



Voluntary and compulsory information disclosed online

The effect of industry concentration and other explanatory factors

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Abstract

Purpose – This work aims to check the validity of the hypotheses of the agency, signalling, political costs and proprietary costs theories in the disclosure of information online. More specifically, to determine the prevalence of the purposes alleged by those theories, we analyse the effect of industry concentration and other factors on an index of items of information disclosed on corporate web sites, in its entirety as well as its breakdown into information whose elaboration and disclosure is compulsory and information whose elaboration and disclosure is voluntary.

Design/methodology/approach – First, a content analysis of the quoted non-financial Spanish companies' web sites was carried out. To do this, three disclosure indexes were created and applied. Then three causal models were estimated by applying a linear regression, taking several factors into consideration.

Findings – The findings emphasise the relevance of the hypotheses of political costs theory as the main explanatory factor for voluntary disclosure of information on the internet by quoted Spanish firms. In particular, the hypothesis that the greater the firm's monopolistic power, the more visible the company is and the more political costs it faces. To reduce these costs, such companies have an interest in disclosing greater amounts of information.

Practical implications – The researchers have analysed only one year of data from one country, but this analysis is significant because the motives which lead a firm to disclose information can be very different depending on its geographic location, especially if the factors which determine disclosure practices are associated with the political costs that the companies face.

Originality/value – This is the first study to examine the effect of industrial concentration on the disclosure of information online.

Keywords Internet, Online operations, Information disclosure, Spain

Paper type Research paper



Introduction

Whether to disclose corporate information is one of the most significant decisions for companies due to the multiple effects that can stem from this action. Corporate information includes records of historical and financial data, descriptions of activities, exposition of the current situation and future plans, etc. – that is, those data that can influence investor expectations and other individuals' behaviour towards the company and that are publicly available for those people interested in analysing a specific firm. Divulgarion can alleviate some of the problems firms usually face, including the differing incentives for managers and owners; the need to stand out from competitors,

to obtain new funding and to send signals to markets; and those caused by the relationships with the public sector and governments.

Several theories provide hypotheses in favour of voluntary disclosure, taking into consideration the different problems which the disclosure can solve. For instance, agency theory fosters the revelation of corporate information as a way to control managers' actions and align incentives for managers and owners.

According to signalling theory, the disclosure of information can be considered a signal to capital markets, sent to decrease the asymmetry of information which often exists between managers and other individuals, to optimise financing costs and to increase corporate value.

In accordance with political costs theory, to avoid the shifting of business wealth towards the public and/or political sector, companies will voluntarily disclose information when this will lead to an improvement in the relationships with governments and the public sector by decreasing political costs (e.g. taxes) and obtaining certain advantages (subsidies, governmental actions in favour of the corporation, etc.).

However, the disclosure of corporate information need not have positive consequences. Proprietary costs theory considers the disclosure of information to be a disadvantage because of the likely detrimental use of this information by some external users (dissenting shareholders, employees and competitors).

Considering the background provided by such theories, several factors may influence the amount of information disclosed. The empirical evidence has emphasised that large companies tend to disclose information because they face larger problems in relation to the separation of ownership and management (agency theory) as well as information asymmetry. They are more politically visible and the effect of proprietary costs (those related to the competitive damage caused by excessive information) is more significant.

However, when the influence of other representative factors is analysed the results are not so conclusive. For example, industry concentration is one of the factors for which there is mixed evidence. An industry can be regarded as concentrated when most of the sales produced in that industry are generated by a small number of companies. In contrast, it can be considered competitive when companies have similar market shares, in other words, when they have similar shares of sales in that sector. As for the repercussions of industry concentration (versus industry competition), the conclusions reached in prior research have been completely different.

On the one hand, some studies (Verrecchia, 1983; Darrrough and Stoughton, 1990; Balakrishnan *et al.*, 1990; Wagenhofer, 1990; Harris, 1998; Botosan and Stanford, 2005; Macagnan, 2005) point out that the disclosure of information may occur less often in competitive industries due to the fact that such disclosure could harm the corporations' competitive position. On the other hand, other works (Deegan and Carroll, 1993; Rodríguez, 2004) have displayed a positive link between a company's monopolistic position and the amount of voluntary information, in that the more monopolistic power a firm holds, the more visible it is and the more political costs it faces. To diminish these costs, firms have an interest in revealing more information. Finally, Christopher and Hassan (1995) and Berger and Hann (2002) did not find any relationship between the disclosure of segment information and industry concentration.

This work is an attempt to contribute to the previous literature by verifying the effect of industry concentration on the disclosure of information on the internet, given

that the internet has taken on special importance worldwide as a mechanism for the dissemination of information. Though relatively recent, the disclosure of information online has undergone dramatic growth as the world wide web provides a user-friendly platform that companies can use to communicate with a large and growing number of financial information consumers.

Furthermore, there are some legal duties that require the online disclosure of some information for shareholders and other stakeholders, for example, in Spain Circular 1/2004 from the Comisión Nacional del Mercado de Valores (CNMV – the National Securities Market Commission, the Spanish equivalent of the SEC in the USA).

With this aim in mind, we carried out a content analysis of the information provided by a sample of Spanish quoted companies on their web sites. Content analysis is considered one of the most important methodologies in communication research and has been widely used by researchers trying to obtain reliable and valid information from narratives which appear in the natural context of the phenomenon being investigated (Krippendorff, 1980; Boesso and Kumar, 2007). Using this methodology, we thoroughly studied various pieces of information related to:

- finance;
- corporate governance;
- corporate social responsibility;
- intangibles; and
- corporate strategy.

Both financial information and information on corporate governance are types of information that are compulsory to disclose under Spanish rules. Information concerning the remaining issues may be revealed voluntarily by companies.

The results of the content analysis are summarised in three disclosure indexes, and three models of analysis based on those indexes are estimated. The first model takes into consideration the index using all of the disclosed information. Subsequently, this index is split into two indexes: one for compulsory information and another for voluntary information. As well as other control variables (corporate size, industry sector, profitability and leverage), the Herfindhal Index – defined as the percentage of sales in an industry that are generated by a specific company – constitutes our explanatory variable as a proxy for industry concentration.

The findings obtained emphasise the relevance of political costs theory as an explanatory factor for the disclosure of voluntary information on the internet when it is studied separately. According to political costs theory, companies that do business in concentrated industries – and, consequently, more visible firms – voluntarily reveal a larger volume of unregulated information on corporate social responsibility, intangibles and strategic information. These disclosure practices may have the goal of diminishing some likely political costs, such as an increase in the regulation of these issues as well as any increase in taxes caused by non-acceptable environmental and social behaviours.

Nevertheless, this theory does not influence the overall disclosure of information by Spanish quoted companies.

The disclosure of corporate information on the internet

The rapid development of the world wide web has provided a user-friendly platform that companies can use to communicate with a large and growing number of financial information consumers (Ettredge *et al.*, 2001). Compared with traditional printed reports, the internet offers many more opportunities to communicate corporate information and allows a wealth of up-to-date, unofficial, critical and alternative channels of accounting information to compete with the official channels (Paisey and Paisey, 2006; Gallhofer *et al.*, 2006). For example, the internet is enhancing interactivity as well as providing enhanced information delivery systems not available just a few years ago (Ihator, 2001).

For a corporation, the advantages of supplying information on a company web site include providing individual investors with a quantity and timeliness of information previously available only to select parties such as institutional investors and analysts. Corporations now have the ability to deliver unfiltered information to their public and without time lag.

The new information technology is providing all with easy access to vehicles of mass communication, which historically belonged to just few institutions. The old forms of corporate communication were unidirectional; in contrast internet communication is multidirectional in nature and very fast in transmission. Easy access to the new information technology, such as the web, now empowers individuals to easily disseminate their viewpoint on anything.

In addition to this, some corporate costs of printing or mailing may be reduced, while at the same time investors may obtain information at less cost. The internet can also arouse interest among potential investors and provide a boost to corporate image (Noack, 1997). This medium allows the company to control the context in which data are presented to emphasise the positive and provide interpretation for potentially negative information.

Consequently, the internet may be an appropriate and useful way to convey corporate strategic information. Likewise, it is possibly the most powerful means of providing targeted information to specific concerned stakeholders as a legitimacy strategy (Campbell *et al.*, 2003).

Nowadays the disclosure of voluntary and compulsory information is a common practice in companies with the objective of diminishing agency costs (those costs entailed by the separation of ownership and management in the largest companies, such as the costs of controlling managers), political costs (those stemming from the relationships between the firm and the authorities) and asymmetries of information between managers and the remaining users of corporate information. Owing to the advantages and opportunities the internet provides (Gandía and Andrés, 2005), although recent, the disclosure of information online has shown dramatic growth according to studies by Petravick and Gillet (1996, 1998), Gray and Debreceeny (1997) and Debreceeny *et al.* (1999) in the USA; Lymer (1998) and Craven and Martson (1999) in the UK; and Hedlin (1999) in Sweden. In Spain, Gowthorpe and Amat (1999) described somewhat of a delay compared with the international context.

These works also revealed important differences in the information provided on the companies' web sites. Moreover, with regard to financial information, they showed that more than 50 per cent of the corporations analysed did not publish audited financial

statements in their entirety (Petrvick and Gillet, 1996; Gray and Debrecey, 1997; Lymer, 1998; Craven and Martson, 1999; Hedlin, 1999; Gowthorpe and Amat, 1999; Larrán and Giner, 2001). Instead they preferred to disclose mainly updated data on profits (Petrvick and Gillet, 1998) and quarterly reports (Ettredge *et al.*, 2001).

Both the fast adoption of the internet as a way of disclosing corporate information and the heterogeneity of the content published online have caused the need for regulation through a normalisation process in the national and international contexts. The objective of this process is to harmonise contents and formats to make the information online comparable.

Thus, in 2002 the International Federation of Accountants (IFAC, 2002) issued a report worldwide to encourage discussion of this topic by considering:

- The type of information that companies should disclose on their web sites.
- The format that firms should use to show the information.
- The security and integrity of data.
- Differentiation between audited reports and non-audited information.
- The disclosure of non-financial information.
- The inclusion of contact details such as e-mail, phone, postal address, etc.
- The provision of the information in different languages.

In a regional context, Directive 2004/109/EC of the European Commission relates to the harmonisation of the transparency requirements and considers the internet to be an appropriate way to communicate financial information (Commission of the European Communities, 2004). Article 17 allows the use of electronic methods for revealing information to stockholders.

In the national (Spanish) context of this study there is a compulsory rule, Circular 1/2004 of the CNMV (2004) as well as some guidelines from one of the most relevant professional and academic organisations in Spain, Asociación Española de Contabilidad y Administración de Empresas (AECA (2002) – the Spanish Accounting and Business Administration Association).

Circular 1/2004 divides into two chapters both the Spanish Government's Law 26/2003 on the transparency of quoted companies and Eco Order 3722/2003 on the annual report on corporate governance and other information on quoted companies (Ley 26/2003, 2003; Orden del Ministerio de Economía 3722/2003, 2003). The first chapter has to do with the annual report on corporate governance, which must be made available to stockholders on the company's web site. The second chapter refers to the minimum content of quoted firms' web sites. This Circular confirms the principle of transparency as the main guideline for the elaboration and disclosure of corporate information.

In addition, the AECA (2002) guidelines cover several issues related to web site content on the enterprise and financial information as well as the format, accessibility and ease of browsing.

Consequently, it is compulsory for Spanish quoted corporations to include some information – financial information and an annual corporate governance report – on their web sites. In addition they can choose to reveal other kinds of information according to the principle of transparency.

Theories on the disclosure of financial information

The disclosure of online information by companies is several theories, such as the agency, political costs, signalling and proprietary costs theories. Table I summarises the assumptions underlying each of these theories and their implications in the disclosure of corporate information.

Agency theory states several advantages linked to the disclosure of corporate information. This theory is based on the problems stemming from the separation of ownership and management in the largest corporations. The separation is likely to lead to different incentives for managers and shareholders, making it necessary to carry out several actions to align these two incentives, including performance-based contracts and bonus sharing plans. Those actions involve some costs, traditionally referred to as agency costs. One of the possible ways to reduce those costs is to disclose information about the managers' actions and the economic reality of the company. With that information, shareholders will be able to monitor managers more appropriately. Consequently, the disclosure of information can serve as a mechanism for control on behalf of companies' shareholders as well as a mechanism of legitimacy for managers.

Signalling theory also encourages the disclosure of corporate information. Signalling theory maintains that corporations could have an interest in providing information as a signal or mechanism that provides the market with additional information on the firm's economic reality so as to change investor expectations and reduce information asymmetries (Baiman and Verrecchia, 1996). The information asymmetries have to do with the different amounts of company information available to managers, who have to deal with the daily operations and activities of the firm, and to other individuals, who receive delayed and filtered information from the managers. Companies wish to stand out from their competitors and voluntary disclosure is one possible way to achieve this distinction and could lead to a more efficient evaluation of a firm's future prospects by the capital market and to a higher share price if the firm is perceived to offer good future prospects. In that context, a company's failure to disclose information could be adversely interpreted by capital markets.

Agency and signalling theories are quite interrelated as both are based on the existence of asymmetries between the information available to managers and that available to investors. Therefore, the mechanisms used for controlling managers may serve as signals to markets and a way of reporting good management by executives. Both provide companies with incentives to divulge information.

The relationships between companies and the public sector are the focus of another disclosure theory, political costs theory. This states that the firms most sensitive to regulation, nationalisation, expropriation, etc. are more likely to reveal information in order to decrease-related costs. Companies usually attempt to keep corporate wealth from being shifted towards the public sector. To that end, companies can voluntarily disclose information which might lead to regulation oriented towards decreasing political costs (e.g. taxes) and obtaining advantages (subsidies, government action which favours the corporation, etc.).

Distinguishing between political costs theory and other disclosure theories is often difficult as they lead to the same result, which can be summarised briefly – the more information the company discloses, the better. Disclosure can serve to control managers' actions and reduce agency costs; it can be useful as a signal to markets, while at the same time decreasing political costs.

Table I.
Main theories
on the disclosure of
corporate information

Theory	Basic underlying principles	Implications	Studies
Agency	<p>Conflicts of interest can arise from the separation of ownership and control of a firm</p> <p>If managers do not act on the behalf of their shareholders but try to further their own interests, this may lead to the need for some systems of incentives and control</p> <p>These systems imply some costs, called agency costs</p> <p>Voluntary disclosures can lower agency costs</p>	<p>Shareholders will require more information as a mechanism of control of management</p> <p>Also, managers will provide owners with information to legitimate their conduct</p> <p>Consequently, disclosure of information is beneficial to the company as it allows the costs associated with control of managers to be lower</p>	<p>Jensen and Meckling (1976), Craven and Martson (1999), Debrecey <i>et al.</i> (2002), Oyelere <i>et al.</i> (2003), Xiao <i>et al.</i> (2004), Birt <i>et al.</i> (2006) and Lim <i>et al.</i> (2007)</p>
Signalling	<p>Corporate information can be used as a mechanism (signal) that provides markets with additional information about the economic reality of the company so that investors' expectations can be changed</p> <p>Consequently, higher quality firms have an incentive to distinguish themselves from lower quality firms that might have poor performance</p> <p>Voluntary disclosure is one possible way to achieve this distinction</p>	<p>Companies have strong incentives to disclose information to stand out from their competitors and avoid a wrong assessment of their performance</p> <p>Markets will punish companies that do not disclose by interpreting that the information is negative</p> <p>The more profitable a company is, the more interested it will be in providing information</p>	<p>Kelly (1994), Leuz (1998), Craven and Martson (1999), Oyelere <i>et al.</i> (2003), Marston and Polei (2004) and Petersen and Plenborg (2006)</p>

(continued)

Theory	Basic underlying principles	Implications	Studies
Political costs	<p>Some political costs exist, derived from the relationships between companies and the public sector (such as regulation, nationalisation, expropriation or the break-up of the entity or industry)</p> <p>Companies are vulnerable to political costs</p> <p>To counter the threat of governmental interference, companies may employ a number of devices (e.g. increasing disclosure)</p>	<p>Firms can employ voluntary disclosure to avoid the attention of external parties such as government regulators, suppliers and unions</p> <p>Firms with high political visibility in the marketplace tend to increase disclosure as a means of mitigating potential political costs</p>	<p>Ahmed (1990), Deegan and Gordon (1996), Debreceeny <i>et al.</i> (2002), Marston and Polei (2004), Bonsón and Escobar (2004) and Xiao <i>et al.</i> (2004)</p>
Proprietary costs	<p>Corporate information can lead to important competitive damages, since the information will be also available to competitors and other individuals</p> <p>To disclose information would help the financial market in evaluating the firm's value more accurately, but at the same time could compromise the company's competitive position by providing strategic information to potential competitors</p> <p>Disclosed information can reveal to competitors and other parties (like customers) the existence of weaknesses or opportunities to be exploited to their own advantage</p>	<p>Companies limit voluntary disclosure of relevant information to the financial market because of disclosure-related costs, such as preparations and competitive costs</p>	<p>Verrecchia (1983), Prenceipe (2004), Petersen and Plenborg (2006) and Birt <i>et al.</i> (2006)</p>

Table I.

Nevertheless, producing and disclosing information can also lead to disadvantages related to certain costs that can sometimes outweigh the benefits (Gray *et al.*, 1990). Proprietary costs theory (Verrecchia, 1983; Prencipe, 2004) states that the disclosure of information may be a competitive disadvantage. Companies may provide useful information to competitors to the disadvantage of the disclosing companies, generating some costs for companies' owners (named proprietary costs).

Proprietary costs theory claims that there are two types of costs associated with information disclosure. The first costs are caused by the processing, collection and dissemination of information. Their importance to the corporation is usually minimal as this information must in any case be prepared in order for the company to make internal decisions. The second set of costs arises from the use which some external users (dissenting stockholders, employees, competitors, etc.) make of this kind of information in the future to harm the company's competitive position (Giner *et al.*, 2003). Elliot and Jacobson (1994) mention that as well as information on business transactions and activities, information on technological innovation, strategies, plans and tactics may lead to significant competitive disadvantages. Faced with this situation, managers could be reluctant to disclose too much information.

In conclusion, there is a trade-off in the disclosure of corporate information. Whereas the agency, signalling and political costs theories promote such disclosure, stating that it can alleviate some of the problems and costs companies are faced with, proprietary costs theory underlines the likely competitive damage companies could suffer in disclosing information.

Bearing in mind the above arguments, companies must ponder both the adverse consequences and the advantages in deciding whether to divulge information, and in the end they must decide to disclose that information only when the marginal benefits are greater than the marginal costs of disclosing the additional information.

Factors of disclosure and hypotheses

Based on the above theories, several studies have analysed some of the factors that may influence the amount of corporate information disclosed. These studies have usually performed an analysis of web sites and applied some statistical techniques of multivariate analysis, such as correlation coefficients, tests of mean differences (e.g. Kruskal-Wallis), regression analysis, etc.

Industry concentration

In the analysis of industry concentration, both the proprietary costs theory and the political costs framework may be applied. On the one hand, concentrated industries may limit the amount of information disclosed because of the damage it could cause in competitive terms (proprietary costs theory). On the other hand, concentrated industries are more politically visible and could experience governmental interference (political costs theory), in which case they would rather disclose information voluntarily to obtain legitimacy and avoid external interference.

Several authors (Verrecchia, 1983; Darrough and Stoughton, 1990; Balakrishnan *et al.*, 1990; Wagenhofer, 1990) have stated that the disclosure of information will take place less often in competitive industries, because of the fact that such information could harm a corporation's competitive position. Nevertheless, empirical verification

has not found conclusive results on the relationship between competition and disclosure.

Harris (1998) found that less competitive industrial sectors are less likely to disclose segment information than highly competitive sectors. Firms that operate in less competitive industries wish to protect the abnormal benefits which usually take place in those industries. The disclosure of more segment information may harm their competitive advantage and decrease those abnormal benefits. Botosan and Stanford (2005) reached equivalent conclusions for the disclosure of information according to the Statement of Financial Accounting Standards No. 131 (an accounting rule issued by the USA's Financial Accounting Standards Board), as did Macagnan (2005) for the disclosure of information on intangibles.

Hayes and Lundholm (1996) and Birt *et al.* (2006) found a positive relationship between competitiveness and the disclosure of segment information. On the one hand, they found that firms with less competition have greater proprietary costs and consequently are less likely to release information that could be useful for competitors. On the other hand, companies in more competitive industries have more incentives for revealing information in order to reduce information asymmetry.

However, Deegan and Carroll (1993) and Rodríguez (2004) found a positive relationship between the firm's monopolistic position (industry concentration) and the amount of voluntary information disclosed. The reason behind this relationship is that the more monopolistic power a company holds, the more visible it is and the more political costs it must face. To diminish those costs, monopolistic corporations are more interested in disclosing more information.

Finally, Christopher and Hassan (1995) and Berger and Hann (2002) did not find any relationship between the disclosure of segment information and industry concentration. As a result, the levels of aggregation and disaggregation of segment information take place in corporations that operate in sectors with similar concentration levels.

The lack of empirical evidence involving online disclosure and the non-conclusive results for the disclosure of several kinds of information gave rise to the following hypotheses:

- H1.* Industry concentration influences the amount of corporate information disclosed on web sites.
- H1a.* Industry concentration influences the volume of voluntary information revealed on web sites.
- H1b.* Industry concentration influences the volume of compulsory information revealed on web sites.

The effect of concentration versus industry competitiveness on the disclosure of information online have been checked using the Herfindhal Index as a measure of the degree of industrial concentration. The Herfindhal Index for company *i* is established as:

$$H_i = \sum \left(\frac{R_{ij}}{R_j} \right)^2 \quad i = 1..n_j$$

In which R_{ij} represents the revenue obtained by company *i* in industry *j* (in accordance with the sector classification of the CNMV), n_j is the number of firms in industry *j* and R_j is the total revenue for all of the companies in industry *j*.

Other explanatory factors

Corporate size. Larger-sized companies usually exhibit some corporative features which make them different from companies of a lesser size, for example, a more diverse range of products, more complex distribution channels and more extensive use of capital markets to obtain financing.

This last aspect especially conditions the amount and quality of the information to be disclosed. According to Giner (1995), one of the main justifications for the disclosure of corporate information is the need to keep adequate links with capital suppliers in order to get financing under the best conditions.

With regard to agency theory, as corporate size increases, the need for external funds rises and the possibility of conflicts of interest between stockholders, debtholders and managers increases. As a result agency costs rise. In this situation, it is possible to use the disclosure of voluntary information as a way to decrease those costs. Voluntary information could be used to reduce information asymmetries, thereby allowing the company to access the capital market more competitively.

From the perspective of a cost-benefit analysis, the costs of preparing and disseminating information on the internet are likely to be unrelated to corporate size (Larrán and Giner, 2002; Bonsón and Escobar, 2004). Nevertheless, the potential benefits will be greater for larger-sized corporations as there is a direct relationship between agency costs and disclosure benefits, as well as other aspects.

In conjunction with this argument, larger-sized companies are more visible in markets and in society as a whole, with greater coverage by analysts and greater sensitivity to public image. This situation could lead to an increased number of potential users of financial information, which creates more information demand and pressure on companies. Also, they face greater political costs and need to send out signals to divulge their management practices.

Taking into account these arguments, most previous research has found that corporate size does have a positive influence on the amount of voluntary information disclosed on web sites. By analysing the implications of agency theory, Craven and Martson (1999), Oyelere *et al.* (2003), Marston and Polei (2004), Bonsón and Escobar (2004), Lim *et al.* (2007) and Boesso and Kumar (2007) all found a positive relationship.

However, other studies have found exceptions to the direct relationship by showing its validity only up to a certain size (Pirchegger and Wagenhofer, 1999), and several works, such as Khanna *et al.* (2004) or Ortiz and Clavel (2006), have not found a statistically significant relationship for European multinationals listed on the New York Stock Exchange. The different institutional settings and the different sizes of the samples (usually small) may explain these divergent results.

As the variable related to corporate size, we selected the market capitalisation at December 2005, data we obtained from the AMADEUS database.

Industrial sector. The industry in which firms operate has often been used as a variable to explain the quantity of information provided by corporations, especially from the signalling and political costs perspectives. Companies that operate in the same industry are supposed to adopt similar guidelines on the information disclosed. They face the same level of business complexity, industry instability and volatility (Boesso and Kumar, 2007). According to signalling theory, if a company fails to adopt the same disclosure strategy as other corporations in the same industry, the market could interpret this as bad news (Watts and Zimmerman, 1978).

Furthermore, industry membership may affect the political vulnerability of firms; therefore companies in industries that are more politically vulnerable may use voluntary disclosure to minimise political costs, such as regulation, break-up of the entity/industry, etc. (Oyelere *et al.*, 2003).

The results found in the literature do not offer a clear conclusion on the relationship between disclosure and industry, unlike for corporate size. While some works have found that industry membership does help explain the amount of voluntary information disclosed (Oyelere *et al.*, 2003; Gul and Leung, 2004; Bonsón and Escobar, 2004), especially in the information technology sector or in high-growth industries (Xiao *et al.*, 2004), other studies have not shown a statistically significant relationship (Giner, 1997; Craven and Martson, 1999; Larrán and Giner, 2002; Giner *et al.*, 2003). Again, the differences in geographic and institutional scope may have constituted limitations on these studies and may have led to divergent conclusions.

In order to analyse the effect of the industry we have followed the CNMV industry classification and included five dummy variables – services, transportation, industry, energy and construction. The variables were defined with the value 1 if the company belonged to industry k and otherwise the value 0.

Profitability. The link between profitability and voluntary disclosure is especially complex. The main disclosure theories tend to indicate that there is a positive relationship. According to agency theory, the managers of profitable companies use information to obtain personal advantages, such as ensuring the stability of their positions and increasing their levels of compensation.

From the perspective of signalling theory, profitability may be considered an indicator of the quality of the investment. Accordingly, if a high level of profitability is achieved, there will be a greater incentive to disclose information and reduce the risk of being viewed negatively by markets. According to this theory, profitable companies reveal information in order to stand out from other less successful corporations, to obtain funds at the lowest cost and to avoid any decrease in stock price.

Moreover, political costs theory supports the disclosure of voluntary information, so as to justify the returns obtained.

However, Wagenhofer (1990), Giner *et al.* (2003) or Prencipe (2004) have analysed a likely negative relationship from the perspective of proprietary costs theory as higher profitability could spur rival companies to enter into the company's market. Consequently, it is essential to consider the influence of competitive costs, which tend to increase when profitability increases.

Despite the coherence of the assumptions of most disclosure theories, most previous studies have not found a statistically significant relationship between voluntary disclosure and profitability (Larrán and Giner, 2002; Oyelere *et al.*, 2003; Giner *et al.*, 2003; Marston and Polei, 2004; Prencipe, 2004; Magness, 2006). However, Khanna *et al.* (2004) and Gul and Leung (2004) found that profitability did have a positive influence on the amount of voluntary disclosure in multinationals listed on the New York Stock Exchange and in quoted companies in Hong Kong, respectively.

As the variable related to profitability, we have used the return on assets (ROA), defined as the ratio between the operating income and the volume of assets, at December 2005.

Leverage. The level of leverage constitutes another factor associated with greater disclosure of information from the agency theory perspective, especially as a result of

conflicts stemming from the leverage. Companies with more debt have greater agency costs because there is a possibility of transference of wealth from debtholders to stockholders. By increasing the amount of information disclosed, corporations can reduce their agency costs and any possible conflicts of interest between owners and creditors.

Moreover, as leverage increases, the demand from creditors for additional information also rises because this is the way in which they attempt to find out how likely it is that the company can meet its financial obligations. In terms of stockholders, voluntary information is a mechanism used to monitor management and evaluate a company's financial health, given that the risk of financial distress increases with rising leverage.

In this respect, by analysing the influence of agency theory, several studies have found that leverage has a positive effect on the amount of information revealed voluntarily (Giner *et al.*, 2003; Xiao *et al.*, 2004; Prencipe, 2004; Alvarez, 2007), whereas other works have not found a statistically significant relationship (Giner, 1997; Oyelere *et al.*, 2003; Gul and Leung, 2004).

In this research paper, we have measured leverage as the debt/total assets ratio (in other words, the percentage of assets acquired by using debt, as it is typically used in the accounting literature) at December 2005.

Research methodology

Sample description

To check the hypotheses, we used a sample of the companies listed on the Madrid Stock Market. The initial sample consisted of all the quoted companies. We then removed those firms belonging to the finance and insurance sectors and our final sample was 117 corporations from different sectors.

We selected this sample for several reasons. First, we were dealing with the set of the largest Spanish companies, the most significant in the Spanish Stock Market, that were particularly active at the time. The largest companies are more likely to have sufficient resources and incentives to adopt a policy of voluntary disclosure online, so that a lack of disclosure or minimal disclosure is likely to reflect a conscious choice. Second, the sample size was representative enough with sufficient statistical variation to make reliable statistical inferences. Third, the study of this sample has allowed us to reach conclusions on the set of the most significant Spanish corporations, which were the main companies with incentives to undertake a policy of voluntary disclosure of information.

After selecting the sample, we carried out an analysis of the sample companies' web sites. All of the firms had their own web site. We studied only the information available for the general public on the main corporate web sites; intranets were not taken into account as they are available only to internal users and not to the general public that may have an interest in the company analysed. Spanish corporate web sites do not typically show stratification of access to special content, except for those companies that use their web sites for e-commerce with customers and suppliers.

In terms of format and accessibility, we were able to find some common patterns:

- Downloading the web site was generally quick (less than ten seconds).
- The annual accounts and other reports were able to be downloaded in pdf format and sometimes in Excel format (for instance, Albertis, ACS, Endesa and Vocento).

- Financial information and other relevant information for shareholders was immediately accessible (they could usually be accessed from the main page).
- The sites had frames and web maps to make it easier to search for relevant information.

Finally, the financial data necessary for the empirical analysis – market capitalisation, ROA and leverage – were obtained from the AMADEUS database in December 2005.

Creating a disclosure index

To carry out the analysis, we created a disclosure index. Creating an index is a form of content analysis and is one of the main techniques used to study the information provided by companies (Ortiz and Clavel, 2006). Thus, the disclosure index is one of the main ways of evaluating the informative transparency of the firms in a sector or country (García-Meca and Martínez, 2004; Bonsón and Escobar, 2004).

To create the index, we initially considered several descriptive studies that have analysed the amount of voluntary information provided on company web sites in different countries such as the USA (Ettredge *et al.*, 2001), Germany (Marston and Polei, 2004), Austria (Pirchegger and Wagenhofer, 1999), Denmark (Petersen and Plenborg, 2006) and Spain (Larrán and Giner, 2002). These studies focussed on verifying a set of issues in the information disclosed on web sites using binary values (1: presence of the information searched for; 0: absence of the information searched for). Then the values obtained are aggregated and, where appropriate, weighted.

Based on these studies and placing a special emphasis on the information recommended for disclosure in the guidelines of the Spanish Accounting and Business Administration Association (AECA, 2002), we selected the information items to be considered in the disclosure index (Table III).

The goal of the index was to show which significant issues companies revealed on their web sites in terms of their financial information, corporate governance, corporate social responsibility, intangible assets and strategic information. The index was divided into two headings:

- (1) *Compulsory information.* According to Circular 1/2004 (CNMV, 2004):
 - financial information; and
 - corporate governance.
- (2) *Voluntary information.* In this case, there is no external obligation; however, it can actually reflect the usefulness of the web site as a way of disclosing relevant information for users:
 - corporate social responsibility;
 - intangible assets; and
 - strategic information.

Because the objective of the proposed index is to determine what information is provided on the internet, we mainly considered variables which reflect web site contents, unlike other studies (Ettredge *et al.*, 2001; Pirchegger and Wagenhofer, 1999; Gandía, 2001), which included variables to assess the ease of browsing, design and technology of corporate web sites.

After defining the items in the index, the next stage was their quantification. When establishing the levels of disclosed information for each item, you can choose a binary method, where a variable takes a value of either 1 or 0 depending on whether the data are reported or not (Cooke, 1989), or you can attempt to estimate a score ranging from 1 to 0. Although the latter solution may be considered conceptually superior, it can lead to a completely subjective evaluation (Giner, 1995).

In this study, according to the most widely used methodology in online disclosure (e.g. Bonsón and Escobar (2006) in their study of online transparency in the banking sector), we opted for the binary method. Nevertheless, we assigned a probable score of 2 for some items, because they represented information of a wide content which could be released only partially. Those items were:

- complete annual accounts;
- complete corporate governance report; and
- corporate social responsibility report.

For these items, partial disclosure is also possible (e.g. disclosing only some reports of the annual accounts, some sections of the corporate governance report, or an environmental or social report instead of the complete corporate responsibility report). In the event of the disclosure of partial information, we assigned a score of 1, whereas we opted for a score of 2 when the information was revealed completely (and 0 when information was absent).

Another relevant issue was the probable weighting of the items, as was done in some studies (Pirchegger and Wagenhofer, 1999; Gandía, 2001). According to Giner (1997) there is some arbitrariness inherent in the use of any weighted index. Moreover, studies which use both weighted and unweighted indexes draw similar conclusions from both types of indexes (Choi, 1973; Chow and Wong-Boren, 1987). As a result, for our research we chose the aggregation of the scores obtained for each item in an unweighted index (Cooke, 1989; Raffournier, 1995; Giner, 1997).

After defining and assigning a value to the items of information included in the disclosure index, we proceeded to perform a thorough analysis of the content of the corporate web sites. Each author visited and coded the contents of the web site of each of the sample companies. The results were then compared and the companies with divergent results between the authors were revised in order to achieve the highest reliability.

Explicative model proposed

After developing a disclosure index for the information on the companies' web sites, we verified the hypotheses by analysing certain factors that can influence the amount of information disclosed.

With that goal in mind, we proposed the following model, in which the amount of disclosed information on web sites is a function of concentration, corporate size, industry, profitability and leverage:

Information disclosed online = $f(\text{Concentration, size, industry, profitability, leverage})$

The model can be estimated empirically using the equation:

$$DIOL_i = \beta_0 + \beta_1 \text{Conc}_i + \beta_2 \text{MC}_i + \sum \beta_{3k} \rho_K + \beta_4 \text{ROA}_i + \beta_5 \text{Lev}_i + \varepsilon$$

In which $DIOL_i$ is the disclosure index obtained after analysing company i 's web site. It takes three values: index of content, index of compulsory information and index of voluntary information. $Conc_i$ is the measure of industry concentration, defined as the Herfindhal Index for the industry in which company i operates. MC_i is company i 's market capitalisation as a variable related to corporate size. $\Sigma\beta_{3k}p_{K}$ are dummy variables which take the value 1 if the company belongs to industry k and otherwise take the value 0. The industry sectors we considered were: services, transportation, industry, energy and construction (according to the industry classification established by the CNMV). ROA_i is the ROA for company i , defined as the ratio between operating income and total assets. Lev_i is company i 's leverage, established as the ratio between debt volume and total assets.

Model was checked empirically through a linear regression, estimated by ordinary least squares. As mentioned earlier, the dependent variable was obtained from the analysis of the items in the disclosure index of the web sites. The independent variables were taken from the AMADEUS database.

Results

Statistical description

Table II shows the average number of items disclosed by the sample companies, grouped into five categories: financial information, information on corporate governance, information on corporate social responsibility, information on intangibles and strategic information.

As shown in Table II, we found that on average Spanish companies released information on 11.2 items out of the 22 proposed as compulsory information. The proportion was lower for voluntary information – companies disclosed 5.6 items out of the 20 items analysed. The variability of the information released (measured by standard deviation) was similar for both information types.

Delving further into the contents of each information type, we can state that for compulsory information, 6.4 items of financial information and 4.8 items on corporate governance were disclosed. For voluntary disclosure, an average of two items was revealed for each of the corporate social responsibility, intangibles and strategic information categories.

In Table III we show the number and percentage of sample companies that disclosed each item of the disclosure index. We note that the most frequently reported

Index	Mean	Min.	Max.	SD
<i>Information on content</i>	16.8	0	42	9.5
<i>Compulsory information</i>	11.2	0	22	4.7
Financial information	6.4	0	12	2.6
Information on corporate governance	4.8	0	10	2.1
<i>Voluntary information</i>	5.6	0	20	4.8
Information on corporate social responsibility	1.9	0	8	2.2
Information on intangibles	1.6	0	5	1.1
Strategic information	2.1	0	7	1.5

Notes: Mean; minimum; maximum and standard deviation

Table II.
Number of items of the
disclosure index
disclosed by sample
companies – descriptive
statistics

OIR 32,5	Content	Frequency	Percentage
612	<i>Financial information</i>		
	Complete annual accounts	106	90.6
	Partial annual accounts	2	1.7
	Audit report without reservations	88	75.2
	Quarterly information	105	89.7
	Annual accounts of the previous three years	92	78.6
	Information on the stock evolution of the company	62	53.0
	Comparison with stock indexes (mainly historical)	42	35.9
	Key ratios of the previous three to five years	34	29.1
	Summary of key financial data for the previous three to five years	41	35.0
	Segment product by business (product or service)	31	26.5
	Segment product by region or geographic market	26	22.2
	Financial statements according to foreign accounting rules or principles (in case of release of accounting information in other countries)	12	10.3
	<i>Corporate governance</i>		
	Complete report on corporate governance	105	89.7
	Partial report on corporate governance	1	0.9
	Reports on corporate governance from the previous three years	58	49.6
	News on meetings and agenda of the general shareholders' meeting	88	75.2
	Existence of a code of ethics	19	16.2
	Analyst evaluations	15	12.8
	Analyst forecasts	14	12.0
	Availability of reports and other documentation given out in press releases and meetings with analysts	66	56.4
	Organisational chart	24	20.5
	Assistance for shareholders	70	59.8
	<i>Corporate social responsibility</i>		
	Report on corporate social responsibility	49	41.9
	Environmental or social report	15	12.8
	Reports of the previous three years	7	6.0
	Information according to the global reporting initiative format	16	13.7
	Certificate of good environmental behaviour (ISO 14001)	36	30.8
	Existence of an auditing report on the information about corporate social responsibility	18	15.4
	Certificate of good behaviour with human resources (OHSAS)	7	6.0
Certificate of high quality (ISO 9001)	21	17.9	
Certificate of product safety (AENOR)	2	1.7	
<i>Intangibles</i>			
Information on R&D projects	25	21.4	
Existence of contracts and cooperation agreements with basic research centres and institutes	16	13.7	
Registered patents, brands and licences of the company (brief description)	9	7.7	

(continued)

Table III.
Number of sample companies that disclosed each item of the disclosure index – frequency and percentage

Content	Frequency	Percentage	Voluntary and compulsory information
Information on the products and services commercialised	96	82.1	
Information on the branch offices	46	39.3	
<i>Strategic information</i>			
Objectives, mission and company philosophy	93	79.5	
Strategic alliances	10	8.5	
Strategic position of the company in its sector (leader, second, etc.)	44	37.6	
Company strategic planning (projects of expansion to other markets, products, regions)	35	29.9	
Company annual planning	9	7.7	
Description of the competition context	12	10.3	
Information on risks (financial, commercial, technical)	9	7.7	
Information on production processes	32	27.4	

Table III.

items (> 89 per cent) – complete annual accounts, quarterly financial information and the complete report on corporate governance – were compulsory information, as could be expected.

A high frequency – between 75 and 85 per cent – of companies also disclosed information on the annual accounts of the previous three years; news on meetings and the agenda of the general shareholders' meeting; information on the products and services sold by the company; the objectives, mission and philosophy of the company – a mix of compulsory and voluntary items.

The less reported items were items of voluntary information and in general were associated with the company's internal behaviour – information on product safety; information on the behaviour with human resources; patents, brands and licences of the corporation; annual planning; information on corporate risks.

The bivariate correlations between the variables analysed are summarised in Table IV. The size variable shows the highest correlations with the dependent variables content index (0.413) and the index of voluntary information (0.328). The concentration variable shows a correlation of 0.349 with the index of voluntary information. The correlations are low enough that there are no multicollinearity problems in the multivariate analysis.

Multivariate analysis

The results after estimating the three models proposed are shown in Table V. The explanatory power of such models (R^2) varies from 26.2 to 34.3 per cent for a confidence level of 99 per cent (p -value < 0.01). In particular, the model with the lowest predictive ability is Model 2, with the index of voluntary information as the dependent variable, reaching an explanatory power of 26.2 per cent. Immediately after is Model 3, with the index of compulsory information as the dependent variable (31.9 per cent). Model 1 – content index – shows the highest R^2 (34.3 per cent).

With regard to the variables analysed, four out of the nine variables are statistically significant. The concentration variable shows a positive effect for Models 1 and 2, and a negative effect for Model 3; however, it is only statistically significant

Table IV.
Correlation matrix
(Pearson correlation
coefficients)

Content index	Index of voluntary information	Index of compulsory information	Content index																
			Concentration	ROA	Leverage	Size	Services	Transportation	Industry	Energy	Construction								
Index of voluntary information	0.875																		
Index of compulsory information	0.895	0.567																	
Concentration	0.268	0.349	0.134																
ROA	-0.073	-0.036	-0.091	0.217															
Leverage	0.062	0.046	0.063	0.218	-0.027														
Size	0.413	0.328	0.395	0.266	-0.026	0.153													
Services	-0.037	-0.042	-0.025	-0.056	-0.016	0.174	0.009												
Transportation	-0.082	-0.034	-0.108	0.072	-0.001	0.043	0.328	0.326											
Industry	-0.156	-0.101	-0.173	-0.049	0.050	-0.177	-0.085	-0.582	-0.190										
Energy	0.239	0.219	0.206	0.054	-0.108	-0.040	0.047	-0.263	-0.086	-0.306									
Construction	0.094	0.045	0.119	0.034	0.100	0.008	0.093	-0.237	-0.077	-0.276	-0.124								

	Model 1. Dependent variable: content index		Model 2. Dependent variable: index of voluntary information		Model 3. Dependent variable: index of compulsory information	
	Standardised β	<i>t</i>	Standardised β	<i>t</i>	Standardised β	<i>t</i>
Intercept	—	2.657***	—	0.893	—	3.633***
Concentration	0.149	1.474	0.271	2.530**	-0.003	-0.026
ROA	-0.143	-1.534	-0.123	-1.242	-0.130	-1.368
Leverage	0.092	0.943	0.015	0.147	0.145	1.459
Size	0.428	4.248***	0.299	2.797***	0.455	4.435***
Services	0.398	1.576	0.365	1.363	0.339	1.319
Transportation	-0.263	-2.568**	-0.166	-1.532	-0.296	-2.841***
Industry	0.343	1.310	0.331	1.194	0.275	1.034
Energy	0.433	2.328**	0.411	2.081**	0.356	1.880*
Construction	0.281	1.545	0.234	1.210	0.263	1.419
R^2	0.343		0.262		0.319	
<i>F</i>	4.709***		3.187***		4.224***	

Notes: * p -value < 0.10 ; ** p -value < 0.05 ; *** p -value < 0.01 . The significant values are in italic print. The dependent variable is the disclosure index found after analysing company *i*'s web site. It includes three values: content index, index of compulsory information and index of voluntary information. Size: company *i*'s market capitalisation. ROA: ROA for company *i*, defined as the ratio between operating income and total assets. Leverage: ratio between debt volume and total assets. Concentration: Herfindhal Index for the industry in which company *i* operated, as a measure of industry concentration. Moreover, the influence of five sectors (services, transportation, industry, energy and construction) has been taken into consideration, according to the CNMV classification

Table V.
Multivariate analysis results – multiple linear regression

($0.05 > p\text{-value} > 0.01$) for Model 2, representing the information voluntarily disclosed by firms on their web sites. The size variable displays a positive and statistically significant effect ($p\text{-value} > 0.01$) for all three models.

The transportation sector and energy sector variables turned out to be statistically significant. The transportation variable shows a negative and significant effect with a confidence level of 95 per cent in Model 1 and 99 per cent in Model 3. Its effect is negative but statistically insignificant in Model 2. The energy variable displays a positive and statistically significant effect in all three models.

The ROA coefficient indicates a negative but non-significant effect in the estimated models, while the remaining variables representing industry sectors – services, industry and construction – and the leverage do not show a significant influence.

These findings only allow us to accept *H1a* (that industry concentration influences the volume of voluntary information revealed on corporate web sites), because the effect of industry concentration is focussed only on voluntary information.

Regarding the interpretation of results, we found that according to the political costs theory, companies with strong monopolistic positions – and, consequently, more visible firms – voluntarily revealed a larger volume of unregulated information on corporate social responsibility, intangibles and corporate strategy. These disclosure practices may have had the goal of diminishing some likely political costs, such as an increase in the regulation of these issues, as well as any increase in taxes caused by non-acceptable environmental and social behaviours.

However, as Christopher and Hassan (1995) and Berger and Hann (2002) also found, the level of concentration had no effect on the disclosure of regulated or compulsory information – financial information and corporate governance – or on disclosed information considered overall.

These findings may mean that firms belonging to more concentrated sectors provide more information on internal and operative issues, which are rarely available to external users. Meanwhile, there was no difference between companies regarding compulsory information, perhaps due to the fact that this latter information forms part of the compulsory information that stakeholders may obtain through other channels.

In relation with the size variable, as in most previous studies (Craven and Martson, 1999; Oyelere *et al.*, 2003; Marston and Polei, 2004; Giner *et al.*, 2003; Bonsón and Escobar, 2004; Gul and Leung, 2004; Prencipe, 2004), we checked the hypotheses of the agency, proprietary costs and political costs theories and found a positive influence of corporate size on the amount of voluntary information disclosed on corporate web sites.

With regard to the industries analysed, we found that corporations in the transportation and energy sectors adopted similar patterns in terms of the information they disclosed, to prevent stakeholders from considering the lack of information to be an adverse signal and minimise their political costs. In particular, the energy sector showed greater levels of information disclosed online, whereas the transportation industry was more reluctant to release information on its web sites.

Finally, in spite of the coherence of the assumptions in the disclosure theories, we have not found any statistically significant relationship between voluntary disclosure on the internet and profitability or leverage, which is consistent with other works (Oyelere *et al.*, 2003).

Robustness tests

To check the findings obtained, we performed a sensibility analysis by including a dummy variable related to the new technologies sector instead of the five industry dummies previously considered.

The new dummy variable did not lead to significant results, whereas the size and concentration variables did maintain their predictive capability. Leverage and profitability did not exhibit any significant effect either.

Conclusions

One of the most important decisions made by corporations is whether to disclose information about their organisation. This decision involves some relevant advantages, such as an increase in the investors' and politicians' trust in the firm, which usually lead to several benefits (e.g. a decrease in external financing costs, tax savings, minor legal pressure regarding the rules which regulate companies' activities).

Given this, the goal of this paper has focused on determining the corporate objective underlying the decision to voluntarily disclose some information on the internet, as a result of the increasing use of this communication channel.

The current disclosure practices (especially on the internet) are distinguished by the absence of unanimity on which hypotheses and theories justify those practices which prevail.

Many of the previous studies have focussed on verifying that the largest companies reveal the greatest volume of information, because of their agency costs, information asymmetry problems and the facts that they are more visible politically and that the effect of proprietary costs is more significant to them.

To achieve our objectives, we have taken into consideration the need to select a factor that gives a clear indication of the firms' preferences. Therefore, we have analysed the impact of the industry concentration on the amount of corporate information disclosed online, both from the proprietary costs theory and the political costs framework. Concentrated industries can limit the amount of information disclosed because of the damage it could cause in competitive terms (proprietary costs theory). In contrast, concentrated industries are more politically visible and could experience governmental interference (political costs theory). Because of this, they would rather disclose information voluntarily to obtain legitimacy and avoid external interferences.

The results have shown the relevance of the hypotheses of the political costs theory as the determinant factor of the voluntary online disclosure of information by non-financial quoted Spanish companies, thereby confirming our *H1a*.

Since they constitute the most politically visible companies, those companies that operate in concentrated industries voluntarily reveal a large amount of voluntary information on corporate social responsibility, intangibles and corporate strategy. The ultimate aim in doing so appears to be:

- To reduce the political costs that can stem from tighter control of firms' activities and operations as well as avoiding any increase in the regulation of issues adversely affecting firms' operations (e.g. legislation on sexual equality, harmonising family and work aspects, emissions reductions, etc.) and any increase in taxes or other payments as a result of non-acceptable environmental and social behaviours.

- To make public administrations aware of the need to develop public policies that encourage innovation efforts in companies by showing them the appropriate use of the subsidies and tax advantages received.

Our findings are in line with the political interest worldwide in encouraging socially responsible corporate behaviours and in promoting investments in research projects that favour productivity and economic growth in the different countries.

In conclusion, firms tend to disclose information voluntarily in order to create changes in the political decisions that may create certain limitations on the liberty of corporate management.

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