

Part I: Preliminary and Decile Analysis

1. What percent of customers responded (i.e., bought anything) from this catalog?

| Percentage of Purchased_Customer | | | | | |
|----------------------------------|-------------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Unpurchased | 94180 | 97.5 | 97.5 | 97.5 |
| | Purchased | 2371 | 2.5 | 2.5 | 100.0 |
| Total | | 96551 | 100.0 | 100.0 | |

From this catalog, only 2371 customers have purchased, accounting for 2.5% of all respondents.

2. Of those who bought, what was the average dollars ordered from this catalog?

Case Summaries

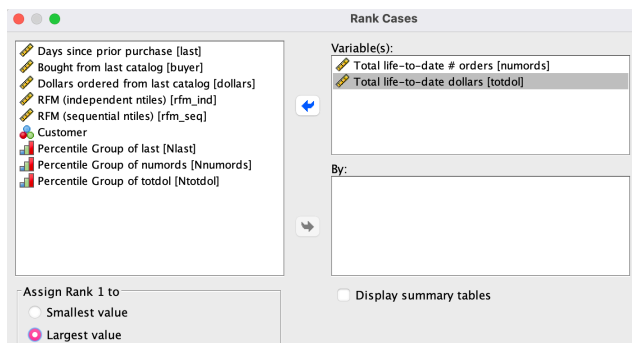
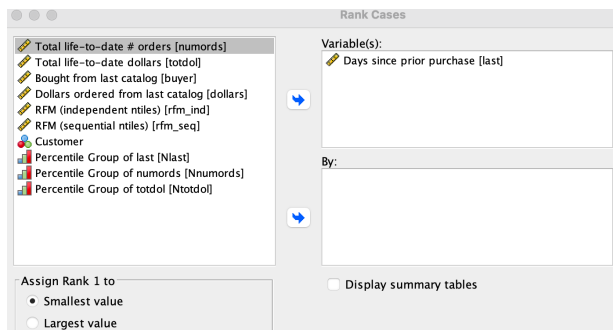
Mean

| Customer | Dollars ordered from last catalog |
|---------------|-----------------------------------|
| Non_purchased | .00 |
| Purchased | 104.24 |
| Total | 2.56 |




Customers who purchased from this catalog cost \$104.24 on average.

3. Create decile variables for recency, frequency and monetary.

Go to Transform – Rank Cases....:

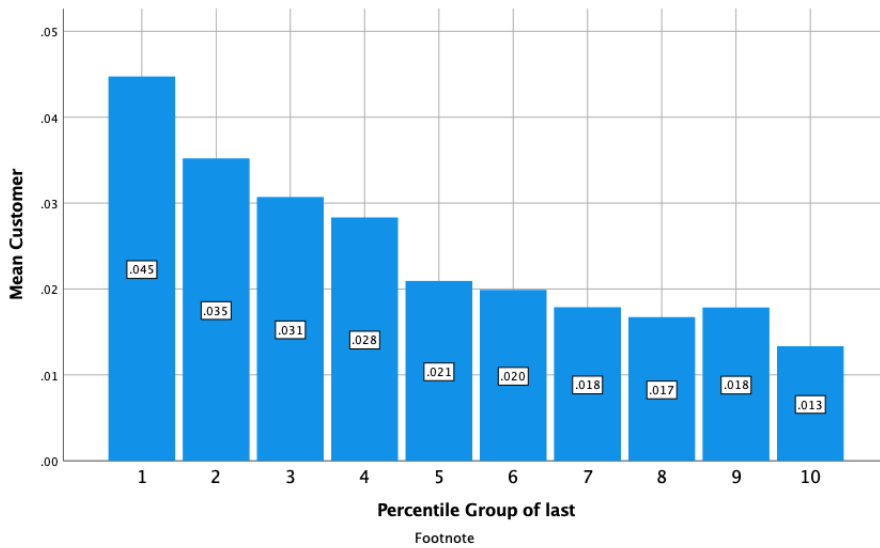


Create 10 Tiles in Recency, Frequency and Monetary for customers.

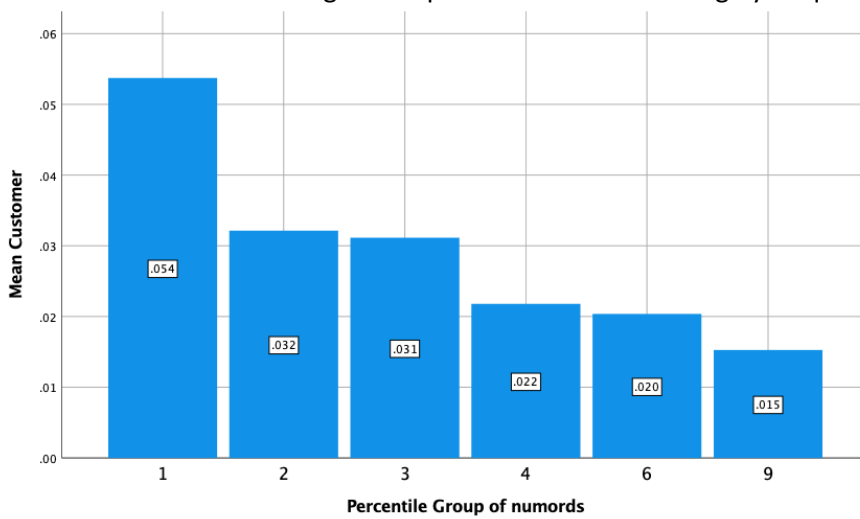
|  Nlast |  Nnumords |  Ntotdol |
|---|--|---|
| 3 | 2 | 2 |
| 7 | 3 | 3 |
| 1 | 3 | 4 |
| 9 | 4 | 4 |
| 5 | 6 | 6 |

4. Create a bar chart showing the response rate

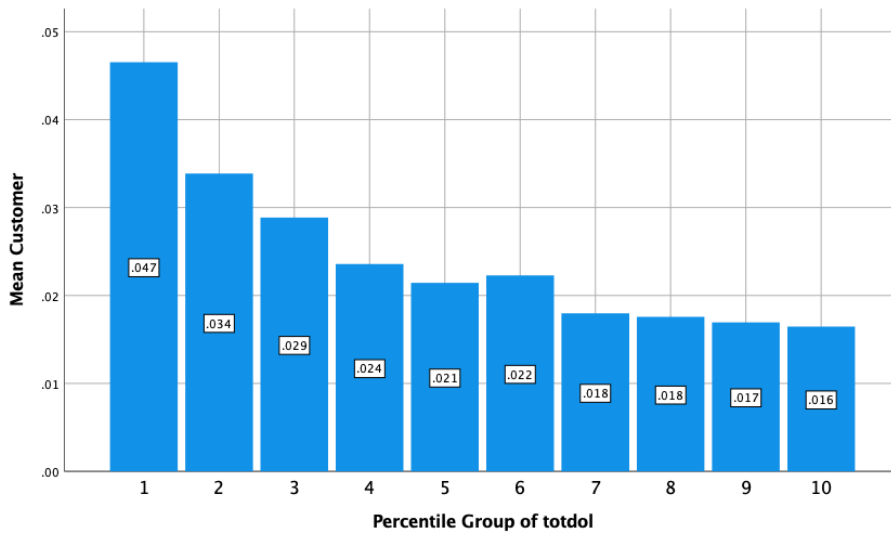
(i.e., the proportion of customers who bought something) to this catalog by recency decile.



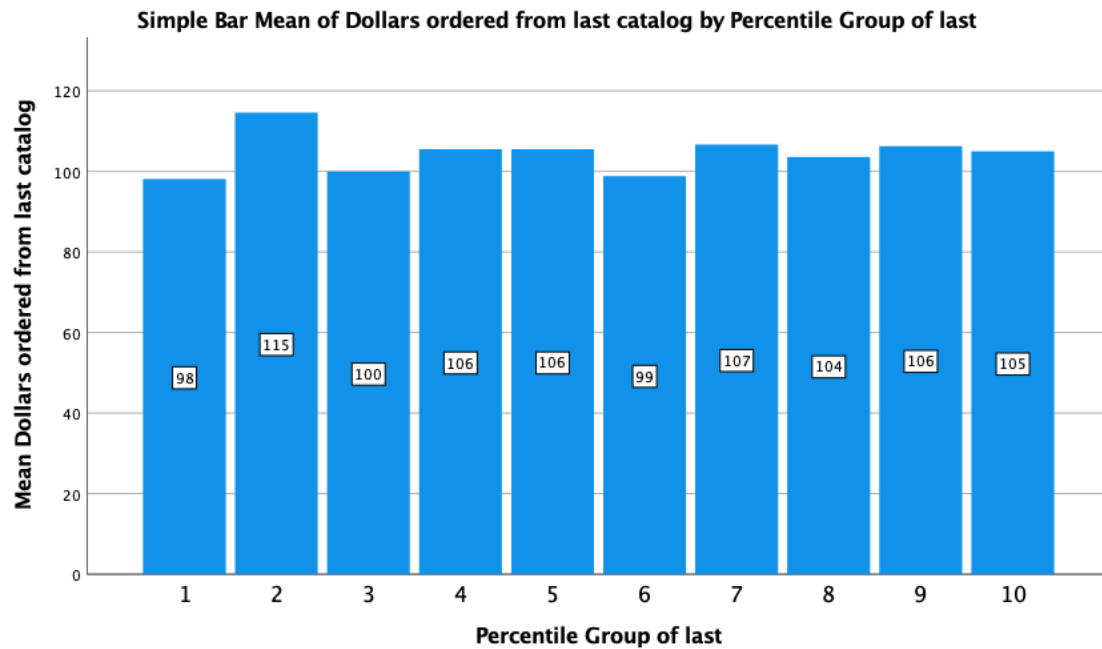
5. Create a bar chart showing the response rate to this catalog by frequency decile.

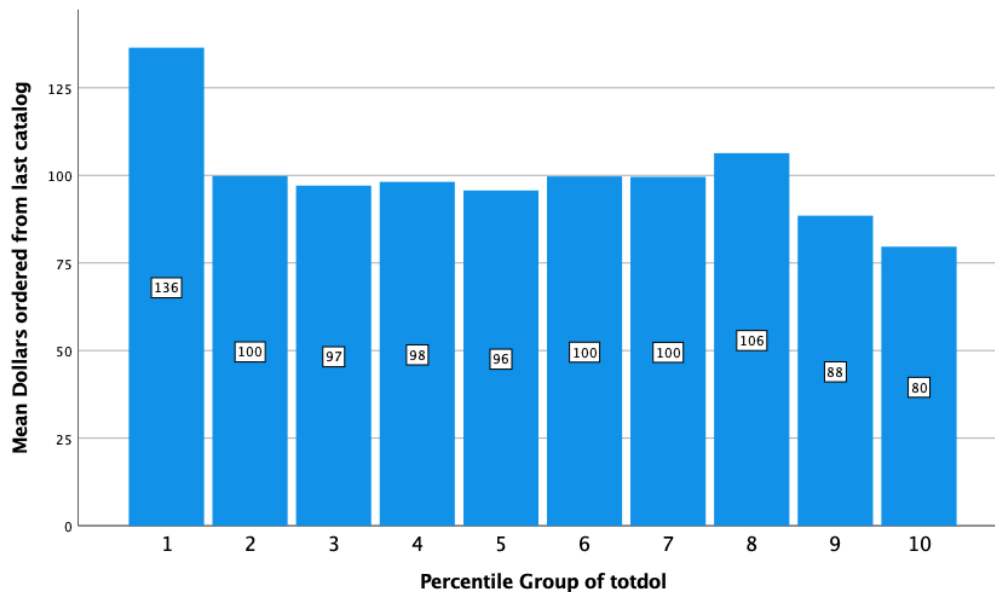
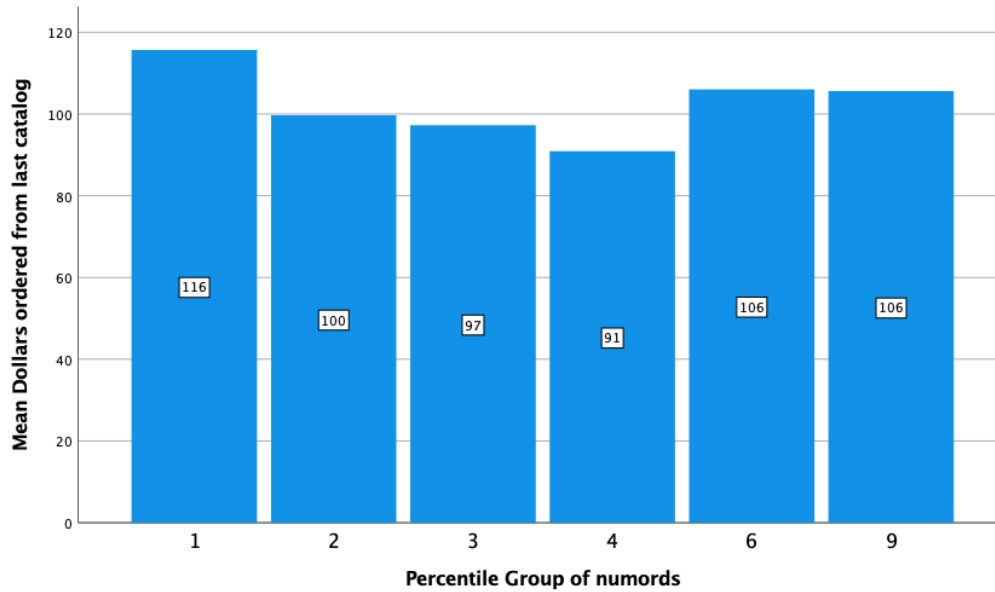


6. Create a bar chart showing the response rate to this catalog by monetary decile.



7. Using only those customers who placed an order from this catalog, create bar charts showing the average dollars ordered from this catalog by recency, frequency and monetary deciles.





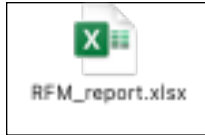
8. What do the above bar charts reveal about the likelihood of response and the size of the order across the different recency, frequency, and monetary deciles?

For the first three bar charts showed, customers purchasing largely, frequently and have a high probability to response marketing offers. And they are more likely to order a large size of order.

For customers who purchased the last catalog in recency groups, they spent generally same on products. And customers with a high frequency cost as same as others.

Part II: RFM Classification

9. Generate a report showing the number of customers, the number of buyers, and the response rate for each RFM cell (using the sequential n-tiles approach as recorded in the RFM_SEQ variable).



(Double click to open it)

Part III: Profitability Analysis

10. Use the following costs to determine:

- (a) the gross profit in dollars,
- (b) the gross profit as a % of gross sales, and
- (c) the return on marketing expenditures (gross profit/cost to mail catalogs) as a result of mailing the catalog to all 96,551 customers.

11. What is the breakeven response rate?

- mailing to all 96,551 customers

Gross Sales = \$247160

Cost to produce and mail a catalog = \$1

COGS and variable costs on orders = $247160 * 50\% = \$123580$

Profit per sale = $(\$247160 - \$123580) / 2371 = \$52.12$

Break-even = $\$1 / \$52.12 = 1.92\% = 0.0192$

12. Compute the following items. You can do these (1) by hand (not recommended), (2) in Excel (using the results from question 9 above) or (3) you can create an aggregate SPSS dataset. If you want SPSS to do the bulk of the calculations, follow the instructions in Exhibit 3 – and then you can use analyze ... reports... case summaries for the final computations:

- Determine which RFM segments (using the sequential n-tiles approach) have response rates exceeding the breakeven rate.
- Determine the number of customers belonging to these profitable segments.
- Determine the number of buyers belonging to these profitable segments.

There are 70 RFM segments with the response rate exceeding 0.0192. If the value is 1 in Profit column, the response rate of the segment is larger than the breakeven rate.

| rfm_seq | Buyer | buyer_mean | NUMCUSTS | Profit | rfm_seq | Buyer | buyer_mean | NUMCUSTS | Profit | rfm_seq | Buyer | buyer_mean | NUMCUSTS | Profit |
|---------|-------|------------|----------|--------|---------|-------|------------|----------|--------|---------|-------|------------|----------|--------|
| 111 | 69.00 | .0867 | 796 | 1.00 | 213 | 42.00 | .0534 | 787 | 1.00 | 332 | 15.00 | .0195 | 768 | 1.00 |
| 112 | 55.00 | .0691 | 796 | 1.00 | 214 | 47.00 | .0595 | 790 | 1.00 | 334 | 15.00 | .0201 | 746 | 1.00 |
| 113 | 51.00 | .0639 | 798 | 1.00 | 215 | 27.00 | .0342 | 789 | 1.00 | 335 | 17.00 | .0211 | 806 | 1.00 |
| 114 | 50.00 | .0628 | 796 | 1.00 | 221 | 20.00 | .0276 | 724 | 1.00 | 411 | 27.00 | .0305 | 885 | 1.00 |
| 115 | 48.00 | .0603 | 796 | 1.00 | 222 | 29.00 | .0397 | 731 | 1.00 | 412 | 25.00 | .0282 | 886 | 1.00 |
| 121 | 30.00 | .0376 | 798 | 1.00 | 223 | 32.00 | .0441 | 725 | 1.00 | 413 | 24.00 | .0271 | 885 | 1.00 |
| 122 | 30.00 | .0377 | 795 | 1.00 | 224 | 26.00 | .0364 | 715 | 1.00 | 421 | 17.00 | .0193 | 883 | 1.00 |
| 123 | 32.00 | .0402 | 796 | 1.00 | 225 | 39.00 | .0535 | 729 | 1.00 | 423 | 8.00 | .0194 | 412 | 1.00 |
| 124 | 36.00 | .0452 | 797 | 1.00 | 231 | 16.00 | .0340 | 471 | 1.00 | 424 | 10.00 | .0235 | 425 | 1.00 |
| 125 | 34.00 | .0426 | 799 | 1.00 | 234 | 12.00 | .0256 | 468 | 1.00 | 433 | 16.00 | .0202 | 794 | 1.00 |
| 131 | 20.00 | .0254 | 786 | 1.00 | 235 | 11.00 | .0235 | 468 | 1.00 | 435 | 21.00 | .0252 | 833 | 1.00 |
| 132 | 29.00 | .0368 | 788 | 1.00 | 241 | 19.00 | .0264 | 719 | 1.00 | 511 | 17.00 | .0194 | 875 | 1.00 |
| 133 | 29.00 | .0371 | 781 | 1.00 | 245 | 19.00 | .0263 | 722 | 1.00 | 512 | 24.00 | .0274 | 877 | 1.00 |
| 134 | 23.00 | .0293 | 784 | 1.00 | 252 | 27.00 | .0242 | 1114 | 1.00 | 513 | 21.00 | .0240 | 874 | 1.00 |
| 135 | 32.00 | .0406 | 789 | 1.00 | 253 | 26.00 | .0215 | 1210 | 1.00 | 515 | 20.00 | .0229 | 874 | 1.00 |
| 141 | 14.00 | .0221 | 634 | 1.00 | 311 | 28.00 | .0348 | 805 | 1.00 | 523 | 14.00 | .0293 | 478 | 1.00 |
| 142 | 19.00 | .0309 | 615 | 1.00 | 312 | 27.00 | .0335 | 807 | 1.00 | 524 | 10.00 | .0211 | 473 | 1.00 |
| 143 | 19.00 | .0291 | 653 | 1.00 | 313 | 29.00 | .0360 | 806 | 1.00 | 533 | 19.00 | .0233 | 814 | 1.00 |
| 144 | 17.00 | .0269 | 633 | 1.00 | 314 | 27.00 | .0335 | 807 | 1.00 | | | | | |
| 145 | 19.00 | .0300 | 634 | 1.00 | 315 | 17.00 | .0212 | 801 | 1.00 | | | | | |
| 151 | 20.00 | .0248 | 806 | 1.00 | 322 | 19.00 | .0255 | 745 | 1.00 | | | | | |
| 152 | 27.00 | .0289 | 934 | 1.00 | 323 | 20.00 | .0267 | 750 | 1.00 | | | | | |
| 153 | 21.00 | .0280 | 751 | 1.00 | 325 | 16.00 | .0212 | 753 | 1.00 | | | | | |
| 154 | 28.00 | .0299 | 937 | 1.00 | | | | | | | | | | |
| 155 | 19.00 | .0235 | 808 | 1.00 | | | | | | | | | | |
| 211 | 36.00 | .0456 | 789 | 1.00 | | | | | | | | | | |
| 212 | 43.00 | .0543 | 792 | 1.00 | | | | | | | | | | |

The number of customers and buyers in each segment is as showed in the NUMCUSTS and Buyer columns respectively.

- Finally, what would the

(a) the gross profit in dollars,

(b) the gross profit as a % of gross sales, and

(c) the return on marketing expenditures (gross profit/cost to mail catalogs) have been as a result of mailing the catalog only to those customers in the RFM cells with response rates exceeding the breakeven? That is, rather than mailing to all 96,551 customers – what would the profitability of the mailing have been if mailed to the subset of customers in ‘profitable’ segments?

Case Summaries

| Profit | | Buyer | NUMCUSTS |
|--------|----------------|---------|----------|
| .00 | N | 40 | 40 |
| | Sum | 602.00 | 43468 |
| | % of Total Sum | 25.4% | 45.0% |
| 1.00 | N | 70 | 70 |
| | Sum | 1769.00 | 53083 |
| | % of Total Sum | 74.6% | 55.0% |
| Total | N | 110 | 110 |
| | Sum | 2371.00 | 96551 |
| | % of Total Sum | 100.0% | 100.0% |

Gross Profit = 1769 * (\$123580 / 2371) – 53083*\$1 = \$39120

Gross Sales = 1769 * (\$237160 / 2371) = \$184405

Gross Profit/Sales = 21.21%








Return on marketing = Gross Profit/ Total Mail Cost = \$39120/ (53083*\$1) = 73.70%

13. Examine the first 20 or so observations in the database. What do you notice about the RFM1 and RFM2 values? That is – do the two approaches generally yield the same RFM index for any given customer? What do you see as the pros and cons of the two approaches (from a statistical as well as logical perspective) and why?

In general, two methods give similar index values with an absolute difference value from 0 to 15. It indicates that they distribute the same value on the recency but minor different on frequency and monetary.

| |  last |  numords |  totdol |  buyer |  dollars |  rfm_ind |  rfm_seq |
|----|--|---|--|---|---|---|---|
| 21 | 213 | 6 | 259 | 0 | 0 | 212 | 224 |

By analyzing No.21, we can notice that independent approach distributes it as 2 on the Monetary, and the sequential distributes it as 4. In the first approach, it just considers the order size instead of the recency and frequency. By contrast, sequential signs it as 4, which treats the customer less importantly than the independent. That is, a customer once purchased a large order although has not activated a long time, she or he can still be assigned to higher group. And thus, the second makes more sense in this scenario.

| |  last |  numords |  totdol |  buyer |  dollars |  rfm_ind |  rfm_seq |
|----|--|---|--|---|---|---|---|
| 18 | 22 | 11 | 756 | 0 | 0 | 111 | 114 |

In No.18, the customer who was purchasing \$756 is still assigned 4 in sequential method. It is influence probably because of the high frequency group. Although he or she has spent a lot, the large size of order in a high frequency group is still small. So, in this approach, one of elements in RFM might be disturbed by other two.