

Financial analysis of Company XYZ

by

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ABSTRACT

Company XYZ is a small business, established in October 2021, that services a variety of vehicles for repairs and modifications. The current business model has reached its maximum workload output given shop space constraints. The objective of this study is to see how well Company XYZ is tracking or meeting company goals. Utilizing financial statements, invoices, and social media marketing, this study provides insight into the company's future success and growth. An interview with the owner of Company XYZ provided information about future goals for the business, as well as relevant background information about their experiences in the automotive aftermarket industry.

By completing a ratio analysis for Company XYZ from its start in October 2021 through December 2022, the study captured a broad view of the financial health and past success of Company XYZ. Completing another analysis of January and February 2023 numbers, provided information on the annual trend line used to inform future decisions. The comparison of Company XYZ's numbers with industry numbers shows how well they perform against their competitors.

The invoicing turnover rate (the number of days it takes an invoice to close) provided a clear picture of how the company is tracking towards their 2023 goal of 20 completed invoices each month with a minimum profit of \$700 per invoice. Past profitability data showing where the company has been will help guide where the owners focus needs to fall for meeting future goals.

Company XYZ uses social media marketing to reach its customer base and promote sales. Analyzing sales revenue resulting directly from one social media post. This provides a marketing model to facilitate the minimum number and type of social media marketing

that will be needed to achieve company objectives. The two categories created for social media posts were family-related and job-related posts. Correlating the number of posts with total monthly sales provides insight into how significant social media marketing is in creating additional sales.

Financial ratios indicated Company XYZ is financially healthy in comparison to the automotive repair industry. Invoices showed profitability for all but one out of 91 invoices. Social media posts overall drew in additional sales. When split into two categories, family-related posts had little impact on sales, while job related posts had a higher impact, although not statistically significant. Total posts overall compared to sales showed an even stronger impact on sales each month but was also not statistically significant. Additional factors play into what brings in monthly sales that were not discovered in this analysis.

TABLE OF CONTENTS

List of Figures	v
List of Tables	vi
Acknowledgments	vii
Chapter I: Introduction	1
1.1 Purpose	1
1.2 Background for Flow of Business	2
1.3 Assumptions	4
Chapter II: Literature Review	5
2.1 Automotive Aftermarket Industry Background	5
2.2 Financial Ratios and Documents	6
2.3 Social Media and Technology	7
Chapter III: Theory and Planning	9
Chapter IV: Methods and Results	13
4.1 Financial Ratios	13
4.2 Invoices.....	16
4.3 Social Media Marketing.....	20
Chapter V: Recommendations and Conclusion	27
Works Cited	29

LIST OF FIGURES

Figure 4.1: Invoice Profit Trendline..... 17
Figure 4.2: Invoice Total Line Fit Plot..... 18
Figure 4.3: Average Days/Invoice Line Fit Plot..... 19
Figure 4.4: Job Related Line Fit Plot 22
Figure 4.5: Family Related Line Fit Plot 22
Figure 4.6: Total Posts Line Fit Plot..... 23
Figure 4.7: Total Posts Line Fit Plot with Lag..... 26

LIST OF TABLES

Table 3.1: Ratios and Formulas.....	10
Table 4.1: Financial Ratios with Industry Averages.....	13
Table 4.2: Invoice Profit Analysis.....	17
Table 4.3: Number of Invoices per Month	20
Table 4.4: Social Media Posts.....	21
Table 4.5: Regression Results.....	24
Table 4.6: Social Media Analysis with a Lag	25

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CHAPTER I: INTRODUCTION

1.1 Purpose

A small business based out of Wake Forest, North Carolina, is owned and operated by one individual working out of an at-home shop. In addition to the owner, the owner's spouse and myself voluntarily handle the bookkeeping and marketing for the business. Company XYZ is an automotive parts installation and upgrade shop for local Jeep and truck owners. The owner has been in the industry for almost 20 years including time working for various automotive companies before starting his own business (Karlson 2023). Established in June of 2021, Company XYZ began accepting customers in November of 2021 and has grown to the maximum output allowed given current shop conditions (Karlson 2023). The owner's long-term goal is to hire four new employees and move into a commercial shop with enough land to build a small four wheeling course (Karlson 2023). To determine if Company XYZ is on the right path for their goals, a financial analysis is needed.

The purpose of this study is to utilize financial statements, invoices, and social media marketing to provide insights into the company's future success and growth. The objective is to use the financial analysis to track Company XYZ's progress towards their company goals. Calculating ratios and comparing them to other companies in the industry will show the financial health and past success of Company XYZ. To determine growth, invoices must be looked at to maximize profits and minimize costs. Social media marketing will also be explored for impacts to total sales.

Having reached the maximum workload output, an important next step for Company XYZ is determining its future growth and profits. Ratio analysis of financial

statements demonstrates how well Company XYZ performs based on efficiency, profitability, solvency, and liquidity categories. Past and current financial ratios can be helpful predictors for the future to show where capital has gone and where numbers can be improved. Invoice analysis from Quarter 4-2021 through Quarter 4-2022 shows profitability numbers for each invoice.

Social media is an important marketing platform for Company XYZ as it can reach large numbers of people very quickly. Performing an analysis based on the number of social media posts, categorized as family-related and job-related, compared to total sales in a month shows the impact of online marketing to the total number of sales. Family-related posts include holiday wishes, attending other company's events, posts about company outings, and any other post that does not fall within the job-related posting category. Job-related posts include events sponsored by Company XYZ, promotional sales posts, or posts related to a customer's vehicle directly.

1.2 Background for Flow of Business

It can be difficult to predict the flow of business for Company XYZ in the automotive installation and repair shop industry as stated by the owner during an interview (Karlson 2023). According to the owner, returning customers are not generally monthly income sources for Company XYZ. Installing parts on a customer's vehicle is determined based on when they want to perform the work and have the finances to do so. Monthly sales must be supplemented with new customers to make up for the inconsistency of returning customers (Karlson 2023). There are many different part options a customer can choose from such as upgraded bumpers, soft tops, hard tops, wheels, and suspension parts. For example, if a customer wants to install a lift kit on their Jeep, it is typically a one-time installation. There may be additional invoices with the lift kit installation if they decide

they want a different lift height in the future or want to remove the lift all together, but these events are not likely to become a monthly revenue stream (Karlson 2023). New customers will need to be acquired to fill the gaps in revenue each month from a parts installation and upgrade standpoint.

Performing repairs on vehicles is on an as-needed-basis when the vehicle breaks down and needs to be returned to a running state (Karlson 2023). Brakes need to be replaced on vehicles regularly, but they also do not provide consistent revenue from the returning customer as they last for thousands of miles according to the company owner. When a customer comes in with a noise from the engine, the company owner diagnoses the sound and provides recommendations for repairs (Karlson 2023). There are a wide range of issues that can be cause noises, but one example given by the owner is a front-end rebuild based on joint wear and tear. Front-end rebuilds require multiple ball joints, axles, control arms, and eight hours of labor to complete. This type of repair lasts for thousands of miles, meaning it is also not a regular revenue stream for Company XYZ (Karlson 2023).

According to the owner, during the months of March through June, most of the work completed in the industry is new part installations or upgrades (Karlson 2023). From July to September, sales are a mix of new part installations and repairs. October through February are the slow months for the aftermarket part installation industry and customers typically complete repairs during this period. In addition to repairs, the holiday season brings in some installations from “Christmas gift work” where the customer only needs the part installed (Karlson 2023). Understanding what kind of job will generally be scheduled helps with planning for customer’s orders before they are needed, which increases invoice turnaround time and customer satisfaction overall (Hsieh and Zhang 2022). Company XYZ

also focuses more on customization to customer needs instead of simply upgrading parts the customer wants which leads to a higher valued specialty shop experience (Karlson 2023).

1.3 Assumptions

- Taxes are ignored in this study for simplification of the financial ratio calculations, calculations of job supply costs from each invoice, as well as the sales tax amounts from each invoice.
- Costs of parts used for the total invoice profit calculation are based on February 2023 values.
- For the remainder of the study, “previous year” refers to the time range of Quarter 4-2021 through Quarter 4-2022, which includes October 1, 2021 to December 31, 2022.
- For the remainder of the study, “current year” refers to Quarter 1-2023 and includes January 1, 2023 to February 16, 2023.
- The financial quarters start in January, April, July, and October for Company XYZ and all financial data was calculated on a cash accounting basis.
- All cancelled invoices are excluded from the total number of invoices used in calculations.
- Company XYZ had no official goals set before 2023 started, but for this study goal values will be used to compare with results found from the previous year’s invoices.
- For anonymity, the name of the owner was changed to Bob Karlson for all citations throughout the study.

CHAPTER II: LITERATURE REVIEW

2.1 Automotive Aftermarket Industry Background

The automotive aftermarket industry reaches a wide variety of audiences across all manufacturers, which for Company XYZ is mainly Jeeps, but also trucks and SUVs of various brands. Planning for regular customer sales in automotive aftermarket suffers from demand uncertainty as stated by the owner of Company XYZ. The methodology from one study that took place in Southeast Asia is applicable to this study in the United States.

The study looked at connections between the different steps in the supply chain from the beginning of the business plan to the result of customer satisfaction (Hsieh and Zhang 2022). They found that eliminating lead time by having inventory in stock increased customer satisfaction, as well as reduced the variability in month-to-month sales numbers (Hsieh and Zhang 2022). Another way to phrase this would be “safety stock” because it allows the business owner to take care of the customer faster, which generally relates to higher customer satisfaction, and is also demonstrated in the study’s results (Hsieh and Zhang 2022).

A limitation with this methodology for Company XYZ would be storage of “safety stock,” with current shop conditions. Keeping the correct inventory in stock for the customer’s regular needs allows for increased number of invoices each month but inventory is difficult to have on hand as there is no room to store parts currently. Analyzing the financial health of Company XYZ is critical for future business growth of moving into a commercial shop, to be able to plan for the types of repairs that happen each month.

2.2 Financial Ratios and Documents

There are many small business development centers across the country to help entrepreneurs achieve their dreams. Small Business Development Center of Wyoming published an article explaining key financial ratios that a small business can use to “measure the different areas of a business that define its health” (Stovall 2020). Stovall explains the best way to use ratios is to look at trends over time. Calculating ratios regularly for profitability, efficiency, liquidity, and solvency measures different aspects of the business and “tells a story” of the company’s past ability to invest as a predictor for future investments (Stovall 2020).

One study described a business as a reservoir of liquid assets filled by inflows and drained by outflows while the reservoir itself is the buffer against variations in flows (Beaver 1996). Beaver further explains that the solvency of the firm can be defined by the company’s ability to pay their financial obligations up until the reservoir is empty. In other words, as long as the fluctuations in cash flows do not empty the company’s bank accounts, the business can continue on and is considered as succeeding. The size of the reservoir, the amount of cash flows in and out, company debt, and overhead costs all play a part in the company’s success through ratio analysis (Beaver 1996). As they relate to Company XYZ, the size of the reservoir is still growing being only one year into business. Cash flows in and out fluctuate, but are not fluctuating to extreme levels where the business is at risk of failure. Company XYZ holds little debt and does not have high overhead costs in part because it is not in a commercial shop space.

2.3 Social Media and Technology

Social media plays an important part in today's marketing industry for a small business as a no-cost method to bring awareness to the company's name (Cox 2012). Sarah Cox studied marketing within small businesses in relation to social media and how the business owner uses it to engage with its customer base for her doctoral defense. Cox evaluated different categories of social media posts used by her client to determine how engagement through social media played a part in bringing in additional sales. The results of her study showed that social media advertising itself did not bring in sales, but that building relationships with other small businesses resulted in increased sales. One example of building relationships with other business owners would be posting online about event sponsorships, or hosting company events with another business that is already well known in the automotive community. In addition, social media posts that had engaging content increased customer engagement (Cox 2012). An example of an engaging post for Company XYZ would be asking for pictures of customer vehicles of a specific color in response to a photo he has posted of the same color. Another journal article also came to a similar conclusion that social media activity does not impact sales or number of invoices each month, but it did show that web traffic was increased for the company's page leading to more brand awareness and sales (Dolega, Rowe and Branagan 2021).

Digital transformation of the world has impacted many different aspects of online sales from the automotive manufacturers to the consumer (Llopis-Albert and Rubio 2021). A study of Spain's automotive industry found that it is necessary to invest in adequate technology advancements for greater profits, competitiveness, and productivity. Not only do technological improvements benefit the business, but they also benefit the consumer by providing ease of access to more and better information for services and parts (Llopis-

Albert and Rubio 2021). Social media is a part of the digital transformation for the world and for Company XYZ it allows for customers to quickly get information from the owner. The owner can receive information about the customer's needs, create an invoice, schedule work, and accept payments digitally from the advancements in technology.

CHAPTER III: THEORY AND PLANNING

The purpose of this study is to complete a financial analysis of Company XYZ using financial ratios, profit analysis, and social media marketing data to determine how well the business is tracking towards their objectives. The balance sheet, statement of cash flows, and profit and loss statements from the previous year are used to provide all expense and revenue data for financial ratio calculations. In addition, the current year's values are also reviewed to provide a comparison with the previous year's ratios. After the ratio analysis for Company XYZ is complete, values can be compared to the industry median values for "Automotive Repair, Services, and Parking" companies according to Ready Ratio's website using most recently released values from 2020 (Avdeev & Co. 2023). While COVID-19 may have impacted the Ready Ratio categories values for 2020, they are still viable comparisons. According to the owner of Company XYZ, the aftermarket industry did not see a slowdown in sales due to contactless interactions or customer spending habits with the stimulus checks (Karlson 2023). Upgrades are not a necessary expense and the stimulus checks promoted additional upgrades during 2020 keep aftermarket sales rolling through shops. Comparing ratio values to industry averages provides the owner with additional performance insights through a broader view.

The financial ratios used for the purposes of this study are current, quick, asset turnover, return on equity, return on assets, profit margin, debt, and debt-to-equity ratio. Asset turnover is calculated in days for better understanding of how long it takes to turn over inventory in this business and the base formula is adjusted for this change. All other ratio values are written as a decimal or percent. Formulas used to calculate Company XYZ's ratio values are listed in Table 3.1 and were acquired from *Principles of Corporate*

Finance (Brealey, Myers and Allen 2020, 751-759). Ratios specifically important for a small business are net profit, quick, debt-to-equity, and return on assets according to the Wyoming Small Business Development Center website (Stovall 2020). Each of these ratios mentioned by the Wyoming Small Business Development Center tells where a business has been as well as predicts where it will be in the future by recognizing positive or negative trends (Stovall 2020). Net profit shows how well the business generates profits from sales and the quick ratio measures the business's ability to generate cash flows (Stovall 2020). Debt-to-equity ratio identifies whether the company is using debt or equity financing to create assets, or services, while the return on asset ratio is how well the assets are used to produce profits (Stovall 2020). Ratios are expected to be better than industry average values based on personal knowledge of cash flows for Company XYZ and the minimized overhead costs from not having a commercial shop space to work in currently.

Table 3.1: Ratios and Formulas

Ratio	Formula
Current Ratio	Current Assets/Current Liabilities
Quick Ratio	(Current Assets-Inventories)/Current Liabilities
Asset Turnover(days)	365/(Sales/Total Assets)
Return on Equity (ROE)	Net Income/Total Equity
Return on Assets (ROA)	Net Income/Total Assets
Profit Margin	Net Income/Sales
Debt Ratio	Total Liabilities/Total Assets
Debt-to-Equity Ratio	Total Liabilities/Total Equity

Given the fluctuation in the number of customers that come into the shop, a monthly budget would not be a consistent measure of profitability. Company XYZ set goals on January 1, 2023, to make \$700 minimum profit per invoice and complete 20 invoices minimum per month to adjust for the variability in customer flow, cover overhead costs, and pay its owner. Finding the profit percentage of each invoice is critical to ensure

the company is making money to cover the business expenses, both current and future, as well as making money to pay its future employees according to the owner (Karlson 2023). To find the profit margin for each invoice, the total costs of parts sold must be calculated. This is found by looking up each part number on an invoice and adding those totals together by invoice number. Subtracting cost of parts sold from the invoice total equals the amount of profit for each invoice. A profit margin ratio, in percentage form, for each completed invoice can then be calculated with the formula:

$$(3.1) \quad (\text{profit/invoice total}) * 100.$$

Invoice total, profit, costs, and profit/invoice total column values are used to calculate mean, standard deviation, minimum, and maximum values for all 91 invoices evaluated from October 2021 through December 2022. It is estimated that profits will be lower than \$700 per invoice for this study and there will be less than 20 per month as the owner did not set business goals until 2023. The owner stated they wanted to be able to cover overhead costs and be able to reap the benefits of their hard work by starting to pay themselves out of the business profits (Karlson 2023).

Once past invoices have been reviewed, the number of days it takes to close an invoice, or receive payment for an invoice, can be calculated by dividing the number of days in each month by the number of invoices closed in that month. This value shows how quickly work is being completed on average for each customer, only working on one customer's vehicle at a time, and helps the owner track progress towards the goal of 20 invoices per month. In other words, this value is tracking the number of days on average it takes to complete a job for a customer.

Marketing is an important part of growing a small business and social media platforms, such as Facebook, provide quick and easy access to large numbers of people (Cox 2012). Facebook does not charge to create a business account, meaning advertising costs are free for this form of marketing. Company XYZ uses Facebook to reach its customer base through posts, which for the purpose of this study will fall into a job-related or family-related category. Manually viewing, categorizing, and counting each post on Facebook beginning October 1, 2021, captures any posts that potentially impacted sales starting November 1, 2021. Correlating the number of social media posts made in the previous month with total monthly sales for the current month will be useful data for determining which type of post brings in the most sales. The basic formula generated for correlation with this study's data is:

$$(3.2) \quad (\textit{previous month's number of posts/current month's total sales}) * 100.$$

In addition to separating the post types, total posts can be looked at and compared to total sales. It is predicted that there will be little correlation between family-related posts and total sales (Dolega, Rowe and Branagan 2021). Total posts and job-related posts are predicted to have a higher correlation with total sales, but still overall a low correlation (Dolega, Rowe and Branagan 2021).

CHAPTER IV: METHODS AND RESULTS

4.1 Financial Ratios

A review of financials statements is an important first step to determine the stability of Company XYZ. With the goal of profit maximization in mind, financial ratios provide insight into how the company is doing overall. These ratios are then compared to industry averages. The balance sheet and statement of cash flows contain valuable data for some of the financial ratio calculations. Calculating monthly financial ratios shows the direction the company is trending for growth whether that is positively or negatively. Previous year and current year ratios were calculated in Table 4.1. Ratio values from 2020 for the automotive repair, service, and parking industry were added to Table 4.1 for easy comparison with Company XYZ's numbers.

Table 4.1: Financial Ratios with Industry Averages

	Company XYZ 1/2023-2/2023	Company XYZ 10/2021-12/2022	Automotive Repair, Services, and Parking Median *2020
Liquidity			
Current Ratio	5.12	3.05	0.78
Quick Ratio	4.93	0.93	0.48
Efficiency			
Asset Turnover(days)	85	54	596
Profitability			
Return on Equity(ROE)	64.8%	21.5%	-62.1%
Return on Assets(ROA)	52.1%	14.5%	-3.4%
Profit Margin	94.0%	2.1%	-16.6%
Solvency			
Debt Ratio	0.20	0.33	0.84
Debt-to-Equity Ratio	0.24	0.49	2.04

Previous and current year numbers for liquidity ratios landed above the industry average and indicate the company has lower liabilities with greater numbers of assets. The current ratio shows Company XYZ has \$3.05 in current assets for every \$1 in current

liabilities, meaning they are covering their debt well. The quick ratio differs from the current ratio by removing inventory values (Brealey, Myers and Allen 2020). For every \$0.93 of assets minus inventory, there is \$1 in current liabilities. The quick ratio for both Company XYZ and the industry are below 1. This shows that as inventory is removed, a significant portion of the current asset value is lost.

Efficiency numbers for the previous year are well below the industry average. The industry has a high number of days for asset turnover at 596 days, meaning the assets take a long time to turn into sales for Company XYZ. In the current year, asset turnover takes 85 days to make a sale with the formula adjusted from 365 days to 47 days to account for the shortened time frame being evaluated. For the current year, sales are still increasing and the number of days to turn over assets would be expected to decrease as the denominator, sales over total assets, increases. For the previous year, there was a larger number of sales with a lower asset value which drove the days to turn over assets down to 54 days.

Profitability ratio values for the previous and current year were higher than industry averages. Company XYZ has a positive return on assets and return on equity value, which compared to the industry average value shows the company is making money. Return on equity increased from 21.5% to 64.8% from the previous year, which means the net income to equity ratio increased. The net income increased in this case as well as the equity value for Company XYZ. Return on assets increased from 14.5% to 52.1% from the previous year as well. The original formula for return on assets includes adding in the after-tax interest value, but tax was not used for this study. Net income and total asset values for Company XYZ increased from the previous year to the current year with a positive and increased ratio balance. The profit margin for the industry is lower than where Company

XYZ landed. Profit margin for the previous year at Company XYZ shows a lower net income over total sales. Looking at the current year for profit margin, the value significantly jumps to show a higher net income compared to total sales. The owner's focus on profits in the current year can explain why the number jumps positively. The profit margin value for the current year means for every \$1 in sales, \$0.94 is generated as profit being returned to the company bank account.

Solvency ratios show how the company is generating profits long term, whether that is through debt financing or equity financing, to take on debt through assets or financing a commercial space. In other words, for every \$1 in assets there is \$0.33 of liabilities for the previous year and \$0.20 for the current year from the debt ratio. The drop in debt from the previous year to this year can explain the \$0.13 gain in profits as loans were paid off and there were are no significant overhead costs such as a building lease. Converting the values to a percent, the debt ratio shows 33% of company business is financed with debt while 77% is financed with equity. Compared to the industry average, Company XYZ is using equity financing to produce assets and the industry is using debt financing on average. The debt-to-equity ratios show that for every \$1 in equity, there is \$0.49 of debt for the previous year and \$0.24 for the current year. Equity values from the previous year to the current year have increased due to the owner keeping more money within the business. The initial equipment needed to work was purchased in the first year of business leading to a higher retention of cash moving forward. In addition, the debt values decreased causing the ratio between debt and equity to increase in the current year.

4.2 Invoices

Financial statements begin October 2021 for Company XYZ, which aligns with the start of Quarter 4-2021 financial data. The first invoice was generated in November of 2021 and all invoices through December 2022 were evaluated for profit. Customer invoices analyzed for profitability ensures the company is earning profits with each transaction. Trending invoice profits over time shows whether Company XYZ is consistent with earning profits and how much they are earning. There were 10 invoices removed from the analysis that were cancelled by the customer, which were not included in this study. Figure 4.1 displays a trendline graph with the number of invoices listed chronologically on the X-axis and invoice profit values on the Y-axis. The trendline over the 91 invoices analyzed increases since the first invoice was created, which means dollars of profit increases over time. The data show the trendline hovering around \$500 in profit per invoice. The owner's goal of \$700 profit per invoice for 2023 is obtainable given the current trendline. While the current year's invoices were not analyzed for profit, it can be assumed from the trendline that values continue to increase over time. Figure 4.1 provides the owner with a visual for how close they are to reaching the goal of \$700 minimum profit on each invoice.

Invoice total, profit, costs, and profit/invoice total were all evaluated for mean, standard deviation, minimum, and maximum values in Table 4.2 for all 91 invoices. The mean values, or average values, for all invoices landed at 63% profit per invoice with a dollar value of \$538.09. Costs per invoice were \$417.11 and invoice totals averaged \$955.20 overall. These numbers explain that over the first year of business, Company XYZ remained profitable. However, looking at all invoices, only 90 of 91 invoices were profitable. The 1 invoice that lost \$7.14, or 2%, in profit was for the sale of parts only and did not include installation. Since part costs were calculated using February 2023 numbers

for a February 2022 invoice, the cost of the part may have changed causing the analysis to look unfavorable but was actually profitable at the time. Company XYZ had customers who supplied their own parts and were seeking only installation services, which explains the 100% profit per invoice value as well as the \$0 cost value in Table 4.2.

Figure 4.1: Invoice Profit Trendline

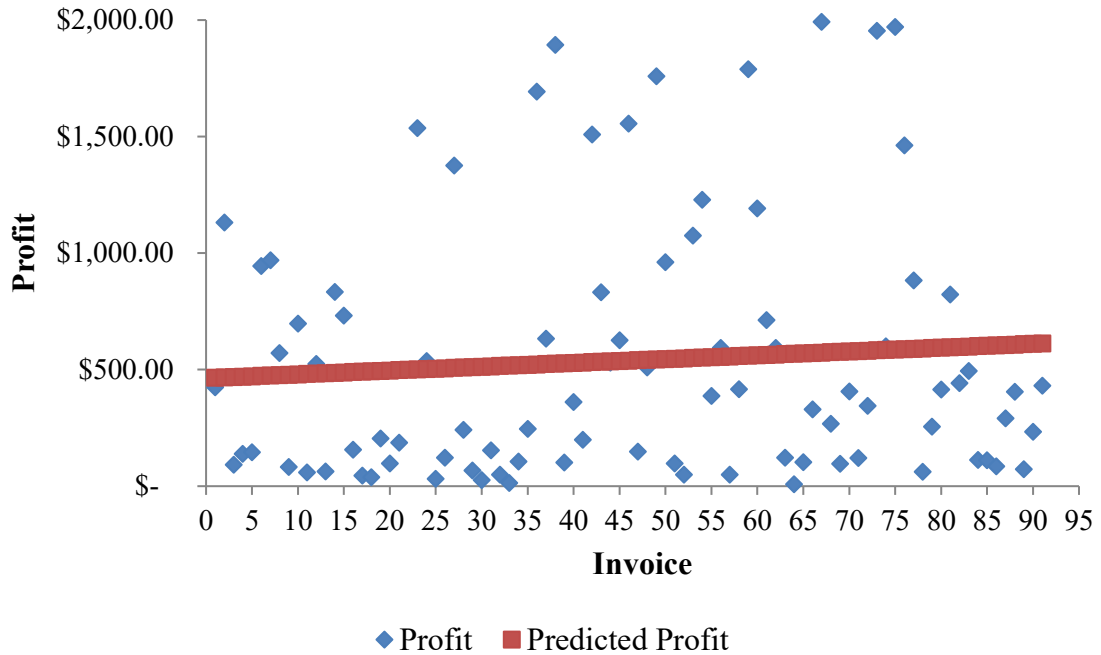


Table 4.2: Invoice Profit Analysis

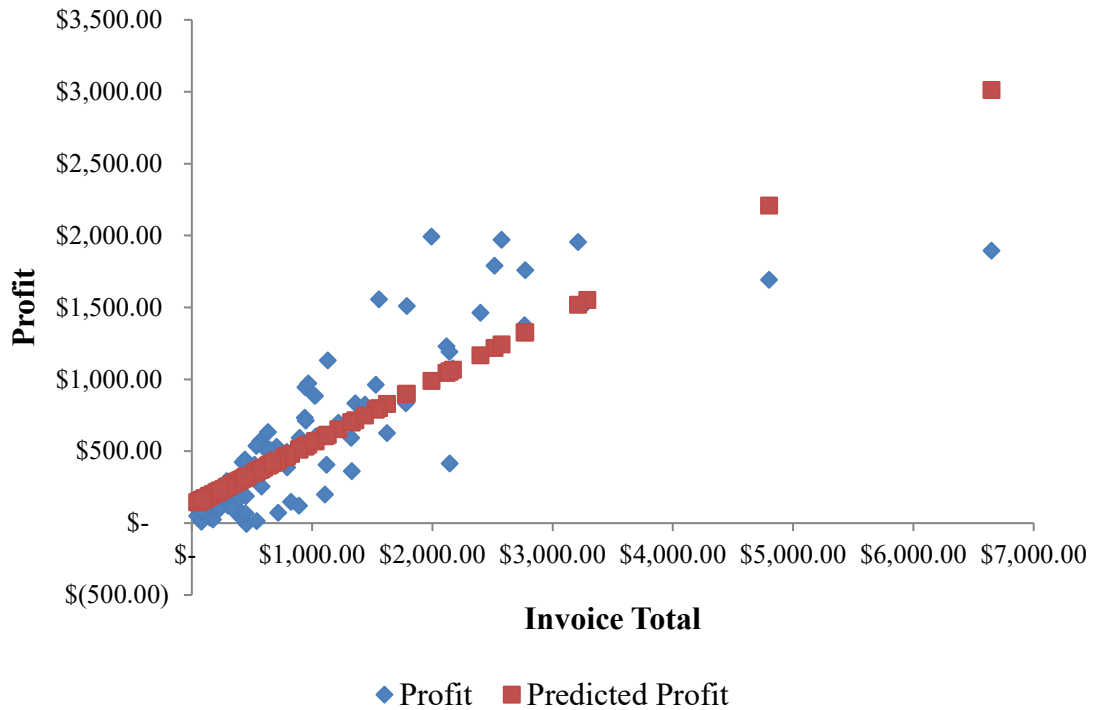
	Invoice Total (\$)	Profit (\$)	Costs (\$)	Profit/Invoice Total (%)
Mean	\$955.20	\$538.09	\$417.11	63%
Standard Deviation	\$1,075.61	\$551.42	\$675.40	30%
Minimum	\$48.26	-\$7.14	\$0.00	-2%
Maximum	\$6,648.61	\$1,991.63	\$4,755.83	100%

Regression analysis of invoice profits to invoice total populates the following formula:

$$(4.1) \quad Profit = f(Invoice\ Total)$$

This means profit is a function of invoice total and translates to every \$1 of invoice total equals \$0.43 of profit plus the base profit per invoice of \$123.29 and is graphed in Figure 4.2. The predicted profit trendline is moving in an upward and positive direction showing consistent numbers for each invoice based on total invoice amount.

Figure 4.2: Invoice Total Line Fit Plot



Not only is the dollar value of profit important for Company XYZ to meet their goals for 2023, but the number of invoices per month determines the multiplier for profit. Displayed in Figure 4.3, there is a negative and downward trendline, which means that as monthly sales decrease, it takes more days on average to complete an invoice. Logically, this makes sense as invoices are how sales are generated and the lower the number of sales, the fewer invoices closed and the higher the number of days to close the invoices rises. However, there may be fluctuations in the number of invoices each month, as some invoices may have a higher profit than others and take longer to complete the work. With

these fluctuations, the business may still be able to reach the total profit target each month even without 20 invoices.

Figure 4.3: Average Days/Invoice Line Fit Plot

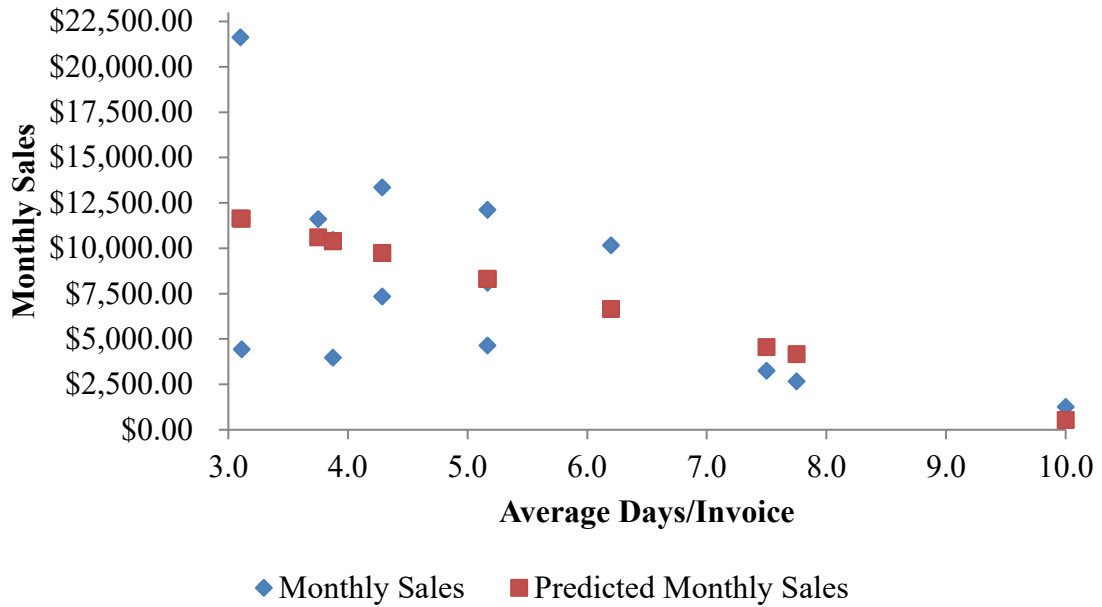


Table 4.3 shows the number of invoices completed each month from the previous year. Given the target for 2023 is 20 invoices per month, there is room for growth going forward by completing more invoices each month and better time management. Gaining a better understanding of how business flows through Company XYZ compared to the industry will be crucial for growing numbers of invoices each month to reach the target.

Table 4.3: Number of Invoices per Month

Month/Year	Number of Invoices
Nov-21	4
Dec-21	6
Jan-22	4
Feb-22	9
Mar-22	5
Apr-22	7
May-22	10
Jun-22	8
Jul-22	6
Aug-22	8
Sep-22	3
Oct-22	6
Nov-22	7
Dec-22	8

4.3 Social Media Marketing

In addition to financial data, marketing trends were looked at to include the number of Facebook posts created in each month and identify any correlations between sales and number of social media posts. Advertising is important for small businesses but can be a costly expense. In this case, Company XYZ has no costs for advertising when using their business page on social media platform, Facebook. Adding up the number of posts shared per month by family-related posts, job-related posts, and total posts was completed in Table 4.4 and then placed next to monthly sales.

Table 4.4: Social Media Posts

Month	Job Related Posts	Family Related Posts	Total Posts	Monthly Sales
Oct-21	6	0	6	\$0.00
Nov-21	0	0	0	\$3,241.66
Dec-21	1	0	1	\$4,632.61
Jan-22	1	0	1	\$2,659.50
Feb-22	1	0	1	\$4,435.62
Mar-22	6	0	6	\$10,163.97
Apr-22	8	1	9	\$7,336.60
May-22	9	1	10	\$21,621.33
Jun-22	1	0	1	\$11,605.67
Jul-22	1	2	3	\$12,110.22
Aug-22	2	0	2	\$10,451.28
Sep-22	3	2	5	\$1,257.62
Oct-22	4	0	4	\$8,091.01
Nov-22	3	1	4	\$13,346.53
Dec-22	3	2	5	\$3,968.67

Scatter plots were created in Figures 4.4, 4.5, and 4.6 to show how the number of posts lines up with the dollar amount of sales for each month with number of posts on the Y-axis and dollars of sales on the X-axis. All line fit plots for social media posts compared to monthly sales have upward and positive trendlines. Job-related line fit plot has data points on either side of the line, but they are not clustered around the line as number of posts increases. Most data points are clustered on the lower end of the trendline with lower sales and lower number of job-related posts falling closer together on the graph. There were fewer family-related posts in the period analyzed compared to job-related. The data points clustered around 0 family-related posts for each month means most of the time there was no relationship with sales as there were no posts written for this category. Total posts compared to monthly sales spreads the data points out across the trendline and the results fall closer to the line itself as you move across.

Figure 4.4: Job Related Line Fit Plot

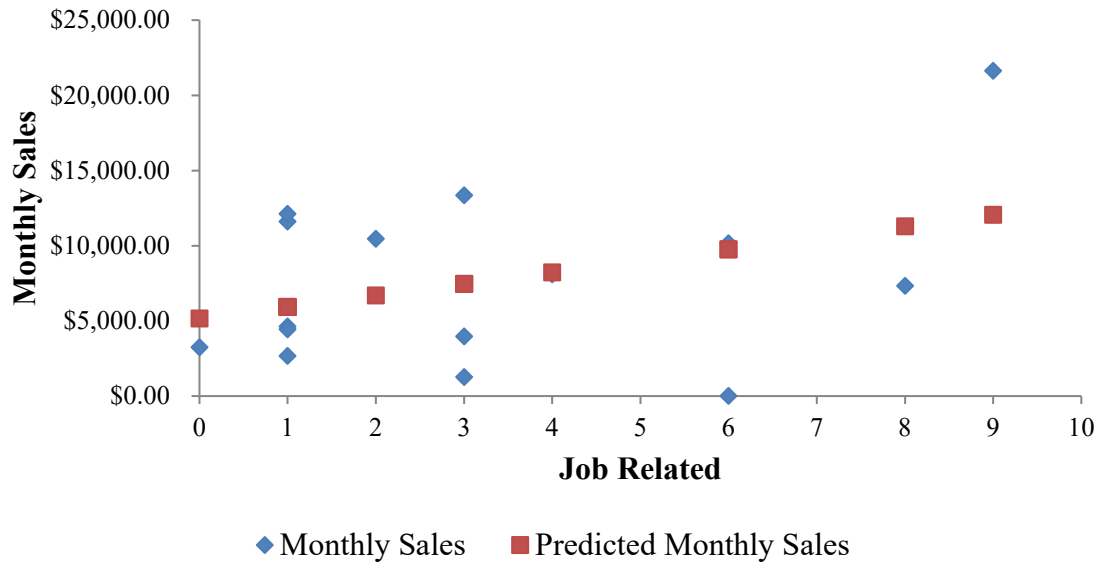


Figure 4.5: Family Related Line Fit Plot

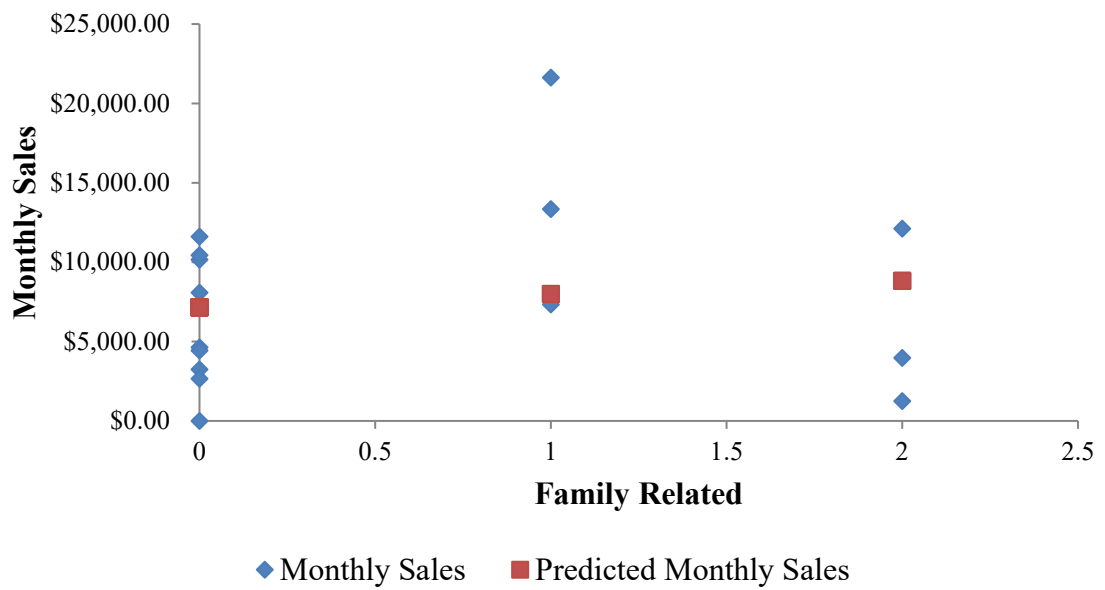
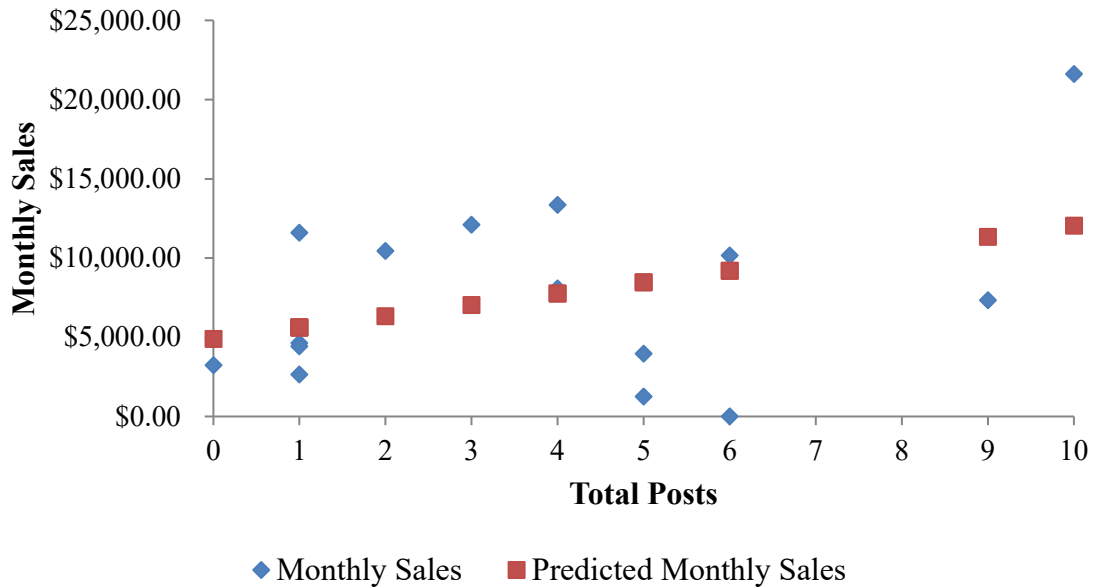


Figure 4.6: Total Posts Line Fit Plot



Regression analysis was completed for job-related, family-related, and total posts to determine coefficients for the formulas. Line fit plots were generated to visually see the formula for each category of posts. Job-related posts compared to monthly sales resulted in the formula:

$$(4.2) \quad \textit{Profit} = f(\textit{Job - related Posts})$$

Profit is a function of job-related posts in this case. A single job-related post results in \$746.55 profit plus \$5,163.97 in base profit each month. Family-related posts compared to monthly sales resulted in the formula:

$$(4.3) \quad \textit{Profit} = f(\textit{Family - related Posts})$$

Profit is a function of family-related posts for this comparison. A single family-related post results in \$835.84 profit plus \$7,159.98 in base profit each month. A regression was completed including both variables in the same analysis and the resulting formula for this was:

$$(4.4) \quad \textit{Profit} = f(\textit{Job - related Posts}, \textit{Family - related Posts})$$

Profit was a function of both variables from social media posts. With this combined equation, the information results in each job-related post brings in \$744.31 in profit, each family-related post brings in \$479.20, and base profit per month would be \$4,942.56.

Table 4.5: Regression Results

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	462.79***	117.51	3.94	0.000
Invoice Profits in \$	1.64	2.22	0.74	0.462
Intercept	123.29***	41.54	2.97	0.004
Profit Per Invoice Total	0.43***	0.03	15.04	0.000
Intercept	16623.05***	3582.75	4.64	0.001
Average Days/Invoice	-1608.58**	642.77	-2.50	0.028
Intercept	4942.56	2462.73	2.01	0.068
Job Related	744.31	550.78	1.35	0.202
Family Related	479.20	1855.33	0.26	0.801
Intercept	4897.45	2344.91	2.09	0.057
Total Posts vs Sales	714.84	484.06	1.48	0.164
Intercept	5163.97**	2224.29	2.32	0.037
Job Related	764.55	525.24	1.46	0.169
Intercept	7159.98**	1893.93	3.78	0.002
Family Related	835.84	1893.93	0.44	0.666
Intercept	4997.57**	2095.22	2.39	0.033
Total Posts vs Sales (LAG)	926.13	432.52	2.14	0.052

** (5% level of statistical significance); *** (1% level of statistical significance)

The first section of Table 4.5 shows the intercept and dollars of invoice profits from Figure 4.1. The intercept is statistically significant at the 1% level, while the dollars of profit coefficient is not significant for this analysis. Figure 4.2's regression analysis shows the intercept and invoice total values are statistically significant at the 1% level. The difference between these two figures is profits were analyzed against monthly sales totals in Figure 4.1, while total invoice amounts were analyzed in Figure 4.2.

The average days per invoice had a negative coefficient and was significant at the 5% level, while the intercept value was at a 1% level of significance for Figure 4.3. As the average days per invoice increases, sales each month are decreased by \$1,608.58. The intercept crossing at \$16,623.05 signifies that if all invoices are closed out the same day this would be the monthly sales value.

Social media regression analysis, without a lag, shows almost no statistical significance except for intercept values for job-related and family-related regressions at the 5% level. To look further into the correlation between total monthly sales and total number of social media posts, a separate analysis was completed using the previous month's social media total posts and the following month's sales. Table 4.6 displays how the regression analysis for the lag was created.

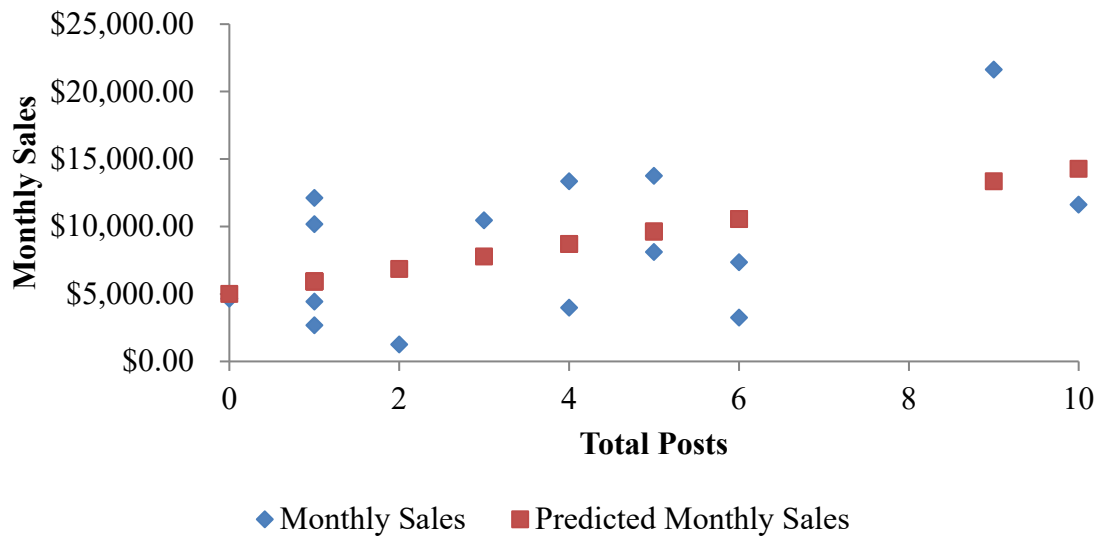
Table 4.6: Social Media Analysis with a Lag

Month	Total Posts	Month	Monthly Sales
Oct-21	6	Nov-21	\$3,241.66
Nov-21	0	Dec-21	\$4,632.61
Dec-21	1	Jan-22	\$2,659.50
Jan-22	1	Feb-22	\$4,435.62
Feb-22	1	Mar-22	\$10,163.97
Mar-22	6	Apr-22	\$7,336.60
Apr-22	9	May-22	\$21,621.33
May-22	10	Jun-22	\$11,605.67
Jun-22	1	Jul-22	\$12,110.22
Jul-22	3	Aug-22	\$10,451.28
Aug-22	2	Sep-22	\$1,257.62
Sep-22	5	Oct-22	\$8,091.01
Oct-22	4	Nov-22	\$13,346.53
Nov-22	4	Dec-22	\$3,968.67
Dec-22	5	Jan-23	\$13,756.57

Results from this regression show the intercept is statistically significant at the 5% level, but the total posts compared to sales still remained insignificant. The coefficients

with lag compared to without the lag ended up close together with an increase of \$100.12 between the intercept values and a decrease of \$211.29 between total posts. The p-value for total posts decreased with the new analysis showing closer to a 5% significance value, but not fully reaching statistical significance. The line fit plot for the lag analysis is shown in Figure 4.7 and displays similar patterns to the original chart from Figure 4.6.

Figure 4.7: Total Posts Line Fit Plot with Lag



CHAPTER V: RECOMMENDATIONS AND CONCLUSION

Financial ratios displayed a financially healthy company in comparison to the industry averages. Company XYZ has a small amount of debt it carries from month to month which helps its financial liquidity ratio values. Maintaining low debt will keep liquidity ratios stable and trending in a positive direction for the long-term success. Efficiency ratios landed below average for the previous year, which can be improved going forward by closing out invoices to bring in additional sales and turnover inventory faster. Profitability ratios show a positive trend for Company XYZ for both the previous and current year. Looking at the current year, profit margin percent increased significantly with the owner's focus on company goals for 2023. Continuing to focus on meeting goals of 20 invoices per month and a minimum of \$700 profit will keep the profit margin value positive. Solvency ratios for Company XYZ can be maintained for the future by keeping overhead costs, or long-term debt, low. Forward looking for Company XYZ means keeping a minimum balance of capital in the accounts to continue financing with equity and not debt financing. This will also keep the reservoir from being emptied resulting in business failure.

Invoices showed profitability for all but one invoice out of 91. Invoice profit can be maximized by selling parts with lower costs and higher markups. Having check-in and check-out sheets can help identify issues that may need to be fixed, which could be added to the invoice or create a return visit for increased profits. All invoice data resulted in statistically significant values for the average invoices per day, profits per invoice, and total invoice dollars compared to monthly sales. Company XYZ is close to meeting their goal of \$700 profit per invoice with their average profit only \$161.91 away from the target. Averaging 63% profit across all completed invoices shows a healthy profit margin for

Company XYZ and the trendline for this data going upwards in a positive direction is a good sign for the long-term. While not close to the target of 20 invoices per month, Company XYZ can focus on this number by completing an invoice a day during a 5-day work week.

Limitations of the invoice analysis were warranty invoices and timeframe constraints with the data. There were no invoices created for warranties, meaning warranty labor loss, or cost, was not captured in this overall analysis. Time constraints played a factor in this analysis as only invoices from the previous year were looked at for data analysis. Looking into 2023 invoices would have shown how well Company XYZ has been meeting their 2023 goals so far.

Social media regression analysis showed low statistically significant values meaning there were additional factors that played into how much capital was brought in each month other than social media. Social media posts brought in additional sales overall, but results followed Cox's (2012) study about social media creating a brand name first leading to sales. Gaining business by growing the company name on social media can lead to customer recommendations and grow the customer pool for future sales which is where the company should be focusing moving forward. When split into 2 categories, family-related had little impact on sales, while job related had a higher impact, but still not statistically significant overall. Total posts compared to sales showed an even stronger impact on sales each month but was also not statistically significant, even with the lag regression. Additional factors play into what brings in monthly sales that were not discovered in this study.

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