

*Precision of Product Matching
Technology & Price Comparison of Local
Versus Amazon – Sudbury*

Conducted by



Executive Summary

Independently owned local stores are typically viewed as more expensive than non-local multinational corporations like Amazon. As an assessment, One Red Maple amassed a sample size of 384 products from the Sudbury online local product population of 66,000. This sample size provides a 95% confidence interval for the precision testing of One Red Maple's product matching technology, as well as for the local versus Amazon price comparison. Upon examining the 384 identical products discovered both locally and on Amazon, the following results were obtained:

- One Red Maple's algorithm yielded a product match in the top five results 69% of the time.
- Local was less expensive 64% of the time, and on average, 6% cheaper.
- When Amazon was more expensive, on average Amazon was 51% more expensive than the exact local product found on One Red Maple.
- When local was the more expensive option, on average it was 14% more expensive than Amazon.
- If all 384 products were purchased locally and on Amazon, shopping locally would save the consumer \$4,065.01.
- If all 384 products were purchased in an optimized manner selecting the least expensive option between One Red Maple and Amazon, a shopper would save \$9,313.96, or 13% of their money.

Table of Contents

Executive Summary.....	i
Introduction	1
Methodology.....	2
Results & Discussion	3
One Red Maple Product Matching Technology.....	3
One Red Maple vs. Amazon Price Comparison	4
Optimized Spending	6
Conclusions & Future Work	7

List of Figures

Figure 1: One Red Maple Matching Technology Success Rate.....	3
Figure 2: One Red Maple vs. Amazon Prices – Frequency of which is Less Expensive.	4
Figure 3: One Red Maple vs. Amazon Prices – Probability of each being Less Expensive.	4
Figure 4: Average Amazon Price Compared to One Red Maple – Percentage of Savings.....	5
Figure 5: Total Product Cost Varying with Purchasing Source.....	6

List of Tables

Table 1: One Red Maple Matching Technology Data	3
Table 2: Savings Breakdown from Using One Red Maple vs. Amazon	5
Table 3: Savings from using One Red Maple and the Least Expensive Option	6

One Red Maple is a North Bay, Ontario company dedicated to the development of local economy and community. Operating both as a mobile application as well as a browser extension, the shop local start-up continues to be an emerging platform in e-commerce, having created the most complete database of products ever assembled in a local market.

All data recorded in this experiment was collected between the months of January – March in 2023 using One Red Maple’s local product matching technology. The prices recorded represent the values at that time.

Introduction

There is a common rhetoric in retail that ‘local is more expensive’, which causes consumers to often sway towards shopping from non-local multinationals. However, the ability to price search from every local store simultaneously has never been available until now. As a result, One Red Maple is determined to test the validity of this hypothesis.

There are over 66,000 products in the online marketplace when considering every independently owned local store in the Sudbury area. To yield a 95% confidence interval, a random sample of 384 products was generated from the total population, with the only criteria being that the 384 products needed to be both in stock at a local store, and on Amazon. Only exact product matches between the two sources (local and Amazon) were utilized.

Here is the list of local stores included in the randomly generated sample:

- Adoro Olives Oils and Vinegar
- Adventure365
- Backyard Birder Home & Garden Gift Store
- Best West Pet Food Warehouse
- Bianco’s Supercenter
- Boutique Step Up
- Covalin Electrical Supply
- Desimone Shoes & Spa Inc.
- Durham Natural Foods
- Jump! The Baby Store
- Jump! The Skate, Dance & Gymnastics Store
- Kitchen Bits
- Lasalle Uniform
- Moxy’s Bait & Tackle
- Paris Natural Foods
- Pro AM Sports Excellence
- Ramakko’s
- Reg Wilkinson Men’s, Ladies’ & Footwear
- S.T.O.P. Restaurant Supply Ltd
- Skater’s Edge Source for Sports
- Stitch & Stone
- Tail Blazers Health Food Store for Pets
- The Notre Dame Boys
- The Outside Store

The Water Guys North
This and That Blooms

From the 384-product sample, two primary variables were to be tested.

1. The precision of One Red Maple's local product matching technology on Amazon's website.
2. A comparison of One Red Maple's local prices vs. Amazon's prices.

Methodology

Below is a step-by-step procedure of the experimental methodology.

1. Open a Local Product URL.
2. Copy and paste the Local Product Title into a Google search bar, adding – “amazon” – to refine the search. Check to see if there is an identical product match on Amazon.
 - A. **If an identical product match does not exist**, mechanically search for the local product in the amazon.ca search bar.
 - i. **If the identical product is on amazon.ca**, skip to 2B.
 - ii. **If the identical product is not on amazon.ca**, search on amazon.com.
 - a. **If the identical product is on amazon.com**, skip to 2B.
 - b. **If the identical product is not on amazon.com**, there is no match. Skip, and open the next Local Product URL.
 - B. **If an identical product match does exist**, record the Amazon Product Title, Amazon Price, Amazon Currency, and Amazon Product URL. Exclude all shipping costs and Amazon Prime membership fees – only record the product price.
3. Repeat until there are 384 successful product matches between local and Amazon.
4. Calculate the net spending difference using One Red Maple vs. Amazon.
5. Using the list of Amazon Product URLs, run a script to automate the product matching technology on each product webpage. Tabulate the success of its matching results.

The multiple iterations of searching techniques are performed to increase the probability of finding an identical match.

Note: The local products selected are randomly generated, and not necessarily the cheapest local options available. The identical product could be sold at a lower price from a different local retailer. Similarly, the identical product matches recorded from Amazon are of the first product match discovered, and not necessarily the cheapest available option. However, the majority of local products tend to have only one identical match on Amazon.

Results & Discussion

One Red Maple Product Matching Technology

After sifting through 1,501 local products, 384 identical product matches were identified yielding a success rate of 26%.

One Red Maple's browser extension analyzed each of the 384 products from Amazon and attempted to match them with the identical products sourced locally. The matches were categorized by the success of the results generated, with a match on the first result being the target. Only matches up to the 13th result were recorded.

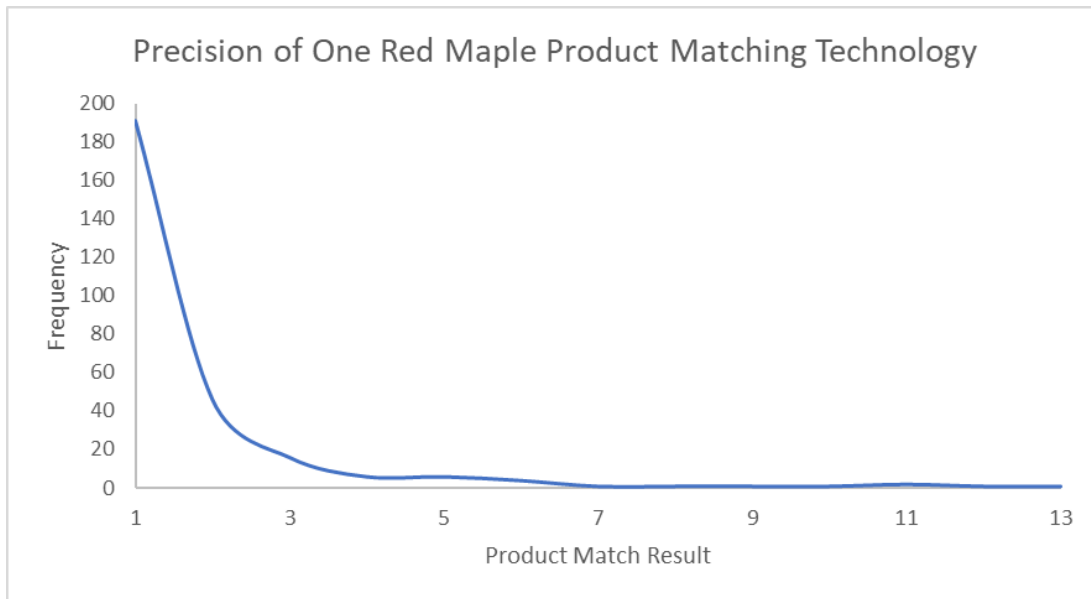


Figure 1: One Red Maple Matching Technology Success Rate

Table 1: One Red Maple Matching Technology Data

Product Match Result	Frequency	Probability	Cumulative Probability
1st Match	191	50%	50%
2nd Match	46	12%	62%
3rd Match	16	4%	66%
4th Match	6	2%	67%
5th Match	6	2%	69%
6th+ Match	12	3%	72%
No Match	107	28%	100%

Displayed in Table 1, through the 384 products the probability of getting a match was 72%. In 50% of the attempts the product was the first result, while 69% of the time, it was in the top five.

These results are directly transferrable to the success rate of the One Red Maple browser extension in everyday use. The matching algorithm is continuously improving with the assistance of AI machine learning, with the intent of yielding a 100% match rate.

One Red Maple vs. Amazon Price Comparison

The Amazon prices and the local prices from One Red Maple were recorded and compared on their frequency and probability of being the less expensive option.

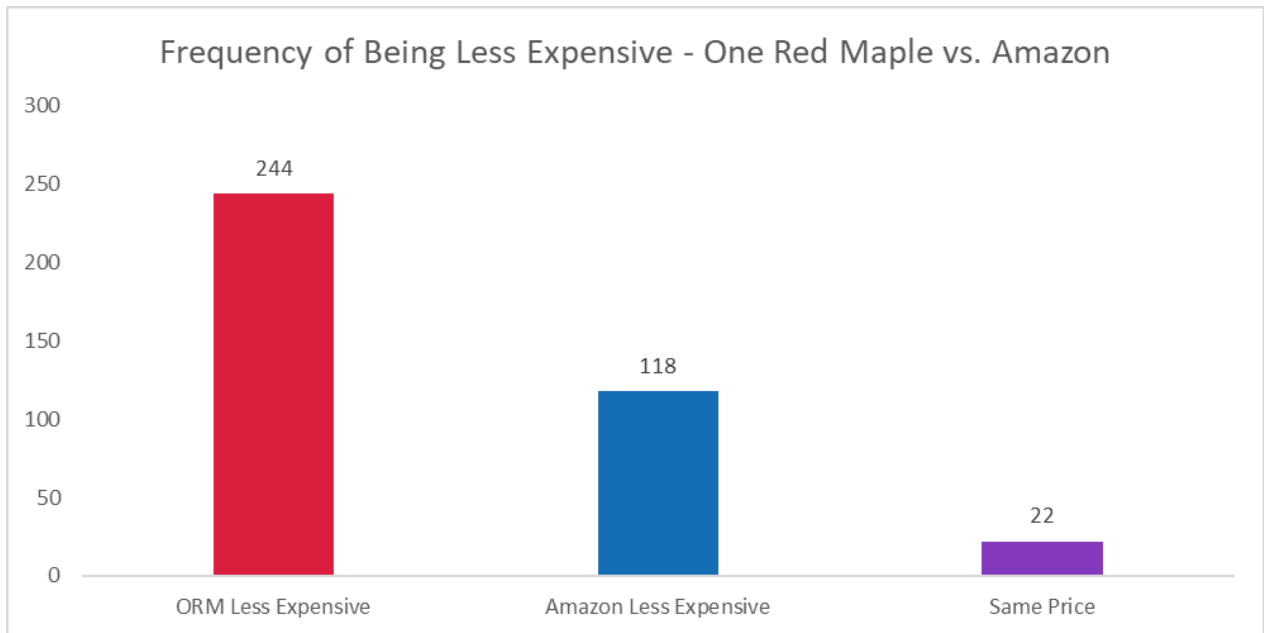


Figure 2: One Red Maple vs. Amazon Prices – Frequency of which is Less Expensive.

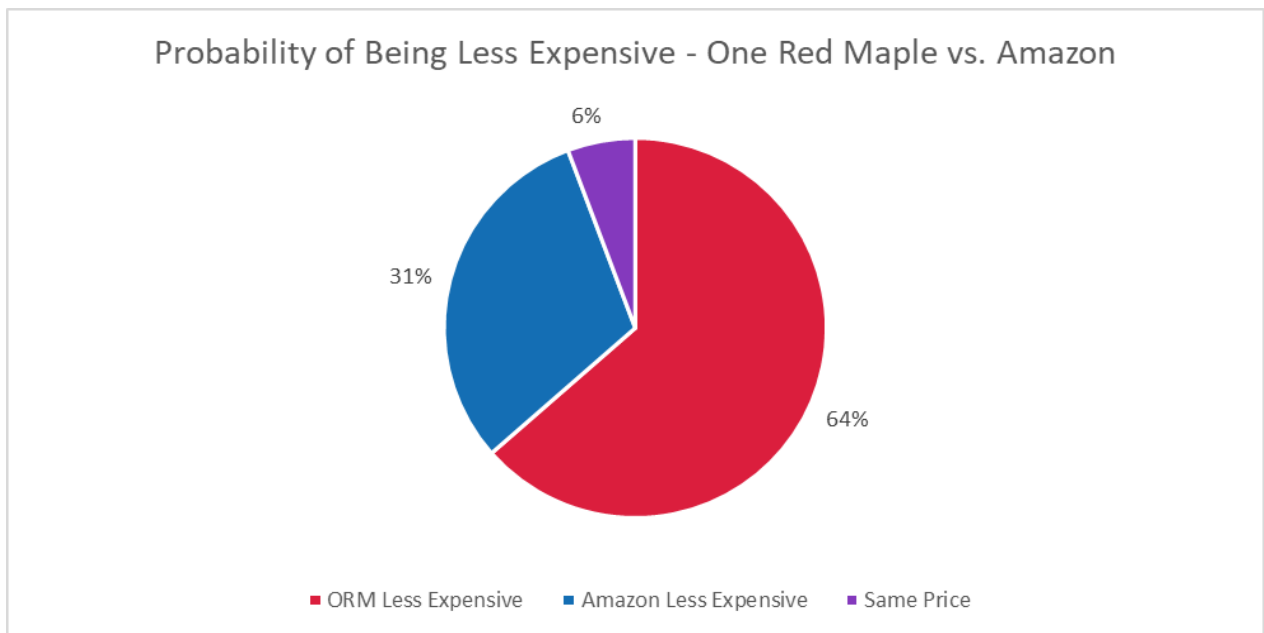


Figure 3: One Red Maple vs. Amazon Prices – Probability of each being Less Expensive.

Illustrated in Figure 2 and Figure 3, of the 384 products One Red Maple yielded cheaper product results in 244 instances, or 64% of the time. On the other hand, Amazon produced 118 cheaper products, being the less expensive option 31% of the time.

Continuing with the calculations, the percentage of potential savings as well as the total savings were determined.

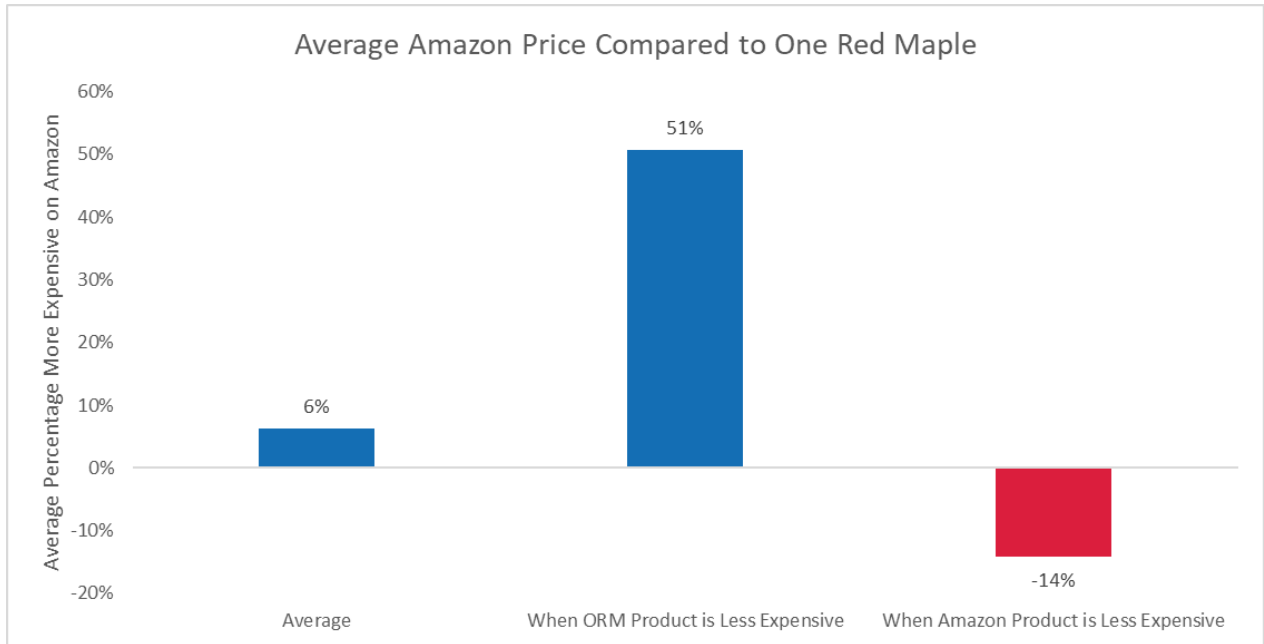


Figure 4: Average Amazon Price Compared to One Red Maple – Percentage of Savings

Table 2: Savings Breakdown from Using One Red Maple vs. Amazon

Savings	Amount
Total Savings with ORM	\$ 4,065.01
Savings per Product with ORM	\$ 16.66
Savings per Product when ORM is Less Expensive	\$ 38.17
Savings per Product when Amazon is Less Expensive	\$ 44.48

The results in Table 2 and Figure 4 indicate that shopping for the 384 products on Amazon would be 6% (or \$4,065.01) more expensive than it would have been shopping locally with One Red Maple. Breaking down the savings per product, One Red Maple was on average \$16.66 less expensive per item.

In addition, when the product on Amazon was more expensive, on average it was a staggering 51% more expensive than the identical product found locally on One Red Maple. Shopping locally in the 244 instances where the local product is the cheaper option could save consumers an average of \$38.17 per item.

When local was the more expensive product, on average it was 14% more expensive than the exact product found on Amazon. In the 118 instances where Amazon was the cheaper option, consumers could save an average of \$44.48 per product. Evidently in this sample, Amazon tends to be the less expensive option when examining a costly product.

Optimized Spending

One Red Maple’s product matching technology allows consumers to seamlessly perform real-time price comparisons between local stores and Amazon while shopping on any Amazon product page. If, as many are, the consumer is price conscientious, they could opt to purchase the least expensive option in every instance – shopping both from One Red Maple and Amazon. Below, Table 3 and Figure 5 demonstrate the potential savings.

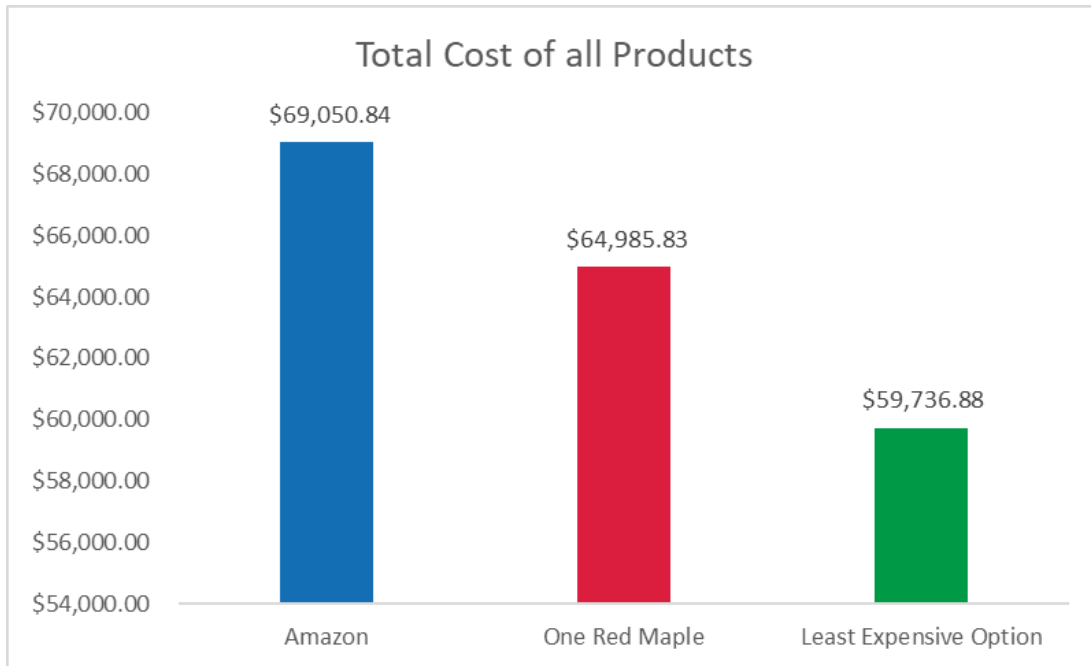


Figure 5: Total Product Cost Varying with Purchasing Source

Table 3: Savings from using One Red Maple and the Least Expensive Option

	Savings vs. Total Amazon Cost	Percentage of Savings
One Red Maple	\$ 4,065.01	6%
Least Expensive Option	\$ 9,313.96	13%

Therefore, if a price conscientious consumer optimized their spending for all 384 products shopping both from One Red Maple and Amazon, they could ultimately save 13% of their money, for a total of \$9,313.96 in savings. Alternatively, if a consumer shopped exclusively from their local stores using One Red Maple, they would save 6% of their money, or \$4,065.01.

Conclusions & Future Work

It is evident that Sudbury's local products discovered using One Red Maple were competitive with Amazon's pricing, being the cheaper option 64% of the time, and on average 6% less expensive. In addition, there is significant value in One Red Maple's ability to compare prices versus Amazon. Price conscientious shoppers could optimize their spending and save up to 13% of their money while using the One Red Maple browser extension on Amazon.

An additional study is set to be conducted in Kingston, ON – One Red Maple's last remaining test market.