

Information Asymmetry and Share Prices: Analysis of the Use of Social Networks in the Brazilian and U.S. Capital Markets^{*,**}

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ABSTRACT

Increasing globalization has meant the internet becoming ever more part of the routine of people around the world. With the evolution of the internet, social networks have emerged in order to facilitate communication between people, communities and even between corporations. Social networks offer companies a way of instantly releasing information, allowing those who use this information greater flexibility when searching for news about the companies in which they have invested or wish to invest. In this context, the objective of this study was to analyze how social networks (Facebook, Twitter and Youtube) affect levels of information asymmetry and the pricing of shares for Brazilian and U.S. public companies during 2012. To achieve the proposed goal, the conceptual framework of the Ohlson model (1995) was used to verify whether the information posted on social networks affects the pricing of shares, and share price volatility was used as a proxy for information asymmetry. The sample included 170 Brazilian companies listed on the BM&FBOVESPA and 100 companies listed on the U.S. stock market in 2012. The results show that social networks can affect levels of information asymmetry in these markets, but only "unofficial" Facebook affects the pricing of shares for companies in the Brazilian stock market, although sensitivity analysis indicated that the groups that use and those that do not use Facebook do not exhibit different average returns. Thus, investors should not use this information to devise strategies to generate better returns.

Palavras-chave: social networks, information asymmetry, pricing of shares.

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1 INTRODUCTION

Traditionally, stock market participants evaluate companies through information released via the usual channels, such as newspapers, journals, reports, and analysts' forecasts (Hu, Liu, Tripathy, & Yao, 2011, p. 1362). With advancements in technology and the increasing use of the internet by many different users around the world, it has become possible for companies to employ these tools to release information and relevant facts, and users of this information have come to base their decisions on this – from product launch announcements, institutional campaigns and advertising, to the communication of economic-financial related facts, by means of financial statements and management reports, among others.

According to Bonsón and Flores (2011), in corporate communication, the main application for Web 2.0 technologies (in which the idea is to make the online environment more dynamic, so that users collaborate in order to organize content) and social media is corporate dialogue. This dialogue means that companies can take advantage of the evolution of the web, making it possible to provide more detailed and useful information to users, thus allowing them to participate effectively via the use of these new platforms.

Adopting a corporate dialogue would mean setting aside the current one-way communication model, that is, from corporation to user, thus facilitating multi-way flows between stakeholders, in whichever public or private entity (shareholders-owners, managers, employees, clients-users, suppliers, authorities, competitors, local communities, environment, etc.) (Bonsón & Flores, 2011); thus having the potential to reduce information asymmetry.

Information asymmetry was initially analyzed by Akerlof (1970), whose research showed that the informational difference between players means that, at the limit, the market does not function, since good buyers and sellers will exit, leaving only the bad ones, which would not negotiate with each other, leading to the market's extinction. Akerlof's "market" is supported by Leland and Pyle (1977), who state that markets are characterized by different levels of information between buyers and sellers. That is, some particular users exhibit higher levels (qualitative or quantitative) of information with respect to some entities than other users. Thus, an increase in the release of relevant information should benefit average users without access to private information.

According to Cormier, Aerts, Ledoux, and Magnan (2009), the internet has led companies to adapt their reporting strategies, since it offers more flexibility than the traditional means of communication. These adaptations to reporting strategies may improve those situations described by Akerlof (1970) and by Leland and Pyle (1977). However, there have been few studies dedicated to analyzing the influence of information posted by companies through social networks in terms of information asymmetry and on the pricing of shares, especially in the Brazilian stock market.

The reasons for this may be varied, such as: (i) the gathering of data is very costly and done manually and individually, which discourages the writing of empirical articles on the subject (data can be downloaded on: http://www.mediafire.com/download/13fvba0rrbbzefy/Social_Networks_data.rar, retrieved from January, 20, 2014); and (ii) the use of social networks is still very recent in Brazilian companies.

Yet, the importance of the subject of this study cannot be ignored, especially following excessive use by some Brazilian companies that announced, via Twitter, that they were discovering new growth opportunities and that they would still produce a lot; however, these companies ultimately ended up in receivership.

On this basis, information released by companies can lead to alterations in their share prices, by it being understood as reporting of relevant facts. If investors take this news into consideration when making decisions – and, given the increasing advance in the use of social networks – companies can take advantage of these tools in order to publish information that is of interest to their investors. As well as the impact on the pricing of shares, such information released via social networks, if used correctly, can also serve to reduce information asymmetry between companies and investors.

Regarding the concerns described in the two preceding paragraphs, it is also worth mentioning that even the *Comissão de Valores Mobiliários* (CVM), the Brazilian Securities and Exchange Commission, has begun to discuss and regulate the release of information via the internet. The first step was the announcement of CVM Instruction no. 547/2014, which even involved the participation of academics presenting data from studies in order to support some of the comments related to the ruling.

In light of the comments in this introduction, the general aim of this study was to verify the relationship between the release of information on social networks with the degree of information asymmetry and the pricing of shares for companies listed on the BM&FBOVESPA. The sample totaled 170 analyzed Brazilian companies and the 100 biggest companies in terms of market value listed on the NYSE (New York Stock Exchange) and the NASDAQ (National Association of Securities Dealers Automated Quotations) in 2012. The United States was chosen as a benchmark since it is the country with the biggest capitalization of companies in the capital market (according to a list of countries and their respective capitalizations taken on February 25th 2014 from <http://www.quandl.com/economics/stock-market-capitalization-all-countries>) and it has a good informational environment (Lopes & Alencar, 2010).

It is hoped that this study contributes to a better understanding of the use of social networks in divulging information – thus assisting investors, as well as widening academic contributions with regards to capital market practitioners and regulatory bodies – showing evidence that such reporting mechanisms are important in reducing information

asymmetry, provided companies use them correctly. Furthermore, this article widens the international debate on the subject via three specific points, namely: (i) an analysis of the effect of reporting via social networks on information asymmetry and company value; (ii) a comparison of a strong informational environment with one that is less strong; and (iii) by encompassing a greater number of social networks, which were not explored in “seminal” studies from this area presented in the literature review.

In order to provide some of the evidence from a line of research that is similar to that of this article, studies regarding voluntary disclosure have shown that this type of reporting is able to reduce the cost of equity (ke), given that ke is linked to informational risk, which is linked to information asymmetry. Yet, the main findings with relation to voluntary disclosure and the cost of equity indicate that the informational environment is a relevant factor in explaining the relationship between voluntary disclosure (which should reduce information asymmetry) and ke (e.g. Botosan, 1997; Cao, Myers, Tsang, & Yang, 2014).

Botosan (1997) found that voluntary disclosure only reduces the ke of companies with low analyst coverage; Fu,

Kraft and Zhang (2012), among other studies, provided evidence that more timely disclosure (as is the case with social networks, for example) is able to reduce ke . Cao et al. (2014) showed that forecasts, made by company management, are also able to reduce ke , provided investors are protected. Blanco, Garcia-Lara and Tribo (2015) found that, even in competitive environments, in which releasing extra information could benefit competitors, its release can reduce ke .

It is also worth noting that the more fragile Brazilian informational environment could mean additional reporting having an even stronger effect for Brazilian companies, as Lopes and Alencar (2010) reported; this study presents some evidence in this direction.

With relation to the results found, it is possible to verify that some social networks affect levels of information asymmetry and the pricing of shares for companies from the Brazilian and U.S. stock markets, with an emphasis on the latter due to the fact that, on average, social networks are more widely used in this country, a fact that renews the debate regarding the informational differences between the two markets.

2 THEORETICAL FRAMEWORK

2.1 Social Networks and Information Asymmetry

The emergence of social media has altered the way people and companies around the world communicate in such a manner that Hutter, Hautz, Dennhardt and Füller (2013) affirm that the revolution caused by social media has altered the communication landscape and had a significant impact on marketing communication. The rising importance of websites like Facebook, YouTube, and others, in the lives of consumers has an ever greater influence over their communication habits. Due to consumers spending more and more time on social networks, an increasing amount of communication has come to take place within these new environments.

This impact on the way of communicating is also approached by Blankespoor, Miller and White (2014), who state that various technologies have emerged to provide companies with additional communication channels, allowing them to ignore information intermediaries and to directly reach investors on a frequent basis and in real time.

The study of social networks on the internet focuses on the problem of how social structures emerge, what type they are, how they are composed by way of communication mediated by computers, and how these mediated interactions are able to generate information flows and social exchanges that have an impact on these structures (Recuero, 2009, p. 24).

Hanna, Rohm and Crittenden (2011) state that content in the form of social networks and blogs is widening the spheres of influence of marketing, given that it allows individuals to create, share and recommend informa-

tion, which has promoted a wide variety of social media platforms that provide tools for exchanging significant information between companies and clients.

According to Hu et al. (2011), due to the rising popularity and reliability of blogs, they have become a valid information channel for market participants to use such information when making decisions regarding their investments.

In light of the above, the importance of social networks for communication between corporations and their clients/investors is verified, and the aim is to analyze the best way of using them, primarily since they involve a tool that belongs to a field that has still barely been explored by entities, considering its range of uses.

Looking at information asymmetry, Blankespoor et al. (2014) emphasize in their work that, at least in the short term, the release of a particular item of news can really increase information asymmetry (if it is used for this objective); however, Kim and Verrecchia (1994) and Lee, Mucklow, and Ready (1993) found empirical evidence that increases in information asymmetry last less than an hour.

It is possible that this problem exists primarily in Brazil, due to there not being effective regulation for the release of content on social networks. This occurs due to the fact that it is a recent issue, with emerging problems that are also recent – like the case cited in the introduction section of this article – and also due to the existence of conflicting objectives between principal and agent (Jensen & Meckling, 1976).

Thus, it is believed that, in the long term, the impact of this release will result in a reduction in information

asymmetry, showing that investors have diluted information (Blankespoor et al., 2014).

Into this context of information asymmetry and market for lemons (Akerlof, 1970) enters Accounting, with the main role, within the business dynamic, of providing relevant information able to reduce information asymmetry, thus minimizing conflicts of agency and, consequently, contributing to the appropriate allocation of available resources, therefore forming part of the system of governance (Paulo, 2007).

Some studies show, though indirectly, that the reporting of company results to the public reduces information asymmetry (Ball & Brown, 1968; Beaver, 1968), since it will make the same information that was available to agents within entities also available to the external public. Concerning social networks, companies can use these means for releasing accounting and economic information.

Thus, there is the following study hypothesis:

Hypothesis₁ (H₁): information asymmetry between companies and investors is reduced through the use of social networks.

As mentioned above, the possible use of these social networks by companies in order to release information that can assist users in decision making is verified. The release of company financial reports – containing the most varied financial statements – is a requirement backed by law, however Drake, Roulstone and Thornock (2012) affirm that available public information does not mean in itself that this is instantly received by all market participants, and that investors should make efforts to obtain information through various channels, such as the press, analysts and the internet, and that the market should demand this information.

With regards to this, the Efficient Market Hypothesis (EMH), studied primarily by Fama (1970), claims that asset values completely reflect available information. As social networks are used to release information, there is the following study hypothesis:

Hypothesis₂ (H₂): information posted on social networks affects the market value of companies.

Comprising the social networks used by the companies that were the object of this study are Facebook, Twitter, and Youtube. According to Recuero (2009), Facebook was launched in 2004, at first only being available to Harvard students; it was seen as one of the social networks with more privacy than others, since only users that formed part of the same network could view each other's profiles. The official Facebook profile states that the mission of this social network is to provide people with the power to share and make the world more open and connected.

The Twitter website declares that this tool is the best way to connect with people, to express yourself and to find out what is happening. On the same website, the Twitter for Business option has the following description: companies use Twitter to share information about their services, bring relevant information together in real time and build relationships with clients, partners and opinion formers.

As announced on the the Youtube website, the channel offers a forum for users around the world to interrelate, and acts as a distribution platform for creators and advertisers of original content, large and small. As mentioned by Shifman (2011), Youtube, launched in 2005, has become the biggest free video sharing website of content created or generated by users.

Youtube is known worldwide, and considered the biggest video sharing website, in which its users post videos with the intention, in most cases, of causing an impact on other users. Therefore, Youtube ultimately serves a large volume of visitors and a range of different audiences, offering a means for its participants to obtain extensive exposure.

Via Alexa – a site that measures webpage use around the world – it is verified that the social networks in this study are among the most accessed websites in the world and in Brazil, as shown in Table 1.

Table 1 Alexa Ranking

Position	Global	Brazil	U.S.A.
1st	Google	Facebook*	Google
2nd	Facebook*	Google Brasil	Facebook*
3rd	Youtube*	Google	Youtube*
4th	Yahoo!	YouTube*	Yahoo!
5th	Baidu	Universo Online	Amazon
6th	Wikipedia	Globo	Wikipedia
7th	QQ	Yahoo!	LinkedIn
8th	Taobao	Windows Live	Ebay
9th	Twitter*	Mercado Livre	Twitter*
10th	Windows Live	Wikipédia	Bing
11th	Taoba	Ig	Craigslist
12th	LinkedIn	Abril	Pinterest
13th	Blogspot	Terra	Blogspot
14th	Hao123	Twitter*	Windows Live

*Social networks included in this study.
Source: Developed by the authors.

2.2 Empirical Evidence

Some studies (Hu et al., 2011; Rubin & Rubin, 2010; Drake et al., 2012; Blankespoor et al., 2014) sought to relate the use of social networks with information asymmetry and the pricing of shares.

In a study carried out by Hu et al. (2011), the authors verified that the visibility of blogs has a positive impact on share evaluations, and they suggest that the SEC (Security and Exchange Commission) should investigate the impact of blogs on the capital market and regulate the release of such information, since it has important implications for company valuations.

Rubin and Rubin (2010) employed the frequency of editing in Wikipedia as an instrument that captures the extent of the population's involvement in the processing of information related to companies. The results obtained indicated that, for investors and analysts to be informed about companies, processing of information via the internet should be related to the extent of the population's involvement.

Drake et al. (2012) investigated factors that influence investors' demand for information with regards to reporting results; such investors use the Google search engine as a way to express their demand for public information. The authors concluded that searches on the website increase around two weeks before release and remain elevated for a given period after the announcement.

In a study carried out by Blankespoor et al. (2014), the authors sought to verify whether companies can use new information technologies to reduce information asymmetry, using Twitter in this case. The authors do not suggest that the social network has an impact on the visibility of firms; however the dissemination of this network can assist in alleviating information asymmetry for companies that are not so visible, since they receive less press coverage.

Given the empirical evidence mentioned above, this study aims to widen knowledge in this area for 3 main reasons that have not been explored in previous studies or that have, but in a different way: (i) to jointly analyze the effect of reporting via social networks on information asymmetry and on company value; (ii) to compare the informational environment in the United States with that of Brazil, expecting the first to be stronger (Lopes & Alencar, 2010), and implying a lower level of information asymmetry; and (iii) to encompass a greater number of social networks, even separating them into "official" and "unofficial" social networks, as detailed in this study's methodology. The contribution of this study lies here, since, as Saito and Silveira (2008) affirmed, evidence of the existence of agency problems has already been provided in various studies, and it is now necessary to find out its economic relevance and the means for alleviating these problems; the appropriate use of social networks has the potential for this.

3 METHODOLOGICAL PROCEDURES

3.1 Sample Composition and Data Collection

The population of this study is formed of publicly traded Brazilian and U.S. companies. The information necessary for this study to be carried out was gathered (manually and individually) from companies' social networks (Facebook, Twitter, and Youtube), categorized as "official" and "unofficial", and from the *Economica*[®] database, covering 2012. "Official" social networks were considered to be those with access links directly provided on companies' websites; "unofficial" ones were considered to be those with links not provided on companies' websites and which were searched for, individually, by company name on the social networks themselves.

The information gathered on social networks for this study are presented below and follow a methodology that is similar to that of Hu et al. (2011) and of Rubin and Rubin (2010), which focuses on the visibility that social networks lend to information, though these studies used blogs and Wikipedia, respectively.

- Facebook: number of "likes" on the companies' pages;

- Twitter: number of tweets and company followers; and
- Youtube: number of views and users subscribed to company channels in this social network.

The study only uses 2012, given that there is no possibility for categorizing *a priori* (directly accessing the websites) year to year the information gathered for the study, thus characterizing it as a cross section analysis. Hence, with relation to accounting numbers, only the last available year, following the 2008 crisis and the adoption of IFRS, was used. The final sample for this study was composed of 170 Brazilian companies and 100 U.S. companies with the highest market value in 2012.

3.2 Definition of Models and Variables Employed

This study sought to relate the companies' book value with their market values, using variables that serve as proxies for information asymmetry and for the use and visibility of social networks. Equation 1 was developed in order to test Hypothesis 1 of this study.

$$IAS_i = \beta_0 + \beta_1 A_i + \beta_2 CG_i + \beta_3 SN_i + \varepsilon_i$$

1

In which:

IAS_i = share price volatility was used as a proxy for the information asymmetry of company i in 2012 ;

A_i = total assets of company i at the end of 2012 divided by the total assets of company i at the end of 2011;

CG_i = level of corporate governance of company i at the end of 2012;

SN_i = social network visibility of company i at the end of 2012;

ε_i = regression error – $\varepsilon_i \sim N(0, \sigma^2)$.

According to Martins (2012), company size can be represented by different variables, among them, the book value of their total assets, the sum of their net revenues in a particular period, and the market value of their shares. For this study, the value of companies' total assets was used to represent their size, so that the proxy is not linked to the market, given that IAS is already tied to market fluctuations.

As a proxy for information asymmetry, share price volatility was used (Yoon; Zo; Ciganek, 2011), and treated as a measure for idiosyncratic risk. These authors claim that, if the market is efficient and information asymmetry is low, security volatility tends to be low, and if not, volatility will be high, as adverse selection problems between traders tends to worsen.

Corporate governance was used as a control variable for Brazil, since, according to Moreiras (2010), the different governance practices adopted aim to improve the quality of information provided by companies, bringing

about a reduction in information asymmetry. As a proxy for corporate governance, the different levels of corporate governance that exist within the BM&FBOVESPA (*N1*, *N2*, and *Novo Mercado*) were used. The CG variable was not used in the United States sample, since the proxy used for this variable specifically applies to the Brazilian stock market, and also because the informational environment in the United States is superior to the Brazilian one, as shown, for example, by Lopes and Alencar (2010).

In order to verify the influence of information posted on social networks over company share valuations, an adaptation of the Ohlson model (1995) was used, since the parameters for the persistence of residual income and for other information were ignored; that is, only the idea that net equity and residual income are value relevant was used.

Market value was used instead of cost of equity (ke), unlike in other studies regarding disclosure and information asymmetry, (e.g. Botosan, 1997), because ke is not directly observable, however is related to the market value of companies. As it is possible for another proxy (which would be ke) not to be used, the use of a variable that is directly observed and that is able to reflect the effects of releasing information was chosen, as ke should be, considering the hypothesis that the market is efficient in a semi-strong form.

Thus, in order to test Hypothesis 2 from this study, there are Equations 2 and 3.

$$P^a = P - r_f * NE \quad \mathbf{2}$$

In which:

P^a = residual income (or abnormal profit) in 2012;

P = net profit for the period;

r_f = risk free interest rate;

PL = net equity in 2011.

To estimate residual income (P^a), the *Selic* Interest Rate (*SELIC*) was adopted as a risk free rate for the Brazilian companies. For the U.S. companies, the average Federal

Funds (effective) rate for 2011 was adopted. Rates from the previous year were used because they cover net equity also from the previous period, which theoretically reflects company net assets that will generate cash flow in the following year.

After that, there is the model for measuring company value (P_i) proposed by Ohlson (1995), based on accounting numbers, as in Equation 3.

$$P_i = \beta_0 + \beta_1 NE_i + \beta_2 P_i^a + \beta_3 SN_i + \varepsilon_i \quad \mathbf{3}$$

In which:

P_i = market value of company i ;

NE_i = net equity of company i in 2012;

P_i^a = abnormal profit of company i in 2012;

SN_i = effect of the use of social networks for company i in 2012;

ε_i = regression error – $\varepsilon_i \sim N(0, \sigma^2)$.

The expected effects of the variables to be analyzed using the previously addressed econometric models for information asymmetry and on the pricing of shares, are contained in Table 2. A question mark was inserted regarding the information posted on social networks due to a lack of empirical evidence, yet, in theory, a positive effect on companies' market value is expected.

Table 2 Expected signs for the analyzed variables

Analyzed Variables	Effect on Information Asymmetry	Effect on Market Value of Shares
Assets	-	
Net Equity		+
Corporate Governance	-	+
Information Posted on Social Networks	-	?
Residual income		+

Source: Developed by the authors.

3.4 Sensibility Analysis

As a sensibility analysis of the results – expecting that the use of social networks affects information asymmetry, as well as share value – it was verified whether there is the possibility of devising investment strategies based

on social networks.

Thus, the groups that use, and those that do not use social networks, were separated, in order to compare the future return on shares using these networks. This result was obtained via the t test for difference of means.

4 EMPIRICAL RESULTS

4.1 Descriptive Statistics

Based on the descriptive statistics in this study, it is possible to infer that the most widely used social network in Brazil is Facebook, since it exhibits a higher average than the other social networks analyzed, whereas in the United States the most widely used is Youtube. It turns out that, for both markets and for the samples analyzed, there are many companies that still do not use these tools.

Another important point to be observed is the difference found between the two markets. The United States exhibits a higher average for all the official social networks of the companies analyzed, thus making it possible to infer that these tools are more widely used in the U.S. market than in the Brazilian one (data not tabulated).

4.2 Results for the Influence of Social Networks on Information Asymmetry

Initially only the control variables were analyzed, using Equation 1. To calculate the results, the ordinary least squares method was used. As shown in Table 3, it can be verified that company size negatively affects information asymmetry, in other words, reducing it, in the Brazilian market, which supports the result of some previous studies regarding informational risk (Easley, Hvidkjaer & O'Hara, 2010). Yet, in the United States, this same relationship cannot be observed. The corporate governance analysis follows the same results found in relation to company size, with it reducing information asymmetry.

Table 3 Results of analysis of control variables

Description	Brazil	U.S.A.
Const	3.868 (0.161)***	2.945 (0.036)***
LnAss	-0.239 (0.114)**	0.395 (0.164)**
N1	-0.295 (0.171)*	-
N2	-0.414 (0.181)**	-
NM	-0.324 (0.168)*	-
R ²	0.107	0.047
R ² adjusted	0.085	0.037
F Statistic	3.453	4.813
F p-value	0.010	0.031
White Test	30.949 ^a	2.823
Akaike Criteria	167.010	50.183
Normality Test	72.975	0.568

Note: *10% significant; ** 5% significant; ***1% significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 1.975.

Source: Developed by the authors.

Table 4 presents the results relating to an analysis of the Facebook social network, in which it is possible to verify that the Brazilian companies' official Facebook (Model 1) does not exhibit statistical significance, that is, it does not affect information asymmetry. However, on analyzing the results regarding unofficial Facebook (LnUOFB) for this same market, statistical significance is verified – negatively affecting information asymmetry, that is, reducing it – which is the same result exhibited by the U.S. companies' official Facebook (Model 3).

Following on from the estimations from the models looked at here, with the explanatory variables, it is possible to verify that the adjusted determination coefficients (R^2 adjusted) from the models for the Brazilian companies presented results between 0.080 and 0.099, while those for the U.S. companies were between 0.046 and 0.063, so that the

regressions carried out with the variables for the Brazilian companies exhibited a higher degree of adjustment than the regressions for the companies from the U.S market.

This result was expected, as the informational environment in the United States is better than the Brazilian one (Lopes & Alencar, 2010), for example, due to a culture of disclosing information to specific institutions (e.g. banks and governments), whether it be for funding or taxes, and an underdeveloped capital market with a lower quality of corporate governance (lower view to attracting shareholders). Such characteristics mean that additional information released by social networks makes more of a difference in Brazil and does not make much of a difference in the United States, since the companies listed there already tend to disclose the necessary information for the various users to make decisions.

Table 4 Results of analysis of "Facebook" variable regarding information asymmetry

Description	Brazil		U.S.A.	
	Model 1	Model 2	Model 3	Model 4
Const	3.873 (0.160)***	3.925 (0.174)***	3.027 (0.051)***	2.930 (0.037)***
LnAss	-0.241 (0.114)**	-0.251 (0.115)**	0.292 (0.159)*	0.339 (0.164)**
N1	-0.291 (0.173)*	-0.304 (0.170)*	-	-
N2	-0.405 (0.185)**	-0.434 (0.180)**	-	-
NM	-0.320 (0.170)*	-0.338 (0.166)**	-	-
LnOFB	-0.002 (0.005)	-	-0.010 (0.005)*	-
LnUOFB	-	-0.014 (0.008)*	-	0.011 (0.008)
R^2	0.108	0.125	0.082	0.066
R^2 adjusted	0.080	0.099	0.063	0.046
F Statistic	2.858	2.748	6.416	3.409
F p-value	0.017	0.021	0.002	0.037
White Test	32.715 ^a	44.665 ^a	15.497 ^a	7.613
Akaike Criteria	168.874	165.435	48.452	50.185
Normality Test	72.881	69.547	0.749	0.787

Note: *10% significant; **5% significant; ***1% significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 2.006.

Source: Developed by the authors.

An analysis of Twitter can be found in Table 5, in which it is verified – with relation to the Brazilian companies – that Models 5, 6, 7, and 8 presented negative signs, which would indicate that this social network negatively affects information asymmetry, by reducing it. However, no statistical significance is exhibited, thus making it possible to conclude that the variables used in these models do not contribute to reducing information asymmetry, since they are statistically equal to zero. In the United Sta-

tes, the tweets variable (Model 10), featured in the companies' official Twitter accounts (LnOTT), exhibited 10% statistical significance, thus affecting the level of information asymmetry between company and investor, a factor that could be explained by the greater use of this social network in the U.S. market, compared with its use in the Brazilian market, as shown by the descriptive statistics in the social network variables. The other U.S. company variables did not exhibit statistical significance.

Table 5 Results of analysis of "Twitter" variable on information asymmetry

Description	Brazil				U.S.A.			
	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Const	3.886 (0.161)***	3.895 (0.161)***	3.872 (0.164)***	3.878 (0.163)***	3.018 (0.058)***	3.024 (0.058)***	2.936 (0.037)***	2.940 (0.037)***
LnAss	-0.250 (0.115)**	-0.250 (0.115)**	-0.241 (0.114)**	-0.246 (0.114)**	0.338 (0.163)**	0.325 (0.163)**	0.348 (0.164)**	0.352 (0.165)**
N1	-0.291 (0.171)*	-0.292 (0.170)*	-0.292 (0.170)*	-0.292 (0.170)*	-	-	-	-
N2	-0.396 (0.182)**	-0.396 (0.181)**	-0.413 (0.181)**	-0.411 (0.179)**	-	-	-	-
NM	-0.319 (0.168)*	-0.321 (0.167)*	-0.3235 (0.168)*	-0.324 (0.167)*	-	-	-	-
LnOSTT	-0.006 (0.007)	-	-	-	-0.010 (0.006)	-	-	-
LnOTT	-	-0.010 (0.008)	-	-	-	-0.014 (0.084)*	-	-
LnUOSTT	-	-	-0.004 (0.009)	-	-	-	0.009 (0.009)	-
LnUOTT	-	-	-	-0.012 (0.009)	-	-	-	0.007 (0.014)
R ²	0.111	0.115	0.108	0.111	0.072	0.075	0.055	0.049
R ² adjusted	0.084	0.088	0.080	0.084	0.053	0.057	0.038	0.030
F Statistic	2.933	3.093	2.756	2.901	3.766	3.979	2.834	2.528
F p-value	0.014	0.011	0.020	0.015	0.027	0.022	0.064	0.085
White Test	30.685 ^a	30.622 ^a	34.249 ^a	34.966 ^a	7.564	5.927	5.607	6.320
Akaike Criteria	168.218	167.514	168.877	168.158	49.498	49.093	51.299	51.896
Normality Test	73.523	73.490	72.378	70.142	0.314	0.203	0.587	0.595

Note: *10% significant; **5% significant; ***1% significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 1.981.

Source: Developed by the authors.

Looking at the Youtube analysis, the results indicated in Table 6 show that the use of this social network does not affect information asymmetry with relation to the Brazilian stock market, however in the U.S. stock market, the influence of the number of video views on the companies' official Youtube pages is verified, negatively affecting

information asymmetry, thus making it inferable that, like the influence of Twitter, the average number of U.S. company Youtube video views (8.351) is greater than the average for Brazilian companies (5.125), thus making it possible to explain the influence of this variable on information asymmetry.

Table 6 Results of analysis of "Youtube" variable regarding information asymmetry

Description	Brazil				U.S.A.			
	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20
Const	3.862 (0.161)***	3.861 (0.160)***	3.878 (0.165)***	3.881 (0.165)***	2.998 (0.047)***	3.035 (0.049)***	2.940 (0.037)***	2.941 (0.037)***
LnAss	-0.242 (0.112)**	-0.241 (0.113)**	-0.242 (0.114)**	-0.243 (0.114)**	0.321 (0.158)**	0.291 (0.159)*	0.353 (0.165)**	0.355 (0.165)**
N1	-0.299 (0.173)*	-0.299 (0.174)*	-0.293 (0.170)*	-0.293 (0.170)*	-	-	-	-
N2	-0.422 (0.183)**	-0.422 (0.184)**	-0.411 (0.179)**	-0.415 (0.179)**	-	-	-	-
NM	-0.328 (0.169)*	-0.328 (0.170)*	-0.327 (0.169)*	-0.327 (0.169)*	-	-	-	-
LnOYT	0.004 (0.009)	-	-	-	-0.010 (0.146)	-	-	-
LnOVYT	-	0.002 (0.005)	-	-	-	-0.010 (0.004)**	-	-
LnUOYT	-	-	-0.012 (0.015)	-	-	-	0.008 (0.012)	-
LnUOVYT	-	-	-	-0.006 (0.015)	-	-	-	0.004 (0.008)

Table 6 Continuation

R ²	0.108	0.108	0.109	0.109	0.065	0.097	0.051	0.049
R ² adjusted	0.081	0.081	0.082	0.082	0.046	0.078	0.031	0.030
F (5.164)	2.909	2.825	2.780	2.780	4.428	6.641	2.598	2.518
F p-value	0.015	0.018	0.019	0.019	0.014	0.002	0.080	0.086
White Test	32.950 ^a	33.391 ^a	36.309 ^a	36.309 ^a	15.158 ^a	14.056 ^a	4.637	4.757
Akaike Criteria	168.811	168.789	168.571	168.571	50.198	46.764	51.759	51.916
Normality Test	70.952	71.226	70.604	69.262	0.562	2.198	0.533	0.566

Note: * 10% Significant; ** 5% Significant; ***1% Significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 1.997.

Source: Developed by the authors

4.2 Results for the Influence of Social Networks on the Pricing of Shares

This part of the study deals with the results found regarding the influence of the use of social networks on the value of the analyzed companies' shares. Table 7 presents the results from an analysis of the control variables. As

is verified, residual income positively affects the value of the Brazilian companies' shares to a 1% degree of significance. Also in Table 7, it is observed that adjusted R2 shows that the applied statistics explain 44.9% of the formulated model. However, as seen in the same table, residual income does not statistically affect the U.S. companies' share prices.

Table 7 Results from analysis of control variables

Description	Brazil	U.S.A.
Const	0.472 (0.234)**	0.998 (0.252)***
NE_Ass	0.980 (0.486)**	2.205 (0.636)***
RI	4.356 (0.647)***	0.002 (0.004)
R ²	0.456	0.110
R ² adjusted	0.449	0.092
F (2.167)	24.649	13.357
F p-value	4.17e-10	7.52e-06
White Test	18.152 ^a	13.790 ^a
Akaike Criteria	519.730	359.796
Normality Test	160.456	109.262

Note: * 10% Significant; ** 5% Significant; ***1% Significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 1.048.

Source: Developed by the authors.

Below, Tables 8, 9, and 10 are presented, with the results for the influence of social networks on the pricing of shares.

Table 8 Results of analysis of "Facebook" variable regarding information asymmetry

Description	Brazil		U.S.A.	
	Model 21	Model 22	Model 23	Model 24
Const	0.468 (0.263)*	0.322 (0.240)	0.953 (0.412)**	0.991 (0.259)***
NE Ass	0.981 (0.496)**	1.040 (0.486)**	2.237 (0.700)***	2.308 (0.726)***
RI	4.353 (0.678)***	4.363 (0.647)***	0.002 (0.005)	0.002 (0.005)
LnOFB	0.001 (0.019)	-	0.004 (0.030)	-
LnUOFB	-	0.039 (0.023)*	-	-0.021 (0.028)

Table 8 Continuation

R ²	0.456	0.467	0.110	0.113
R ² adjusted	0.446	0.457	0.083	0.085
F (3.166)	18.509	16.496	8.838	10.103
F p-value	2.09e-10	1.99e-09	0.000	7.59e-06
White Test	36.368 ^a	42.257 ^a	17.914 ^a	21.165 ^a
Akaike Criteria	521.728	518.291	361.764	361.510
Normality Test	159.923	166.923	108.595	100.53

Note: * 10% Significant; ** 5% Significant; ***1% Significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 1.143.

Source: Developed by the authors.

As seen in Table 8, just like the results for the influence of social networks on levels of information asymmetry for publicly traded Brazilian companies, unofficial Facebook affected the pricing of shares, reaching a 10% degree of significance, as can be verified in Model 22 contained in Table 8.

This same model showed the best result for the adjustment of the regression variables, with an adjusted determination coefficient of 0.457, compared to 0.449 in the Brazilian model without social networks, and indicating that the LnUOFB helped to improve the explanation for share price by 0.8%.

Table 9 Results from analysis of "Twitter" variable regarding pricing of shares

Description	Brazil				U.S.A.			
	Model 25	Model 26	Model 27	Model 28	Model 29	Model 30	Model 31	Model 32
Const	0.462 (0.279)*	0.468 (0.275)*	0.448 (0.239)*	0.454 (0.238)*	0.834 (0.382)**	0.953 (0.394)**	1.011 (0.246)***	1.015 (0.246)***
NE_Ass	0.986 (0.513)*	0.982 (0.509)*	0.971 (0.489)**	0.975 (0.489)**	2.272 (0.658)***	2.229 (0.667)***	2.225 (0.672)***	2.223 (0.663)***
RI	4.351 (0.671)***	4.353 (0.678)***	4.350 (0.652)***	4.347 (0.652)***	0.001 (0.021)	0.001 (0.021)	0.001 (0.004)	0.001 (0.004)
LnOSTT	0.002 (0.026)	-	-	-	0.019 (0.029)	-	-	-
LnOTT	-	0.001 (0.029)	-	-	-	0.007 (0.040)	-	-
LnUOSTT	-	-	0.030 (0.030)	-	-	-	-0.017 (0.036)	-
LnUOTT	-	-	-	0.028 (0.034)	-	-	-	-0.029 (0.050)
R ²	0.456	0.456	0.458	0.457	0.114	0.110	0.111	0.112
R ² adjusted	0.446	0.446	0.448	0.448	0.087	0.082	0.084	0.084
F (3.166)	17.829	18.050	17.086	17.141	4.128	3.971	10.620	10.267
F p-value	4.44e-10	3.47e-10	1.02e-09	9.59e-10	0.008	0.010	4.30e-06	6.33e-06
White Test	33.178 ^a	36.348 ^a	17.794 ^a	17.892 ^a	16.501	16.239	19.345 ^a	20.203 ^a
Akaike Criteria	521.719	521.728	520.936	521.187	361.330	361.765	361.640	361.582
Normality Test	158.852	159.770	164.065	163.484	113.554	110.915	107.666	107.643

Note: * 10% Significant; ** 5% Significant; ***1% Significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 1.099.

Source: Developed by the authors.

Regarding the Twitter social network, no statistical influence of its use over the pricing of shares is verified, both

in the Brazilian and the U.S. markets, with similar results obtained for the control variables, as shown in Table 7.

Table 10 Results from analysis of "Youtube" variable regarding pricing of shares

Description	Brazil				U.S.A.			
	Model 33	Model 34	Model 35	Model 36	Model 37	Model 38	Model 39	Model 40
Const	0.448 (0.251)*	0.461 (0.251)*	0.456 (0.244)*	0.465 (0.247)*	1.030 (0.356)***	1.091 (0.366)***	0.993 (0.264)***	0.995 (0.263)***
NE Ass	0.986 (0.490)**	0.981 (0.488)**	0.991 (0.492)**	0.985 (0.493)**	2.189 (0.660)***	2.149 (0.664)***	2.272 (0.732)***	2.285 (0.735)***

Table 10 Continuation

RI	4.342 (0.665)***	4.348 (0.673)***	4.354 (0.651)***	4.356 (0.650)***	0.002 (0.021)	0.002 (0.021)	0.002 (0.005)	0.002 (0.005)
LnOYT	0.009 (0.029)	-	-	-	-0.005 (0.034)	-	-	-
LnOVYT	-	0.002 (0.014)	-	-	-	-0.009 (0.020)	-	-
LnUOYT	-	-	0.018 (0.043)	-	-	-	-0.027 (0.048)	-
LnUOVYT	-	-	-	0.003 (0.020)	-	-	-	-0.022 (0.033)
R ²	0.456	0.456	0.456	0.456	0.110	0.112	0.112	0.113
R ² adjusted	0.446	0.446	0.446	0.446	0.082	0.084	0.084	0.086
F (3.166)	18.901	19.201	16.517	16.390	3.969	4.026	11.274	10.752
F p-value	1.35e-10	9.75e-11	1.94e-09	2.24e-09	0.010	0.010	2.11e-06	3.72e-06
White Test	30.267 ^a	32.424 ^a	18.179 ^a	18.323 ^a	15.881	15.609	18.668 ^a	18.970 ^a
Akaike Criteria	521.613	521.704	521.611	521.714	361.771	361.612	361.583	361.440
Normality Test	157.484	159.186	160.913	160.317	107.688	105.83	106.969	107.128

Note: * 10% Significant; ** 5% Significant; ***1% Significant. Standard errors in brackets.

^a Regressions estimated with standard errors robust in heterocedasticity. The normality assumption was relaxed by the Central Limit Theorem (Brooks, 2008). The greatest VIF obtained in the regressions contained in this table was 1.102.

Source: Developed by the authors.

An analysis of the influence of the Youtube social network presented similar results to the Twitter social network, since both the networks had no influence over the pricing of the analyzed companies' shares.

Although some of the social network variables linked to the U.S. companies statistically affect information asymmetry, via the results shown in Tables 8, 9, and 10, it is verified that the social networks in the United States do not affect the pricing of shares for the companies listed on this country's stock exchange, and that they only play a role in reducing the volatility of share prices, thus not supporting the results found by Hu et al. (2011), when analyzing U.S. companies' blogs.

Theoretically, through the relationship between risk and return, if social networks affect information asymmetry (informational risk), they should affect share prices at the moment in which information is released, which was found – without considering the effect of the moment of release – in Brazil. Yet, for the U.S. sample, the same result cannot be found, a fact that may be linked to the liquidity and informational environment of this market, which is bigger than the Brazilian one, resulting in information being discounted from share prices faster than in Brazil; also similar to what was mentioned in section 2.1 in this study (Lee et al., 1993; Kim & Verrecchia, 1994; Blankespoor et al., 2014).

Also worth highlighting, along with the results previously mentioned, is that the effect of the social network interaction variables over asymmetry and pricing of shares was observed, however, it is concluded that there is no effect of this interaction on the dependent variables (data

not tabulated).

4.3 Result of Sensibility Analysis

For the sensibility analysis only the unofficial Facebook social network (LnUOFB) in Brazil was used. This fact is justified by it being the only variable that exhibited statistical significance in the regressions previously presented, separating into groups that use and those that do not use this social network.

The Kolmogorov-Smirnov test presented a statistic of 0.089* for the group that does not use unofficial Facebook and a statistic of 0.103* for the group that uses it, thus displaying evidence of normal distribution. Carrying out the Levene test, a statistical result of 1.908 was reached, by which the existence of homogeneous variances in the analyzed groups can be verified.

As the two assumptions for the t test were met, the means parametric test can be used for the two independent samples. The t test was equal to -1.012, not exhibiting statistical significance – thus making it possible to state that the groups do not have different average returns – similar, for example, to what was found by Blanco et al. (2015) in relation to the release of additional information and to competition between companies.

Through these analyses, it can be emphasized that, despite Facebook apparently reducing information asymmetry, investors should not use this information to devise strategies for generating better returns, which is in line with the Efficient Market Hypothesis (EMH), as long as information is public and free, and not able to be used to generate abnormal returns.

5. CONCLUDING REMARKS

The internet has become an important tool for communication, whether it is in the personal or professional field. With its advance, social networks have emerged – used for divulging information, sharing opinions and debates worldwide. The results of this study have provided evidence that various companies have used social networks as channels for communicating with their investors and clients, among other users.

Announcing by means of social networks has countless advantages for entities, such as: (i) reducing the costs of releasing information related to an entity; (ii) instantaneous information; (iii) information captured by a greater number of users in a shorter period of time etc.

The results showed that Hypotheses 1 and 2 in this study were generally rejected by the Brazilian companies, with the exception of the unofficial Facebook social network, which exhibited statistical significance when its influence over levels of information asymmetry and the pricing of shares was analyzed. Regarding the companies listed in the U.S. stock market, Hypothesis 1 was not rejected for companies' Facebook social networks, number of tweets, and number of views on Youtube, these varia-

bles being related to official profiles on social networks; however, for the U.S. market, Hypothesis 2 was rejected for all of the variables analyzed.

It is worth highlighting that this study only analyzed 2012 due to limitations regarding the gathering of data related to the social networks from previous years, due to the reasons already explained in the section on methodology. The quality of information posted on the social networks was another limitation of the study, since the content of information released on social networks was not analyzed, only the quantity. Another limitation that implied an unexpected result – though specific to the U.S. sample – is the fact that the inclusion of only the 100 biggest companies in this country, in terms of market capitalization, may have affected the relationship between information asymmetry and company size, due to some specific characteristic of these companies.

For future studies, the creation of a social network usage index is suggested, thus allowing for its combined analysis and analysis of the quality of information posted. It must also be stressed that this study was limited to Facebook, Twitter, and Youtube.

References

- Akerlof, G. A. (1970). The market for 'lemons': quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84(3), 488-500.
- Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6, 159-178.
- Beaver, W. H. (1968). The information content of earning announcements: empirical research in accounting. *Journal of Accounting Research*, 6, 67-92.
- Blanco, B., Garcia-Lara, J. M., & Tribo, J. A. (2015). Segment disclosure and cost of capital. *Journal of Business Finance & Accounting*, 42(3-4), 367-411.
- Blankespoor, E., Miller, G. S., & White, H. D. (2014). The Role of Dissemination in Market Liquidity: Evidence from Firms' Use of Twitter. *The Accounting Review*, 89(1), 79-112.
- Bonsón, E., & Flores, F. (2011). Social media and corporate dialogue: the response of global financial institutions. *Online Information Review*, 35(1), 34-49.
- Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *The Accounting Review*, 72(3), 323-349.
- Brooks, C. (2008). *Introductory econometrics for finance*. 2 ed. Cambridge: Cambridge University Press.
- Cao, Y., Myers, L. A., Tsang, A., & Yang, Y. G. (2014, November). Management Forecasts and the Cost of Equity Capital: International Evidence. *Asian Finance Association (AsianFA) 2014 Conference Paper*.
- Cormier, D., Aerts, W., Ledoux, M. J., & Magnan, M. (2009). Attributes of Social and Human Capital Disclosure and Information Asymmetry between Managers and Investors. *Canadian Journal of Administrative Sciences*, 26(1), 71-88.
- Drake, M. S., Roulstone, D. T., & Thornock, J. R. (2012, September). Investor Information Demand: Evidence from Google Searches Around Earnings Announcements. *Journal of Accounting Research*, 50(4), 1001-1040.
- Easley, D., Hvidkjaer, S., & O'Hara, M. (2010). Factoring information into returns. *Journal of Financial and Quantitative Analysis*, 45(2), 293-309.
- Fama, E. F. (1970). Efficient capital markets: a review of theory and empirical work. *The Journal of Finance*, 25(2), 383-417.
- Fu, R., Kraft, A., & Zhang, H. (2012). Financial reporting, frequency, information asymmetry, and the cost of equity. *Journal of Accounting and Economics*, 54(2), 132-149.
- Hanna, R., Rohm, A., & Crittenden, V. L. (2011). We're all connected: The power of the social media ecosystem. *Business Horizons*, 54(3), 265-273.
- Hu, N., Liu, L., Tripathy, A., & Yao, L. (2011). Value relevance of blog visibility. *Journal of Business Research*, 64(12), 1361-1368.
- Hutter, K., Hautz, J., Dennhardt, S., & Füller, J. (2013). The impact of user interactions in social media on brand awareness and purchase intention: the case of MINI on Facebook. *Journal of Product & Brand Management*, 22(5-6), 342-351.
- Jensen, M., & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Kim, O., & Verrecchia, R. E. (1994). Market liquidity and volume around earnings announcements. *Journal of Accounting and Economics*, 17(1), 41-67.
- Lee, C. M. C., Mucklow, B., & Ready, M. J. (1993). Spreads, depths, and the impact of earnings information: An intraday analysis. *The Review of Financial Studies*, 6(2), 345-374.
- Leland, H. E., & Pyle, D. H. (1977). Information asymmetries, financial structure, and financial intermediation. *The Journal of Finance*, 32(2), 371-387.
- Lopes, A. B., & Alencar, R. C. (2010). Disclosure and cost of equity capital in emerging markets: the Brazilian case. *The International Journal of Accounting*, 45(4), p.443-464.
- Martins, O. S. (2012). *Relações entre assimetria de informação e as características das empresas no mercado acionário brasileiro*. Tese de Doutorado, Programa Multiinstitucional e Inter-regional de Pós-Graduação em Ciências Contábeis, UnB/UFPB/UFRN, João Pessoa, PB, Brasil.
- Moreiras, L. M. F. (2010). *Os efeitos da governança corporativa sobre a informação assimétrica*. Tese de Doutorado, Escola de Administração de Empresas de São Paulo, Fundação Getúlio Vargas, São Paulo, SP, Brasil.
- Ohlson, J. A. (1995). Earnings, Book Values, and Dividends in Equity Valuation Contemporary. *Accounting Research*, 11(2), 661-687.
- Paulo, E. (2007). *Manipulação das informações contábeis: uma análise teórica e empírica sobre os modelos operacionais de detecção de gerenciamento de resultados*. Tese de Doutorado, Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo, SP, Brasil.
- Recuero, R. (2009). *Redes sociais na internet*. Porto Alegre: Editora Sulina, 2009.
- Rubin, A., & Rubin, E. (2010). Informed investors and the internet. *Journal of Business Finance & Accounting*, 37(7-8), 841-865.
- Saito, R., & Silveira, A. M. (2008). Governança Corporativa: Custos de Agência e Estrutura de Propriedade. *RAE - Revista de Administração de Empresas*, 48(2).
- Shifman, L. (2011). An anatomy of YouTube meme. *New Media & Society*, 14(2), 187-203. doi: 10.1177/1461444811412160
- Twitter. *About Twitter*. (n.d.). Retrieved on November 23, 2013, from <https://about.twitter.com/>
- Yoon, H., Zo, H., & Ciganek, A. P. (2011). Does XBRL adoption reduce information asymmetry? *Journal of Business Research*, 6(2), 157-163.
- Youtube. *Sobre o Youtube*. (n.d.). Retrieved on November 22, 2013, from http://www.youtube.com/t/about_youtube

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