenheer et al., 2007). It is possible that the difference in SOW between members and non-members may be partly attributed to the self-selection of the most loyal customers into the loyalty program, rather than to the loyalty program, *per se*. We have mitigated the problem of self-selection to some extent by controlling for customers' main store in which they make a large share of their purchases and other independent variables that drives shoppers' SOW, additional instrumental variables are required to control for other unobservable factors.

ENDNOTES

¹Share of Wallet is defined as the percentage of money a customer allocates to a particular store in a category (Jang, Prasad, & Ratchford, 2016; Koschate-Fischer, Hoyer, Stokburger-Sauer, & Engling, 2017; Mägi, 2003).

²Moreover, Australian studies' focus is on department stores and retail cosmetics (Bridson, Evans, & Hickman, 2008; So et al., 2015).

³Some notable exceptions are Ailawadi et al. (2010) and Singh et al. (2006), who investigate the market implications of Wal-Mart entry.

⁴Customers' main store is the store at which they principally purchase goods of a given type. In the current study grocery food expenditures in supermarkets are of interest, and the main store is defined as the one to which they allocate 60 percent or more of grocery food expenditures.

⁵A full transcript of the questionnaire, which was administered using handheld devices, is available from the authors on request.

⁷~~It~~⁶It is worth noting that our model is censored (not truncated) because values of the dependent variables are observed at the limits.

⁸~~We~~⁷We separately examine customers' share of wallet (dependent variables) for the three major supermarkets that are, Woolworths, Coles, and IGA.

⁹~~A~~⁸A large number of alternative specifications were attempted, particularly in utilizing the interaction variables. These results are available from the authors upon request.

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Figures:

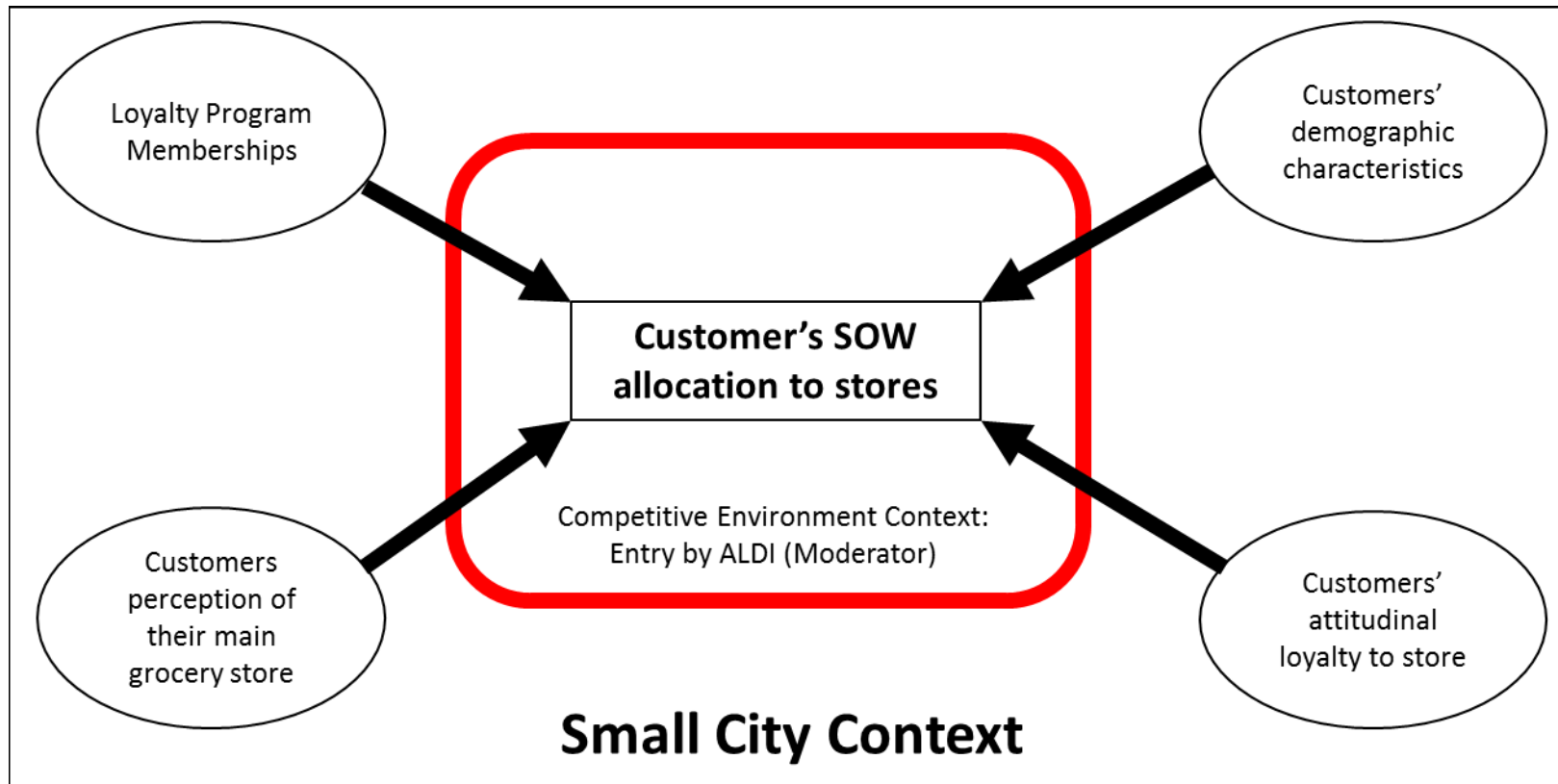


Figure 1: Conceptual Framework



Figure 2: Location of supermarkets in Armidale, NSW, Australia

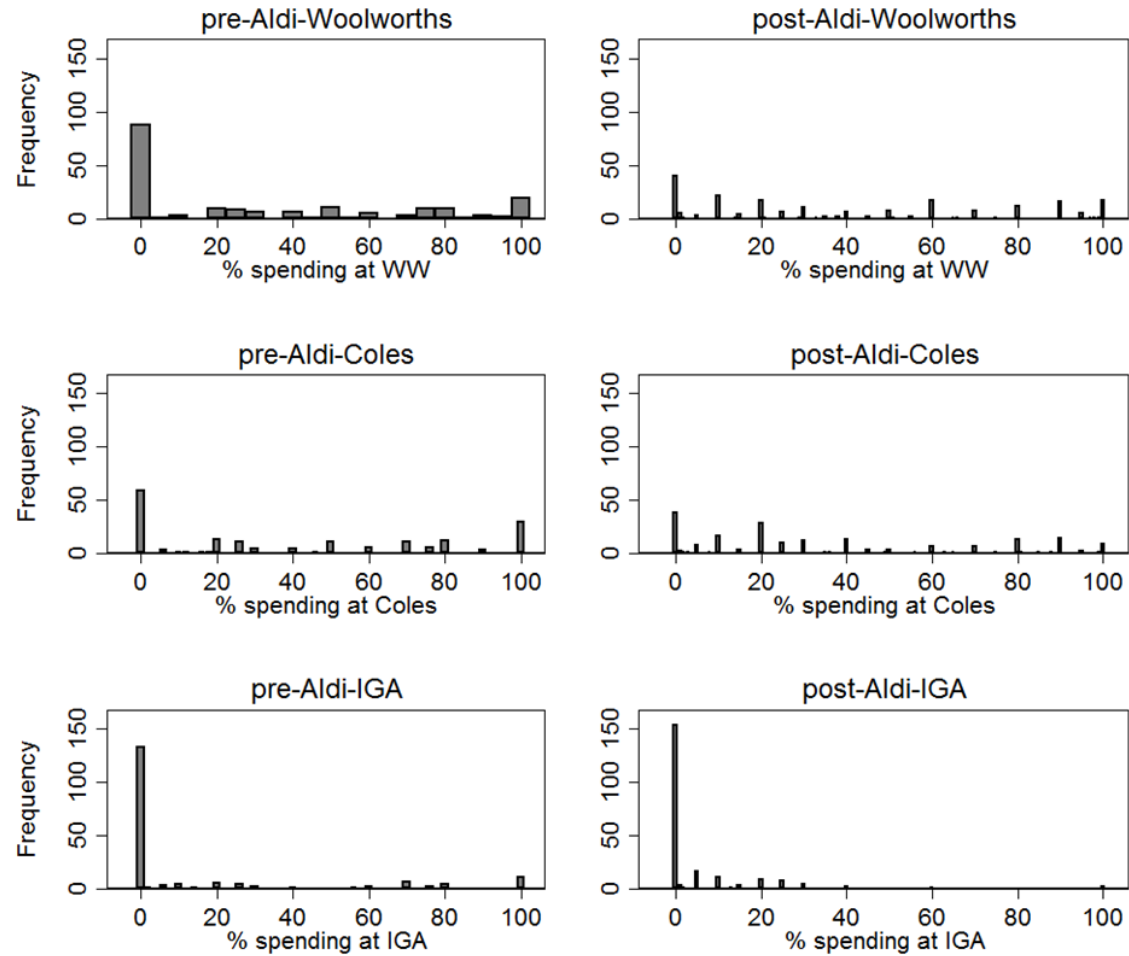
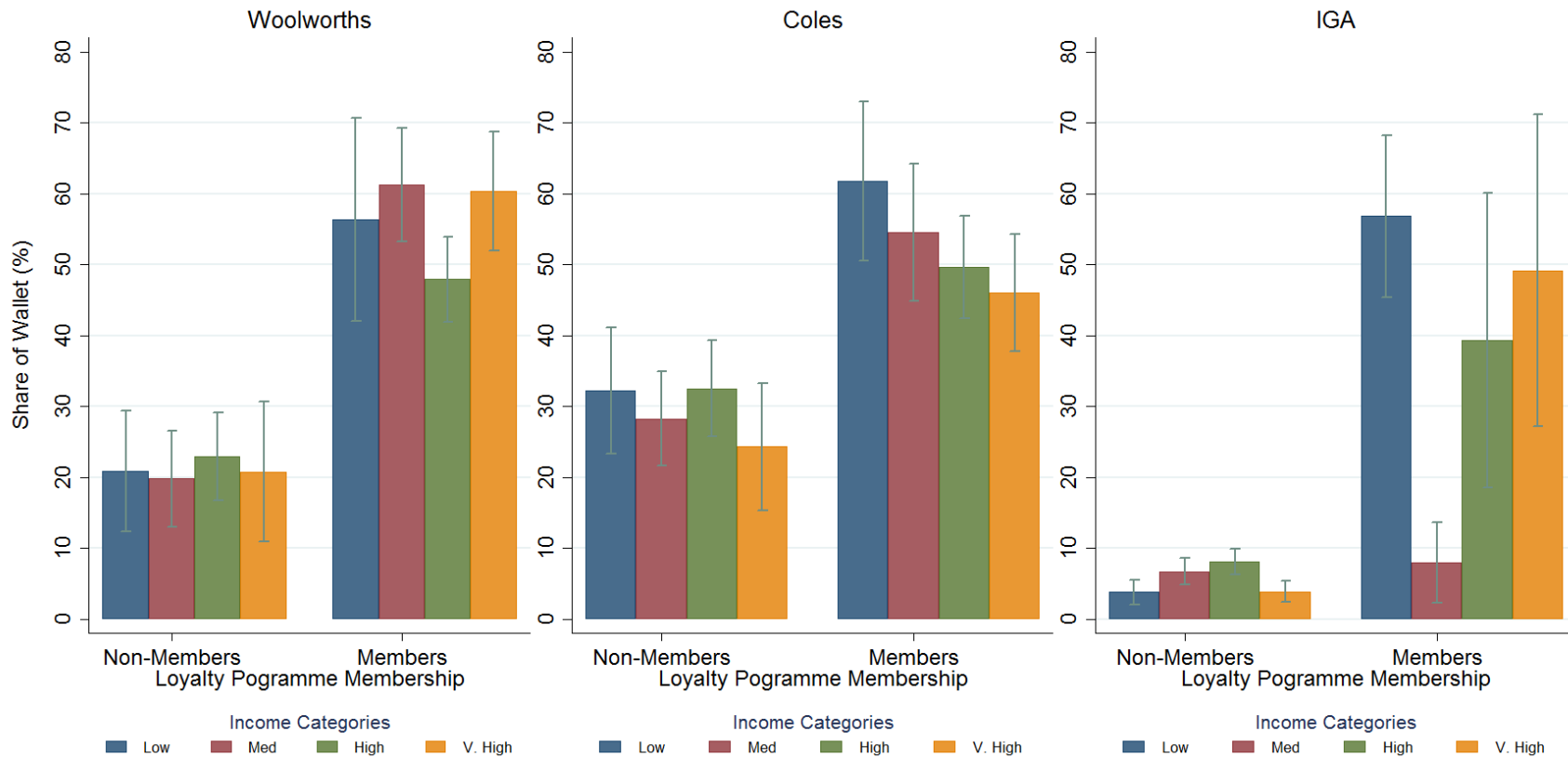
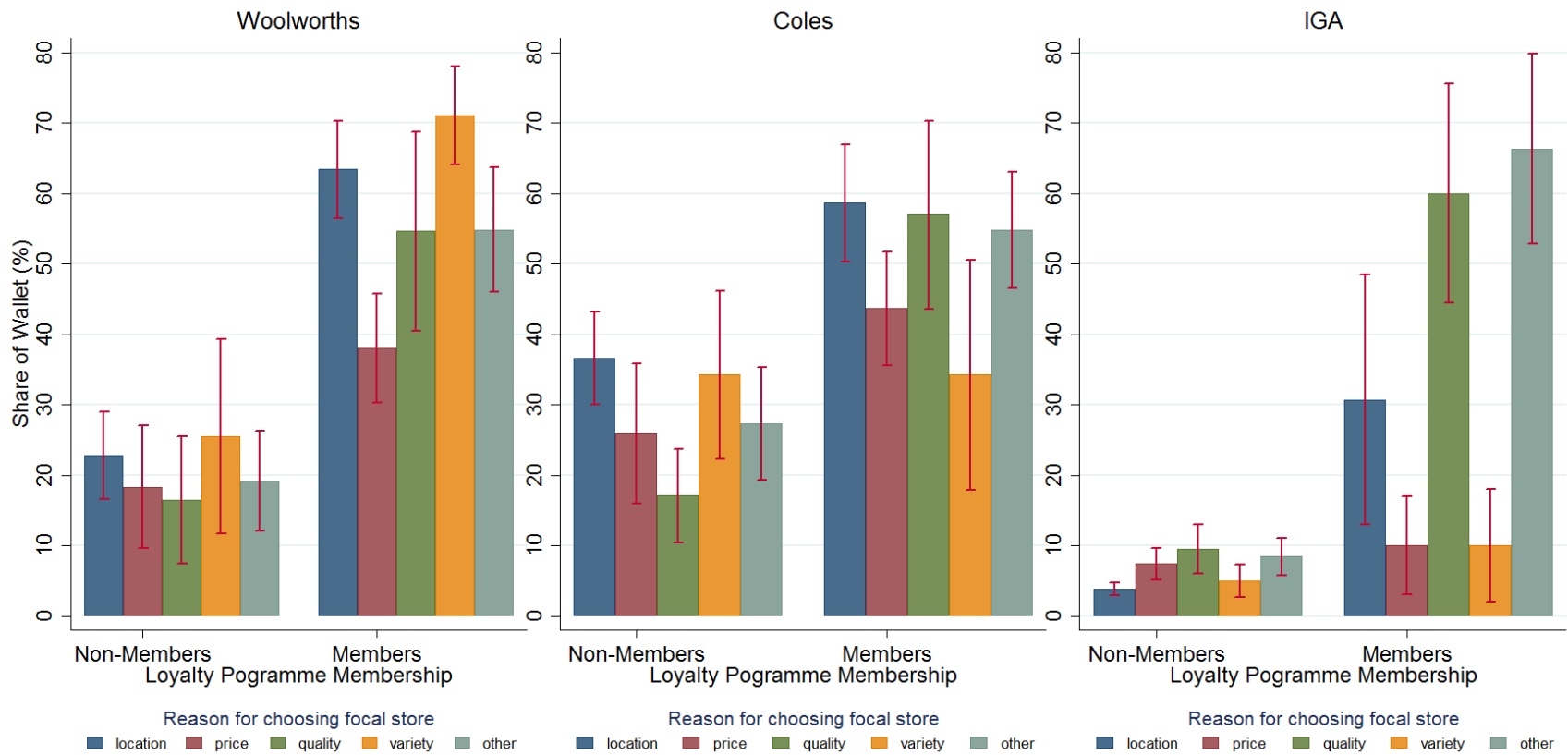


Figure 3: Customers' share of wallet SOW at different each supermarkets in Armidale, before and after ALDI opening



Source: authors' survey of food shoppers 2015-16

Figure 4: Share of wallet and customers' stated main reason for the choice of main store, by loyalty program membership



Source: authors' survey of food shoppers 2015-16

Figure 5: Customers' income categories and SOW at each supermarket, by loyalty program membership

Tables:

Table 1: Tobit Estimates of Customers' Share of Wallet at Woolworths, Coles, and IGA

Dependent Variable = Share of Wallet		(1)	(2)	(3)
Independent Variables		Woolworths	Coles	IGA
Loyalty-card holder	(yes=1)	22.65*** (3.95)	16.12*** (3.63)	31.86*** (8.99)
Competing card holder	(yes=1)	-6.28** (2.61)	-9.77*** (2.48)	-0.82 (3.79)
Main store Woolworth	(yes=1)	49.74*** (3.69)	-22.03*** (3.43)	-14.44*** (4.77)
Main store Coles	(yes=1)	-27.24*** (3.77)	52.78*** (3.44)	-14.62*** (4.55)
Main store IGA/Other	(yes=1)	-18.93*** (4.30)	-14.01*** (3.85)	88.78*** (7.26)
Households acquisition of food: reference category is all purchase from market				
Most from market		-9.76*** (3.30)	-3.36 (2.93)	-1.32 (4.35)
Half from market		-15.38*** (5.24)	-4.39 (4.25)	3.36 (6.46)
What is the single main reason for the customer's choice of main store (>60% spending): reference category is 'Other'				
Location		1.17 (4.84)	3.39 (4.15)	-2.10 (7.01)
Price		3.82 (6.35)	0.16 (5.58)	5.45 (9.23)
Quality		-3.13 (5.95)	-1.91 (5.08)	-6.04 (7.95)
Variety		-2.18	6.85	18.04*

	(7.94)	(7.00)	(9.73)
Customer's sock-out response: reference category is 'postpone purchase'			
Switch-brand	7.29**	1.27	-7.77
	(3.70)	(3.21)	(4.95)
Switch-store	4.37	3.88	-2.54
	(4.43)	(3.92)	(5.83)
Household Demographics			
Age/100	-20.42**	2.80	38.10***
	(8.13)	(7.23)	(11.67)
Household size	0.63	-1.35	1.11
	(1.08)	(1.00)	(1.50)
Gender (Female=1)	-7.21*	1.03	4.95
	(3.67)	(3.19)	(5.28)
Households' weekly income: reference category is low income, i.e. less than AUD 500			
Medium (\$500-\$1000)	8.06**	-5.25	1.08
	(4.09)	(3.55)	(6.03)
High (\$1000-\$2000)	6.46	-4.37	5.74
	(4.24)	(3.71)	(6.24)
Very high (>\$2000)	10.06**	-3.83	2.22
	(4.64)	(4.09)	(6.78)
Household Type: reference category is 'live alone'			
Live with own family	-6.28	5.19	0.66
	(4.80)	(4.24)	(6.66)
Other than family	-11.38**	8.70**	-1.83
	(4.88)	(4.38)	(7.48)
post-ALDI	11.05*	-2.32	14.29*
	(5.93)	(5.33)	(8.44)
post-ALDI × loyalty-card holder	-15.03***	-4.82	-15.88
	(4.76)	(4.50)	(11.32)
post-ALDI × Location conscious	-6.44	-0.71	8.95
	(6.25)	(5.58)	(9.28)

post-ALDI × Price conscious	-15.45** (7.84)	-0.45 (7.03)	-3.47 (11.26)
post-ALDI × Quality conscious	9.80 (8.60)	-2.54 (7.68)	9.62 (11.82)
post-ALDI × Variety conscious	-2.56 (9.45)	-4.78 (8.46)	-22.46* (12.79)
post-ALDI × Female	5.69 (4.78)	2.06 (4.27)	-14.18** (7.04)
Constant	27.10*** (8.00)	28.61*** (6.95)	-33.11*** (11.88)
Sigma	19.67*** (1.00)	18.37*** (0.88)	21.98*** (1.89)
L. Likelihood	-1094.68	-1197.68	-506.33
Prob>Chi2	0.00	0.00	0.00
Pseudo R ²	0.21	0.19	0.22
Total N (# of observations)	379	379	379
Total N outliers (0 values, 100 values)	226 (118:35)	253 (90:36)	91 (276:12)

Source: Authors' calculations using Armidale's food shopper survey data: 2015-2016

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Main store: >=60% spending.

Table 2: Tobit estimates for customers share of wallet (pre and post-ALDI sample)

		(1)	(2)	(3)	(4)	(5)	(6)
		Woolworths		Coles		IGA	
VARIABLES		<i>Pre-ALDI</i>	<i>Post-ALDI</i>	<i>Pre-ALDI</i>	<i>Post-ALDI</i>	<i>Pre-ALDI</i>	<i>Post-ALDI</i>
Loyalty card holder	(yes=1)	28.37*** (6.11)	5.64* (2.99)	18.21*** (5.50)	10.23*** (2.46)	32.05*** (12.10)	12.62* (6.63)
Competing card holder	(yes=1)	-11.03* (5.80)	-3.64 (2.81)	-10.41** (5.20)	-9.02*** (2.60)	-3.38 (7.71)	-2.11 (4.23)
Main store Woolworth	(yes=1)	58.12*** (12.19)	49.51*** (3.46)	-33.32*** (10.92)	-18.36*** (3.04)	1.48 (11.76)	-20.89*** (5.15)
Main store Coles	(yes=1)	-21.43* (12.47)	-27.12*** (3.56)	52.16*** (11.21)	52.67*** (3.05)	-24.42* (12.62)	-10.47** (4.57)
Main store IGA/Other	(yes=1)	-14.17 (11.57)	-20.07*** (4.68)	-19.98** (10.00)	-14.27*** (4.10)	91.96*** (11.74)	93.53*** (13.97)
Most from market		-25.81*** (8.55)	-3.49 (3.33)	-4.44 (6.63)	-2.71 (2.93)	-0.69 (8.30)	-2.17 (4.92)
Half from market		-15.85* (9.55)	-16.26** (7.58)	-1.31 (8.13)	-7.45 (5.70)	-2.44 (12.40)	6.93 (8.49)
Location		1.03 (6.86)	-4.88 (3.28)	5.09 (5.98)	2.88 (2.87)	-6.05 (8.58)	5.32 (5.42)
Price		0.85 (8.97)	-11.19*** (3.84)	-0.31 (8.04)	0.82 (3.38)	2.92 (11.01)	0.46 (5.87)
Quality		-3.25 (8.34)	4.52 (5.11)	-2.34 (7.33)	-5.17 (4.50)	-6.36 (9.64)	3.94 (7.62)
Variety		-1.12 (11.15)	-4.65 (4.17)	8.68 (10.00)	1.26 (3.64)	14.01 (11.93)	-3.56 (7.29)
Switch-brand		6.27	7.88	4.79	-4.06	-10.03	-5.46

	(6.06)	(5.48)	(5.32)	(4.73)	(7.09)	(8.04)
Switch-store	1.20	4.30	1.83	-0.64	3.61	-0.38
	(10.45)	(5.66)	(9.24)	(4.89)	(11.94)	(8.25)
Age/100	-13.03	-21.09**	0.11	4.62	52.76*	33.44**
	(19.35)	(8.54)	(17.02)	(7.48)	(26.74)	(13.33)
Household size	2.49	0.22	-0.31	-2.10**	1.62	1.14
	(2.63)	(1.11)	(2.44)	(0.99)	(3.62)	(1.64)
Gender (Female=1)	-9.32*	-2.03	0.61	2.23	9.39	-9.15**
	(5.11)	(2.53)	(4.52)	(2.22)	(6.44)	(4.13)
Medium (\$500-\$1000)	18.03*	2.53	-8.44	-4.28	-1.01	1.15
	(9.43)	(4.24)	(7.60)	(3.68)	(12.23)	(6.49)
High (\$1000-\$2000)	14.19	1.70	-8.33	-3.64	5.89	6.88
	(10.08)	(4.29)	(8.16)	(3.77)	(12.87)	(6.56)
Very high (>\$2000)	23.98**	2.66	-7.00	-2.80	2.80	2.68
	(10.67)	(4.79)	(8.78)	(4.18)	(13.14)	(7.47)
Live with own family	-18.31*	-0.82	2.96	6.74	3.68	1.13
	(10.49)	(5.10)	(8.83)	(4.45)	(13.49)	(7.46)
Other than family	-16.07	-7.90	7.07	9.99**	5.95	-4.03
	(10.83)	(5.15)	(9.48)	(4.52)	(15.10)	(8.63)
Constant	13.40	38.80***	32.06*	29.88***	-47.19*	-14.75
	(19.19)	(8.03)	(17.36)	(7.03)	(26.42)	(12.89)
Sigma	25.76***	16.03***	24.92***	14.19***	24.58***	18.92***
	(2.43)	(0.96)	(2.09)	(0.82)	(3.45)	(2.06)
L. Likelihood	-385.65	-691.90	-473.85	-703.95	-197.40	-299.36
P>Chi-square	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R ²	0.22	0.20	0.18	0.20	0.29	0.14
Total observations	170	209	168	209	170	209
Total outliers	72(80, 18)	154 (38, 17)	90 (53, 27)	163 (37, 9)	35 (125, 10)	56 (151, 2)
(0 values, 100 values)						

Source: Authors' calculations using Armidale's food shopper survey data: 2015-2016

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix

Appendix A: Descriptive Statistics

VARIABLES	Full	Pre and Post-ALDI		Difference
	sample	(Pre-ALDI)	(Post-ALDI)	
	(Mean/SD)	(Mean/SD)	(Mean/SD)	(2-3)
	(1)	(2)	(3)	(2-3)
Customers' Share of Wallet				
Share of Wallet at Woolworths	36.60 (36.62)	31.44 (37.15)	41.02 (35.67)	-9.59***
Share of Wallet at Coles	38.71 (35.79)	40.84 (38.32)	36.88 (33.44)	3.96
Share of Wallet at IGA	9.57 (23.09)	14.76 (30.19)	5.10 (12.96)	9.66***
Customers' loyalty program membership				
Loyalty Card Woolworths (yes=1)	0.45 (0.50)	0.37 (0.48)	0.52 (0.50)	-0.15***
Loyalty Card Coles (yes=1)	0.40 (0.49)	0.29 (0.45)	0.50 (0.50)	-0.21***
Loyalty Card IGA (yes=1)	0.08 (0.27)	0.10 (0.30)	0.07 (0.25)	0.03
Customers' store patronage (>= 60% share of wallet at a particular store)				
Main store Woolworths (% of customers)	0.33 (0.47)	0.28 (0.45)	0.37 (0.48)	-0.09**
Main store Coles (% of customers)	0.33 (0.47)	0.38 (0.49)	0.30 (0.46)	0.08*
Main store IGA/other (% of customers)	0.20 (0.40)	0.30 (0.46)	0.12 (0.33)	0.18***

Households acquisition of food				
All food purchase from market	0.75 (0.44)	0.72 (0.45)	0.77 (0.42)	-0.05
Most food purchase from market	0.16 (0.37)	0.14 (0.34)	0.19 (0.39)	-0.05
Half food acquired from other than market	0.09 (0.29)	0.14 (0.35)	0.05 (0.21)	0.09***
Single main reason of the customer's choice of main store (>= 60% share of wallet at a particular store)				
Location	0.36 (0.48)	0.40 (0.49)	0.33 (0.47)	0.07
Price	0.17 (0.38)	0.12 (0.33)	0.22 (0.41)	-0.10*
Quality	0.12 (0.33)	0.17 (0.38)	0.08 (0.27)	0.09***
Variety	0.10 (0.30)	0.06 (0.24)	0.14 (0.34)	-0.08***
Other reason	0.24 (0.43)	0.24 (0.43)	0.24 (0.43)	0.00
Customers sock-out response (Attitudinal loyalty)				
Switch-brand	0.68 (0.47)	0.65 (0.48)	0.70 (0.46)	-0.05
Switch-store	0.17 (0.38)	0.09 (0.28)	0.24 (0.43)	-0.15***
Postpone purchase	0.15 (0.36)	0.26 (0.44)	0.06 (0.23)	0.20***
Customers demographic characteristics				
Age/100	0.40 (0.18)	0.41 (0.18)	0.39 (0.17)	0.02
Household size	2.58 (1.54)	2.86 (1.41)	2.34 (1.61)	0.52***
Gender (Female =1, Male =0)	0.49	0.49	0.49	0.00

	(0.50)	(0.50)	(0.50)	
<i>Customers Income</i> (\$ Australian dollars)				
Low Income (<\$500)	0.16 (0.37)	0.15 (0.35)	0.17 (0.38)	-0.02
Medium Income (\$500 - \$1000)	0.29 (0.45)	0.30 (0.46)	0.28 (0.45)	0.02
High Income (\$1000 - \$2000)	0.33 (0.47)	0.31 (0.46)	0.36 (0.48)	-0.05
Very High Income (>\$2000)	0.19 (0.40)	0.20 (0.40)	0.19 (0.39)	0.01
<i>Family type</i>				
Alone (yes=1)	0.18 (0.38)	0.17 (0.38)	0.19 (0.39)	-0.02
Family (yes=1)	0.61 (0.49)	0.63 (0.49)	0.59 (0.49)	0.04
Other (yes=1)	0.21 (0.41)	0.21 (0.41)	0.21 (0.41)	0.00
Sample data (before/after opening of ALDI in Armidale)				
post-ALDI (pre-ALDI =0, post-ALDI =1)	0.54 (0.50)	-	-	-
Observations	398	184	214	

Source: Authors' calculations using Armidale's food shopper survey data: 2015-2016

Notes: Standard deviations in parenthesis. ***significance at 1%, ** significance at 5%, and *significance at 10%. Sum of certain categories may not be equal to 100 for different reasons. For example sum of customers store patronage is not equal to 100 because there are customers in our dataset who do not have a main store (i.e., multiple store patronage).

Appendix B: Correlation among key explanatory variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LoyWW	1	1													
LoyColes	2	0.29	1												
LoyIGA	3	-0.03	0.00	1											
Location	4	-0.02	-0.07	-0.09	1										
Price	5	0.10	0.13	-0.06	-0.34	1									
Quality	6	-0.06	-0.12	0.06	-0.28	-0.17	1								
Variety	7	0.03	-0.04	-0.01	-0.25	-0.15	-0.13	1							
Age	8	-0.04	0.03	0.22	-0.11	0.01	0.04	0.03	1						
HHsize	9	0.11	0.03	-0.12	-0.13	0.10	0.08	0.03	-0.25	1					
Female	10	0.07	0.07	0.02	-0.14	-0.01	0.01	0.10	0.09	-0.02	1				
Low-income	11	-0.12	-0.04	0.22	0.03	0.00	-0.02	0.01	0.07	-0.40	-0.04	1			
Med-income	12	-0.03	-0.05	-0.11	0.06	0.02	-0.05	-0.03	0.14	-0.14	0.04	-0.28	1		
High-income	13	0.04	0.04	-0.07	0.01	-0.03	-0.04	-0.01	-0.14	0.15	0.00	-0.31	-0.45	1	
V.high-income	14	0.13	0.09	0.00	-0.10	0.01	0.11	0.05	-0.05	0.33	-0.04	-0.21	-0.31	-0.35	1

Source: Armidale's food shopper survey data: 2015-2016

Notes: loyww= member of Woolworths' loyalty scheme; loycoles = member of Coles' loyalty scheme; loyiga = member of IGA's loyalty scheme; Location = location conscious customer; Price = price conscious customer; Quality = Quality conscious customer; Variety= Variety Conscious customer. Numbers in bold are significant at 5%.