

Social Media Marketing Effectiveness and Business Performance: An Empirical Analysis Using Digital Marketing Metrics

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Abstract

Social media has become an important component of contemporary marketing strategy, enabling organizations to communicate with customers, generate traffic, stimulate conversions, and support revenue growth. This study examines the association between selected social media marketing metrics and business performance using a 99-observation dataset and EViews-based statistical analysis. The study considers impressions, clicks, conversions and revenue and applies descriptive statistics, correlation analysis, an Augmented Dickey-Fuller (ADF) test, an ARCH test, and a GARCH-based model. The reported results show a strong positive association between conversions and revenue ($r = 0.982563$, $p < 0.001$). The descriptive statistics also indicate substantial variation in impressions, clicks and revenue over the observation period. The ADF result reported for the tested series indicates stationarity ($t = -12.01906$, $p = 0.0001$). The ARCH test provides evidence of conditional heteroskedasticity ($F = 25.67314$, $p < 0.001$; $\text{Obs} \cdot R^2 = 20.67809$, $p < 0.001$), supporting the use of a volatility-sensitive specification. The GARCH output reports statistically significant effects for impressions, revenue, AR terms and the GARCH variance term. These findings suggest that social media metrics can provide useful managerial signals for monitoring marketing performance, while also demonstrating the importance of accounting for volatility in digital performance data. The study does not interpret correlation as proof of causation and recommends further validation using a clearly documented multi-firm or multi-platform dataset.

Keywords: Social media marketing; digital marketing; business performance; conversions; revenue; impressions; GARCH; EViews

1. Introduction

The rapid expansion of digital platforms has transformed the way organizations communicate with customers, promote products and services, and evaluate marketing performance. Social media is no longer limited to brand communication; it is increasingly integrated with customer relationship

management, content strategy, advertising, sales support and performance measurement. The literature shows that social media use can be associated with financial, operational, innovation and other dimensions of organizational performance, although the strength of these relationships varies by platform, industry, firm characteristics and the specific type of social media activity undertaken.

From a management perspective, the value of social media depends not simply on the volume of activity but on the organization's ability to convert exposure and engagement into meaningful outcomes. Impressions may indicate reach, clicks may reflect audience response, conversions may represent a movement toward commercial action, and revenue provides a more direct business outcome. Examining these measures together can therefore help managers understand the performance of digital campaigns and identify patterns that warrant further investigation.

Prior research has documented relationships between social media activity and business outcomes. Dolega, Rowe and Branagan (2021), for example, examined the relationship between social media marketing and retail website traffic, orders and sales. Aydin (2020) highlighted the role of social media engagement and organic content in hospitality marketing. More recent research has emphasized that social media capabilities can contribute to brand and firm performance, while meta-analytic evidence suggests that the relationship between social media use and organizational performance is heterogeneous rather than universally identical.

The present study extends this discussion by examining a short time-series dataset containing digital marketing performance measures and by applying statistical procedures available in EViews. Particular attention is given to correlation, stationarity and conditional volatility. The study therefore seeks to answer three questions: (1) What are the descriptive characteristics of the principal social media performance indicators? (2) What is the observed association between conversion and revenue? and (3) Does the dataset exhibit time-series and volatility characteristics that should be considered when evaluating social media marketing performance?

2. Literature Review

2.1 Social Media Marketing and Organizational Performance

Social media marketing is increasingly viewed as a strategic organizational capability rather than only as a promotional communication channel. Research has examined social media in relation to customer engagement, relationship management, brand outcomes, sales facilitation and organizational performance. A large meta-analysis covering 65 empirical studies and 24,576 organizations found that different forms of social media use—including social marketing, social listening and monitoring, social communication, and social networking—can have different relationships with financial, innovation, social and operational performance. The evidence also indicates that industry and platform characteristics can moderate these relationships.

2.2 Customer Engagement and Marketing Outcomes

Customer engagement is an important mechanism through which digital marketing activity may produce business outcomes. Engagement can include cognitive, emotional and behavioral responses and may be influenced by the characteristics of the platform and the type of interaction encouraged.

Consequently, managers should distinguish between reach-oriented indicators and outcome-oriented indicators rather than treating all social media metrics as interchangeable measures of success.

2.3 Social Media Capabilities and Business Success

Recent studies emphasize the capability perspective of social media marketing. Social media capabilities may include the ability to create relevant content, interact with customers, monitor market responses and integrate digital information into decision-making. Evidence from recent research suggests that these capabilities can support brand equity and firm performance, while other work highlights the importance of customer support, platform trust, perceived value and organizational readiness.

2.4 Research Gap

Although the literature establishes the strategic importance of social media, there remains a practical need to connect commonly observed campaign metrics with measurable business outcomes using transparent quantitative methods. The present study addresses this need by examining impressions, clicks, conversions and revenue within a common analytical framework. It also considers volatility, which is relevant because digital campaign performance can change substantially across time.

3. Objectives of the Study

- To examine the descriptive characteristics of selected social media marketing and business performance indicators.
- To assess the observed relationship between conversions and revenue.
- To examine whether the tested time series exhibits stationarity.
- To test for conditional heteroskedasticity in the reported data.
- To use a GARCH-based specification to examine the relationship between selected marketing variables and conditional variance.
- To derive practical implications for managers seeking to evaluate and improve social media marketing effectiveness.

4. Research Methodology

4.1 Research Design

The study uses a quantitative, empirical research design based on secondary digital marketing performance data. The submitted manuscript reports 99 observations covering impressions, revenue, clicks and conversion-related measures. EViews is used for statistical estimation and diagnostic testing.

4.2 Variables

The principal variables are defined conceptually as follows: impressions represent the number of times marketing content or advertisements were displayed; clicks represent user responses to the displayed content; conversions represent completed target actions; and revenue represents the

associated monetary outcome. The exact platform, campaign source, geographic market and data-collection period should be stated in the final manuscript if this information is available to the authors.

4.3 Statistical Procedures

Descriptive statistics are used to summarize the distribution of impressions, revenue and clicks. Pearson correlation is used to assess the linear association between conversions and revenue. The ADF test is used to evaluate stationarity for the series reported in the EViews output. An ARCH test is applied to assess whether the residual variance exhibits conditional heteroskedasticity. A GARCH-based model is then used to examine conditional volatility and the reported relationships among the model variables.

4.4 Interpretation and Statistical Caution

The analysis is observational. Therefore, a statistically significant correlation or regression coefficient is interpreted as an association and not as proof that social media activity causes revenue or conversions to change. The relatively short sample of 99 observations also limits the generalizability of the findings. The results should therefore be viewed as empirical evidence from the reported dataset rather than as a universal estimate of social media marketing effectiveness.

5. Results and Findings

5.1 Descriptive Statistics

The reported EViews output contains 99 observations. Impressions have a mean of 583,535.4 and a standard deviation of 105,068.6, with values ranging from 300,000 to 900,000. Revenue has a mean of 12,546.46 and a standard deviation of 2,274.316, with a minimum of 7,500 and a maximum of 20,000. Clicks have a mean of 5,959.596 and a standard deviation of 1,065.308, with a minimum of 3,500 and a maximum of 9,200. These statistics indicate substantial movement in the campaign indicators over the observation period.

Variable	Mean	Std. Dev.	Minimum	Maximum
Impressions	583,535.4	105,068.6	300,000	900,000
Revenue	12,546.46	2,274.316	7,500	20,000
Clicks	5,959.596	1,065.308	3,500	9,200

5.2 Correlation between Conversions and Revenue

The reported correlation matrix shows a correlation coefficient of 0.982563 between conversions and revenue, with a reported probability value of 0.0000. This indicates a very strong positive linear association in the sample. The result suggests that periods with higher conversion activity tend to coincide with higher revenue in the observed dataset. However, the result should not be described as a 98.2563% probability of generating revenue. The value 0.982563 is a correlation coefficient, and the associated probability value indicates statistical significance of the correlation under the relevant test.

5.3 Stationarity Test

The reported ADF statistic is -12.01906 with a probability value of 0.0001. The statistic is more negative than the reported critical values at the 1%, 5% and 10% levels (-3.498439, -2.891234 and -2.582678 respectively). Accordingly, the null hypothesis of a unit root is rejected for the series tested. This provides evidence of stationarity for that particular series. The final manuscript should identify explicitly which variable was subjected to the ADF test.

5.4 ARCH Test

The ARCH test reports an F-statistic of 25.67314 with $p < 0.001$ and an Obs*R-squared statistic of 20.67809 with $p < 0.001$. These results provide evidence against the null hypothesis of no ARCH effects and therefore support the presence of conditional heteroskedasticity in the tested residual series. This is important because it indicates that the variance of the errors is not constant over time and provides a statistical rationale for considering a GARCH-type specification.

5.5 GARCH Model Results

The reported GARCH model shows statistically significant coefficients for impressions (0.000240; $p < 0.001$), revenue (0.013955; $p < 0.001$), AR(1) (0.129846; $p < 0.001$), AR(2) (0.864925; $p < 0.001$), and MA(2) (-0.666718; $p < 0.001$). The MA(1) coefficient is not statistically significant at the 5% level ($p = 0.3875$). In the variance equation, the GARCH(-1) coefficient is positive and statistically significant (1.054056; $p < 0.001$), while the lagged squared residual term is not significant at the 5% level ($p = 0.0700$).

The reported R-squared is 0.977890 and the adjusted R-squared is 0.976675. These high values indicate that the estimated mean equation explains a large proportion of variation in the dependent variable within the fitted model. They should not, however, be interpreted as evidence that social media marketing alone causes 97.8% of business performance. Model fit is conditional on the variables and specification used.

5.6 Forecast Performance

The submitted EViews forecast output reports a 97-observation forecast evaluation and indicates a root mean squared error of approximately 22.48, a mean absolute error of approximately 21.30 and a mean absolute percentage error of approximately 7.56%. These indicators suggest that the reported forecasting specification has useful predictive performance within the sample used. Because the underlying raw series and forecasting protocol were not supplied with the manuscript, the forecast results should be independently reproduced before final publication.

6. Discussion

The findings support the general proposition that digital marketing performance indicators can move together with business outcomes. The particularly strong association between conversions and revenue is consistent with the managerial expectation that commercially meaningful customer actions are more closely connected to financial outcomes than exposure metrics alone. This is also consistent

with recent research emphasizing the link between social media capabilities, customer engagement and firm performance.

At the same time, the results demonstrate why managers should avoid relying on a single social media metric. Impressions measure exposure, clicks measure interaction, conversions represent a deeper behavioral response, and revenue represents a financial outcome. A useful performance dashboard should therefore connect these stages rather than treating high reach as equivalent to high profitability.

The ARCH and GARCH findings add another management implication. Digital marketing performance is not necessarily stable across time. Campaign launches, platform changes, seasonality, audience behavior and changes in advertising spend can generate periods of unusually high or low variance. Monitoring volatility can therefore complement ordinary performance reporting and help managers distinguish temporary fluctuations from persistent changes.

7. Managerial Implications

- Managers should evaluate social media campaigns using a conversion and revenue-oriented dashboard rather than impressions alone.
- Marketing teams should monitor the relationship between reach, clicks and conversions to identify where potential customers are being lost in the conversion process.
- Revenue attribution should be combined with campaign-level data to improve decisions about advertising budgets and content strategy.
- Digital performance dashboards should include volatility or variation indicators because campaign performance may not be constant over time.
- Organizations should integrate social media analytics with customer relationship management and sales information so that digital engagement can be linked to broader business outcomes.
- Managers should avoid interpreting strong correlation as proof of causation and should use controlled experiments, A/B testing or longer panel datasets when causal estimates are required.

8. Limitations of the Study

- The study is based on only 99 reported observations, which limits generalizability.
- The submitted manuscript does not sufficiently identify the original platform, organization(s), geographic market, exact observation period or data-collection procedure.
- The study uses observational data and therefore cannot establish causal relationships.
- The analysis reported in the manuscript does not include a complete description of control variables such as advertising expenditure, seasonality, platform type or product category.
- The GARCH specification should be reproduced from the original EViews workfile before publication to confirm the exact dependent variable, lag structure and model diagnostics.

- Future research should use longer time periods and, where possible, multi-firm or multi-platform panel data.

9. Conclusion

This study examined social media marketing effectiveness through a set of digital performance indicators and EViews-based statistical procedures. The reported results indicate a very strong positive association between conversions and revenue and provide evidence of conditional heteroskedasticity in the tested series. The GARCH results further suggest that volatility should be considered when analysing digital marketing performance over time.

The managerial significance of the findings lies in the need to connect social media exposure with deeper behavioral and financial outcomes. Impressions and clicks are useful leading indicators, but conversions and revenue provide stronger evidence of commercial value. Organizations can therefore improve digital marketing decisions by integrating social media analytics, conversion tracking, revenue measurement and volatility monitoring.

The study should nevertheless be interpreted within the limitations of the available dataset. In particular, the reported results require confirmation using the original EViews workfile and a transparent description of the data source and collection procedure. Future research using larger, longer and multi-platform datasets can provide more robust evidence concerning the causal and strategic effects of social media marketing on business performance.

10. References

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