MARKET VALUE APPROACH: REDEFINING THE INTANGIBLE ASSETS

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ABSTRACT

This paper provides an innovative way of defining the proxies for intangible assets of a company. Social media with its growing prominence and traditional media with its continuing influence on a company’s performance are important platforms for businesses. We propose that content produced about a company in social and traditional media shall be included to the existing list of intangible asset proxies such as patents and trademarks. We posit that the combined list of proxies will better predict the market value of a company. We develop an extended model to test related hypotheses using the Market Value Approach.

Keywords: Social Media, Traditional Media, Market Value Approach, Intangible Assets

INTRODUCTION

Social media has become an integral part of a company’s ecosystem, complementing the traditional media, which the companies have historically relied on to connect with their current and potential stakeholders. Sinclare and Vogus (2011) emphasize the power of the social media and its widespread adoption by consumers to share experiences and information about products and companies. The authors observe that companies, not only consumers, have been increasingly using social media in an active/passive, proactive/reactive and tactical/strategic manner to understand and influence their consumers. Gallaugher and Ransbotham’s (2010) study of Starbucks’ social media processes further shows that a company can leverage social media to both influence the customers and manage the influences of customers on the company. So, while social media has nontraditional dimensions, which empowered the consumers to become active co-creators of messages about companies, it still has a traditional dimension: companies can still

671954-1
connect with their consumers via this platform similar to other traditional media such as newspaper, radio and TV (Mangold and Faulds, 2009).

Despite the strong emergence and diffusion of social media, it is important to note that the traditional media such as newspapers and professional publications are still considered to be invaluable for companies. Hanna, Rohm and Crittenden (2011) emphasize that social media is a part of the ecosystem involving digital and traditional media. They recommend that social media shall be strategically integrated to companies’ overall marketing communications strategy along with other traditional media elements.

As we will detail further within the literature review section, there have been several empirical studies performed to measure the impact of social and traditional media on a company’s financial performance. Some of these studies focus on the impact of the content originating from traditional media platforms such as newspapers and professional magazines on stock performance (Deephouse, 2000; Tetlock, 2007; Tetlock, Tsechansky and Macskassy, 2008; Fang and Peress, 2009). A more recent research track focuses on the impact of social media content (blogs, tweets, facebook postings, etc.) on a company’s financial performance such as sales revenue, stock value and volume (Chevalier and Mayzlin, 2006; Dellarocas, Xiaoquan and Awad, 2007; Liu, Chen, Lusch, Chen, Zimbra and Zeng, 2010; Sonnier, McAlister, and Rutz, 2011; Tirunillai and Tellis, 2012).

In this paper, we use the Market Value Approach (Griliches, 1981), which states that the market value of a company is a function of its tangible and intangible assets. Historically, the definition of intangible assets includes proxies such as Research and Development (R&D), patents, trademarks and advertising expenditures (Griliches, 1981; Ben-Zion, 1984; Connolly and Hirschey, 1984; Chauvin and Hirschey, 1993; Simon and Sullivan, 1993; Hall, 1999; Hall, Jaffe & Trajtenberg, 2001; Greenhalgh and Rogers, 2006; Sandner and Block 2011). Our research revealed that social and traditional media content can have an impact on a company’s stock performance, hence the market value. Therefore, we focus on expanding the definition of a company’s intangible assets by including social media and traditional media content.

We are primarily interested in the evaluation of Information and Communication Technology (ICT) companies. We posit that we can better predict an ICT company’s market value by incorporating social and traditional media content to the existing list of intangible asset proxies; R&D, advertising expenditures, patents and trademarks. Our contribution to the body of knowledge is to measure intangible assets in a holistic manner by leveraging measurable variables that facilitate practical application.

The following sections discuss the theoretical framework and prior literature to lay the foundation for our proposed model. We then define the proposed model and hypotheses, explain
the study design, expected conclusions and study limitations. Finally, the paper outlines managerial implications and proposed future research.

THEORETICAL FRAMEWORK

Our research focuses on a pragmatic model that attempts to predict the market value of a company. One of the most prominent lines of research was initiated by Zvi Griliches, where he proposed that the market value of a company is a function of tangible and intangible assets and developed an additive linear model to express this mathematically (Griliches, 1981).

\[ V = q \times (A + K) \]  

where:

- \( V \) is the Market Value of a firm
- \( A \) is the current value of the firm’s conventional (tangible) assets
- \( K \) is the firms’ intangible ‘stock of knowledge’ measured by past R&D and the number of patents
- \( q \) is the current market valuation coefficient of firm’s assets

As we will discuss in the literature review section, many other researchers have leveraged this approach and expanded on it. Nevertheless, there are detractors such as Hall (1999) and Cummins (2005) who criticize and disagree with the market value approach respectively. Given that Market Value Approach is simple and has been used by many researchers since 1981 until today, we decided to leverage this approach as a basis for our model.

We leverage four theories to support the inclusion of Social and Traditional Media in the definition of a company’s intangible assets. First, the Social Network Theory states that an organization can be considered a system of objects (e.g. people, groups, and organizations) joined by a diverse set of relationships (Tichy, Tushman, and Fombrun, 1979). Tichy et al. (1979) defines transactional content, which includes exchanges such as expression of affect and information, as a property of a social network. We can observe these exchanges within the Social Media (Bernoff and Li, 2008; Gallaugher and Ransbotham, 2010). Second, Strength of Weak Ties’ Theory by Granovetter (1983) states that weak ties act like bridges connecting and diffusing information across different communities. Third, we can infer from the Informational Cascade Theory that consumers are affected by the observable choices of others (Bikhchandani, Hirshleifer and Welch, 1992). Furthermore, Westbrook’s (1987) study on affective responses to product/consumption experiences show that potential buyers can be affected by the post-purchase product evaluations of other consumers through offline word of mouth.
Leveraging these theories, we conclude that it is important to monitor all relevant platforms and measure the word of mouth effect.

**LITERATURE REVIEW**

We divide our literature review into two sections. The first section covers the prior literature focusing on the intangible asset proxies, which are used to predict either a company’s market value using market value approach or other dependent variables such as competitiveness, brand value, and profitability using other approaches. The second section is dedicated to literature on Social and Traditional media. We primarily focus on articles discussing the observed variables used to estimate the impact of media content on company’s financial performance such as sales revenue and stock performance. Our comprehensive literature review covers studies from the early 1980s until today.

**Proxies for Intangible Assets and Market Value Approach**

This section provides a detailed literature review of how the market value approach was originally hypothesized, what constitutes as the measurement for the intangible assets of a firm and how the constituents have been extended by various researchers. We further present literature review on intangible assets, which do not explicitly leverage Market Value Approach. We find that these studies also leverage same proxies such as patents, trademarks, advertising and R&D.

Griliches (1981) was the first one to explore the topic of intangibles using an additive model. He finds a significant relationship between the market value of a firm and its ‘intangible’ capital, where past R&D expenditures and the number of patents are used as proxies. Ben-Zion (1984) emphasizes the determinants of market value and the rate of return in his study. His research reveals that the market value of a firm is affected by its R&D and investment policy. Connolly and Hirschey (1984) consider the complex relationship between R&D, market structure and market value-based measure of profit. They estimate the economic profits based on market value of a firm using R&D expenditures and advertising intensity and find positive effect of R&D on profits. A study by Chauvin and Hirschey (1993) finds that advertising and R&D expenditures have large positive and consistent influence on the market value of a firm. The authors view R&D and advertising spending as a form of investment in intangible assets of a company with expected positive cash flows.

Simon and Sullivan (1993) show that a company’s brand equity can be estimated objectively using advertising share, R&D and patents. Hall (1999) outlines the motivation of using the market value approach in the past for valuing innovative assets. He concludes that the market value of the modern manufacturing corporation is strongly related to its knowledge assets. He
finds that patent measures can predict the market value in addition to R&D measure. Hall et al. (2001) shows that citation-based patent measures can predict a company’s market value better than patent volume. Greenhalgh and Rogers (2006) perform an empirical analysis of the market valuation of innovative activities by United Kingdom (UK) production firms on a sectorial basis. Their analysis shows that, on average, higher R&D, European Patent Office (EPO) patenting and UK trademarking (relative to firm size) all tend to increase market value. Sandner and Block (2011) find that trademarks have a positive effect on firm value.

Chen, Cheng and Hwang (2005) present evidence that R&D expenditure may capture additional information on structural capital (which includes innovative capital, relational capital and organizational infrastructure) and has a positive effect on firm value and profitability. Chu and Keh (2006) suggest that firms should allocate their spending on advertising, promotional activities and R&D carefully to enhance their brand value. Pavlou and El Sawy (2006) suggest that Information Technology (IT) companies shall focus on R&D to develop new products during turbulent times in order to gain competitive advantage. Peterson and Jeong (2010) emphasize that larger advertising and R&D expenditures are related to greater brand values, and this in return leads to better firm-level financial performance metrics. We further infer from these articles that R&D and advertising expenditures are good proxies for intangible assets.

Campbell (1983) suggests that patent trend analysis is a management forecasting tool that can be useful in (1) acquisitions and divestitures, (2) R&D planning, and (3) new product development to know relative technological strengths of the firms. Wyatt, Bertin and Pavitt (1985) indicate that technological advantage is a major source of competitive advantage and patents are the most important methods of protecting and/or securing that advantage. Trajtenberg (1990) states that patent counts weighted by citations are good indicators of the value of firm’s innovation and simple patent counts are good indicators of the inputs to the innovative process as measured by R&D expenditures. Harhoff, Narin, Scherer and Vopel (1999) suggest that patent citation counts rather than only R&D expenditures and number of patents provide a better approximation of economic value of innovation. According to Bloom and Van Reenen (2002), patents have a statistically significant impact on firm-level productivity and market value. A study by Hagedoorn and Cloo (2003) establishes that a composite construct based on four indicators: R&D inputs, patent count, patent citations and new product announcements, clearly can represent the ‘innovative performance’ of a company. We further infer that patent related measures are good indicators of a company’s intangible assets.

Mendonca, Pereira and Godinho (2004) propose trademarks as a complementary indicator for evaluation of firm’s innovation. Flikkema, de Man and Wolter (2010) state that 60% of Benelux trademarks refer to innovative activities. They seem particularly valuable as measures of service and small firm innovation. Gotsch and Hipp (2012) aim at exploring the use and relevance of trademarks for the measurement of innovation and demonstrate that a trademark can be used as an innovation indicator. Cho and Pucik, (2005) propose that a firm’s capability to balance innovativeness with quality drives growth and profitability, and in turn drives superior market value. Lee and Hsieh (2010) find that a company’s innovative capabilities impact the sustained
competitive advantage directly. They further note that marketing capabilities influence sustained competitive advantage indirectly through innovative capabilities.

Lev (2001) expands the literature on intangibles by introducing a comprehensive “value chain” scorecard. Lev states that intangibles are nonphysical sources of value (claims to future benefits) generated by innovation (R&D, patents), unique organizational designs, or human resource practices. He notes that intangibles interact with tangible and financial assets to create corporate value or economic growth. In his value chain scorecard, he proposes the following constructs to measure the intangibles: internal renewal (e.g. organizational capital), acquired capabilities (e.g. spillover utilization), networking (e.g. communities of practice), intellectual property (e.g. licensing agreements), technology feasibility (e.g. beta tests), Internet (e.g. threshold traffic), growth prospects (e.g. planned initiatives), performance (e.g. knowledge earnings), customers (e.g. customer churn and value). Given our goal to develop a pragmatic model, we deem this scorecard impractical since collecting data on the respective observed variables for a company and its competitors is not feasible on timely basis. Leveraging the Occam Razor’s Theory (Baker, 2011), we believe that market value approach is superior for this purpose.

Social and Traditional Media

This section covers the literature review on the social and traditional media and their ramifications on a company’s performance.

Deephouse (2000) states that firms with more favorable media reputations have higher financial performance. The author also notes that the greater a firm's current media visibility, the better is its reputation. In this study, the author leveraged news, letters to the editor, editorials and columns as data sources and used frequency and valence as observed variables. Tetlock’s (2007) empirical study shows that news media content can predict movements in stock market activity and unusually high or low pessimism predicts high market trading volume. High media pessimism predicts downward pressure on market prices. The author used frequency of articles and valence as observed variables. Tetlock et al. (2008) note that negative words in firm-specific stories predict low firm earning in the next quarter and predict low stock returns on the next trading day. The authors used frequency of company mentions and valence as key observed variables in their empirical study. Fang and Peress (2009) perform an empirical study to find relationship between traditional media and stock return. They find that stocks with no negative media coverage can earn higher returns compared to stocks with high negative media coverage. They conclude that breadth of information dissemination affects stock returns. We infer that content originating from traditional media can impact a company’s financial performance.

As we have noted earlier in the introduction section, social media has emerged as an important platform for businesses and consumers alike. Paine (2011) defines the social media as the community which the company does business within. She further notes that “relationship with the community is what matters and the aggregated outcome of those relationships is the
company’s reputation”. Bernoff and Li (2008) emphasize that companies can’t ignore the potential benefits brought by the social media. The authors view social media as a medium to manage “direct and intimate customer relationships”. Having established the importance of social media, we researched the literature to determine key observed variables used to measure the impact of social media on companies in a holistic manner. We identified several recent empirical studies on this matter. For example, Dellarocas, Xiaoquan and Awad’s (2007) empirical study focuses on analyzing the impact of online product reviews on forecasting the sales of motion pictures. The authors apply user and professional critic ratings (valence), volume of user ratings (frequency) and the dispersion of these user ratings across different age and gender groups as variables in their model along with other variables. Their analysis shows that the sales forecasting accuracy of a model, which combines the traditional professional critic review and online user product review metrics, outperforms all previously published post-release motion picture sales forecasting models.

Tirunillai and Tellis’ (2012) more recent empirical study examines whether the consumers’ review of companies’ products within social media is related to stock performance. The authors use the volume of chatter (frequency), consumer ratings, positive and negative chatter (valence) as key variables. They also deploy control variables such as advertising, new product announcements and media citations. The authors find that volume of chatter has the strongest positive effect on abnormal returns (based on a 250-day rolling window) and trading volume. They note that negative chatter has significant negative impact on abnormal stock returns. One interesting finding is that an increase in off-line advertising results in an increase in volume of chatter and reduction in negative chatter about the respective company. This finding is in line with the Dellarocas et al. (2007), where combination of positive traditional (offline) and online media content can produce greater positive effect on company’s performance.

Table 1 includes other empirical and conceptual studies performed on the impact of social media on company performance. We observe that these research articles used frequency, dispersion, recency and valence as the key observed variables to measure the impact of social media, while frequency and valence being most widely used.

In line with the two empirical studies discussed above, other authors have noted the importance of both social and traditional media. Wright and Hinson (2008) state that, while blogs and social media have enhanced public relations domain, both traditional and social media still complement each other for a successful execution of public relations strategy. Fombrun and Shanley (1990) note the importance of reputation in crystallizing companies’ status within the society and emphasize that publics construct reputations using different sources; media, market information, economic and noneconomic cues. Yoon, Guffey and Kijewski (1993) also deem favorable reputation as an important asset for a company and advise that companies shall commit to foster reputation through multiple channels inclusive of mass-media and word-of-mouth.
Table 1. Observed Variables for Social Media

<table>
<thead>
<tr>
<th>Article</th>
<th>Frequency</th>
<th>Dispersion</th>
<th>Recency</th>
<th>Valence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonnier, McAlister, and Rutz (2011)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Chevalier and Mayzlin (2006)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dellarocas, Xiaoquan and Awad (2007)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Moe and Trusov (2011)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Tirunillai and Tellis (2012)</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Liu, Chen, Lusch, Chen, Zimbra and Zeng (2010)</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Jansen, Zhang, Sobel, and Chowdury (2009)</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mostafa (2013)</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Spangler, Chen, Proctor, Lelescu, Behal, He, and Davis (2009)</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mandelli, Accoto, and Mari (2010)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sponder (2011)</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Paine (2011)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

As observed in the literature review, previous studies have modeled company’s market value prediction using tangible assets and intangible assets such as patents, trademarks, research and development expenditures, and advertising expenditures. However, none of these studies have focused on combining social and traditional media with the aforementioned proxies. Furthermore, the studies which focused only on social media and traditional media such as Tirunillai and Tellis (2012) did only leverage consumers’ review of products and excluded any other content such as contents produced by experts. In our research, we do not have any limitation, as to who produce the content; consumer versus expert. Given our thorough literature review, we propose social and traditional media as additional proxies for intangible assets to predict the market value of a company. We further see the need to not limit the content produced about companies in both traditional and social media in order to obtain a more holistic view of the companies.

**PROPOSED MODEL AND HYPOTHESES**

Using the findings from our literature review and leveraging the fundamentals of the Market Value Approach, we propose the following model detailed in Figure 1. We believe this model will significantly improve predictability of the market value model.
Figure 1. Proposed Model

As observed in the model, we further expand the model by adding two constructs as proxies for intangible assets: social media and professional publications. Social media represents content produced within platforms like blogs, Facebook, and Twitter. Professional publications represent the number of articles published in newspapers, magazines, and other periodicals that are presented in Lexis Nexis database. As you can see, we use only the professional publications to represent the traditional media. This is primarily due to the lack of consistent and accurate data on other traditional media platforms. However, we believe using professional publications is still an appropriate representation, since Stempel (1991) notes that 67% of people obtain news about local businesses from their local newspaper based on a nationwide survey. Furthermore, two studies note that audience recall is stronger from newspaper stories (DeFleur, Davenport, Cronin and DeFleur, 1992 & Robinson and Levy, 1996).

We propose the following research questions and related hypotheses in regard to the ICT companies:
Research question 1: Can frequency of contents with positive valence produced about a company in social media have significant positive impact on an ICT company’s intangible assets?

Recent literature on social media shows that reviews or chatter with positive valence as well as higher frequency of mentions/chatter about a product, brand or company result in higher sales (Chevalier and Mayzlin, 2006; Dellarocas, Xiaoquan and Awad, 2007; Sonnier, McAlister, and Rutz, 2011; Liu, Chen, Lusch, Chen, Zimbra and Zeng, 2010). Tirunillai and Tellis’ (2012) empirical study shows that volume of chatter has a significant positive lead effect on stock returns of a few days and the impact of user generated content on stock returns prevail even after controlling for analysts’ forecasts, media citations, advertising, and new product announcements. Given this, we formulate the following hypothesis:

H1: Frequency of contents with positive valence produced about an ICT company in social media has significant positive impact on a company's intangible assets.

Research question 2: Can frequency of contents with negative valence produced about an ICT company in social media have significant negative impact on a company’s intangible assets?

Chevalier and Mayzlin’s (2006) empirical study reveals that user reviews with negative valence (e.g. one-star reviews) has a greater impact on sales than user reviews with positive valence (e.g. five-star reviews). Sonnier et al. (2011) find similar power of negative comments on sales. In line with these findings, Tirunillai and Tellis (2012) find that online chatter with negative sentiment have a stronger influence on stock returns than do positive chatter. They also observed that the volume of chatter and negative chatter positively influence the trading volume in both the short term and the long term. Given this, we formulate the hypothesis:

H2: Frequency of contents with negative valence produced about a company in social media has significant negative impact on an ICT company’s intangible assets.

Research question 3: Does frequency of contents produced about a company in social media have a significant impact on an ICT company’s intangible assets?

Several empirical studies find that frequency of chatter/mention within social media have significant impact on a company’s financial performance measured in sales revenue or stock performance (Dellarocas, Xiaoquan and Awad, 2007; Liu, Chen, Lusch, Chen, Zimbra and Zeng, 2010; Sonnier, McAlister, and Rutz, 2011; Tirunillai and Tellis, 2012). Dellarocas, Xiaoquan and Awad (2007) note in their findings the following relationship; higher the volume of online reviews, higher the sales of a movie. In line with this study, Tirunillai and Tellis (2012) show
that volume of online chatter has a high positive impact on stock returns in the short run. Assuming that the inverse of the relationships found in these studies holds true, we formulate the following hypothesis:

\[ H3: \text{Frequency of contents produced about an ICT company in social media has significant impact on a company’s intangible assets.} \]

**Research question 4**: Can frequency of articles produced about an ICT company in professional publications have significant impact on intangible assets?

Fang and Peress (2009) examine the relation between media coverage and the cross-section of stock returns and find a significant relationship between media coverage and stock returns. Fombrun and Shanley (1990) attempt to fuse sociological and economical approaches to study firms’ interactions with the public and find that more exposure to traditional media results in increased reputation. In both of the empirical studies, media exposure of firms is measured using number of articles about a firm in the newspapers. Given this, we formulate the following hypothesis:

\[ H4: \text{Frequency of articles produced about an ICT company in professional publications has significant impact on a company’s intangible assets.} \]

**Research Question 5**: Can the market value of an ICT company be predicted more accurately by extending the proxies of intangible assets in the market value approach?

As observed in our literature review, several empirical studies show that content generated about a company in social and traditional media can impact the reputation and the financial performance of a company. (Deephouse, 2000; Dellarocas, Xiaoquan and Awad, 2007; Liu, Chen, Lusch, Chen, Zimbra and Zeng, 2010; Sonnier, McAlister, and Rutz, 2011; Tetlock, 2007; Fang and Peress, 2009; Tirunillai and Tellis, 2012). Given this, we believe incorporating social media and professional publications to the existing proxies for intangible assets will produce a powerful prediction and holistic view of a company’s asset value. Therefore, we formulate the following hypothesis:

\[ H5: \text{The addition of social media and professional publications to measure intangible assets will lead to more accurate prediction of the market value of an ICT company.} \]
STUDY DESIGN

In order to conduct our empirical study, we focus on the publicly traded ICT companies within the U.S. We create a database, ICT 360, which is stacked with the defined observed variables for each company. The list of observed variables for each construct is detailed in Table 2.

Table 2. Constructs and Their Observed Variables

<table>
<thead>
<tr>
<th>Construct</th>
<th>Observed Variable</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Media</td>
<td>Frequency, Valence, Dispersion, Recency</td>
<td>SocialMention, Google News and Blog Search</td>
</tr>
<tr>
<td>Professional Publication</td>
<td>Frequency</td>
<td>LexisNexis</td>
</tr>
<tr>
<td>Trademarks</td>
<td>Trademark Volume</td>
<td>USPTO(^1)</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>R&amp;D expenditures as a % of sales</td>
<td>COMPUSTAT</td>
</tr>
<tr>
<td>Patents</td>
<td>Patent Volume, Patent Citation Volume</td>
<td>USPTO</td>
</tr>
<tr>
<td>Advertising</td>
<td>Advertising expenditures as a % of sales</td>
<td>To be defined</td>
</tr>
<tr>
<td>Intangible Asset</td>
<td>Market Value of the Firm – Firm’s Tangible Assets</td>
<td></td>
</tr>
<tr>
<td>Market Value</td>
<td>Stock Value</td>
<td>CRSP(^2)</td>
</tr>
</tbody>
</table>

We are leveraging Google News and Blog search to collect content produced in web logs and other web based news sources. We further leverage the SocialMention to collect content produced from social networking and micro blog sites such as Facebook and Twitter. Social Mention is a social media aggregator, which gathers social media data from many sources including Facebook, Twitter, Identica and Google Blog. We will exclude any Google Blog originated content from queries run on SocialMention data to avoid any possible duplication. We will focus only on the content produced in English and leverage the opinion lexicon (Hu and Liu, 2004) for the sentiment analysis. Finally we plan to use the respective company’s name and its main products for the keyword search to capture content.

Once we collect the respective datasets, we will perform Principal Component Analysis (PCA) to evaluate whether any of the dimensions defined in the model need to be reduced or not. Once the PCA process is complete, we will perform Structured Equation Model (SEM) analysis using the aforementioned research model to test the hypotheses.

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1 United States Patents and Trademarks Office.
2 Center for Research on Security Prices
EXPECTED CONCLUSIONS

We expect the following conclusions upon completion of our analysis. For the first hypothesis, we predict that frequency of contents with positive valence produced about a company in social media will have significantly positive impact on the company’s intangible assets. We expect to accept the second hypothesis, where frequency of contents with negative valence produced about a company in social media will have significantly negative impact on a company’s intangible assets. For the third hypothesis, we expect that frequency of contents produced about a company in social media have a significant impact on a company’s intangible assets. We expect to accept the fourth hypothesis, where frequency of articles produced about a company in professional publications has significant influence on a company’s intangible assets. Lastly, we predict that the combination of patents, advertising expenditures, R&D, trademarks, social media and professional publications is a better predictor for the market value of a company.

STUDY LIMITATIONS

There are five key limitations for this study. Firstly, we understand that the traditional media in the broader sense ideally involves more platforms, namely professional publications (magazines and newspapers), television and radio. However, in our study, we concentrate only on the professional publications inclusive of magazines and newspapers due to the limitation of data availability with respect to television and radio. Secondly, as discussed in the study design, professional publication construct is measured using the frequency of articles published about an organization. When measuring the frequency of articles using Lexis Nexis, we will not consider the valence of the articles published due to the data limitations. Thirdly, we run risk of not collecting the advertising expenditures for all ICT companies. Therefore, advertising expenditures may not be considered in our study to assess the market value of a company. Alternatively, we consider leveraging sales and marketing expenses, if that data set has less missing value. The fourth limitation pertains to the list of sources we use to study the social media content. Since we are using a social media aggregator, there is a risk that we may not capture all the necessary content produced from social networking sites such as Facebook and Twitter. The last limitation is related to the keyword search. Our search criteria may exclude some valid content.

RESEARCH IMPLICATIONS

We expect this research to have the following implications for the academia and the industry. Firstly, we project that extending the intangible asset proxies to include the social media and professional publications will improve an estimate of the intangible assets of a company. This in return will better predict the market value of a company. Secondly, the business executives can expand their executive dashboards to monitor their companies’ intangible assets including social media and professional publications as well as their competitors. This expansion to the executive...
dashboard would not be expensive for the management to maintain on a periodic basis due to the availability of and easy access to the information.

**FUTURE RESEARCH**

Considering the fact that the present research is focused only on the ICT companies in the United States, we plan to expand our database to include ICT companies operating across the globe. Performing this research on a global level may provide opportunities for companies to search for suitable candidates for merger and acquisitions as well as for strategic partnerships. It will be interesting to see if these constructs differ across countries or regions. If they are, what could be the reasons for these differences?

As stated in the limitations, valence (positivity-negativity) of the articles is not included in measuring the traditional publication construct. Future research can be done by considering the negative and the positive sentiments of the articles.

**REFERENCES**


