Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.
Theory of Due Repurchase

Gaining More from Using Less

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Business Studies in Marketing

at Massey University, Albany New Zealand

Hussam Abdulrahman H. Aldolaigan

2016
STATEMENT OF ACADEMIC INTEGRITY

I declare that this research study is entirely the product of my own work and that it has not been taken from the work of others. When the work and ideas of others have been used in the study, the work has been properly cited in the text.

Hussam A. H. Aldolaigan

June 2016
Abstract

The aim of the thesis is to enhance the current knowledge on repurchase behaviour and provide a model that enables marketing practitioners to ‘gain more from using less’ through reallocating their resources and investing more in underutilised customer data. This is because producing the desired customer response using the least costly marketing actions is the key to success in today’s increasingly competitive marketplace. Although models predicting repurchase behaviour in non-contractual settings exist, their predictive and explanatory performances are poor. None of these existing models considers the roles of purchase quantity (PQ) and homogeneity of interpurchase times (IPTs) in predicting repurchase behaviour. Hence, Theory of Due Repurchase is developed in this thesis and suggests that the customer’s next purchase is highly expected under three repurchase conditions, which are that the customer is 1) a frequent shopper; 2) has upward-trending PQs; and 3) has homogeneous IPTs. These three variables are not only expected to be strong predictors of repurchase behaviour, but also correctly classify more customers than existing behavioural models, including recency, frequency and monetary value (RFM). Using a transaction dataset available in the literature, six studies were conducted to empirically test the Theory of Due Repurchase, examine its predictive accuracy and replicate the findings. The results support all of the hypotheses, developed as part of the conceptual model, and replicate the findings. Theory of Due Repurchase correctly classifies over 88% of customers across four samples, improving the current level of accuracy in predicting repurchase behaviour by approximately 19 percentage points. The thesis provides a number of academic and managerial insights on effective targeting.
ACKNOWLEDGEMENTS

I would like to sincerely thank Dr Andrew Murphy for his supervision of this thesis and support as well as Associate Professor Jonathan Elms for his co-supervision of this thesis and support. I would also like to thank Al-Watania Poultry and Saudi Telecom Company (STC) for their interest in this research and willingness to participate. Finally, I would like to thank my friend Faheem Zaidi from Massey’s Institute of Mathematical Sciences for his feedback on the purchase quantity measure.
Contents
1 Introduction ................................................................................................................ 1
  1.1 Background to the Thesis ................................................................. 1
  1.2 Academic Relevance of the Thesis ........................................ 3
  1.3 Thesis Objectives and Structure ............................................. 4
2 Literature Review ...................................................................................................... 6
  2.0 Introduction ................................................................................. 6
  2.1 Attitudinal School of Thought .................................................... 6
  2.2 Behavioural School of Thought .................................................. 10
  2.3 Conceptual Model ........................................................................ 15
  2.4 Hypotheses .................................................................................. 22
  2.5 Chapter Summary ........................................................................ 23
3 Methodology ............................................................................................................ 24
  3.0 Introduction .............................................................................. 24
  3.1 Methodological Approach .......................................................... 24
  3.2 Data ............................................................................................. 25
    3.2.1 Dataset .................................................................................... 25
    3.2.2 Samples .................................................................................. 26
  3.3 Data Preparation ........................................................................... 29
    3.3.1 Outliers ................................................................................ 29
    3.3.2 Trial Purchases (1st Purchase) ............................................ 31
  3.4 Measurement .................................................................................. 33
    3.4.1 Frequency (F) ................................................................. 35
    3.4.2 Last Purchase Quantity (LPQ) ........................................... 35
    3.4.3 IPT Homogeneity (IPT_h) .................................................. 39
    3.4.4 Repurchase Behaviour (RB) ............................................... 44
    3.4.5 Repurchase Frequency (RF) .............................................. 44
    3.4.6 Control Variables ............................................................ 45
  3.5 Procedures .................................................................................... 45
    3.5.1 Analytics .............................................................................. 45
    3.5.2 Studies ............................................................................... 46
  3.6 Chapter Summary ........................................................................ 46
4 Findings .................................................................................................................. 47
TABLE 4.2: RELATIONSHIP BETWEEN RB AND SATISFYING REPURCHASE CONDITIONS 50
TABLE 4.3: SCENARIOS OF REPURCHASE CONDITIONS (2×2×2 BLOCK DESIGN) 59
TABLE 4.4: REPURCHASE BEHAVIOUR VS. SCENARIOS OF REPURCHASE CONDITIONS 60
TABLE 4.5: REPURCHASE BEHAVIOUR VS. SCENARIOS OF REPURCHASE CONDITIONS ACROSS SAMPLES 67
TABLE 4.6: SUMMARY OF MODEL’S MEASURES 73
TABLE 4.7: FULL MODEL’S ESTIMATES AND STATISTICS 78
TABLE 4.8: ROBUSTNESS CHECK – VARIABLES DROPPED OUT 79
TABLE 4.9: ROBUSTNESS CHECK - MODEL’S ACTUAL PERFORMANCE 80
TABLE 4.10: MODELS’ ESTIMATES AND STATISTICS (ACROSS SAMPLES) 88
TABLE 4.11: ROBUSTNESS CHECK - VARIABLES DROPPED OUT (ACROSS SAMPLES) 89
TABLE 4.12: ROBUSTNESS CHECK - MODEL’S ACTUAL PERFORMANCE ACROSS SAMPLES 90
TABLE 8.1: MODEL ESTIMATION RESULTS 121
TABLE 8.2: THE PERFORMANCE OF THE CLUMPINESS MEASURE ACROSS 10 SAMPLES 126

LIST OF FIGURES
FIGURE 2.1: SUMMARY OF THE PERFORMANCE OF ATTITUDE-BEHAVIOUR MODELS 8
FIGURE 2.2: PREDICTIVE PERFORMANCE OF RFM VARIABLES 11
FIGURE 2.3: THEORY OF DUE REPURCHASE 17
FIGURE 2.4: INCREASING PQ 19
FIGURE 2.5: DECREASING PQ 20
FIGURE 2.6: IMPROVED VERSION OF THE PARADOX ILLUSTRATION FIRST DEVELOPED BY FHL (2005A, P.422). 21
FIGURE 3.1: DISTRIBUTION OF FHL’S SAMPLING UNITS ACROSS SAMPLES A, B AND C 27
FIGURE 3.2: DISTRIBUTION OF PURCHASE TRANSACTIONS OVER SIX QUARTERS ACROSS FOUR SAMPLES (TRIAL PURCHASE INCLUDED) 32
FIGURE 3.3: DISTRIBUTION OF PURCHASE TRANSACTIONS OVER SIX QUARTERS ACROSS FOUR SAMPLES (TRIAL PURCHASE EXCLUDED) 33
FIGURE 3.4: INCREASING VS. DECREASING PURCHASE QUANTITY 38
FIGURE 3.5: ILLUSTRATION OF THE "INCREASING FREQUENCY PARADOX" (FHL, 2005A, P.422) 40
FIGURE 3.6: MEASURING IPT HOMOGENEITY USING HHI 41
FIGURE 4.1: MEAN DIFFERENCES IN RF BETWEEN BEHAVIOURAL GROUPS (HYPOTHESIS 1) 49
FIGURE 4.2: MEAN DIFFERENCES IN RF BETWEEN BEHAVIOURAL GROUPS ACROSS SAMPLES 54
FIGURE 4.3: REPURCHASE DECISION VS. SATISFYING ALL REPURCHASE CONDITIONS (ACROSS SAMPLES) 56
FIGURE 4.4: MEAN DIFFERENCES IN RF ACROSS 8 SCENARIOS OF REPURCHASE CONDITIONS 61
FIGURE 4.5: MEAN DIFFERENCES IN RF ACROSS EIGHT SCENARIOS OF REPURCHASE CONDITIONS (ACROSS SAMPLES) 69
FIGURE 4.6: ROC CURVE FOR THE MODEL 77
FIGURE 4.7: ROC CURVES FOR THE FOUR MODELS 87
FIGURE 8.1: FADER ET AL., 2005B, P.281 122
FIGURE 8.2: PREDICTED VS. ACTUAL FREQUENCY/PERCENTAGE OF REPEAT TRANSACTIONS ACROSS THREE SAMPLES 124
**LIST OF ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Clumpiness</td>
</tr>
<tr>
<td>F</td>
<td>Frequency</td>
</tr>
<tr>
<td>IPT</td>
<td>Interpurchase Time</td>
</tr>
<tr>
<td>IPT_h</td>
<td>Interpurchase Time homogeneity</td>
</tr>
<tr>
<td>LPQ</td>
<td>Last Purchase Quantity</td>
</tr>
<tr>
<td>MV</td>
<td>Monetary Value</td>
</tr>
<tr>
<td>PQ</td>
<td>Purchase Quantity</td>
</tr>
<tr>
<td>R</td>
<td>Recency</td>
</tr>
<tr>
<td>RB</td>
<td>Repurchase Behaviour</td>
</tr>
<tr>
<td>RF</td>
<td>Repurchase Frequency</td>
</tr>
<tr>
<td>T</td>
<td>Relationship length</td>
</tr>
</tbody>
</table>