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# The Determinants of Firm Profitability: The Effect of Social Media

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# THE DETERMINANTS OF FIRM PROFITABILITY: THE EFFECT OF SOCIAL MEDIA

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**Abstract**

This study seeks to explore whether social media plays an important role in determining a firm's profits. Using data from 392 Large American firms from the period 2005-2013, obtained primarily from the database, COMPUSTAT, I find that a firm's adoption of Social Media plays a minor role in determining profits, while higher Lagged Profits, Lagged Productivity, Firm Sizes, and Advertising Expenses lead to higher profits.

## 1. Introduction

The primary ambition of this paper is to explore which factors are significant in determining firm profitability. Specifically, this paper explores how Social Media is relevant to firm profitability. This investigation exposes that variables, such as Lagged Profit, Lagged Productivity, Firm Sizes and Advertising Expenses all have significant impacts on Firm Profits. The Social Media variable however, does not emerge as significant.

The determinants of profit have always been important knowledge to firms. Many studies have been done examining certain aspects of the way firm's conduct business and its effect on profits. However, up to this point there have been no papers written specifically analysing Social Media's effect on Firm Profits. The purpose of this paper is to combine the Social Media literature and the firm profitability literature by examining the effect Social Media has on firm profitability over and above the usual determinants of firm profits. By including a Social Media dummy variable in a regression analysing determinants of Firm Profits, I am able to examine Social Media's effect on firm profits.

Social Media has been an increasing presence in all aspects of life in the last decade (Shih 2009). Online platforms such as Facebook.com and Twitter have become common tools for the modern person to interact with. These Social Media platforms have increasingly become more integrated into our social lives and as of recently, the business world (Shih 2009). Social Media has created a space where the social world has been intertwined with the business world. These sites enable the connection and sharing of ideas and information which has led to greater efficiency in markets (Trainor 2012). I estimate that as firms' adopt Social Media, it will bring them these various business advantages which will in turn increase their profits.

Using data from COMPUSTAT, Facebook.com, and Forbes 2000, I find that Social Media is not a significant determinant of Firm's Profits. Consistent with the existing literature however I do find that firm's Lagged Profits, Lagged Productivity, Firm Size, and Advertising Expenses all emerge as relevant factors in determining Firm's Profits.

The remainder of the paper is as follows. Section 2 discusses the existing literature on Firm Profits and Social Media in more detail. The data is presented in Section 3. Section 4 presents the empirical strategy and results. The conclusions are discussed in the final section

## 2. Literature Review

Social Media's recent integration into the business world has not allowed for much literature to be written on its role on business profits. However, there does exist a comprehensive number of articles that discuss the benefits Social Media brings to business. There also exists a thorough amount of articles written on the determinants of Firm Profits. I present both these strands of literature and demonstrate the connections between the two to indicate Social Media's role in determining Firm Profits.

### *2.1 Determinants of Profit Literature*

Profit is the most important financial measure to most businesses. In order to survive and succeed in a competitive market firms must focus on maximizing profit, or they will eventually be driven out of business (Dutta & Radner 1999). Jovanovic (1982) supports this claim by saying that only efficient firms stay in the market, and that less productive firms will eventually exit the market. Many companies are thus very understandably interested in what factors influence profits. The existing literature on Firm Profits point to several key determinants of profits, in which I will discuss each in turn.

First, a number of studies have shown that higher Lagged Profits lead to higher Current Profits (see for example, Hurdle 1974 and Stierwald 2009). These studies argue that this finding is not surprising because Lagged Profits are indicative of the firm's potential performance and help establish the firm in maintaining their competitive position (Stierwald 2009). These Lagged Profits are also a good sign of growth as they are able to be re-invested in the firm, and help the firm realize profits in the future (Stierwald 2009).

Second, it has also been shown that Lagged Productivity is an important determinant of Firm Profits (see for example, Demsetz 1973 and Stierwald 2009). Specifically, Demsetz (1973) argues that with increased Productivity a firm is able to realize lower average costs of production, higher product quality, and a higher output quantity produced.

Third, studies show that highly productive firms are more profitable than their less productive competitors and that this effect grows with increasing persistence at high productivity levels (see for example, Demsetz 1973 and Jovanovic 1982). Stierwald (2009) also finds this to be true, as his Productivity Persistence variable is significant and positive on Firm Profits.

Fourth, an interaction term between Productivity and Productivity Persistence is shown to be significant in determining Firm Profits (see for example, Stierwald 2009). This further reinforces that persistent firms with high productivity levels will receive higher profits

Fifth, the Firm Size is another important factor in determining Firm Profits (see for example Bain 1951, Hall & Weiss 1967, and Stierwald 2009). These studies claim that larger firms benefit in relation to smaller firms in higher brand recognition, greater amounts of funds and resources, as well as economies of scale, where they are able to produce larger quantities at a lower per unit cost (Stierwald 2009).

Sixth, a number of studies have shown that a higher Leverage Ratio leads to higher Firm Profits (see for example, Hurdle 1974 and Stierwald 2009). Specifically Hurdle (1974)

argues that large debt corresponds with large rates of return, supporting the Capital Assets pricing model, in which individuals demand a higher return for taking on more risk.

Seventh, it has also been shown that Firm Age is a significant determinant of Firm Profits (see for example Geroski 1998 and Stierwald 2009). Stierwald (2009) argues that a firm's age may serve as an approximation of intangible capital, such as market experience and reputation.

Eighth, a number of studies have found Industry differences to be an important component in determining a firm's profit (see for example Hurdle 1974, Peltzman 1977, Geroski 1998, and Stierwald 2009). Specifically, Peltzman (1977) argues that different industries have different market concentration, which will have an effect on productivity levels and collusion.

Ninth, it has been shown that Advertising Expenditures is an important determinant of Firm Profits (see for example, Hurdle 1974). Specifically, Hurdle (1974) argues that advertising has become a means of product differentiation, and hence encourages customers to buy more of the specific advertised product. These ads help build brand identity, increase sales, and hence capture a higher percentage of the market share (Hurdle 1974).

### *2.2 Social Media Literature*

Since the emergence of Social Media in the last 15 years, there has been a profuse amount of literature written on the benefits Social Media can have for businesses. However, although these articles look at the advantages that can come to businesses through Social Media, they do not specifically look at if they ultimately influence Firm Profits. I will discuss the benefits that come to firms as they adopt Social Media and then marry this strand of literature to what determinants make Firm Profits.

In the last 15 years, Social Media has come to be an important factor in many forms for businesses. Social Media's complex networks and global reach has provided it means to enhance business goals on many levels. This emergence of Social Media has allowed companies to sell more of their products, which in turn increases their revenues and profits (Shih 2009).

Social Media's wide reaching capacity gives it the ability to create new opportunities for the company involved, by reaching further markets. This technology has evolved from simply connecting friends to now an important business platform for reaching new potential customers, which may potentially raise their Firm Size (Shih 2009). According to the Nielsen Company (2010), Social Media users worldwide have grown from 244 million in 2010 to 315 million just a year later. All of these online users are potential customers as they are now connected into the network through which businesses are able to communicate with their potential customers. This transformative technology is allowing business now to be done further and further in the marketplace, as companies are able to get in touch with customers all over the world, as well as receive ideas and from these remote places (Rodriguez, Petersen, & Krishnan 2012).

Social Media also has the ability to encourage the sharing of new knowledge and expertise, which has gone onto increase the development of new innovations and products (Zwass 2010). In turn now these companies are able to be more productive by producing goods and services that are demanded by the market (Zwass 2010).

Firms are also able to utilize Social Media in researching other businesses to do business with, and how to incorporate their products into their business (Rodriguez, Petersen, and Krishnan 2012). For example, Forrester Research conducted a study in which they surveyed over 1,200 technology executives on their Social Media usage in relation to their buying behaviour (Rodriguez, Petersen, and Krishnan 2012). They find that over 75% of

these individuals utilize Social Media in order to research and obtain information of specific product or services that they are interested in. Again, this information is helping reduce transaction costs and making research more efficient, which is in turn making these companies more productive (Rodriguez, Petersen, and Krishnan 2012).

Additionally, Social Media increases a company's ability in managing customer relationships, as they are more closely connected with these individuals via their Social Media contacts, relative to traditional customer relationship techniques (Trainor 2012). These Social Media sites give the firm the ability to communicate more efficiently with potential customers, which helps improve the firm's ability to win clients. Specifically, Erffmeyer and Johnson (2001) demonstrate in their paper that Social Media has helped sales professionals improve closing rates and generate revenue faster. These Social Media platforms provide simple and quick ways of communication, that range from messages, comments, to posts (Erffmeyer and Johnson 2001). Both of these factors then have a net positive effect on these company's abilities to sell their products and services. By being more aware of their customers' needs, and fostering these relationships, companies are able to enhance their sales figures as they create new innovative products to more loyal customers (Trainor 2012).

Companies spend millions of dollars in order to enhance their sales forces and build stronger relationships with customers (Rodriguez, Petersen, and Krishnan 2012). The Customer Relationship Model (CRM) is a new concept that has grown out of this and has come to dominate sales teams and marketing strategies (Trainor 2012). Social CRM is also able to identify emerging market trends via these social media sites (Rodriguez, Petersen, and Krishnan 2012). This platform then provides a forum in order for the customers and companies to have collaborative conversations in order to maximize the value and utility to both parties. From the business's standpoint this increased contact and interaction with their customers results in deeper and more meaningful relationships with their customers, who in

turn are then more likely to stay a loyal customer to the company and continue doing business with them (Trainor 2012).

Social Media is also extremely beneficial to these companies because businesses must capture detailed information about their potential clients, in order to gain a clearer understanding of the client's needs (Rishika, et al. 2013). Social Media gives these companies the ability to scout out their customers and learn about their potential market, rather than simply having the customers learn about the company via advertisements and other traditional models. Social Media gives businesses the ability to screen and self select the clients they are interested in, and by doing these checks and research, they are able to choose those individuals they believe will be the most beneficial to the firm (Shih 2009).

While these studies highlight the potential benefits Social Media can have for a business, they do not explicitly examine the direct effect of Social Media on Firm Profits. Moreover, the existing literature on Firm Profits to the best of my knowledge has not accounted for the potential role of Social Media on a Firm's Profits. Therefor the purpose of this paper is to combine the two strands of literature to determine if there are indeed benefits, in terms of higher profits, from a firm's adoption of Social Media.

## 2. Data

I use data from COMPUSTAT. This dataset is ideal for my purposes because it contains a majority of the financial figures the regression model uses in order to discover the determinants of Firm Profits. The COMPUSTAT data is supplemented with information from Forbes 2000 in order to ascertain Firm Ages, as well as with information from Facebook.com to ascertain the firms' adoption dates of Facebook.

I focus on firms in the S&P 500 as of March of 2014. I restrict the sample to firms with complete information on my variables of interest. This results in a final sample of 392 large American firms for the period 2005-2013.

Firm Profits are computed as the annual Gross Profit for each individual firm, divided by the firm's Net Assets. The dependent and independent variables are scaled by dividing the applicable one's by their firms Net Assets. These annual Gross Profits are computed as the difference between Total Revenue of the firm and the Cost of Goods Sold for the firm. Total Revenue is defined as the Gross Income received from all divisions of the company, while Cost of Goods Sold is defined as all costs directly allocated by the company to production, such as material, labour, and overhead.

I create a Social Media indicator variable that takes on the value of 1 when the firm has adopted Facebook, and a value of 0 in the years prior to adoption. This variable aims at capturing the firms that are quick to adopt Social Media, and analyse the benefits this has had on their profits. The summary stats presented in Table's 6 and 7 indicate Social Media's increasing adoption rates through the time period 2005-2013, with a roughly 30% mean. This shows that for the firm's measured in the time period 2005-2013, around 30% of the time did the company in question have a Facebook page.

Lagged Profit Rates are measured as Profit Rates lagged 1 year from the year being examined for the years 2005 through 2013. For example, if the year under investigation is 2005, then Lagged Profits would be a firm's profits from 2004. Lagged profits

Lagged Productivity Rate is measured as the Productivity Rate lagged 1 year from the year being examined where a firm's Productivity Rate is determined by taking the Total Revenue the firm receives in a year and dividing it by a combination of the costs the firm incurs. These costs include Cost of Goods Sold, Interest Expense, and Selling, General and Administrative Expenses (Coelli et al. 2005

I also create an indicator variable for Productivity Persistence. Specifically, Persistent and Non-Persistent firms are determined by calculating the within-firm average covariance of the firm's current and past productivity levels. These firm's first 3 years (2005-2007) are

compared to the last 3 years (2011-2013) to determine this covariance. Higher values indicate more persistent patterns of productivity. Once these covariance values are calculated, firms that have a covariance value that exceeds the sample wide 75th percentile are assigned a value of 1 and 0 otherwise (Stierwald 2009).

Firm Size is measured by the number of employees a firm has, divided by the Net Assets of the firm. The summary statistics indicate that Firm Size consistently decreases through the years 2005-2013. This may be because the Firm's Net Assets are increasing proportionally quicker than the number of employees. It may also signify companies do not need as many workers as they are able to designate human jobs to computers.

The Leverage Ratio is computed by dividing the Total Liabilities a firm has by the Total Assets the firm has. Firm Age is computed as the difference from the year 2013 and the year the firm was founded.

Advertising Expense is measured by the cost of advertising media, which includes radio, television, periodicals, as well as promotional expenses, which is then divided by the Net Assets of the firm. The summary statistics show that the average Advertising Expenses have gone down consistently for the time period 2005-2013. This is best explained by platforms, such as Social Media, which allow these firms a free means of Advertising. As firms' adopt these free techniques of marketing and advertising they are able to cut down on their Advertising Expenses.

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## Empirical Strategy and Results

Following Stierwald (2009) I estimate a linear dynamic model of firm profitability to determine the role that Social Media has on a firm's profitability. Specifically, I estimate a model of the following form:

$$\pi_{ij,t} = \alpha + \beta SocialMedia_{ij} \ \infty\pi_{ij,t-1} + £prod_{ij,t-1} + d(prod_{ij,t-1}) + \Psi_{ij,t-1} \quad (1) \quad + \sigma empl_{ij,t} \ + \ \Omega lev_{ij} \ + \mu age_{ij,t} + \quad + \quad D_j + \ \varepsilon_{ij,t}$$

Where $\pi_{ij,t}$ ,and $\pi_{ij,t-1}$ represent Current and Lagged Profits for firm i in sector j respectively. Lagged profits are included in the model, as the lagged profit rate is indicative of the firm's success in the market to date, and also allows for the firm to have more resources and assets to utilize in the continuing profitability of the company (Stierwald 2009).

$prod_{ij,t-1}$ and $(prod_{ij,t-1})$ are Lagged Productivity and Productivity Persistence respectively, with $\Psi_{ij,t-1}$ acting as the interaction term between the two variables. Productivity is included in the model as it indicates how efficient the firm is in maximizing their revenue while keeping their costs low. Productivity Persistence is also included as highly productive firms with strengthening persistence are shown to be more profitable than their less productive competitors (Demsetz 1973).

$empl_{ij,t}$ is the Firm Size particular firm i has at time t. Firm Size is included in the model as Firm Size demonstrates a company's ability to engage in economies of scale (Hall and Weiss 1967).

$lev_{ij}$ is a measure of a firm's capital structure, and defined as the ratio of the firm's Total Liabilities to their Total Assets. Leverage Ratio is included in the model as it represents the amount of debt a company has, which should increase a firm's profits under the Capital Assets pricing model (Hurdle 1974).

$age_{ij,t}$ is the age of firm i at time t. Firm Age is included in the model as it is representative of the experience a company has in the market, as well as an established presence in the market, in terms of their customers and their reputation (Stierwald 2009).

$Social\ Media_{ij,t}$ is a Social media dummy variable, holding a value of unity when the firm has adopted Facebook, and 0 before Facebook. This Social Media variable is included in the model as it represents a firm's commitment to social media, as it allows them a new level of marketing and customer feedback that they were not able to experience before (Shih 2009).

Lastly, $D_j$ is a vector of industry indicator variables (the omitted category is the Telecommunications Industry). The Industry variable is included in the model as it accounts for differences in profits across industries, as different industries will have different concentrations which will result in different profits (Gersoki 1998). Table 4 indicates that there is a wide dispersion of firm profitability across different industries. This is evidence that specific industry differences do play an important role in firm profitability. Table 4 presents an overview of the variables used in the profit model in (1).

The last term I include is an error term, $\varepsilon_{ij,t}$, that picks up determinants of profit that are not included in my model.

The results based on equation (1) are presented in Table 3. There are several noteworthy patterns. Consistent with the existing literature I find that Firm Size, Lagged Profits, Lagged Productivity, and Advertising Expense are all statistically significant. Lagged Firm Profits explain for a majority of Firm Profits with an extremely high coefficient of .885. Advertising Expense has a coefficient of .249, Lagged Productivity's coefficient is .0322, while Firm Size is only .00146

Perhaps surprisingly, I do not find a direct effect of the adoption of Social Media on the profitability of a firm. All Industry effects are also insignificant as well as the other

explanatory variables such as Firm Age, the Productivity Persistence dummy variable, the Leverage Ratio, and the interaction variable between Productivity and Productivity Persistence.

My regression structure is as follows. My first regression includes only the Social Media variable as a determinant of profit. After this, I run 9 more regressions, each time including one more profit determinant to see the effect the new variable has on Firm Profits, and how it influences the Social Media variable.

**Table 1: Determinants of Profits (Coefficients and Standard Errors)**

| VARIABLES | (1)<br>FirmProfits | (2)<br>FirmProfits | (3)<br>FirmProfits | (4)<br>FirmProfits |
|---|---|---|---|---|
| Social Media | 0.0500*** | 0.0494*** | 0.0500*** | 0.0501*** |
| | (0.00829) | (0.00765) | (0.00730) | (0.00730) |
| Firm Size | | 0.00945*** | 0.00879*** | 0.00880*** |
| | | (0.000381) | (0.000366) | (0.000366) |
| Leverage Ratio | | | -0.280*** | -0.284*** |
| | | | (0.0151) | (0.0157) |
| Firm Age | | | | 6.38e-05 |
| | | | | (7.20e-05) |
| Constant | 0.271*** | 0.241*** | 0.413*** | 0.411*** |
| | (0.00446) | (0.00429) | (0.0101) | (0.0104) |
| Observations | 3,528 | 3,528 | 3,528 | 3,528 |
| R-squared | 0.010 | 0.157 | 0.232 | 0.232 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Table 2: Determinants of Profits (Coefficients and Standard Errors)**

| VARIABLES | (5) FirmProfits | (6) FirmProfits | (7) FirmProfits | (8) FirmProfits |
|---|---|---|---|---|
| Social Media | 0.0291*** | 0.000756 | 0.000880 | 0.000677 |
| | (0.00648) | (0.00224) | (0.00223) | (0.00223) |
| Firm Size | 0.00814*** | 0.000984*** | 0.00107*** | 0.00106*** |
| | (0.000324) | (0.000120) | (0.000120) | (0.000121) |
| Leverage Ratio | -0.272*** | -0.0160*** | -0.0131*** | -0.0139*** |
| | (0.0139) | (0.00505) | (0.00504) | (0.00508) |
| Firm Age | 9.72e-05 | -7.79e-06 | -1.37e-05 | -1.66e-05 |
| | (6.35e-05) | (2.19e-05) | (2.18e-05) | (2.19e-05) |
| Advertising Expense | 2.836*** | 0.250*** | 0.254*** | 0.256*** |
| | (0.0895) | (0.0348) | (0.0346) | (0.0346) |
| Lagged Profits | | 0.921*** | 0.914*** | 0.914*** |
| | | (0.00570) | (0.00574) | (0.00575) |
| Lagged Productivity | | | 0.0301*** | 0.0303*** |
| | | | (0.00445) | (0.00445) |
| Productivity Persistence | | | | -0.00292 |
| | | | | (0.00239) |
| Constant | 0.380*** | 0.0256*** | 0.0263*** | 0.0280*** |
| | (0.00922) | (0.00386) | (0.00384) | (0.00407) |
| Observations | 3,528 | 3,528 | 3,528 | 3,528 |
| R-squared | 0.403 | 0.929 | 0.930 | 0.930 |

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

**Table 3: Determinants of Profits (Coefficients and Standard Errors)**

| VARIABLES | (9)<br>FirmProfits | (10)<br>FirmProfits |
|---|---|---|
| Social Media | 0.000657 | -0.000214 |
| | (0.00224) | (0.00226) |
| Firm Size | 0.00105*** | 0.00112*** |
| | (0.000121) | (0.000123) |
| Leverage Ratio | -0.0139*** | -0.00755 |
| | (0.00509) | (0.00532) |
| Firm Age | -1.64e-05 | -1.29e-06 |
| | (2.20e-05) | (2.30e-05) |
| Advertising Expense | 0.257*** | 0.249*** |
| | (0.0346) | (0.0364) |
| Lagged Profits | 0.914*** | 0.885*** |
| | (0.00575) | (0.00668) |
| Lagged Productivity | 0.0287*** | 0.0352*** |
| | (0.00716) | (0.00729) |
| Productivity Persistence | -0.00288 | -0.00178 |
| | (0.00239) | (0.00247) |
| Interaction | 0.00252 | -0.000144 |
| | (0.00897) | (0.00909) |
| Energy Industry | | 0.00105 |
| | | (0.00966) |
| Materials Industry | | 0.00173 |
| | | (0.00971) |
| Industrials Industry | | 0.00730 |
| | | (0.00928) |
| Consumer Discretionary Industry | | 0.0140 |
| | | (0.00927) |
| Consumer Staples Industry | | 0.0183* |
| | | (0.00983) |
| Health Care Industry | | 0.0149 |
| | | (0.00942) |
| Financials Industry | | -0.0135 |
| | | (0.00917) |
| Information Technology Industry | | 0.0116 |
| | | (0.00943) |
| Utilities Industry | | -0.0112 |
| | | (0.00960) |
| Constant | 0.0279*** | 0.0268*** |
| | (0.00408) | (0.00982) |
| Observations | 3,528 | 3,528 |
| R-squared | 0.930 | 0.931 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

When including only the Social Media variable, it emerges as significant at the 1% level and with a coefficient of .050. This indicates that without any other explanatory variables present, whether one adopts Social Media or not will influence profits by 5%

The next regression includes Firm Size as a second explanatory variable into the model. Firm Size also emerges as significant at the 1% level while Social Media retains its 1% level significance. Social Media's coefficient slightly falls to .049, while Firm Size has a low coefficient of .0095.

Next, with the Leverage Ratio included, Social Media, Firm Size, and the Leverage Ratio are all significant at the 1% level. Social Media and Firm Size coefficients stay practically the same, while it is interesting to note that the Leverage Ratio takes on a negative coefficient of -.280. This result goes against the Capital Assets pricing model , and instead indicates that as firms take on more risk they are in fact decreasing their profits.

Firm Age is then included, and practically has no effect on any of the other 3 variables. Firm Age is not significant at any level and has an extremely low coefficient of .0006.

When including Advertising Expense, a significant change occurs in the Social Media variable. The Social Media variable, as well as all the others, retain their 1% significance, however, its coefficient drops from .05 to .02. The Advertising Expense coefficient is extremely high at 2.836 and is significant at the 1% level.

Next, when including Lagged Profits, the Social Media variable drops from being significant. The Social Media coefficient drops from .03 to .0007. Firm Size, Leverage Ratio, and Advertising Expense all remain significant at the 1% level, while Lagged Profit has an extremely high coefficient of .921, while also being significant at the 1% level. The other variable coefficients all fall drastically, as the Advertising Expense coefficient drops from

2.836 to .250, the Firm Size coefficient drops from .008 to .0009 and the Leverage Ratio coefficient drops from -.272 to -.016.

There is not much change in coefficients with the inclusion of Lagged Productivity, with all significance levels staying the same. Lagged Productivity emerges as significant at the 1% level with a coefficient of .0301.

The inclusion of the Productivity Persistence variable, the Interaction term, and Industry differences do not affect the results. The only significant change is with the inclusion of the last variable, Industry Differences, where the Leverage Ratio is knocked out from being significant at the 1% level, to not significant.

With all controls variables accounted for, Firm Size, Advertising Expense, Lagged Profit, and Lagged Productivity all emerge as the significant determinants of Firm Profits. The Social Media variable is insignificant and extremely low with a coefficient of -.0002.

## Conclusion

The determinants of Firm Profits has been an important issue for most firms. Recently, the adoption of Social media has also emerged as a significant factor for firm's to analyse.

The study illuminates certain factors that are integral determinants of a Firm's Profits. Our full regression illustrates that a firm's Lagged Profits is the most significant factor in estimating Firm Profits. However, other variables such as Lagged Productivity, Firm Size, and Advertising Expenses are also all significant factors in determining Firm's Profits.

This study adds to existing literature by examining a new Social Media component, and analyses how integrating Social Media into one's business structure may affect profits. The results show that Social Media is insignificant in explaining Firm Profits when all

variables are used, however, Social Media is significant in explaining profits until Lagged Profit is included. Prior to this, Social Media is significant with a positive coefficient, indicating that it is advantageous for a firm to adopt Social Media.

This paper hence identifies particular aspects firms' may utilize in enhancing their profits. By increasing one's Firm Size, increasing one's Productivity, as well as increasing one's Advertising Expenses a firm may expect higher profits, which will then in turn produce higher Lagged Profits which will reinforce higher profits.

My model is limited in only exploring if these firms had adopted Facebook. Social Media includes many other platforms that may have had a more profound effect on the Firm's Profits. Also, because my sample was only examining the most successful firms in the United States, there may have been some bias as far as the level of success went. Had I examined a more diverse array of firms, maybe I would have seen different results.

There is still much room to develop in the field of study, as Social Media continues to become a more integral part of the business platform.

# Appendix

**Table 4: Variables in the Profit Model**

| Dependent Variable | Definition |
|---|---|
| $\pi_{ij}$ | Current Profit Rate |
| **Explanatory Variables** | |
| $\pi_{ij,t-1}$ | Lagged Profit Rate |
| $lnProd_{ij,t-1}$ | Lagged Productivity Estimate |
| $d_t$ $(Prod_{ij,t-1})$ | Productivity Persistence Dummy |
| $\Psi_{ij,t-1}$ | Interaction of Lagged Productivity Level & Productivity Persistence |
| $empl_{ij,t-1}$ | Lagged Firm Size (No. of employees) |
| $lev_{ij,t}$ | Lagged leverage ratio |
| $age_{ij,t}$ | Age of firm |
| $ad_{ij}$ | Advertising Expense |
| $Facebook_{ij}$ | Facebook adoption dummy |
| $D_j$ | Industry dummy variable |

**Table 5: Firm Profitability by Industry, 2005-2013.**

| Sector | Number of Firms | Number of Obs. | Profit Rate Mean | Profit Rate Std. Dev. |
|---|---|---|---|---|
| Discretionary | 58 | 522 | .39791 | .17202 |
| Energy | 30 | 270 | .20380 | .05876 |
| Financials | 70 | 630 | .07648 | .05825 |
| Health Care | 43 | 387 | .35585 | .12398 |
| Inform.Tech | 47 | 423 | .39449 | .14047 |
| Industrials | 55 | 495 | .30654 | .12977 |
| Materials | 27 | 243 | .26211 | .07421 |
| Staples | 29 | 261 | .53570 | .15806 |
| Telecom. | 5 | 45 | .20421 | .02437 |
| Utilities | 28 | 252 | .08972 | .02381 |
| All Industries | 392 | 3,528 | .28268 | .09637 |

**Table 6: Descriptive Statistics, 2005-2013**

| Variable | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Social Media | 3528 | .2893 | .4535 | 0 | 1 |
| Firm Size | 3528 | 3.1564 | 9.0959 | 0 | 187.7545 |
| Leverage Ratio | 3528 | .607927 | .2204 | 0 | 2.386138 |
| Firm Age | 3528 | 68.400 | 48.067 | 0 | 253 |
| Advertising Expense | 3528 | .0105 | .03293 | 0 | .4738511 |
| Lagged Profits | 3528 | .28657 | .22576 | -.42833 | 1.411 |
| Lagged Productivity | 3528 | -.0218 | .2309 | -4.8884 | 1.018 |
| Productivity Pers. | 3528 | .25 | .43307 | 0 | 1 |
| Interaction | 3528 | -.0014 | .181852 | -4.8884 | .79120 |
| Energy Industry | 3528 | .0765 | .26588 | 0 | 1 |
| Materials Industry | 3528 | .06887 | .25328 | 0 | 1 |
| Industrial Ind | 3528 | .1403 | .34735 | 0 | 1 |
| Discretionary Ind. | 3528 | .14795 | .355109 | 0 | 1 |
| Staples Industry | 3528 | .0739 | .26177 | 0 | 1 |
| Health Care Industry | 3528 | .10969 | .31255 | 0 | 1 |
| Financials Industry | 3528 | .1785 | .38304 | 0 | 1 |
| InfoTech. Industry | 3528 | .1198 | .324888 | 0 | 1 |
| Telecom Industry | 3528 | .0127 | .1122318 | 0 | 1 |
| Utilities Industry | 3528 | .0714 | .257575 | 0 | 1 |

**Table 7: Variable Means, 2005-2013**

| Variable | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| Social Media | 0 | 0 | .0255 | .114 | .308 | .433 | .538 | .576 | .607 |
| Firm Size | 3.67 | 3.541 | 3.425 | 3.36 | 3.06 | 3.01 | 3.02 | 2.95 | 2.33 |
| Lev. Ratio | .590 | .5935 | .6040 | .634 | .603 | .598 | .616 | .617 | .613 |
| Firm Age | 64.4 | 65.40 | 66.39 | 67.3 | 68.3 | 69.3 | 70.2 | 71.3 | 72.3 |
| Ad. Expense | .011 | .0114 | .0114 | .011 | .010 | .010 | .010 | .009 | .007 |
| LagProfit | .284 | .2904 | .2965 | .294 | .302 | .269 | .279 | .284 | .277 |
| LagProd. | -.029 | -.026 | -.0195 | -.026 | -.021 | -.020 | -.017 | -.016 | -.017 |

**Table 8: Industry Profit Means, 2005-2013**

| Variable | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| Energy | .2204 | .2459 | .2369 | .2444 | .1735 | .1727 | .1867 | .1751 | .1717 |
| Materials | .2908 | .3055 | .2809 | .2884 | .2394 | .2558 | .2444 | .2360 | .2173 |
| Industrial | .2981 | .3185 | .3225 | .3311 | .2837 | .2973 | .3094 | .3005 | .2974 |
| Discretion | .3893 | .3995 | .3910 | .4083 | .3802 | .4053 | .4244 | .4213 | .4233 |
| Staples | .5663 | .5608 | .5427 | .5566 | .5328 | .5157 | .5187 | .5184 | .5090 |
| HealthCare | .3437 | .3443 | .3542 | .3880 | .3602 | .3576 | .3655 | .3512 | .3374 |
| Financials | .0929 | .0986 | .0881 | .0687 | .0612 | .0684 | .0707 | .0687 | .0705 |
| Info Tech. | .4092 | .3935 | .4132 | .4301 | .3737 | .4024 | .3910 | .3776 | .3594 |
| Telecom | .2090 | .1796 | .2141 | .2186 | .2057 | .1983 | .1977 | .2091 | .2053 |
| Utilities | .0865 | .0919 | .0949 | .0920 | .0912 | .0932 | .0886 | .0835 | .0853 |

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