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## Article

# How does reporting frequency influences the performance of a firm? : a theoretical review and empirical evidence

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# HOW DOES REPORTING FREQUENCY INFLUENCES THE PERFORMANCE OF A FIRM? A THEORETICAL REVIEW AND EMPIRICAL EVIDENCE.

*DINIS SANTOS*

## **Abstract:**

The aim of the present report is to review the available literature on how does the mandatory reporting frequency affects the binomial relationship between the performance and the short-term concerns of the firms as well as to show empirical evidence on the same subject. For this, we used a sample of 2722 firms from a heterogeneous international environment. After running the analysis, we find he a higher reporting frequency negatively impacts the results of firms. There seems to be a short-termism concern leading to a performance decrease. Also, there are few approaches to try to deal with this issue within the literature.

## **Keywords:**

Firms performance, reporting frequency, short-termism, performance impact, disclosing information

**JEL Classification:** L10, L20, L25

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# 1 Introduction

More than ever, managers of listed companies are giving more emphasis to short-term (from now on ST) concerns. Fulfilling the analysts and market expectations and please to all the stakeholders seem to have become the main objective of every single manager of a listed company.

It is easy to think that by being too much concerned with short-term situations, managers forget about the objectives of the companies and therefore the firms performance/value will suffer. However, we can also retain that because managers have got to have everything under control to face all the expectations, there is no room for error, not in the short nor the long term.

Thus, the idea that firms are getting too much focused in presenting short term results to fulfill the market expectations has been object of analysis in the last years. Sometimes, to be able to match to the market expectations, managers tend to inflate their earnings. The theory behind this so-called inflation is very simple.

If a certain level of earnings of a firm fulfills the market expectations, this will be reflected in the firm's market price and therefore all is well for managers because the stakeholders are happy. But, there is more than meets the eye in this theory. First, we must understand that managers are, in fact, able to inflate and deflate their results when they want and feel necessary.

Jones (1991) studied the earnings management issue. He applied time series modeling to study if companies used to reduce their earnings in times of need (import relief investigations) to benefit from smaller earnings presentations. Although the goal of this author was to show that companies negatively influenced their earnings, it was a pioneer work due to the fact that, negatively or positively, the work of Jones proved that companies were ready to manipulate their earnings if it was necessary.

Around the same time, two years early to be exact, other author studied if managers were, in fact, prepared to harm the value of their firm in order to achieve the short-term goals. Switching words, managers could become short-sighted.

Stein (1989) presented his myopic behavior breakthrough in the end of the 1980's decade. In a reference article, the author showed that managers can pump up their short-term earnings to increase the stock prices in disadvantage of the performance of the firm. The author explains that before his analysis, the academic economists dismissed this view due to the fact that because the market can't be systematically misled, if managers wanted to increase stock prices they could not increase their short-term earnings. The price increase could only come from maximizing the firm's performance. This view was based on the tenet of efficient markets (Stein, 1989).

To proceed with his work, Stein (1989) used a “signal-jamming” model where the basic concept was the following: the markets use the earnings as a mean to forecast the firm’s value, therefore, managers will try to influence the shareholders signals increasing the stock price and consequently the firm’s value. Obviously that when in an equilibrium situation the market understands that there will be an inflation in the earnings and the predictions of the analysts will have this into account. Stein (1989) states that this equilibrium does not occur.

The author concludes that managers have different horizons. When the horizon is shorter, managers tend to increase their myopic behavior even when the market participants are rational. This myopic behavior can be defined as the Nash equilibrium of a game with no cooperation between managers and the market (Stein, 1989).

Also, Stein shows that in order to increase the predictions (read predicted value) of the market, managers tend to increase their short-term earnings. When in an equilibrium situation the market cannot be misled, but, nevertheless managers still present the same behavior. This approach shown by the authors clearly shows that the Nash equilibrium reveals the present misconception in the older idea that since managers can’t mislead the market forever they don’t even bother.

The work of Stein served as foundation to several authors in the last years. Bhojraj and Libby (2005) studied the effect of the reporting frequency on the myopic behavior. More specifically, these authors showed that this effect might depend on the market pressures and on the conflict between the total cash flows and the reported short-term earnings. So, following the myopic behavior theory presented by Stein (1989) the short-termism of the managers should increase when the reporting frequency increases due to the fact that generally, when the reporting frequency increases there is conflict between the long and short-term concerns, and most of the times the short-term concerns are considered more important at that time.

Bhojraj and Libby (2005) define myopic behavior as the giving up of projects with greater cash flows to externally report higher near-term earnings, more formally, the authors define myopic behavior as: “the desire to achieve a high current stock price by inflating current earnings at the expense of cash flows (or earnings)”. Stein (1989) had already shown that the myopic behavior may be influenced by capital market pressures which determine the extent to which managers’ care about short term price relative to value. This can be summed in a short sentence: short-term concerns versus performance.

Going back to Bhojraj and Libby (2005), these authors analyzed their study subject by creating an experimental setting, manipulating the degree of market pressure that a manager suffers (this pressure can appear in the form of likelihood of stock issuance, probability of takeover or even the meeting of the analysts’ forecasts), the mandatory

reporting frequency (which can be semiannually or quarterly) and the project based pattern of earnings. The authors also control for other factors.

As stated above the authors use an experimental approach. They analyze the managers' propensity to choose between projects which can maximize the short or the earnings/cash-flows when there is a change in the reporting frequency or the market pressure. For this, they analyze the behavior of a total 89 managers from 19 diversified public companies (44 for the first experiment and 45 for the second). The managers' choice is very important for the project mainly because it introduces the experience and beliefs of individuals who are intimately connected with the market environment (Bhojraj & Libby, 2005).

For the development of the experience itself, the authors present the managers with two different projects. One of the projects has larger total cash-flows but smaller short-term earnings, the other project has smaller total cash flows but larger short-term earnings. From this point on, managers choose the project that they prefer and report as normal as if it was any other regular project, following the market pressure and the external conditions that they're used to. It is here that their experience about the stock market incentives, mandatory accounting reports, availability of alternative communication channels and other is introduced in the study (Bhojraj & Libby, 2005).

After this, the authors manipulate the earnings pattern to create disorders. For instance, in the first experiment, a quarterly reporting frequency makes the first project look less attractive than semiannually reporting frequency due to the intrinsic proprieties of the project (large total cash flows but low short-term earnings). On the other hand, in the second experiment, semiannually reporting makes the first project look worse than quarterly reporting at the given point in time.

The authors conclude that by controlling for agency frictions, the managers will make more myopic choices in response to higher stock market pressure. When this happens, managers often chose the projects that, for them, will maximize their short-term earnings, and therefore the firms' price instead of the total earnings or the performance. The authors also find than under normal conditions, away from higher than normal market pressure, a change from semi-annually to quarterly reporting does not have a large effect on the managers' project choices (Bhojraj & Libby, 2005). But, bear in mind that, when in a quarterly reporting frequency system and when faced with larger than normal market pressure due to a stock issuance, managers tend to become more myopic and choose projects that favor short-term earnings instead of larger total cash flows (Bhojraj & Libby, 2005). Also, from the different market pressure inducers, the stock issuance is the one that has a bigger effect on the manager's choices (Bhojraj & Libby, 2005).

As we can see, the market pressures and the mandatory reporting frequency might actually have a very large impact on manager's decisions. The subject of the mandatory reporting frequency has generated massive debates in and out academia. The differences in the

legislation from region to region are massive and there is no final consensus to what is best or worst for firms and for the market transparency. Graham, Harvey and Rajgopal (2005) followed a not very common approach to study the financial reporting subject.

These authors interviewed several CFO's and asked them about their choices associated to accounting and voluntary reporting. Their goal was to understand if firms cared about earnings benchmarks, which are the important benchmarks, what are the motives for firms to sacrifice the performance and, at last, how does the academic theories explain the earnings management/voluntary reporting situation. They also use surveys as a complement to the field interviews. The authors explain that this methodology allows them to get the ratings of the academic theories made by the financial officers, learn new patterns of behavior and clarification for those patterns and for existing ones, get to stylized facts that are hard to get from other methodologies between others (Graham, Harvey, & Rajgopal, 2005).

Graham, Harvey and Rajgopal (2005) find that the interviewed CFO's believe that more than the cash flows, the earnings are the indicator for which the outsiders look. More specifically they find that the most important benchmarks are the quarterly earnings from the same exact quarter from the previous year and the analyst consensus estimates. In their work, the authors also state that managers show a trade-off between the short-term concerns (earnings) and the performance (value). This trade-off helps the credibility of the firm and, therefore, helps to maintain or increase the stock price. This hunger to meet the earnings targets is explained by stating that the market reactions to small EPS<sup>1</sup> can be very strong due to the fact that, when a firm cannot find a way to meet the expectations of the players is because maybe something is wrong, this can indicate concealed difficulties inside the firm. More, if the guidance is not reached, it can indicate poor management since the management can't even predict its firm future (Graham, Harvey, & Rajgopal, 2005).

Graham, Harvey and Rajgopal (2005) explain that these are the reasons why managers make sacrifices in terms of value to maintain the firm credibility and therefore maintain or increase the stock price of the firm. Switching the text, this is way managers enter in myopic behavior and inflate their earnings.

In terms of the earnings type, the authors conclude that the majority of the interviewed CFO's prefer smooth earnings to volatile ones. The justification is that volatile earnings are a lot riskier than smooth ones, and this makes it harder for the analysts to predict the firm's future. Over 78% of the interviews CFO's prefer smooth earnings to value (Graham, Harvey, & Rajgopal, 2005). Summing up, for the authors the CFO's make their choices believing that by avoiding the short-term turmoil there are maximizing their options.

It is a fact that, by inflating earnings, when the reporting frequency increases, all of the firm's stakeholders will be affected, which is part of the objective. But, is it possible to please

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<sup>1</sup> Earnings per share.

all the firm's stakeholders at once? To study this phenomenon in a more profound way that it was studied till 2007, Freeman and McVea (2007) dedicated some of their work to study the stakeholder management approach.

These authors started by stating that the theory behind the stakeholder management approach is the building of a framework which can be responsive to the concerns of managers who are suffering with elevated levels of pressure, turbulence and change (Freeman & Mcvea, 2007). Therefore, managers should be able to understand the needs of all the stakeholders. These needs are seen as crucial to the performance of a firm and all the relationships should be explored to maximize the business strategies of a firm (Freeman & Mcvea, 2007).

In their 2007 article the authors compare the stakeholder manager approach to other older approaches. They start by explaining that this view was almost seen as a breakthrough from the older corporate planning literature which incorporated a limited role for the stakeholders of a firm. Here, the stakeholders were recognized but acknowledged as limitations for the firm's main goals (Freeman & Mcvea, 2007).

If we think about it, in one stream the stakeholders should be recognized to help maximize the business practices, and on the other stream the stakeholders were also recognized but with a negative connotation because they were responsible to generate barriers in the firm's business strategies. This is the main difference presented by the authors.

They continue their work explaining that these streams also have a very different process of strategy development. Freeman and McVea (2007) believed that the corporate planning approach was based in two elements: the prediction and the adaptation. For this, the management analyzed the environment in order to be able to predict the future environment. More, this analysis scanned all the stakeholders (including analysts) at a very generic level. It was certain that this approach would lead to several mistakes, for instance because the analysis is so generic, the nature of specific stakeholder relationships or skills and knowledge may very well be mistreated (Freeman & Mcvea, 2007).

Freeman and McVea (2007) also explained how the systems theory can be of most importance to the stakeholder theory. The authors start by stating that because the systems theory highlights the external connections of companies, it shows that companies are not self-standing entities but a part of a very large network. In this theory, the connections and stakeholders have very important because the resolutions of firm related problems can only be solved with the backing of all stakeholders. The term collective strategies is of great significance in this theory. These strategies would help to maximize solutions. Note that in this theoretical conception, individual solutions are considered sub-optimal (Freeman & Mcvea, 2007).

The same authors also make the parallelism to the organizational theory. They explain that these sorts of theories intended to describe and somehow explain the being and nature of

organizations. In this particular theory, the realization that it was impossible to recognize a firm's nature and existence without referring to its connections and to its stakeholders was an important step towards the stakeholders approach (Freeman & Mcvea, 2007).

Both, the organizational and the systems theory have several limitations. Freeman and McVea (2007) state that the autonomy of the companies is affected in these approaches due to their collectivist nature. This makes it hard to understand the role of the management or even the importance of the corporate strategy. Also, it is difficult to visualize a start and finish point for the analysis of problems. The authors defend that these issues make these strategies only suitable for monopolistic markets. They defend this opinion by stating that in these markets the goals of the companies and the goals of the network are aligned.

The social responsibility area is also approached by Freeman and McVea (2007). Summing up their analysis, managers bear in mind the power of the social responsibility in a firm's reputation. This effect has emphasized some of the relationships that are present in a perfectly working system. Therefore, and because social responsibility can be expensive, the practice of "good" for the society has become an indulgence to some businesses. The authors also defend that this can generate several problems because some might say that all stakeholders are of the same importance to the firm, but if the business is not as good as expected, the social responsibility will probably be sacrificed (Freeman & Mcvea, 2007).

Trying not to get too far off the stakeholder approach and to the purpose of this literature review, it is important to state that the authors defend that the stakeholder approach aims to generate a single strategy framework. This framework must be capable and flexible enough to allow managers to deal with all possible situations without having to adopt different strategies. Likewise, the stakeholder approach is seen by the authors as a strategic management process instead of a strategic planning process. The difference between both can be defined as follows: strategic planning tries to predict the future and to build individual plans for the firm to act in different situations. Strategic management finds a completely new path for the firm and considers all the possible relationships between the firm and the environment and vice-versa (Freeman & Mcvea, 2007).

Correspondingly, the authors also state that the main concern of the stakeholder approach is for the firm to survive. Therefore, the goal is very clear. This is why the relationships of the firm must be very well understood. Bear in mind that Freeman and McVea (2007) are very clear stating that the stakeholder approach does not consist on a single management objective and consequently maximizing the shareholders wealth is not out of the picture in any way. More, the stakeholders approach is said to inspire managers to look out to all the relationships of the firm and find ways to guarantee realization. For the authors, the values of managers are a key element of the strategic management process. The ethical and corporate concerns have a large presence at this point (Freeman & Mcvea, 2007).

Going even further, Freeman and McVea (2007) defend that the stakeholder approach is not only empirical and descriptive but also prescriptive. The applied strategic management approach is said to mix economic, political, and moral analysis. It is also said to be able not only to describe what was analyzed but also to prescribe what the path to follow is. Furthermore, the authors also emphasize the importance of the stakeholder approach being real about all the stakeholders. This means that no generic analysis is made, as it was explained above. The individual relationships and stakeholders must be thoroughly analyzed to be able to generate a strategy that is capable to perform as expected. Only by doing this, the survival of the firm is achieved.

Finally, and probably more important, the authors highly defend that this approach needs to be integrated to strategic decision making. For them, managers must be able to satisfy all the stakeholders at once. The not accomplishment of this “rule” might create conflicts between the stakeholders and generate difficulties for the firm (Freeman & Mcvea, 2007).

But way is it that reporting frequency is important? Even, what is it that reporting to the market is important? Brown and Pinello (2007) ground themselves on the basic principles that financial reporting helps to avoid earnings surprises. But, these authors state that because the yearly financial reporting is object of a greater amount of scrutiny, interim reporting is most vulnerable to myopic behavior from managers and therefore earnings inflation. These authors state that although annual reporting gives managers less chances of increasing their earnings, it increases the descendant expectations of managers. They show that, mandatory and regulatory activities to display firm’s checks and balance are more effecting when restricting earnings inflation than avoiding negative surprises (Brown & Pinello, 2007).

Brown and Pinello (2007) make a clear distinction between annual and interim reporting and conclude that annual reporting decreases the managers’ earnings inflation tendency, and when their ability to inflate earnings is restricted, managers tend to use downward expectations.

As seen above, the financial reporting frequency can affect not only a company but also all its stakeholders. Also, managers are the ones that have the power to decide how to navigate throughout the pressure infested waters. Furthermore, we can say that around the same time, and going in a little different direction, but pursuing the same logical conclusions, Butler Kraft and Weiss (2007) studied the effects of the financial reporting frequency on the security prices reflection speed. In other words they studied how the frequency of reporting affects the timeliness of the earnings.

These authors defend a different point of view to what was presented till now. They defend that more frequency reporting increases the quality of the annual earnings forecast, this does not go hand in hand with the myopic theory where higher frequency in the reporting leads managers to induce in short-termism and to maybe inflate the short-term earnings,

inflation after inflation cannot lead to better predictions of the yearly earnings. Also, the authors state that the effect on the timeliness of the earnings is not clear. This is because: first, more frequent financial reporting affects the ability of gathering information by the market intermediaries, second, more frequent mandatory reporting can also induce companies to report even more frequently voluntarily, and these reports are considered more accurate indicators of value.

However, if we think about it, more information is only better until a certain point. After that point it is harder to process and this should be another reason to forecasts being harder to achieve. Also, the second argument is only valid until a certain level due to logistic factors.

Nevertheless, to study this subject, the authors study both, voluntary and mandatory reporting, more specifically its changes. They use a massive sample of 28824 firm-observations sample that comprehends a time horizon starting in 1950 and ending in 1973. This sample represents all the CRSP<sup>2</sup> population of non-regulated industries. The choice of this period is justified because in the beginning of the period, firms were only required to report annually, only after 1955 semi-annually reporting was made mandatory. Quarterly reporting was not required until 1970. With this sample, the authors had data with three different mandatory regimes where in the first two firm could also choose to report more frequently if they wanted. This analyzed period is the most utilized period to analyze reporting frequency related issues with US data due to its very peculiar characteristics.

Butler Kraft and Weiss (2007) first goal was to find out how quickly the information provided by earnings was reflected in the price throughout the existing reporting period. The authors expected that this effect was direct because with more frequent reporting, annual earnings should become easier to anticipate, and therefore the anticipation occurs faster. Following already proven techniques, the authors distinguish measures of intra-period timeliness and long-horizon timeliness. They state that the last ones are supposed to capture how much of that periods' information about earnings is explained or explains present economic income. They also control for the possibility of firms selecting their own reporting frequency only when the selected frequency is higher than the mandatory one.

The authors find that there is no substantial difference on the timeliness of companies that report quarterly when compare to companies that report semi-annually. Only the period of 1950 to 1955 has a higher intra-period timeliness for quarterly reporting companies. Even when the authors controlled for self-selection. At the same time, the long-horizon timeliness difference between quarterly and semi-annually reporting frequency in companies was not substantial. But, Butler Kraft and Weiss (2007) find that there is a meaningful relationship between the voluntary changes in the reporting frequency and the changes in timeliness. They find that when companies voluntarily increase their reporting frequency (only in the first and second sub-periods) the intra-period timeliness tended to increase significantly.

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<sup>2</sup> Center for Research in Security Prices

Also, they find some support backing that companies that choose to report more frequently suffer from timelier loss recognition. When the reporting frequency changes are mandatory there was no statistically significant difference (Butler, Kraft, & Weiss, 2007). They conclude by stating that regulation that require firms to report more frequently does not increase the timeliness of the earnings as much as the increase in the timeliness of firms that freely choose to increase their reporting frequency.

Firm's financial reports are the most important type of disclosure that comes from a firm. Because we already analyzed several areas connected to the reporting frequency, the managers and stakeholders, it was only logic that some emphasis was given to how the information flows when the reporting frequency increases.

Fu, Kraft and Zhang (2012) studied the effect of a change in the reporting frequency on information asymmetry. The authors go after the concept that more frequent financial reporting should decrease the asymmetry in information. This is due to the fact that it increases the amount of information available to the public. They also show an opposite point of view where more frequent information reporting leads to a bigger information asymmetry. This is only possible if we see private information acquisition as an endogenous decision (Fu, Kraft, & Zhang, 2012).

Fu, Kraft and Zhang (2012), aware to the fact that more frequent mandatory information reporting leads to less frequent voluntary disclosure, because as it was stated above logistically it is impossible to be always increasing the voluntary disclosure when the mandatory disclosure increases, an increase in information reporting may also decrease the incentives for intermediary agents to produce information (Fu, Kraft, & Zhang, 2012). So, this can impact other sources.

The authors also study the impact on the cost of equity. To achieve their goals, they gathered a dataset, which is similar to the dataset used by Butler Kraft and Weiss (2007) due to its time horizon configuration, and which they justified stating that it comprehends three sub-periods that have major implications to their study variables, mainly to the reporting frequency. Just as in the Butler, Kraft and Weiss study presented above the key element that lead to the choice of this specific period was the fact that if the researchers were going to study the reporting frequency effect on the information asymmetry, they would need to have periods when the reporting frequency was different. So, holding to the fact that the SEC (Securities and Exchange Commission – Regulatory entity) required annually reporting in 1934, semiannually reporting in 1955 and quarterly reporting in 1970 they were able to comprehend variations in the reporting frequency in their time horizon. Having secured their argument, the researchers stated that by having a time series cross section that comprehended three different periods of different legislations requirements on reporting frequency, they had a particularly good database for the proposed study. Summing up, the researchers use 7654 firm-observations, and the analyzed period goes from 1951 to 1973.

Also, it is important to state that in the statistical cut of the study, the researchers have used not only OLS regressions but also 2SLS and fixed effects modeling. They also used a matched control sample analysis to improve their study results. The results the authors found that higher reporting frequency seems to lower the information asymmetry. Also, results from the match control sample show that information asymmetry and cost of equity are reduced significantly in firms that increase their reporting frequency when compared to the control firms (Fu, Kraft, & Zhang, 2012). Regardless if the increase is mandatory or not. They also show that a decrease in the reporting frequency as a weaker effect and this is due to its temporary crater. They state that statistically more than 90% of the companies that reduce the reporting frequency revert to its original frequency or to a higher one (Fu, Kraft, & Zhang, 2012).

Because the main purpose of this literature review is to study the reporting frequency effects in the firm's decisions when it comes to the performance short-term concerns binomial, it is only fair to study the impact of the reporting frequency on a firm's business. Therefore, and to go after a more recent take on the possibility of myopic behavior by managers in the presence of a highly pressurized market with high reporting frequency Ernstberger, Link and Vogler (2011) studied the effects of mandatory quarterly reporting on the business of a firm. They tested whether a higher reporting frequency induced managers to have more myopic behavior.

These authors ground themselves on the theory that when required to report more frequently, managers tend to manipulate their results more because they want to achieve the earnings benchmark or the placed expectations. This can lead to the expense of values as stated in their work. Out of curiosity, Ernstberger, Link and Vogler (2011) give the example of Porsche Firm which was excluded from the German stock market because it refused to report quarterly arguing that it would lead to short-term decision making.

In a more contemporary take on the subject Ernstberger, Link and Vogler (2011) compare quarterly reporting firms with semi-annually reporting ones. Additionally, they also compare a set of firms that suffered a recent change in the required reporting frequency. As normal when studying this subject, they use the European Union as a "playground" to study the subject due to its heterogeneity in the required reporting frequency between Member States. At the time of the study, from the fifteen members, only eight required quarterly reporting. The remaining required semi-annually reporting (Ernestberger, Link, & Vogler, 2011).

To measure the effects on the business, the authors use the real activities manipulation which they state is a very well-established concept. They define this concept as "deviations from normal operational practices for avoiding earnings surprises and other adverse effects such as, e.g., loss in reputation." (Ernestberger, Link, & Vogler, 2011).

Ernstberger, Link and Vogler (2011) create a new measure which comprehends the generally used abnormal cash flow from operations, abnormal productions costs, and abnormal discretionary expenses as measures of real activities manipulation. This new measure is intended to detect if the reporting frequency influences the real activities manipulation (Ernestberger, Link, & Vogler, 2011).

The authors had to collect data on the mandatory reporting frequency for the companies in the EU national regulatory entities, the stock exchanges and from individual interviews with analysts and stock market operators. Note that the authors also eliminated all the voluntary companies that reported quarterly because those companies could in fact bias the results.

Ernstberger, Link and Vogler (2011) also use propensity-based score matching to ensure that the different reporting frequency companies are comparable. This analysis results in a sample with 3366 firm-observations. The authors consider the probability of real activities manipulation and start by analyzing the years in which that probability is higher. They also control for the determinants of earnings management in order to consider the relationship among accounting earnings management and real activities manipulation. More, they use control variables, country fixed effects and error clustering by country in order to decrease the possibility of cross-sectional differences based bias.

The findings are as expected. Higher reporting frequency leads to higher real activities manipulation. This conclusion is clearer in suspect years as the authors' state. Also, the regulatory environment and the specific characteristics of the companies are found to be of relevance due to the finding of cross-sectional differences in the analysis. Their results are predominantly solid in high equity market and earnings management scores countries and weak legal implementation. As expected, the effect is also sturdier for companies which aren't as much monitored by analysts, companies in more competitive industries, and companies with investors than are not oriented to the (Ernestberger, Link, & Vogler, 2011). Summing up, Ernstberger, Link and Vogler (2011) find that a higher mandatory reporting frequency can be connected to higher real activities manipulation. This goes hand in hand to the myopic behavior theory presented above.

These authors follow a very thorough methodology and use an extensive body of parallel analysis to test their findings. By doing this, they also find that when using real activities manipulation, managers tend to use this technique more frequently in the first quarter, when they are more concerned about the quarterly earnings, and the degree of usage decreases along the year showing that their yearly earnings concern increases towards the end of the year (Ernestberger, Link, & Vogler, 2011). Also, the real activities manipulation of companies which are used to report semi-annually tend to increase when the mandatory reporting frequency increases to a quarterly pattern.

Therefore, more frequent reporting leads to more real activities manipulation. This is the same that saying that managers enter in short-termism practices. **So how frequently should firms report after all?**

Gigler, Kanodia, Saprà and Venugopalan (2013) studied the costs and benefits of the reporting frequency and confirm that more frequent reporting causes managers to have a higher myopic behavior. The authors start by stating that it is only normal that the mandatory reporting frequency tends to increase. This is due to the increasing demand for transparency and accountability. More, because there is no pure idea of the costs and benefits of the reporting frequency, more is always considered better.

For this, in their 2013 work, the authors show that when people take the effect of the companies reporting frequencies into account, a higher reporting frequency can actually be worse. This conclusion is based on the fact that, more frequency reporting frequency can induce managers to myopia. To study this subject the authors have developed a model that presents the costs and the benefits of the reporting frequency and then they study their trade-off.

So, the authors start to state that higher frequency reporting increases the amount of information that is contained on the stock prices. This information has a better time distribution and creates a more comprehensive framework about the firm performance. This extra information should provide a better market discipline. This is the main advantage that the authors present for more frequent reporting (Gigler, Kanodia, Saprà, & Venugopalan, 2013). They also state that it could be that more frequent reporting could reduce the information asymmetry between traders and therefore make the stock more liquid. Also, the corporate governance could be facilitated between others.

In terms of costs, Gigler, Kanodia, Saprà and Venugopalan (2013) consider that the costs are harder to imagine. They state that when the reporting is voluntary, there can arise proprietary costs because information can outflow to competitors. Moral hazard issues due to the managers becoming more severe are other problem that the authors believe that exists. But, none of the costs mentioned above come directly from reporting to the market. They come from reporting to other entities at the same time (Gigler, Kanodia, Saprà, & Venugopalan, 2013).

Other cost that the authors think arise directly from reporting to the market is the cost that comes from the accounting measurement errors. This cost tends to become more severe when the reporting frequency increases and the measurement period decreases (Gigler, Kanodia, Saprà, & Venugopalan, 2013). The authors also explain that the worse cost that can come from a higher frequency report is the short-termism or myopia. And as we have seen above this is a very real consequence of high frequency mandatory reporting.

With this in mind, Gigler, Kanodia, Saprà and Venugopalan (2013) have developed a framework with several plausible conditions where an increase in the mandatory reporting

frequency would increase the myopia due to the pressures of the market, and more specifically price pressures. They show that the trade-off between costs and benefits of increasing the mandatory reporting frequency is present. The main benefit are the better *ex ante* incentives for investment and the main cost is the increase of myopic behavior. They end up by creating a set of conditions where higher reporting frequency is better, and a set of conditions where it is not (Gigler, Kanodia, Sapa, & Venugopalan, 2013).

The authors also show that the impatience of the market is not enough, on its own, to create a level of price pressure so high that managers could start behaving myopically. This myopia will only be justifiable if the information gaps between the market and the managers leads to market inferences that can occur from messed up periodical accounting statements. By making use of these information gaps, the authors similarly studied the equilibrium between the price and the investment strategies in two different frequency accounting regimes. They state that under both regimes the market is efficient because their participants are rational, making the correct decisions from the information on the accounting reports of the companies that can affect its future probability. These decisions are consistent with the optimizing strategy of the firm, and all of this is reflected by the market prices (Gigler, Kanodia, Sapa, & Venugopalan, 2013).

Finally, the authors conclude that more frequent reporting can increase the myopic behavior, this goes hand in hand with the previously reviewed literature. The pressure for this behavior can disappear when the mandatory reporting frequency decreases. Therefore, when the mandatory reporting frequency is lower, the project selection decisions can have better encouragements (Gigler, Kanodia, Sapa, & Venugopalan, 2013).

Summing up, the literature seems to show that mandatory reporting frequency lead to a higher emphasis to the short-term concerns by the managers (myopic behaviour), and this will, in fact, be reflected in the value of the firm. Also, if the reporting frequency of a firm is high but not mandatory it is more likely that the firm is performing correctly in the and fulfilling its short-term targets. Also, there are several approaches that try to reach both goals at the same time. For instance, the stakeholder approach (Freeman & Mcvea, 2007) is one of these approaches where when applied nor the short or the goals are impaired.

Although there is research on the subject, it seems that lack a direct study between firms' performance actual reporting frequency. Thus, in order to address this issue, we decided to study the effect of the reporting frequency, which serves as an indicator of need for short, medium, or disclosure concerns, and the performance of the firm measured by a simple fundamental indicator such as the return on assets (ROA).

We detach from the earnings measure approach has well as add to the literature by using a multi-country sample with a lot of diversity. We also controlled for market performance measured by the 52-week price, the real dimension of the firm measured by the number of

employees, and the dividend payment frequency due to its impact on cash-flow distribution and fluctuation on market price.

We use a set of 2722 firms from Australia, Spain, Portugal, Italy, Greece and Slovenia for differentiation on reporting frequency. This allows for the introduction of a fairly large heterogeneity between firms, environment's and reporting frequencies.

After computing the data, we found evidence that managers concerned with short-term result publications, meaning managers of firms with a higher reporting frequency, are more likely to neglect the goals of the firms. This work contributes to the literature on management results, literature on reporting frequency and literature on performance impact.

The remaining of this paper is organized as follows. Section 2 focus on the research design: the data-collection process and the calculation procedures. Section 3 presents and discusses the empirical results. Section 4 concludes.

## 2 Research design

The current work aims to study the impact of the reporting frequency on the performance of a firm.

For this, we use a large sample of firms, comprising 2722 observations from firms coming from Australia, Portugal, Spain, Italy, Greece and Slovenia. This choice of the firms is linked to the fact that both, the Euromed provide a good sample of firms with a heterogeneous reporting frequency.

In terms of data, we not only use data on performance and reporting frequency but also control variables for dimensional size, market performance and time dividend expectation. Thus, we have:

1. **Return on assets** – To detach from what is made on the related literature, instead of using earnings we use the return on assets. This variable is used as the dependent variable and as a measure of the performance of a company. As an indicator of performance, we've have tested two approaches. The first one was to use the 1-year ROA. The second approach was to average the last five years ROA to have a better indicator of the latest years performance of the companies. After analysing both indicators We've decided to include the 1-year ROA of the companies. The return on assets gives an indication of the capital intensity of the company, In the Thompson Reuters platform ROA is defined as: "ROA Total Assets - This value is calculated as the Income After Taxes for the selected period year

divided by the Average Total Assets, expressed as a percentage. Average Total Assets is the average of the Total Assets at the beginning and the end of the year”.

2. **Dividend Type** - In the Thompson Reuters platform the dividend type variable is defined as follows: “This field will contain a 'Q', 'S' or 'A' to indicate the frequency of the dividend payout (quarterly, semi-annually, annually). For companies that do not pay dividends, 'NM' (not meaningful) will be displayed.”. In the present study, this variable was coded from 1 to 3 being 3 the quarterly frequency, 2 the semi-annually frequency and 1 the annually frequency. So, it is expected that when the frequency of the dividend payment decreases (the variable values decrease), the performance measured by the return on assets also decreases. This is due to the fact that, when a company pays less dividends, they tend to use the “dividend money” to increase their assets. When they increase their assets, they are decreasing their ROA because the denominator has gotten bigger. Please note that this is thought assuming that the magnitude of the dividend stays the same no matter of the frequency. This variable is also used as an alternative to the sector variable presented below. This will be explained with more detail in the empirical section below.
3. **Period Length** - The period length is the independent variable that will carry the effect of the reporting frequency. We use the period length for the Interim Statement and the scale is defined as follows: “If you have selected an Interim view, the length is typically 4 months (that is, quarterly); but it could alternatively be 6 months (if the company reports semi-annually), or 4 months (if it reports by trimester), or something else.” To operationalize this variable, we’ve coded its values. We’ve used a 1 to 4 scale, 4 representing quarterly, 3 semi-annually, 2 representing every value between semi-annually and annually, and, at last, 1 annually. From the literature, no specific effect is expected due to the fact that there are two opposite streams that state the following: Stream one: More frequent financial reporting leads to better performance because companies are preparing themselves more frequently and the presentation of more frequent reports make them be less sloppy when it comes to important business features. Stream two: Because companies are concerned about fulfilling the analysts and other short-term expectations, they will not pay the proper attention to their goals and therefore, their performance will be negatively affected.
4. **Employees** - Employees represent the number of full-time employees and full-time equivalents of part-time/temporary employees, as reported, as of the fiscal period end date. The variable also includes part-time employees if the company does not differentiate between the two. This information is generally obtained from the notes or from a company’s multi-year financial summary. Generally, the higher the number

of employees, the higher the costs. Therefore, the expected effect of the employees is negative.

5. **52-week Price % Change** - In theory, the better the return on assets, the higher (and positive) the price change, but this relationship is bilateral. So, the higher (positive) the price change, the better the results. This variable is defined as the percentage change in the company's stock price for a period of 52 weeks. A positive effect is expected from the price change.

Given the data we wrote the following model:

$$\ln_{ROA_i} = b_0 + DT_i + PL_i + \ln_{emp} + \ln_{pricechange52weeks_i} + u_i \quad (1)$$

Where:

- $\ln_{ROA_i}$  – is the logarithm of measure of the company  $i$  performance (return on assets).
- $DT_i$  – Is the coded variable which captures the company  $i$  dividend frequency.
- $PL_i$  - Is the coded variable which captures the company  $i$  reporting frequency.
- $\ln_{emp}^3$  – is the logarithm of the number of employees of the company  $i$ .
- $\ln_{pricechange52weeks_i}$  - is the logarithm of the price change in a period of 52 weeks for the company  $i$ .
- $u_i$  – stands for the error term.

### 3 Results

In the present study, we aim to find how the reporting frequency impacts on the performance of firms. Thus, after computing our estimations, table 1 presents our results.

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<sup>3</sup> Because the number of employees cannot grow indeterminably, and because its effect on the dependent variable may have an inversion point, we have decided to add, and test the squared logarithm of the number of employees. The same thing happens to the square of the logarithm of the 52-week price change. Notice that we've tested the coefficients signals of the squared variables individually and compared them with the main variables. Because the coefficient signals were the same, the squared variables were not included. These issues were to provide a better interpretative model.

**Table 1 Estimation results:**

	Coefficient	STD. Error	t-stat	P-Value	VIF	Confidance Intervals
<b>Constant</b>	145,219	0.489101	2.9691	(0.00317***)		(0.490598, 2.41379)
<b>I_P_52_Wk</b>	0.198096	0.0562437	3.5221	(0.00048***)	1,018	(0.0875176, 0.308673)
<b>I_EMP</b>	-0.088888	0.0254581	-3.4915	(0.00054***)	1,096	(-0.138940, -0.0388361)
<b>PL_IS</b>	-0.220505	0.0895246	-2.4631	(0.01421**)	1,394	(-0.396515, -0.0444950)
<b>DT</b>	0.326628	0.125057	2.6118	(0.00935***)	1,314	(0.0807585, 0.572497)
<b>Statistical Inference</b>						
<b>R-Squared</b>	0.139772					
<b>F(5, 389)</b>	15.88273 (0.000***)					
<b>N</b>	2722					
<b>RESET's test</b>	P(F(2, 389) > 0.881149) = 0.415132					
<b>White's test</b>	P(Qui-squared(14) > 23.4558) = 0.0532451					
<b>Chow's test</b>	P(F(5, 386) > 1.94123) = 0.0866422					

The table presented above presents the results of our estimation. Where the return of assets acts as dependent variable. Here,  $DT_i$  – Is the coded variable which captures the company  $i$  dividend frequency;  $PL_i$  - Is the coded variable which captures the company  $i$  reporting frequency;  $\ln\_emp$ – is the logarithm of the number of employees of the company  $i$  and  $\ln pricechange52weeks_i$  - is the logarithm of the price change in a period of 52 weeks for the company  $i$ . Also, statistical inference results are present in the table. Also: The specification of a model can be evaluated by the RESET test introduced by Ramsey; The value of the VIF indicates the existence of multicollinearity. Normally the VIF limit value is 10. Above 10 we are in the presence of an  $R^2$  between independent variables that is higher then 0.9. Multicollinearity is present; To detect heterokedasticity we use the White test. To test the stability of the model we can use the Chow test. This test also allows to verify if there are structural changes along the estimation period. P-values are presented. \*\*\*,\*\* and \* show statistical significance at a level of 1, 5 and 10% respectively.

Thus, our model can be re-written as:

$$l\_ROA_i = 1.45219 + 0.198096l\_P\_52\_Wk - 0.088888l\_EMP - 0.220505PL\_IS + 0.326628DT + u_i \quad (2)$$

Looking at all the results we can see that all the variables show statistical significance at an individual level, and the model as global also shows good levels of statistical significance (0.000\*\*\*). Regarding the  $R^2$ , our model shows a 14% level, considered fairly good given the nature of the study.

By interpreting our results, we found that: First, an increase of one percent in the 52-week price change may lead to an increase of 0.19 percent in the performance of a company measured by the return on assets; Second, an increase of one percent in the number of employees of a company may lead to a decrease of 0.088 percent in the performance of a company measured by the return on assets; Third, an increase in the reporting frequency may in fact lead to a decrease in the performance of a company which goes hand in hand with the related theory concepts; fourth an increase in the dividend payment frequency may in fact lead to an increase in the performance of a company. *Ceteris Paribus*.

Thus, our obtained result regarding the reporting frequency, given by the *PL\_IS* variable corroborates the theory that managers that are very concerned with short-term result publications may in fact neglect the goals of a company. Also note that the log-log format between the number of employees and the return on assets and the 52-week price change and the return on assets gives us the direct elasticity of both independent variables.

Regarding the statistical inference on the model, no issues were found, showing a good fit to the data on the model. In the present study, the RESET<sup>4</sup> test give us a p-value of 0.4151. Because the p-value is superior than 0.05 we cannot reject the null hypothesis of correct specification of the model. Also, we've computed the VIF<sup>5</sup> values for each one of the variables. The analysis is present in table 1 and it confirms that the model does not present any multicollinearity issues.

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<sup>4</sup> The specification of a model can be evaluated by the RESET test introduced by Ramsey. This test aims to see if the estimated model is well specified, or if it is badly specified. If  $F_{stat} > F_{K,N-g}$  we reject the null hypothesis which stands for correct specification. The same thing happens when the p-value is inferior to 0.05.

<sup>5</sup> Normally the VIF limit value is 10. Above 10 we are in the presence of an  $R^2$  between independent variables that is higher than 0.9. Multicollinearity is present. The absence of multicollinearity implies that none of the independent variables is perfectly correlated to any other independent variable or linear combination of independent variables. The value of the VIF indicates the existence of multicollinearity.

Moreover, the White's test<sup>6</sup> gives us a p-value of 0,053. This means that we cannot reject the null hypothesis of homokedasticity. At last, the Chow's test<sup>7</sup> shows a p-value of this test is 0.08, therefore the null is not rejected and the model does not suffer of structural differences.

Overall, the presented model is a good fit, and its results corroborate the theory behind the study.

### 3.1 Analysis complements

As a complement, we also tested the model for endogeneity. Endogeneity is present when there is a correlation between the parameter or variable and the error term. In some cases, the exogeneity of the independent variables may be doubtful. When this happens the OLS estimators are not appropriate anymore. When the independent variables aren't exogenous, the OLS estimators became biased and inconsistent. The lack of exogeneity can be related with: The omission of independent variables; Measurement errors and Simultaneity (when the dependent variable depended of the independent variable but the opposite also occurs).

In the present model, there are two variables which can be tested for endogeneity. The variables are the logarithm of the number of employees and the logarithm of the 52-week price change.

Thus, to be able to beat the endogeneity issue we used an instrumental variables approach.

This method is used when, for instance, there is a suspicion that the variable  $X_{1i}$  is correlated with the error term, and therefore  $cov(X_{1i}, u_i) \neq 0$ . In this case the OLS estimation methodology turns unviable. To achieve unbiased and consistent estimators one must find exogenous variables, called instruments, which are highly correlated with the endogenous independent variable, but are not correlated with the structural equation error term.

Naturally while choosing estimators we accounted for the variables to be not correlated with the structural equation error term and the variables partially correlated with the endogenous independent variable in the structural model.

Generally, one assumes that in the OLS model all the independent variables are endogenous. But, when this does not happen, one can find the IV estimator with the

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<sup>6</sup> To detect heterokedasticity we use the White test. The white test is a general test. The interpretation of the test is that given a certain  $\alpha$  (normally 5%) we do not reject the null hypothesis.  $TR^2 < X(p)$  or p-value  $> 0.05$

<sup>7</sup> To test the stability of the model we can use the Chow test. This test also allows to verify if there are structural changes along the estimation period. To interpret the results. We can state that if  $F_{stat} < F_{k, N_1 + N_2 - 2k}(1 - \alpha)$  or a p-value superior than 0.05 we cannot reject the null hypothesis of equality in two different periods.

following configuration:  $\hat{\beta}_{IV} = (X'P_ZX)^{-1}X'P_ZY$ . Where:  $P_Z = Z(Z'Z)^{-1}Z'$  is a symmetric and idempotent matrix (Greene, 2003).

The IV estimators can be seen as the result of the applications of a two stage least squares. In the first stage we do the regression of each endogenous independent variable on the instrumental variables ( $X = f(Z)$ ) to obtain the estimated value matrix  $\hat{X}$ , where  $\hat{X} = Z(Z'Z)^{-1}Z'X = P_ZX$ .

In the second stage, is where we apply the regression of  $Y$  over  $\hat{X}$  to get the 2SLS estimators,  $\widehat{\beta}_{2sls} = (X'X)^{-1}(\hat{X}'Y) = (X'P_ZX)^{-1}(X'P_ZY) = \hat{\beta}_{IV}$  with  $cov(\widehat{\beta}_{2sls}) = \sigma^2(X'P_ZX)^{-1}$ . Therefore, the IV estimator can be calculated by applying a 2SLS procedure (Greene, 2003).

In our work, the chosen instruments for our study are the stockrotation, which can be defined as follows:

$$stockrotation = \frac{average\ monthly\ volume \times 12}{Float} \times 100 \quad (3)$$

Where: the float is the number of free traded shares in public hands. It can be calculated as the shares outstanding minus the shares owned by insiders.

And the market capitalization (MCAP) which is simply the total number of shares of a company times its price.

After defining our instruments, the first step when we suspect of endogeneity is to test the model and more specifically the independent variables that we suspect of. For this we used the Durbin-Wu-Hausman test.<sup>8</sup>

Thus, we estimated our IV regression. In both cases, suspicion of endogeneity in the logarithm of the number of employees or the logarithm of the 52-week price change, the Durbin-Wu-Hausman test presents a p-value higher than 0.05.

This tells us that our suspicions were not valid and the model does not suffer of endogeneity in the tested variables. The p-values were 0.50 and 0.92 respectively. This way, the IV approach proved not necessary. OLS is the best methodology available.

<sup>8</sup> The Durbin-Wu-Hausman test is the test to apply when we want to test a variable for endogeneity. This test uses a  $\chi^2$  distribution to test the endogeneity hypothesis of the regressors. Once more if the p-value is inferior to 0.05 or  $H > \chi^2_k$  the null hypothesis is rejected which validates the IV estimation method.

Also, notice that we tested for the validity and strength of our instruments. Thus, we applied the Sargan<sup>9</sup> test for validity. In both cases the p-value of the test is higher than 0.05 therefore we cannot reject the null hypothesis of valid instruments. The p-values are 0.70 (stockrotation) and 0.44 (MCAP) respectively.

Regarding the strength or weakness of the instruments, we accounted for the fact that, instruments that poorly explain the variation of the endogenous independent variable are considered weak. When this happens the IV estimators turn biased and the statistical inferences based on the  $t_{stat}$  become non-credible. The same thing happens to the confidence intervals.

To test the weakness of the instrument we can apply an F test to test the global significance of the independent variables coefficients from the first stage of the 2SLS procedure equation. A simple technique is to assume that the instruments are weak when the value of the F statistics is inferior to 10. In our case, if there was endogeneity of the variables and the IV approach had to be used it is good to know that the chosen instruments present higher than 10 values (11 and 164 respectively) for the F statistics. Also, note that when the instruments are weak the OLS procedure is better than the IV/2SLS. With our instruments, this would not be the case.

After testing for endogeneity and showing that this issue was not present in the model, the results found in the previous estimation are considered a fairly good fit and stand as the best option for the study.

## 4 Concluding Remarks

The aim of the present report was to review some of the available literature on how does the mandatory reporting frequency affects the binomial relationship between the performance and the short-term concerns of the firms. Obviously, this relationship is dependent from the market and its pressures, the firm's decision makers (managers), and all the firm's stakeholders. Knowing this, we've followed a chronological approach trying to cover as much areas as possible. We also tackled this issue in an empirical manner, detaching by the literature by using a different measure of performance and using a multi-country sample creating a model where we could study the impact of the reporting frequency on the performance of a firm.

From the presented literature review, it is possible to conclude that when there's an increase in the mandatory reporting frequency, and therefore an increase in the market

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<sup>9</sup> The Sargan–Hansen test or Sargan's J test is a statistical test used for testing over-identifying restrictions in a statistical model. The Sargan tests the validity of over-identifying restrictions. The test statistic can be computed from residuals from instrumental variables regression by constructing a quadratic form based on the cross-product of the residuals and exogenous variables. The interpretation of the test is very like the previous ones. If  $LM > \chi^2_q$  or the p-value < 0.05 we reject the null hypothesis of valid instruments. When this happens, new instruments must be found.

pressures, managers tend to induce in a myopic behavior where they give away some of the value of the firm to be able to fulfill their short-short term concerns. This mainly happens because the market is very “clear” when it comes to the firm’s earnings. If a firm cannot, at least, reach its guidance, the reflection on its market price will be almost immediate. Therefore, managers tend to inflate their earnings to avoid their short-term problems. This view is considered main stream in the literature.

Summing up, higher reporting frequency leads to higher short-termism by managers and, therefore, to a value decrease of the firm. Also, it can be said that there are several approaches that try to deal with the studied subject. The stakeholder approach is just an example that if well applied can solve the short vs concerns binomial. This is possible by maximizing the firm’s strategy considering account all the stakeholders and relationships of the firm.

From the empirical work, there is no doubt that a higher reporting frequency impacts negatively on the perform of a firm measured by the return-on-assets.

The present work contributes to the literature in influences of firms’ performance, reporting frequency and management results.

For future studies, we aim to extend data into a panel configuration. In statistical terms, a higher number of observations leads to a better assuring of the asymptotic proprieties of the estimators, due to an increase in the freedom degrees, the statistical inferences became more credible, the risk of multicollinearity is reduced, the information amount is with no doubt bigger, the efficiency and stability of the estimators is increased, and, at last, it would allow to introduce dynamic adjustments. We also aim to include more proxies for perform within the study.

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