

Do annual reports give the information stakeholders need?

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Abstract

This research investigates disclosure practices in the annual reports of European insurance companies in the STOXX® All Europe 800 Insurance Index over the 2006-2010 time horizon. First it constructs a disclosure index based on the information companies provide in their annual reports to shareholders in order to analyze the disclosure level and observe its trend over time. Then it estimates the relationship between the extent of disclosure and insurers' characteristics to identify the factors that could explain a higher (or lower) level.

This study reports some interesting results: the level of disclosure has increased over time, in particular between 2008 and 2010, thus supporting the hypothesis that companies are enhancing the quality of their reports close to the implementation of Solvency II; big insurers, insurers with their home country in northern Europe and with a high amount of written premiums disclose more, while the level of profitability and the subsector do not appear relevant in determining the amount of information disclosed.

Keywords: insurance companies, disclosure, annual reports

JEL classification: G22, G14

1. Introduction

In recent years, a number of regulatory initiatives have sought to enhance the quality of disclosure by insurance companies, as well as by all financial intermediaries, and in this way to meet the need of transparency of investors and the market. The third pillar of Solvency II requires European insurers to disclose financial information publicly through the reporting from insurance undertakings to their supervisors (*supervisory reporting*) and the disclosure of information by undertakings to the public (*public disclosure*). More precisely, member states shall require insurance and reinsurance undertakings to disclose publicly, on an annual basis, a report on their solvency and financial condition, containing information about the business and the performance of the undertaking, the system of governance, the risk profile and the amount of solvency requirements (CEIOPS, 2009). The disclosure issue is a topical theme of discussion with open spaces for the debate and the recent turmoil in world financial markets, in particular during 2008, has outlined the importance of enhancing communication with the entire financial community.

Disclosure is the act of releasing all relevant information pertaining to a company that may influence an investment decision. Disclosure is “to reveal to knowledge, to free from secrecy or ignorance, or make known” (Lanam, 2007). If relevant information is put into the public domain then participants in the marketplace can sanction unsatisfactory results, shareholders and other stakeholders can better manage their risk positions and the companies themselves should benefit from a reduction in their cost of finance (Linsley and Shrivs, 2005). However, only if all the actors involved – law-makers, disclosers and disclosees – play their parts properly, disclosure succeed, otherwise it fails to reach its purposes (Ben-Shahar and Schneider, 2010).

The debate on the issue of disclosure has developed considerably in recent years. Most of the existing literature focuses on firm disclosure; only few and recent studies pay attention to disclosure practices by financial intermediaries, in particular banks.

This paper attempts to fill this gap and to extend the previous literature by investigating disclosure practices in the European insurance industry. First it constructs a disclosure index based on the information companies provide in their annual reports to shareholders, then it analyzes empirically the determinants of the disclosure level. In particular, it asks whether the disclosure level is increased over time and whether the extent of disclosure depends on insurers’ characteristics (such as size, profitability, home country, subsector and premiums).

The remainder of the paper is organized as follows. Section 2 describes the literature review and develops the hypotheses tested, section 3 reports the sample selection process and the statistical methodology, section 4 discusses descriptive statistics and results, section 5 provides the conclusions and a final appendix concludes the paper.

2. Related literature and hypotheses development

In recent years, the debate on the issue of disclosure has been developed considerably, due to the recent global financial crisis and, consequently, to the increasing importance that the corporate communication has gradually taken.

The literature review, which is reported in the summary below, shows that this topic has not been yet explored in depth for the insurance industry. At the same time, it is a topical theme of discussion, with open spaces for the debate, in particular if we consider the current financial turmoil and the new regulatory framework of Solvency 2 which is close to being implemented.

The literature on disclosure level concerns non-financial companies (*Firm disclosure*), banks (*Bank disclosure*) and insurance companies (*Insurer disclosure*). It provides descriptive analyses of the disclosure level, aims at identifying the factors which determine a higher (or lower) extent of disclosure and covers several geographic areas of investigation (Table 1).

Fields of research		
Firm disclosure	Bank disclosure	Insurer disclosure
<i>Descriptive analyses of the disclosure level and its determinants, regarding non-financial companies</i>	<i>Descriptive analyses of the disclosure level and its determinants, regarding banks</i>	<i>Descriptive analyses of the disclosure level and its determinants, regarding insurance companies</i>
<i>n. 15 paper</i>	<i>n. 5 paper</i>	<i>n. 7 paper</i>
<u>Geographic areas:</u> America: n. 1 Europe: n. 6 Asia-Australia: n. 3 Cross-country: n. 2	<u>Geographic areas:</u> America: n. 1 Europe: - Asia-Australia: - Cross-country: -	<u>Geographic areas:</u> America: - Europe: n. 1 Asia-Australia: n. 1 Cross-country: -
Other*: n. 3	Other*: n. 4	Other*: n. 5

* Studies that do not focus on a particular geographic area listed or do not provide an empirical analysis

Table 1 - *Number and characteristics of the main papers analyzed, for each field of research*

The studies analyzed explore this phenomenon adopting similar research methods (disclosure index, content analysis, statistical analysis and regression model), with sample companies set in different sectors (firms, banks and insurers) and countries (European and American companies), and taking into account different points of view (insurers, policyholders and stakeholders).

Firm disclosure

The first stream of studies is composed of a large number of both recent and older studies that investigate the characteristics of disclosure by firms.

In 1989, Cooke builds an index to measure the extent of disclosure and its determinants in the annual reports of a sample of 90 Swedish companies, for the year 1985. The research reveals that the disclosure level is very variable and that the size of enterprises and the listing status

significantly impact on it (Cooke, 1989). The same author, in two subsequent papers, extends the investigation to 35 Japanese companies, verifying that multiple listed corporations disclose more information in their annual reports than corporations listed only on the Tokyo Stock Exchange, that the size of enterprises has an important influence on disclosure level and that manufacturing firms disclose significantly more information than other types of corporations (Cooke, 1992; Cooke, 1993).

Botosan (1997) constructs a disclosure index based on 5 categories of voluntary information that firms provided in their annual reports in 1990 (background information, summary of historical results, key non-financial statistics, projected information, management discussion and analysis). The evidence suggests that, for firms that attract a low analyst following, a greater disclosure is associated with a lower cost of equity capital.

La Porta et al. (1998) propose the construction of an index to quantify the measures to protect investors in countries of common law and civil law, with a methodology that is analogous to which this paper follows for the construction of a disclosure index for insurance companies. First they identify a set of significant measures to protect minority shareholders, if these measures are present they give the score 1, otherwise score 0, with an additional score of 1 when it is particularly strong; the sum of the single scores determines an aggregate score for each firm, with a range between 0 and 5. They find that common-law countries provide the strongest protection of investors and French civil-law countries the weakest.

Another example of this stream is a paper of Ahmed and Courtis (1999), who realize a meta-analysis of 29 previous studies and find a significant positive relationship between disclosure levels and corporate size, listing status and leverage; no significant association is found with corporate profitability and size of audit firm.

Ho and Wong (2001) test if the extent of voluntary disclosure provided by listed firms in Hong Kong depends on corporate governance attributes. Using a weighted disclosure index, the results show that the existence of an audit committee is significantly and positively related to the extent of voluntary disclosure, while the percentage of family members is negatively related.

The research of Camfferman and Cooke (2002) provides a cross-country analysis of disclosure levels in United Kingdom and Netherlands. The disclosure index, based on the annual reports of 322 companies in 1996, reveals that differences in legal systems, capital markets and corporate governance and a more stringent regulation explain why disclosure by UK firms is more complete than by Dutch firms.

Some studies included in this field focus on the disclosure of risk information.

Beretta and Bozzolan (2004) construct an index to measure the quality of risk disclosure for a sample of non-financial companies listed on the Italian Stock Exchange, finding that the index of disclosure quantity is not influenced either by size or industry.

Lajili and Zeghal (2005), employing a content analysis, examine risk information disclosures in Canadian annual reports in 1999 and find high levels of both mandatory and voluntary disclosure by the sample companies. However, it is little useful and clear, thus suggesting the need for a more comprehensive disclosure.

Linsley and Shrives (2006) explore risk disclosure practices in annual reports for a sample of 79 UK companies, through the content analysis methodology, and they find that the level of disclosure is positively associated with company size and environmental risk.

Next to a considerable literature on developed countries, Barako et al. (2006) analyze risk disclosure practices in a developing country like Kenya, over the 1992-2001 time horizon, finding that the extent of voluntary disclosure is influenced by corporate governance attributes, ownership structure and company characteristics.

Taking as reference the information in the 2002 annual reports of 14 UK non-financial companies from the FTSE 100, Abraham et al. (2007) develop a methodology to analyze business risk disclosure statements and find that firms provide little or no information about risks.

For the same sample companies in 2002, Abraham and Cox (2007) find a positive association between corporate risk reporting and the number of executive and independent directors, while negative with the amount of shares owned by long-term institutions, thus stating that institutional investors prefer firms with a lower level of risk disclosure.

Deumes (2008) observes that the risk measures in the annual reports of Dutch companies in the period 1997-2000 predict the volatility of companies' stock prices, the sensitivity of stock prices to market fluctuations and decline in stock prices.

Bank disclosure

The second stream of disclosure literature involves more recent studies that explore the phenomenon with reference to banks.

Baumann and Nier (2004) collect information in the annual reports of about 600 banks, in 13 countries, over the period 1999-2000. Through the construction of a disclosure index, they find that the disclosure is beneficial for banks: banks that disclose more information on key items of disclosure benefit of a lower stock volatility than banks that disclose less information.

In recent years, several authors have investigated risk disclosure practices by banks. A bank is a risk-taking enterprise and therefore it is expected that relevant risk-related information are disclosed. Starting from this observation, Linsley and Shrives (2005) observe that accounting and policy are the most disclosed matters, but banks do not yet provide full risk disclosure and managers could be reluctant to provide too much information not to be judged and not to give advantages to competitors.

Helbok and Wagner (2005) analyze operational risk disclosure by banks in 1998-2001 and observe that it increased in both extent and content and is inversely related to equity ratio and ROA.

Another example of this strand is Sundmacher (2006) who examines the operational risk disclosure in annual reports of 57 financial institutions, over the period 2004-2005. He finds that this kind of disclosure varies across institutions, is descriptive and qualitative; therefore, the absence of quantitative disclosure does not allow comparisons among banks.

Perignon and Smith (2008) examine the level of VaR disclosure for a sample of US and international commercial banks, over the period 1996-2005. They construct a VaR disclosure index and find that the level of VaR disclosure increases over time, while the quality is not increasing.

Insurer disclosure

The third stream of literature on disclosure include a limited number of studies that focus on insurance industry.

Belth, in a paper of 1968, observes that price ignorance and an ineffective price competition in life insurance market bring policyholders to pay a premium higher than that necessary for their protection. Thus he suggests the need for a rigorous system of price disclosure, that makes price competition more effective and allow policyholders taking sound decisions (Belth, 1968). The same author in 1976 expresses the need for disclosing reliable information, so that policyholders can really understand what they are doing (Belth, 1976).

Adams and Hossain (1998) empirically test the relationship between the level of voluntary disclosure in the annual reports (1988-1993) of New Zealand's life insurers and their organizational characteristics. The results reveal that the level of voluntary disclosure is positively related to size, product diversity and distribution system, thus supporting the idea that disclosure reassures policyholders, shareholders and other people that the company is able to fulfill the obligations.

Horing and Grundl (2011) explore risk disclosure practices in annual reports for a sample of European insurers in the Dow Jones Stoxx 600 Insurance Index, over the period 2005-2009. First they construct a disclosure index to measure the extent of risk disclosure by insurers; then they test the relationship between the disclosure level and sample companies' characteristics to identify the reasons that could incentive enhanced risk disclosure. The research reveals that the importance of risk disclosure increased during the time horizon chosen for the analysis, bigger and more risky insurers show high risk disclosure and disclosure reduces insurers' profitability.

Other examples of this field focus on consumers and their ability to understand the disclosure. Product disclosure has not been evaluated for more than 20 years, instead it is very important for consumers as it informs them about the characteristics of insurance products, makes insurers and producers transparent and provides tools to compare price, product and quality (Kirsch, 2003). A survey by the CEO Task Force reveals that the starting point for an effective disclosure is to understand that the receiver is the consumer; therefore the information should be simple, plain, with a non-legal language, concrete rather than abstract and less is more (Lanam, 2007).

Cude (2008) reports the results of 3 focus groups, conducted in 3 countries over the period 2004-2005. The analysis shows that there are no differences in gender, age and ethnicity in understanding the disclosure. Some participants report they do not read the reports, but they would read them if the most important information appeared immediately and if the documents were short and readable. But if they do not read they are not capable of taking optimal decisions that will benefit themselves and the entire sector.

The research proposed in this paper focuses on disclosure level and its determinants by European insurance companies and thus it gives a contribution to the relatively scarce literature identified in the third strand.

The literature review reported above shows that several researchers have investigated the disclosure level in a particular year, assuming that disclosure practices remain constant over time (Cooke, 1989; Botosan, 1997; Camfferman and Cooke, 2002; Beretta and Bozzolan, 2004; Lajili and Zeghal, 2005; Abraham et al., 2007; Abraham and Cox, 2007). Other authors have explored the phenomenon in different years, in order to identify its trend (Baumann and Nier, 2004; Helbok and Wagner, 2005; Barako et al., 2006; Sundmacher, 2006; Deumes, 2008; Perignon and Smith, 2008; Horing and Grundl, 2011).

This paper analyzes the disclosure level of the sample insurers in several years, expecting that different years have different levels and that internal and external circumstances have brought the companies to disclose more information over time (as found by Helbok and Wagner, 2005 and Horing and Grundl, 2011). So, the first hypothesis to test is the following:

H1: The level of disclosure has increased over the time horizon 2006-2010.

Several studies have analyzed the relationship between disclosure levels and companies' characteristics, observing that the size, the industry and the eventual listing status (Cooke, 1989; Cooke, 1992; Cooke, 1993; Adams and Hossain, 1998; Ahmed and Curtis, 1999; Beretta and Bozzolan, 2004; Linsley and Shrivs, 2006), but also the profitability (Ahmed and Curtis, 1999; Helbok and Wagner, 2005; Horing and Grundl, 2011), as well as governance characteristics (Ho and Wong, 2001; Camfferman and Cooke, 2002; Barako et al., 2006; Abraham and Cox, 2007), determine a higher or lower level.

Consistent with this literature, it is expected that disclosure level in annual reports depends on insurers' characteristics (H2). Disclosure requires an effort to energies, people and money, so it is counted that big insurers disclose more information, because they can (H2a). It is expected that when financial results are particularly good, insurers enhance the disclosure level to stress them (H2b). Finally, since the sample insurers are all European and operate in the same sector, even if in different subsectors, it is counted that the level does not depend on the home country (H2c) and the subsector (H2d).

H2: The level of disclosure depends on insurers' characteristics.

H2a: Big insurers have higher disclosure levels than small insurers.

H2b: Well performed insurers have higher disclosure levels than less profitable insurers.

H2c: The level of disclosure does not vary according to the insurers' home country.

H2d: The level of disclosure does not vary according to the insurers' subsector.

3. Data and methodology

3.1 Sample and data

The sample is composed of all the companies included in the *STOXX® All Europe 800 Insurance Index*, which covers companies that:

- i) are included in the *STOXX® All Europe 800 Index*,
- ii) and operate in the insurance industry.

The *STOXX® All Europe 800 Index* represents the largest 800 companies in Eastern and Western Europe and, in turn, is derived from the *STOXX® All Europe Total Market Index*, covering about 95 percent of the free float market capitalization of European companies (Table 2).

STOXX® All Europe Total Market Index	
The STOXX® All Europe Total Market Index (TMI) represents the Western and Eastern Europe region as a whole, covering approximately 95 percent of the free float market capitalization of European companies with a variable number of components.	
Number of components: 1555	
Free float market capitalization: 5'613'924.221 MEUR	
↓	
STOXX® All Europe 800 Index	
STOXX® All Europe 800 Index is derived from the STOXX All Europe TMI, representing the largest 800 companies in Eastern and Western Europe.	
Number of components: 800	
Free float market capitalization: 5'313'142.404 MEUR	
↓	
STOXX® All Europe 800 Insurance Index	
Number of components: 38	
Free float market capitalization: 256'885.501 MEUR	

Table 2 – Sample selection process

The *STOXX® All Europe 800 Insurance Index* includes 38 European insurance companies and, considering its derivation, can be considered a good representation of the European insurance industry¹.

Table 3 shows some information about the 38 components, organized by subsector and geographic area, as provided on the STOXX's website².

Number/Variable	Subsector			Geographic area			
	Life Insurance	Non life Insurance	Total	North Europe	Centre Europe	South Europe	Total
# companies	13	25	38	17	18	3	38
%	34.21	65.79	100	44.74	47.37	7.89	100

Table 3 – Sample insurers' characteristics

¹ Proceeding in the analysis, two companies are eliminated because are brokers and other six because the reports are not available. The final sample is composed of 30 companies.

² The information derives from the website www.stoxx.com, in the section about *STOXX® All Europe 800 Insurance Index*.

The sample includes both life and non life insurance companies: most of the sample companies are non life insurers, while about 34 per cent of them are life insurers. Almost all the companies have their home country in central and northern Europe, which is also a consequence of the physical structure of Europe.

Data for the research is collected from the annual reports to shareholders, whose companies publish on their websites in the “Investor Relations” section. The information disclosed in the annual report is crucial for a company, should be clear, transparent, accurate and timely, and is generally aimed at ensuring stakeholders have the information they need to make sound decisions. The annual report usually contains, after an introductory letter of the CEO to shareholders, information about the strategy to be pursued, the description of the business, the corporate governance system (in addition to financial information, financial statements and notes to them). Historical and forward-looking data, quarterly results and corporate responsibility are also often disclosed in the annual report.

The annual report is only one form of disclosure by companies but is considered by literature as one of the most important container of corporate information: it is the main disclosure vehicle (Marston and Shrivess, 1991) and is an influential source of information because of its wide coverage and availability (Beretta and Bozzolan, 2004). In support of this choice, the literature has also shown that annual report disclosure levels are positively correlated with the amount of corporate disclosure provided via other media (Lang and Lundholm, 1993).

The time horizon chosen for the analysis is 2006-2010³. It allows investigating the trend of the phenomenon in recent years and observing companies behavior close to the implementation of Solvency 2.

3.2 Disclosure Index

The methodology chosen to investigate the level of disclosure is content analysis. The content analysis methodology is *a research technique for the objective, systematic and quantitative description of the manifest content of communication* (Berelson, 1952). It is also defined as *a research technique for making replicable and valid inferences from texts, or other meaningful matters - art, images, maps, sounds, signs, symbols - to the contexts of their use* (Krippendorff, 2004).

As a *research technique*, content analysis involves specialized procedures and increases researcher’s understanding of particular phenomena. Techniques are expected to be *reliable*, thus must be governed by rules that are explicitly stated and applied equally to all units of analysis, and should result in findings that are *replicable* in different points in time and under different circumstances. They must yield *valid* results, open for careful scrutiny. Birth in journalism and

³ More precisely, the analysis covers the years 2006, 2008 and 2010.

communication research, nowadays the use of content analysis involves numerous disciplines and is considered a scientific tool. It is potentially one of the most important research techniques in the social sciences (Krippendorff, 2004).

Consistently with accepted practices in this field, the level of disclosure is measured through the construction of a disclosure index. A disclosure index is an ex-ante specified list of items (Horing and Grundl, 2011); in this process, the documents are analyzed to evaluate the presence of these items and, based on the presence and the quality of each information, a score is assigned to each of them. It does not exist a disclosure index for insurance companies, except the risk disclosure index of Horing and Grundl (2011). So it is necessary to build one appropriate for this study.

In order to define the items to be included in the disclosure index, first I start with the elements identified in the disclosure index by Botosan (1997). I modify and expand them taking into account the peculiarities of the insurance companies. Then I add the items related to risk information, as in Horing and Grundl (2011). Moreover, in addition to the existing literature, the items are selected taking into account the requirements provided by CEIOPS (2009).

The annual reports published by the companies on their websites have a quite similar structure and all the companies provide a wide set of information to stakeholders. Starting from this observation, in the selection of the items and in giving the scores the focus is on information that is often different from those required and a particular attention is paid to the depth at which information is provided.

The items identified to measure the level of disclosure are 50 in total and concern four subjects:

- i) *Business Information and Strategy (BIS)*,
- ii) *Financial Information (FI)*,
- iii) *Governance Characteristics (GC)*,
- iv) *Risk Profile (RP)*.

Similar to Botosan (1997), Baumann and Nier (2004) and Horing and Grundl (2011), as general rule each information included in the index is assigned a score between 0 and 2⁴:

- | | |
|---|--|
| 0 | when there is no disclosure |
| 1 | when the information is provided in a basic way |
| 2 | when the information is provided in an extensive way |

Business Information and Strategy (BIS)

The first area includes general information about the mission and the operative goals, the description of the business, the products offered, the markets served, the competitive environment and the disclosure of the market share. This kind of information is very important for investors and stakeholders in order to have a clear idea of what the company does and is also

⁴ It is the general rule followed to assign the score. More precisely, some items are awarded a score 0 or 1, others between 0 and 2. See the rest of the paragraph and see the appendix for details.

useful for a better comprehension of the different sections of the annual report. Each item is assigned the score 0 when it is not disclosed, 1 when it is disclosed, except for the first and the fifth items which are awarded an additional point when are in depth.

Financial Information (FI)

- *Historical Results.* Five or ten years of historical data and historical information about written premiums and reserves are useful to build ratios, to analyze the financial performance of the company and for conducting a trend analysis, too. The score assigned is 1 when data is disclosed, with an additional point when it is on ten years or is accompanied by comments.

- *Performance of the year.* The performance of the year is based on the disclosure of the results per lines, products and geographic areas and on the analysis of changes in premiums, income, reinsurance, reserves and expenses. Other kinds of information, such as financial highlights, consolidated balance sheets, consolidated statements of income, consolidated statements of cash flows, even if important for the analysis of the performance, are not considered in this sub-index because they are always present in the annual reports, so they are not elements that allow to discriminate the disclosure level. The items chosen were assigned 1 when the information is provided, 0 otherwise, except for the first item that receive the score 2 when it is in depth.

- *Forward-looking information.* Forward-looking information about market share, cash flows, profits and premiums are useful to understand the future plans of the company and then the risks of its activity. Forecasting can be identified in forward-looking statements introduced by “believe, estimate, target, intend, may, expect, anticipate, predict, project, counting on, plan, continue, want, forecast, should, would, is confident, will” and similar expressions (in this case, score 1) or in a point estimation (in this case, score 2).

These statements do not guarantee the future performance predicted, involve risks and uncertainties and performance may differ from plans and expectations. At the same time, this kind of information is rewarded as a proxy of the ability to look ahead.

Governance Characteristics (GC)

This area includes non-financial statistics about system of governance, main shareholders, related parties transactions, number of employees and remuneration policies. This kind of information is often considered more important than financial one because it allows understanding how the business is run, who has the power, what is the way of thinking; it provides accountability to shareholders and all external stakeholders (such as regulators, rating agencies and analysts).

Each item is awarded 1 when the information is provided, 0 otherwise; the items about employees and remuneration receive 2 when the information is in depth.

Risk Profile (RP)

The fourth area concerns risk and includes both general information on risk management policies and information on specific risks. It is very useful to evaluate the level of solvability by the company and the importance given to risk management with the forthcoming of Solvency 2. Risk

management increases the value from the perspective of several stakeholders, in particular shareholders, customers, regulators and potential business partners.

- *Risk management*. General information on risk management concerns the identification of risks, the description of risk management policies, with particular reference to capital adequacy approach and capital requirements. Risk management aims to ensure that risks are properly identified, risk measurement is independent and the capital base is adequate in relation to the risks.

- *Underwriting risk*. The underwriting risk arises from higher claims than was anticipated. The focus is on definition and quantification of the risk, description of mitigation activities and sensitivity analyses.

- *Market risk*. The market risk is due to fluctuations in interest and exchange rates, share prices and market prices. The focus is on definition and quantification of the risk, description of mitigation activities and sensitivity analyses.

- *Credit risk*. It is the risk that the company is exposed to loss if another party fails to perform its obligations. The focus is on definition and quantification of the risk, description of mitigation activities and sensitivity analyses.

- *Operational risk*. The operational risk arises from inadequate or failed internal processes, people and systems, or from external events. The focus is on definition and quantification of the risk, description of mitigation activities and sensitivity analyses.

- *Liquidity risk*. The liquidity risk is the risk either not having sufficient financial resources available to meet the obligations or securing them only at excessive cost. The focus is on definition and quantification of the risk, description of mitigation activities and sensitivity analyses.

- *Other risks*. Finally, the focus is on identification and quantification of other risks and on rating disclosure.

Each item is awarded 1 when it is disclosed, in some cases 2 when it is more in depth.

See the appendix for further details about each item and the potential scores.

Aggregating the information on the subjects above, a composite *Disclosure Index for Insurers (DII)* is obtained. It consists of 50 items, organized into 4 sub-indices:

$$DII_{i,t} = \sum_{j=1}^6 BIS_{j,t} + \sum_{h=1}^{12} FI_{h,t} + \sum_{k=1}^5 GC_{k,t} + \sum_{l=1}^{27} RP_{l,t} \quad \text{Eq (1)}$$

The level of disclosure for each insurer i ($i = 1, \dots, 30$) in each time period t ($t = 2006, 2008, 2010$) is given by the sum of the scores assigned in the four subjects; $j = 1, \dots, 6$, $h = 1, \dots, 12$, $k = 1, \dots, 5$ and $l = 1, \dots, 27$ identify the elements that make up the four sub-indices *BIS*, *FI*, *GC* and *RP*.

This analysis allows to empirically test the hypothesis H1, as discussed in paragraph 2.

The methodology based on the disclosure index has the important limit of being subjective, because the researcher chooses the items, the scores and the weights. At the same time, it represents the main methodology adopted in disclosure studies. In order to reduce the subjectivity of the method, as in the existing literature previously cited, each information included

in the index has the same weight. As observed in Horing and Grundl (2011), although this implicitly assumes that each item is equally important, it eliminates the subjectivity in determining the weights and, when the number of items is large, the statistic results are the same. In order to ensure the validity and the reliability of the results, the rules are stated and applied equally to all units of analysis. Moreover, the assessment is qualitative, not quantitative, so it is not considered how much information is disclosed (i.e. number of pages or lines) but how it is provided and no additional points are awarded if the same item is in several parts of the report.

3.3 Empirical model

After having measured the level of disclosure for the sample companies through the disclosure index, statistical analyses are provided and the determinants of the disclosure level are evaluated with a regression model. It is implemented a random effects regression to observe whether the level of disclosure depends on some characteristics of the insurance companies, that are size, profitability, home country, subsector and gross premiums. The regression Eq (2) is formulated to empirically test the hypothesis H2, as discussed in paragraph 2.

$$DII_{i,t} = \alpha + \beta_1 LOGSIZE_{i,t} + \beta_2 ROE_{i,t} + \beta_3 HOME_{i,t} + \beta_4 SUBSECTOR_{i,t} + \beta_5 GROSS_{i,t} + \beta_6 S_t + \varepsilon_{i,t} \quad \text{Eq (2)}$$

where i indicates the insurer ($i = 1, 2, \dots, 30$), t is the time period ($t = 2006, 2008, 2010$), S is the vector of omitted variables, ε is the error term, DII is the aggregate *Disclosure Index for Insurers* as previously constructed. The independent variables in the regression are described in Table 4.

Variable	Description
Dependent variable: <i>Disclosure Index for Insurers (DII)</i>	
<i>LOGSIZE</i>	The logarithm of total assets
<i>ROE</i>	The ratio between profit and equity
<i>HOME</i>	Dummy variable, equal to 1 if the home country is in north of Europe, 0 if in central/southern Europe
<i>SUBSECTOR</i>	Dummy variable, equal to 1 if the subsector is life insurance, 0 if non life insurance
<i>GROSS</i>	The ratio between gross written premiums and total assets

Table 4 – *Description of the variables included in the regression model*

The database is a balanced panel of 30 European insurance companies and the variables are calculated for three years. A random effects estimation allows controlling for time varying effects for the individuals (i.e. the business cycle or a regulation that affects all the states but changes over time, such as the solvency regulatory frameworks) and in this way avoiding omitted variable bias.

4. Descriptive statistics and results

Table 5 reports descriptive statistics for the aggregate disclosure index and for each sub-index. The average value of the total disclosure index (*DII*) over the period 2006-2010 is 35.81 and it increases over time, from 32.28 in 2006 to 39.6 in 2010. If compared with the maximum potential value attributable to this index, equal to 75, this scores could appear low, but they are justified by a strict scoring, so can be considered good results. In fact, as general observation, most of the companies provide a large set of information in their annual reports but the score awards the depth and the quality. Looking at the sub-indices, the Business Information and Strategy (*BIS*) sub-index has an average value of 3.95 with a minimum of 0 and a maximum of 8. The Financial Information (*FI*) sub-index is 8.63 on average and varies from 4 to 13. The Governance Characteristics (*GC*) sub-index is 5.08 on average, from minimum of 2 to a maximum of 8. The Risk Profile (*RP*) sub-index varies from 1 to 32 over the period 2006-2010 with an average value of 18.16.

Variable	Year	Mean	Stand. dev.	Minimum	Percentile			Maximum
					25%	50%	75%	
<i>DII</i>	2006	32.28	6.73	15	28.5	33	36.5	45
	2008	35.56	5.55	23	31.5	36	40.5	44
	2010	39.60	6.73	25	34.5	41	44.5	54
	2006-2010	35.81	6.96	15	32	36	41	54
<i>BIS</i>	2006	3.88	1.05	2	3	4	5	5
	2008	4.04	1.51	0	3	4	4.5	8
	2010	3.92	1.55	1	3	4	5	8
	2006-2010	3.95	1.37	0	3	4	5	8
<i>FI</i>	2006	8.60	2.20	4	7	9	10.5	12
	2008	8	1.98	5	6	8	10	12
	2010	9.28	2.37	5	7.5	10	11	13
	2006-2010	8.63	2.22	4	7	8	10	13
<i>GC</i>	2006	4.88	1.36	2	3.5	5	6	7
	2008	5.08	1.22	3	4	5	6	7
	2010	5.28	1.34	2	4.5	5	6	8
	2006-2010	5.08	1.30	2	4	5	6	8
<i>RP</i>	2006	14.92	6.08	1	11.5	16	19	26
	2008	18.44	5.03	5	15.5	19	22.5	27
	2010	21.12	5.75	5	18	20	25	32
	2006-2010	18.16	6.12	1	15	19	23	32

Table 5 - Descriptive statistics of disclosure index and sub-indices

Figure 1 reports minimum, mean and maximum values of the four sub-indices, for the years 2006, 2008 and 2010, and it shows the distribution and the variability of the scores in each year.

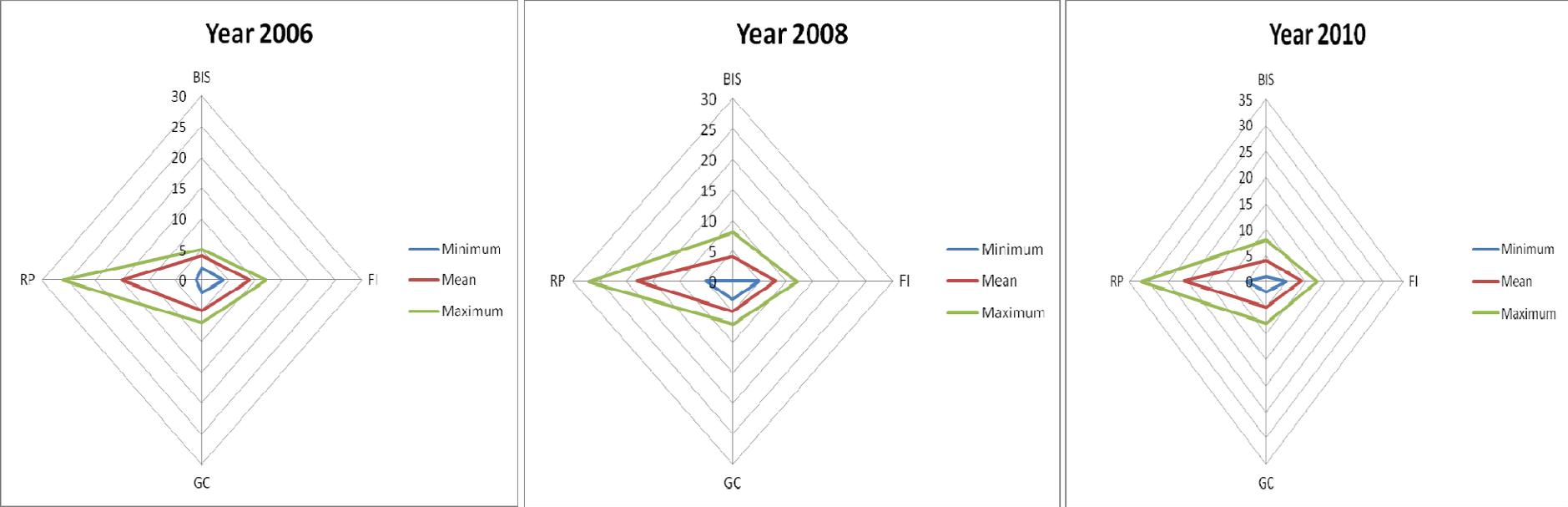


Figure 1 – Radar graphic of minimum, mean and maximum value of disclosure sub-indices (2006-2010)

This data shows that the quality of disclosure is increased over time, both considering the aggregate value and looking at the sub-indices, and supports the first hypothesis formulated in this research project: *the level of disclosure has increased over the time horizon 2006-2010 (H1)*. The increase of disclosure level is particularly evident between 2008 and 2010, in particular about risk and capital adequacy information; it allows stating that insurers are enhancing the disclosure quality, in particular risk disclosure, close to the implementation of Solvency II.

Table 6 reports descriptive statistics for some insurer-specific variables. For the year 2010, the average value of total assets (*SIZE*) is € 152,133 million; the smallest insurer has total assets for € 2,110 million while the largest € 624,945 million. The amount of net profit before taxes (*PROFIT*) in 2010 has a range from € 127 million to € 7,173 million, with an average value of € 1,307 million. The average value of gross premiums earned (*PREMIUMS*) in 2010 is € 14,212 million. Data also reveals the crisis of the year 2008 when the average profit decreases and becomes negative for several companies; the trend of gross premiums is instead increasing.

Variable	Year	Minimum	Mean	Maximum
<i>SIZE (€000)</i>	2006	899,609	181,691,925	1,053,226,000
	2008	1,211,421	151,010,307	955,576,000
	2010	2,110,663	152,133,250	624,945,000
<i>PROFIT (€000)</i>	2006	103,819	3,570,147	43,674,000
	2008	-2,572,172	744,593	5,473,000
	2010	126,608	1,307,123	7,173,000
<i>PREMIUMS (€000)</i>	2006	224,946	12,748,628	46,835,000
	2008	360,151	13,875,486	66,171,000
	2010	686,470	14,211,749	68,582,000

Table 6 – Descriptive statistics of the sample companies

Figure 2 provides other observations about the structure and the content of the annual reports analyzed. The number of pages changes from an average value of 186 in 2006 to 212 in 2008 and 233 in 2010; the shortest report in 2006 has 86 pages, the longest reaches 452 pages in 2010. Even if the analysis assumes that quantity is not a proxy of quality, it can be observed that companies have increased the confidence in this document, making it longer, more interactive, with colorful pages, pictures and interviews. References to Solvency II increase, too. Risk description and risk management information is provided not only in the notes, as required, but also in other sections of the report.

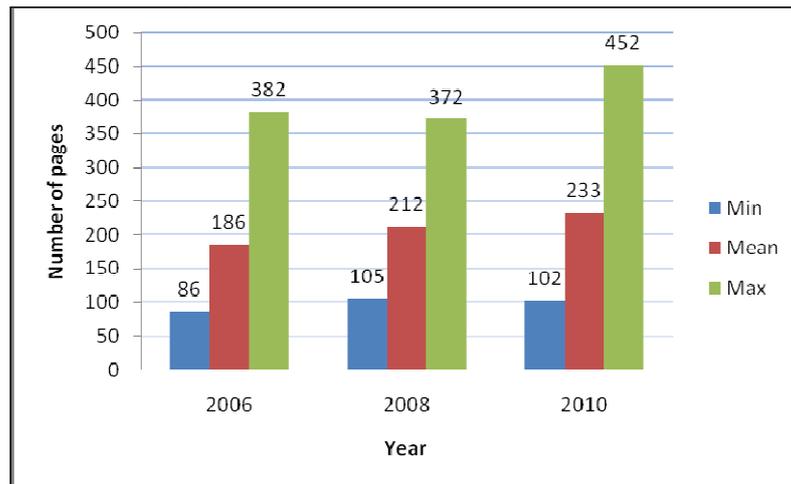


Figure 2 – Number of pages of the annual reports 2006, 2008 and 2010

Table 7 reports the results from random effects regression Eq (2)⁵. As previously explained, the dependent variable is *DII*, the aggregate disclosure score; the independent variables are the logarithm of total assets (*LOGSIZE*), the return on equity (*ROE*), two dummy variables home country (*HOME*) and subsector (*SECTOR*) and the amount of gross premiums written scaled by total assets (*GROSS*).

Independent Variable	Predicted Sign	Coefficient	p-value
Dependent Variable: <i>DII</i>			
Intercept		-64.09	0.0142
LOGSIZE	+	8.52***	0.0003
ROE	+	0.12	0.9709
HOME	+/-	5.13**	0.0314
SECTOR	+/-	-1.07	0.7048
GROSS		34.89***	0.0073
R-squared	0.4668		

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Table 7 - Results from random effects regression

The *LOGSIZE* variable is positively and significantly related to total disclosure (the coefficient is 8.52 and the p-value is 0.0003): an increase of one unit in *logsize* determines an increase of 0.0852 in the amount of *DII*. This result supports the hypotheses H2a (*big insurers have higher disclosure levels than small insurers*). Consistent with the literature (Cooke, 1989, 1992, 1993; Ahmed and Curtis, 1999; Linsley and Shives, 2006), it means that the size of the company positively impact on the disclosure level: big insurers disclose more information because they have a wide variety of stakeholders but also have money, resources, skills to do it; when the size is lower, disclosure

⁵ A pooled regression has been implemented, too, and it reports quite different results with a R-squared equal to 26%.

might become too expensive and so it decreases. Moreover, big insurers are more in the public eye than others corporations and receive pressures for adequate levels of disclosure by investors and other users.

The *ROE* variable is not significant, so the hypothesis H2b is rejected (*well performed insurers have higher disclosure levels than less profitable insurers*). Consistent with part of the literature (Ahmed and Courtis, 1999), the level of profitability does not affect the extent of disclosure; it means that there are other reasons, different from the financial results, that bring insurers to communicate with stakeholders.

The *HOME* variable is positively and significantly related to total disclosure (the coefficient is 5.13 and the p-value is 0.03). The *SECTOR* variable is not significant. So the hypothesis H2c is rejected (*the level of disclosure does not vary according to the insurers' home country*) and the hypothesis H2d is confirmed (*the level of disclosure does not vary according to the insurers' subsector*): northern Europe insurers disclose more information than insurers with their home country in centre or south of Europe, while the specific subsector in which they operate does not influence the disclosure level.

The *GROSS* variable is positively and significantly related to total disclosure (the coefficient is 34.89 and the p-value is 0.0073): it could be considered as a proxy of the amount of customers, so when the number of policyholders (or the amount of premiums required) increases, the company feels the need to disclose more.

The regression is well-fitted, with an R^2 of 47%.

Table 8 shows Pearson pairs-wise correlation matrix among the variables in the regression model.

Variable	<i>DII</i>	<i>LOGSIZE</i>	<i>ROE</i>	<i>GROSS</i>
<i>DII</i>	1.000			
<i>LOGSIZE</i>	0.214	1.000		
<i>ROE</i>	-0.183	-0.244*	1.000	
<i>GROSS</i>	0.016	-0.812**	0.170	1.000

* Correlation significant at 5%. ** Correlation significant at 1%.

Table 8 - Correlation matrix among the regression variables

5. Conclusions

This paper investigates disclosure practices in the annual reports of companies included in the *STOXX® All Europe 800 Insurance Index*, over the 2006-2010 time period. First it examines the level of disclosure and constructs a disclosure index based on the information companies provide in their annual reports to shareholders. The analysis reveals that disclosure level has increased over time both considering the aggregate value and looking at the sub-indices; the increase of disclosure level is particularly evident between 2008 and 2010, in particular about risk and capital adequacy information, thus supporting the hypothesis that insurers are enhancing the disclosure quality close to the implementation of Solvency II. Then it investigates the determinants of disclosure level, thus the factors that could explain a higher (or lower) level. The evidence suggests that disclosure level depends on some insurers' characteristics. In particular, the size of the company positively impact on the disclosure level: large insurers disclose more information probably because they have a wide variety of stakeholders but also have money, resources, skills to do it; when the size is lower, disclosure might become too expensive and so it decreases. The level of profitability does not affect the extent of information disclosed. Northern Europe insurers disclose more information than insurers with their home country in centre or south of Europe, while the subsector in which they operate is not relevant. The amount of premiums positively impact on disclosure level.

This research provides useful evidence to investors, supervisory authorities and insurers. In fact, the analysis of the content of disclosure, increasing market transparency, reduces the information asymmetry and could be a guide for proper choices by investors. It is also a relevant tool for the exercise of the supervisory control and for the introduction of adequate regulatory requirements. For insurers, it is an effective way to develop a good reputation and get stakeholders' trust, it should also prevent excessive risk-taking and promote the adoption of a more efficient behavior. The issue is very interesting in the current worldwide turmoil in financial markets and close to the implementation of a new regulatory framework for insurance industry (Solvency II).

This paper does not want to provide a definitive answer, but points to avenues of future research. The research presented can be further developed expanding the sample, extending the study to US companies in order to make a cross-country analysis between different countries and thus different regulatory systems, investigating the effects of disclosure or applying the same techniques to a different industry or time period.

Appendix: Disclosure Index for Insurers (DII)

The level of disclosure is measured through a self-constructed disclosure index and it expresses whether an insurer discloses one or more sources of information on four subjects:

- i) *Business Information and Strategy (BIS)*,
- ii) *Financial Information (FI)*,
- iii) *Governance Characteristics (GC)*,
- iv) *Risk Profile (RP)*.

As general rule, each item included in the index is assigned the score 0 when there is no information, 1 otherwise, and in some cases an additional point is awarded when it is provided in depth. In order to ensure the reliability of the results, the rules stated are applied equally to all units of analysis.

Aggregating the information on the four subjects, a composite *Disclosure Index for Insurers (DII)* is obtained, defined as:

$$DII_{i,t} = \sum_{j=1}^6 BIS_{j,t} + \sum_{h=1}^{12} FI_{h,t} + \sum_{k=1}^5 GC_{k,t} + \sum_{l=1}^{27} RP_{l,t} \quad \text{Eq (1)}$$

where $i = 1, 2, \dots, 30$ represents each insurer; $t = 2006, 2008, 2010$ is the time period; $j = 1, \dots, 6$, $h = 1, \dots, 12$, $k = 1, \dots, 5$ and $l = 1, \dots, 27$ are the elements that make up the four sub-indices *BIS*, *FI*, *GC* and *RP*.

The table below lists the items used and the potential scores in more detail. Criteria for scoring are better described in paragraph 3.2.

BUSINESS INFORMATION AND STRATEGY	Score		
Declaration of mission or operative goals	0	1	2
Description of the business	0	1	
Description of products	0	1	
Description of markets	0	1	
Description of the competitive environment	0	1	2
Market share	0	1	

FINANCIAL INFORMATION	Score		
Historical Results			
Five (ten) years of historical data to build ratios	0	1	2
Historical information about written premiums and reserves	0	1	2
Performance of the year			
Performance per lines, products, geographic areas	0	1	2
Analysis of change in premiums	0	1	
Analysis of change in operating income	0	1	
Analysis of the level of reinsurance	0	1	
Analysis of change in reserves	0	1	
Analysis of interest expense	0	1	
Forward-looking information			
Forecast of market share	0	1	2
Forecast of cash flows	0	1	2
Forecast of profits	0	1	2
Forecast of premiums	0	1	2

GOVERNANCE CHARACTERISTICS	Score		
System of governance	0	1	
Major shareholders	0	1	
Related parties transactions	0	1	
Number of employees	0	1	2
Remuneration policies	0	1	2

RISK PROFILE	Score		
Risk management			
List and definition of risks	0	1	
Description of capital adequacy approach	0	1	2
Description of capital requirements	0	1	2
Description of risk management policies	0	1	2
Underwriting risk			
Definition of the risk	0	1	
Description of risk mitigation activities	0	1	2
Quantification of risks	0	1	
Description of stress tests and sensitivity analysis	0	1	2
Market risk			
Definition of the risk	0	1	
Description of risk mitigation activities	0	1	2
Quantification of risks	0	1	
Description of stress tests and sensitivity analysis	0	1	2
Credit risk			
Definition of the risk	0	1	
Description of risk mitigation activities	0	1	2
Quantification of risks	0	1	
Description of stress tests and sensitivity analysis	0	1	2
Operational risk			
Definition of the risk	0	1	
Description of risk mitigation activities	0	1	2
Quantification of risks	0	1	
Description of stress tests and sensitivity analysis	0	1	2
Liquidity risk			
Definition of the risk	0	1	
Description of risk mitigation activities	0	1	2
Quantification of risks	0	1	
Description of stress tests and sensitivity analysis	0	1	2
Other risks			
Identification of other risks	0	1	
Quantification of other risks	0	1	2
Rating	0	1	

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