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An Investigation of the Integrity of Internet Financial Reporting[1]

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Abstract. Since the mid 1990s, large companies have increasingly used the Internet to disclose business and financial information. Internet technology is regularly claimed to facilitate greater relevance and timeliness of business information. The integrity of information disclosed on corporate websites has, however, been subject to comparatively little scrutiny. This study focuses on the integrity of Internet Financial Reporting (IFR) by reference to the adequacy of underlying corporate governance procedures. Using a sample of 100 large European companies, a questionnaire survey was used to identify whether or not governance procedures that specifically address the distinguishing features of web-based financial reporting are used by large companies. The results confirm the trend identified in prior research of increasing Internet usage to replicate paper-based financial information. Responses to the questionnaire also suggest that concerns about the integrity of IFR are justified. Erroneous assumptions and assertions by respondents regarding the security of IFR, in addition to knowledge of work undertaken by external auditors indicate limited engagement with IFR by management of large European companies. The conclusion of this study is that the governance framework surrounding IFR has received insufficient managerial attention.

Key words: Financial reporting, Internet, corporate governance, security, integrity.

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1. INTRODUCTION

Globalisation, an increasingly dynamic and competitive business environment, and recognition of broader stakeholder interest in business have increased demands on corporate reporting in recent years (Andersen 2000; Ashbaugh *et al*. 1999). Widespread access to the Internet in the last decade has facilitated a convergence of commerce and technology with the result that use of the Internet to communicate corporate information is now commonplace (Brennan and Hourigan 2000). Fundamental changes to business reporting models and a 'democratisation' of business reporting were forecast to result from a dynamic Internet medium (FASB 2000; Trites 1999; Spaul 1998; Wallman 1997; Tapscott 1996). However, whilst many large companies use corporate websites to disseminate information, the pace of development of Internet Financial Reporting (IFR), in terms of distinguishing itself from paper-based reporting, is proving to be evolutionary rather than revolutionary (Lymer and Debreceny 2003; Xiao *et al.* 2002; Richardson and Scholz 2000).

The objective of this study is to investigate aspects of corporate governance that relate to IFR. This study complements those that have examined IFR from the perspectives of users and regulators (for example Lymer and Debreceny 2003; Beattie and Pratt 2001) in addition to numerous studies that have described developments in IFR practice (see Table 1). It differs from descriptive IFR studies in that it focuses on underlying corporate governance procedures rather than website content disclosures as indicators of the significance and quality of IFR.

The implementation of adequate governance procedures is important given a current business reporting environment in which the effectiveness of corporate governance generally is under the spotlight and in which regulatory bodies have yet to comprehensively respond to the challenges posed by Internet reporting technologies (Lymer and Debreceny 2003; Ettredge *et al.* 2001). The adequacy of IFR corporate governance is assessed in this study by reference to the responses of preparers of financial information to a survey questionnaire. The questionnaire was informed by IFR guidance that exists for directors (ICSA 2000) and auditors (APB 2001), in addition to IFR integrity questions raised in the literature (Bagshaw 2000; Trites 1999; Lymer 1999; Debreceny and Gray 1999; IASC 1999).

The results of this study indicate that the slow development of IFR attributed to regulatory and legal uncertainties is compounded by a lack of knowledge of IFR characteristics on the part of preparers. Erroneous assumptions and claims by survey respondents regarding the integrity of IFR, in addition to the widespread use of website content disclaimers, indicate a limited engagement by preparers with the specifics of IFR. Technological possibilities are not matched by corresponding regulatory and political frameworks to protect users of IFR from unreliable information within and outside large organisations.

The remainder of this paper is organised as follows: the relevant prior literature is reviewed in the next section. The third section of the paper sets out the research questions and method adopted. The fourth section reports results. Conclusions are drawn in the final section based on a discussion of the research findings.

2. LITERATURE REVIEW

Until relatively recently, paper-based general-purpose reports were the most substantial and frequent means of direct corporate communications between management and the majority of stakeholders. Under this model, companies provide different users with standardised audited financial reports (Jensen and Xiao 2001). An increasingly dynamic and global business environment however has resulted in greater demands on, and for, business communications. Increasing political and social demands for corporate responsibility have also increased demands for corporate information (Ashbaugh et. al. 1999; Lymer 1999). Seeking alternative means of cost-effective communication, since the mid-1990s, large companies have increasingly turned to the Internet.

Within a few years of browser technology making the Internet widely available, the incidence of large companies disclosing financial information on web sites has increased substantially. IFR can be characterised as (i) solely another distribution channel for existing printed material, (ii) having the ability to interact with Internet technologies such as web browsers and search engines or (iii) providing enhanced or expanded information that could not be cost effectively (or even possibly) produced in paper form and which may be interrogated using interactive analysis tools (IASC 1999). Table 1 summarises the significant descriptive studies of IFR in the US, UK and Europe up to 2000, at which point IFR for quoted companies was almost universal.

US	Data collection date	Population	Corporate web site (%)	Financial data on site (%)
Louwers, Pasewark and Typpo (1996)	March 1996	Top 150 Fortune 500 companies	65%	37%
Petravik and Gillett (1996)	May 1996	Top 150 Fortune 500 companies	69%	55%
Flynn and Gowthorpe (1997)	December 1996	Top 100 Fortune 500 companies	89%	>71%
Debreceny and Gray (1997)	Late 1996	50 Largest US industrial corporations	98%	69%
Ashbaugh, Johnstone and Warfield (1999)	November 1997 - January 1998	290 Non-financial US listed companies	87%	70%
Deller, Stubenrath and Weber (1999)	January 1998	Top 100 Standard & Poor companies	95%	91%
Ettredge, Richardson and Scholz (2001)	May 1998	259 AIMR companies plus 231 Compustat computer technology and biotechnology companies	82%	>80%
FASB (2000)	January 1999	Top 100 Fortune 500 companies	99%	93%
UK				
Marston and Leow (1998)	November 1996	FT-SE 100 companies	63%	45%
Hussey, Guiliford and Lymer (1998)	August 1997	FT-SE 100 companies	75%	54%
Deller, Stubenrath and Weber (1999)	January 1998	FT-SE 100 companies	85%	72%
Hussey, Guiliford and Lymer (1998)	March 1998	FT-SE 100 companies	91%	63%
Craven and Marston (1999)	July 1998	Largest 200 UK companies	74%	71%
Europe				
Lymer and Tallberg (1997)		All 72 Finnish listed companies	90%	
Gowthorpe and Amat (1999)	July 1998	All Spanish listed companies	19%	49%
Hedlin (1999)	September 1998	60 listed Swedish companies	98%	83%
Deller, Stubenrath and Weber (1999)	January 1998	Top 100 DAX companies	76%	71%
Pirchegger and Wagenhofer (1999)	December 1997 December 1998	32 companies listed on the Vienna Stock Exchange	72% 88%	63% 82%
Brennan and Hourigan (2000)	July 1998	94 companies listed on the Irish Stock Exchange	37%	26%
Brennan and Kelly (2000)	July 1999	99 companies listed on the Irish Stock Exchange	67%	56%
Debreceny and Gray (1999)	Late 1998	15 largest listed from each of UK, Germany and France	98%	82%
Lybaert (2002)	July 2000	188 AEX companies	86%	94%
Marston and Polei (2004)	July 2000	Top 100 DAX companies	100%	99%

Table 1. Internet Corporate Financial Disclosure Studies

The continued growth of IFR within and beyond countries with capital market orientations is evident from replicated descriptive studies undertaken in numerous countries since 2000 (for example Barac 2003; Nasir *et al.* 2003; Joshi and Al-Madhaki 2003; Allam and Lymer 2003; Bonson and Escobar 2002; Fisher *et al.* 2000).

The potential of IFR is well documented. The possibilities of extracting data from underlying databases, tailoring content to match user needs, using multimedia communications to generate dynamic and responsive content, and using artificial intelligence applications to make possible interactive exchanges between preparers and users all lend credence to the claim that IFR 'democratises' corporate reporting (Xiao *et al.* 2002; FASB 2000; Trites 1999; Ashbaugh *et al.* 1999; Lymer 1999; Spaul 1998; Tapscott 1996).

Getting a new idea adopted however, even when it is technically feasible and has obvious advantages, is often difficult (Rogers 1995). There is little empirical evidence to suggest that a financial reporting revolution based on multi-media technology is occurring or is likely to occur in the foreseeable future, notwithstanding expressed preferences by users that the Internet satisfies information needs beyond paper financial reports (Beattie and Pratt 2001). On the contrary, the evidence indicates that IFR amounts to little more than electronic replication of existing paper reports (Xiao *et al.* 2002; Richardson and Scholz 2000; Brennan and Kelly 2000; Pirchegger and Wagenhofer 1999).

Under-utilisation of IFR is attributable to (i) general uncertainties regarding the IFR regulatory framework (Marston and Polei 2004; Lymer and Debreceny 2003, Xiao *et al.* 2002; Richardson and Scholz 2000) and (ii) a lack of preparer knowledge of the implications of reporting in an electronic environment (Ettredge *et al.* 2000b; Debreceny and Gray 1999; Ashbaugh *et al.* 1999; Marston and Leow 1998; Flynn and Gowthorpe 1997). As a medium unconstrained by geographical and legal boundaries, monitoring IFR does not fall as neatly within the jurisdictions of national accounting regulatory bodies as does paper-based reporting. Whereas regulatory bodies may be able to monitor all the financial information published by companies that operate under their national jurisdictions, this no longer automatically means that most, or even a majority, of the total publicly available financial information in that jurisdiction is monitored by domestic regulatory authorities.

Furthermore, once preparers realised that the rules of paper-based reporting still apply, IFR disclosures have largely been guided, and consequently restricted, by rules that implicitly assume paper to be the medium of communication. Companies choose to limit IFR in the belief that 'the application of current regulations is straightforward when the information's electronic presentation is directly analogous to its paper-based counterpart' (FASB 2000).

FASB (2000) also states however that 'Internet technology…has produced situations outside the paper paradigm'. Although many of the technological possibilities, such as dynamic and interactive presentation and content, have yet to be widely implemented, additional governance considerations to ensure the integrity of information disclosed arise as a result to the use of an electronic medium. Three issues that are not predicated on dynamic or interactive content or presentation but which are particular to the governance of IFR are those concerning security of information, use of hyperlinks and the respective roles and responsibilities of directors and external auditors.

(i) In the context of IFR, the reliability of information, in addition to its completeness and faithfulness to what it purports to represent, is also dependent upon the existence and implementation of proper security measures (Trites 1999; IASC 1999). IFR requires additional considerations in terms of ensuring appropriate authorisation within organisations to edit web-based information and appropriate controls to prevent unauthorised access from within and outside the organisation (FASB 2000; Trites 1999; Lymer 1999). Security concerns also extend to external auditors if audit reports are posted on corporate websites and hyperlinked to other information (FASB 2000; Debreceny and Gray 1999).

(ii) Whilst hyperlinks can facilitate ease of browsing of websites, the reader may unknowingly be moving from one corporate website to an unrelated third party site or from audited information to unaudited information. Conversely, the user may have difficulty ascertaining the precise point at which all the information associated with a particular matter of interest has been viewed (Trites 1999). Hodge (2001) demonstrated that participants who viewed hyperlinked material on a website misclassified more optimistic, unaudited information as audited and believed the optimistic, unaudited information to be more credible than did participants who viewed hardcopy materials. Marston and Polei (2004) included structure criteria in a 2003 website disclosure and presentation checklist to determine the extent to which German companies set clear boundaries between audited and unaudited information. Only two of 50 companies used a special icon for audited pages. While some companies may open a new window, or use a different background colour or symbol to identify audited information, a physical boundary on a familiar package such as an annual report provides a reassurance that is not yet available to the same extent with IFR (Marston and Polei 2004; Trites 1999; Ashbaugh *et al.* 1999; Debreceny and Gray 1999).

(iii) Financial reporting is an important element of the system of corporate governance (Baker and Wallage 2000). The process of financial reporting now includes IFR. The respective IFR responsibilities of directors and external auditors should therefore be agreed by both parties. At present in the UK and Ireland, directors are deemed responsible for the maintenance and security of a corporate website (APB 2001). The examination of controls over the website's maintenance and security is beyond the scope of a statutory audit. Where companies include the publication of audit reports on websites, the auditor is advised to discuss the associated published content with the directors prior to giving consent for the audit report to be published. The auditor should agree the material to be electronically published with manually signed accounts, should ensure the audit report will not be inappropriately associated with other published information and should check for inappropriate hyperlinked information. Directors are advised to obtain clearance from the auditor prior to displaying audited information and the audit report, to clearly identify statutory and audited information, and to ensure that the maintenance of the website becomes a routine part of the system of internal controls (ICSA 2000).

It would therefore be premature for preparers or regulators to conclude that there are no additional financial reporting issues to consider merely because IFR is little more than replication of paper-based reports. Underpinning a good financial reporting framework are good quality accounting and auditing standards and standard setters, audit firms with effective quality controls, and active regulatory oversight (SEC 2000; Cadbury 1992; ASSC 1975). However, given a current business-reporting environment in which '[IFR] pronouncements made thus far by the various [regulatory] bodies around the world fall considerably short as a response to the challenges that arise from current and future Internet reporting technologies' (Lymer and Debreceny 2003), the spotlight falls primarily on the adequacy of corporate governance.

3. RESEARCH QUESTION AND METHOD

3.1. Research question

This study investigates whether there are corporate governance procedures in place to ensure the integrity of IFR of quoted European companies. Assuming effective operation of corporate governance systems in the context of paper-based financial reporting, this study focuses on additional risks to the integrity of information communicated through corporate websites. Integrity of IFR is therefore inferred from (i) the security of web-based financial information, (ii) senior management knowledge of external audit procedures that address IFR risks, and (iii) the use of legal disclaimers regarding the validity of web-based financial information.

3.2. Research method

A listing of all companies quoted on the London Stock Exchange as at 31 March 2001 was downloaded from the LSE website1 in July 2001. All companies with non-EU countries of origin were excluded and the remaining listing sorted in descending order of market capitalisation. A full listing of the top 100 EU companies at that date is included in Appendix A.

The sample comprised 62 UK companies, ten Dutch, eight German, seven French, four Irish, three Spanish, three Swedish, and one company from each of Luxembourg, Denmark and Belgium, reflecting the fact that IFR transcends geographical borders. All companies in this sample are subject to a common financial reporting framework in so far as the UK Listing Authority (UKLA) Listing Rules include minimum standards regarding annual reports, accounts, corporate governance and the requirements of auditors. Non-UK companies may be permitted to depart from the standards outlined but only with the agreement of the UKLA. The UKLA therefore operates a shareholder protection system that applies to both UK and non-UK companies.

In July 2001, each company in the sample was requested to send a paper copy of their most recent annual report. Within six weeks, annual reports for seventy-six companies had been received. The investor relations web pages of these companies were analysed for comparative financial reporting content. Seventy-four companies (97%) substantially replicated their hardcopy annual report for IFR purposes in terms of primary financial statements, notes to the financial statements, audit opinions, directors' reports, senior executive statements, operating and financial reviews, and corporate governance confirmations. In addition, use of IFR to make voluntary disclosures was widespread among these companies. Categories of voluntary disclosures and their frequency are listed in Table 2.

	No.	**%**
Press and news releases	71	93
Share price/market cap.	66	87
Speeches/presentations	62	82
Historical summaries	58	76
Regulatory filings (e.g. Form 20F)	44	58
Financial highlights	38	50
Ratio analysis	23	30
Industry data	8	11

Table 2. Nature and Frequency of IFR Voluntary Disclosures

Having confirmed a high incidence of IFR, a senior manager in each company was requested to arrange the completion and return of a questionnaire in July 2001. Prior to sending questionnaires, either the chief financial officer or the investor relations department of each company was contacted by phone or email to briefly outline the nature of the questionnaire and to establish the identity of an appropriate recipient. Typically senior officers with financial reporting and/or information risk responsibilities were targeted.

An extract of the full questionnaire, which forms the basis of this study, comprised 16 questions divided into three main categories of inquiry (see Appendix B):

(i) Are procedures in place to ensure that the wording of the audit opinion cannot be interfered with and that the scope of the opinion is communicated to the website user?

(ii) Are senior management of companies aware of procedures undertaken by external auditors that address IFR risks?

(iii) What is the extent of legal advice sought in relation to IFR and reliance thereon?

The questions were based on guidance issued for directors (ICSA 2000) and auditors (APB 2001), and on matters of concern identified in the literature that relate to the security and integrity of IFR (Bagshaw 2000; Trites 1999; Lymer 1999; Debreceny and Gray 1999; IASC 1999). The final question in the questionnaire requested the views of senior finance officers on the likely future significance of the corporate website for financial reporting. The purpose of this question was to determine whether concerns raised in the literature, even if not currently significant, might become significant in the future.

4. RESULTS

Fifty-nine companies returned definitive responses to the questionnaire request. Of the 41 companies that did not respond to the questionnaire request, seventeen had submitted an annual report. Twenty-four companies, therefore, responded neither to the annual report request, nor the questionnaire notwithstanding follow up emails and phone calls over a number of weeks. The questionnaire response rate was 27.6%, excluding unreachable companies.

Questionnaire completed and returned:	**No.**
UK companies	13
Netherlands	3
Ireland	2
Denmark	1
France	1
Sweden	1
Sub-total of completed questionnaires	21
Questionnaire returned but not in usable format	1
Response of ‘insufficient time’ or ‘not interested in participating’	37
No response to questionnaire request	41
Total sample	100

Table 3. Questionnaire Responses

The Kolmogorov-Smirnov test was employed to determine whether the companies that completed questionnaires were representative of the full sample. The null hypothesis was stated as:

H0: There are no differences between the frequency distributions of companies that returned questionnaires and distributions of all companies in the sample in terms of (i) company size, (ii) country of origin or (iii) economic sector2.

The calculated D statistics for company size, country of origin and economic sector were 0.05, 0.08 and 0.09 respectively. The critical D statistic for 21 observations is greater than 0.21 at a significance level of 0.23. On this basis, the null hypothesis is accepted.

4.1. Security of Web-based financial reports

A review of the websites of respondents confirmed that they all make substantial use of Adobe Portable Document Format (PDF) to electronically communicate financial information. PDF is a commonly used standard for distribution and exchange of electronic documents because it uses a universal file format that preserves the attributes of source paper documents (Adobe 2004). Adobe software can also be used to preserve the integrity of PDF files and has been increasingly used because it is convenient for preparers (Trites 2005).

Table 4 summarises responses to questions on the security and independence of the external audit opinion.

	Yes	No	No answer
External audit opinion located on corporate website	16 (76%)	5 (24%)	
External auditor permission obtained to place opinion on website	13 (62%)	2 (10%)	6 (28%)
Possible to alter wording of external audit opinion	6 (28%)	11 (52%)	4 (20%)

Table 4. Security and Independence of External Audit Opinion

When asked whether the external audit opinion was located on the compamy website server, sixteen respondents (76%) responded positively. Upon reviewing the PDF annual reports of the five companies that stated the audit opinion was not located on the company website server, it was established in four cases that the opinion was included in the PDF document and therefore on the website server. It is possible that these respondents may only have considered whether the audit opinion was on the website as a separate document but only one respondent, in fact, did not have the audit opinion located on the website server. Thirteen respondents (62%) received permission from the external auditor to include the audit firm name and opinion on their website. One of these commented that because the opinion was within a PDF document, external auditor permission was implicit.

Three of the six respondents who answered 'yes' to the question of whether the wording of the audit opinion could be changed by someone within the organisation qualified their answer with comments such as: 'as the company ultimately uploads the data, there is always scope for change' or 'as much as any data stored on a server can be altered'. Whilst it is possible that these respondents answered 'yes' on the basis that it is difficult to foolproof any system of internal controls, none of these respondents gave any indication of awareness of the basic security features of PDF documents that may be used to safeguard them from being edited. A review of the security status of PDF documents revealed that only two of the 21 respondents had enabled the security features of PDF annual reports posted on their corporate websites.

Four respondents answered 'no' because the opinion was included in a 'closed' PDF document. Their view was that a PDF document is a 'fixed' document and cannot be changed. In the absence of enabled Adobe Acrobat security features to restrict editing, this view is erroneous as it is possible to edit PDF documents using Adobe Acrobat Standard software. Although Acrobat Standard is not text editor software, it does have a number of editing functions. None of these four respondents had enabled Acrobat security features.

Two respondents answered 'no' on the basis of enabled Acrobat security features and one answered 'no' on the basis of its wider system of internal controls. Only these three respondents addressed the question of whether it is possible to alter the wording of the external audit opinion on an informed basis. The other respondents to this question demonstrated ignorance of Acrobat security features and/or a misunderstanding of the default security status of a PDF document.

Given the apparently low level of questionnaire respondents' knowledge of Acrobat security features, the security status of online 2001 annual reports for all companies in the sample was further investigated in July 2004. The most recent annual reports for each company in the sample, whether for financial years ended 2003 or 2004, were also investigated. All companies in the sample without exception made financial reports available for download in PDF format. Using Adobe Acrobat 6.0 Standard software, each annual report was downloaded and the security status established using the 'Document Properties' function.

Due to mergers, acquisitions and de-listings, the number of companies in the sample reduced from 100 in July 2001 to 94 in July 2004[4]. Tables 5 and 6 analyse the companies for which PDF security features were enabled in 2001 and 2004, geographically and by size, respectively. Size is measured by market capitalisation.

Geographical	**Total (No.)**	**UK**	**German**	**Dutch**	**French**	**Danish**	**Swedish/Spanish/Irish/ Belgian/Luxembourg**
2004	21 of 94 (22%)	10 of 59 (17%)	6 of 8 (75%)	3 of 8 (38%)	1 of 6 (16%)	1 of 1 (100%)	0 of 12 (0%)
2001	12 of 100 (12%)	7 of 62 (11%)	3 of 8 (38%)	1 of 10 (10%)	1 of 7 (14%)	0 of 1 (0%)	0 of 12 (0%)

Table 5. Analysis of Annual Reports with Enabled PDF Security Features: Geographic

Size category		**Top 25**	**26-50**	**51-75**	**76-100**	**>100 in 2004**	**De-listed in 2004**
		Number of companies (%) in each size category					
2004	21 (100%)	10 (48%)	6 (28%)	0 (0%)	3 (14%)	1 (5%)	1 (5%)
2001	12 (100%)	6 (50%)	0 (0%)	3 (25%)	3 (25%)		

Table 6. Analysis of Annual Reports with Enabled PDF Security Features: Size

Overall use of Acrobat security features has increased since 2001, though not substantially. Twenty-one (22%) of the sample companies now enable security features (2001: 12%). The PDF annual reports of German companies are most likely to have security features enabled. Only two German companies in the sample did not make use of the available functions by 2004. Table 6 indicates that the greater the market capitalisation of a company, the more likely the company is to have enabled PDF security features. In 2004, 50% of the companies that had enabled PDF security features were part of the largest 25 companies by market capitalisation (2001: 48%). In 2004, 76% of the companies in the sample that had security features enabled were in the top 50 category of companies by market capitalisation (2001: 50%).

Surprisingly, four companies that used PDF security features in 2001 did not use them in 2004. Only eight companies (8.5% of the 2004 sample) therefore appear to consistently use Acrobat security features as a matter of company policy to prevent the possibility of PDF document editing. It was also noted as part of the July 2004 file security status investigation that none of the companies use an additional function that is available in Adobe Acrobat Standard 6.0 software that certifies an online PDF annual report as an exact replica of the paper-based equivalent. The certification function attests to the contents of a document. Given that current IFR practice is to substantially replicate paper based financial reports, directors and/or external auditors could choose to certify the contents as exact replicas of the paper based equivalents and simultaneously lock or secure the contents of the files to prevent any subsequent editing.

4.2. Knowledge of external audit procedures

Table 7 summarises senior management knowledge of external audit work on the controls governing the company website.

	Yes	No	Don't know	No answer	Not applicable
Auditor performs security tests	4 (19%)	14 (67%)	1 (4%)	2 (10%)	
Auditor compares website disclosures with hardcopy	9 (43%)	10 (47%)		2 (10%)	
Auditor monitors changes on website to date of opinion	6 (29%)	12 (57%)		3 (14%)	
Where hyperlinks included, auditor audits hyperlinked information	4 (19%)	7 (33%)	1 (4%)	3 (14%)	6 (30%)

Table 7. Awareness of Senior Financial Officers of External Audit Work Relating to IFR (2001)

The profile of responses indicating limited knowledge is unsurprising given the prevalence of PDF replication of paper reports and the assumptions of preparers regarding the inherent security of PDF files. It may be the case that external auditors actually carry out more work than respondents are aware of, but the responses suggest that, until such time as the contents of IFR differ substantially from existing paper-based reports, IFR is perceived by preparers to differ little from paper reports in terms of required external auditor input and in terms of risks to the integrity of the information.

Limited use of technology for IFR purposes is also evident from the absence of hyperlinks. Whilst it is possible to hyperlink from within PDF documents, six respondents (30%) expressly stated they do not use hyperlinks as a matter of company policy. An examination of the web-based financial information of all respondents revealed that only five companies (24%) used hyperlinks. Hyperlinks were used predominantly to link from primary financial statements to notes to the financial statements. Hyperlinks were also used to link from unaudited information to audited information. There were no instances of links from audited to unaudited information nor were there any identified instances of links from financial information on company websites to third party websites.

4.3. Legal disclaimers

Table 8 highlights that almost all respondents took legal advice on the use of disclaimers in relation to the validity of web-based financial information. Fourteen respondents stated they include a disclaimer on the website. Almost all respondents also claim their IFR is clearly segregated from other web-based information. A review of the websites of all companies in the samples confirmed that financial information is disclosed in the 'investor relations' or similarly named section of the website. The use of self-contained PDF files to disclose annual reports also facilitates the segregation of audited information from other web-based financial information and reduces the need to explicitly date online information.

	Yes	No	Don't know	No answer	Not applicable
Legal advisors consulted	19 (90%)	2 (10%)			
Disclaimer in relation to financial information	14 (67%)	6 (29%)		1 (4%)	
Advised where hyperlinks to third party sites are used	10 (47%)	9 (43%)		1 (5%)	1 (5%)
First page of each document dated	11 (52%)	10 (48%)			
Financial information segregated from other material	19 (90%)		1 (5%)	1 (5%)	

Table 8. Legal Considerations (2001)

The online annual reports of respondents were also reviewed for inclusion of external auditor disclaimers in relation to responsibility for any changes to financial statements following initial placement on the website. Ten websites (48%) include external auditor disclaimers, thereby confirming that directors are responsible for the maintenance and integrity of the website. The external auditor disclaimers were in addition to corporate disclaimers in relation to the validity of online financial data. The remaining websites did not include an identifiable or explicit external auditor disclaimer, thereby leaving possible doubt as to the respective responsibilities of directors and external auditors.

5. DISCUSSION AND CONCLUSIONS

Financial information traditionally disclosed in periodic paper reports is now very likely to be available for download from the websites of quoted companies. Voluntarily disclosed additional information is also relatively easy to access on these websites. In addition, the possibility of fulfilling statutory reporting requirements using IFR is now possible in the UK under the Companies Act 1985 (Electronic Communications) Order 2000. Documents previously disseminated in writing may now be sent electronically (email or website) if shareholders agree. Evidently, IFR is, in principle, well established and formally recognised as a legitimate means of business communication.

The evidence presented in this paper suggests that, in practice, Internet technologies such as hyperlinks and multimedia, which provide the potential for substantial paradigm changes from paper-based reporting, continue to be conservatively applied to IFR. Use of PDF documents to replicate complete hardcopy reports is, in contrast, widespread. The evidence suggests that preparers continue to regard IFR as a distribution channel for existing printed material that has some limited ability to interact with Internet technologies. The evolutionary development of IFR is also apparent from the finding that IFR practice and regulation thereof did not change substantially between 2001 when the original data were collected and 2004 when the websites of sample companies were re-visited.

This study set out to establish whether corporate governance procedures in large listed European companies operate to protect the integrity of information posted on corporate websites. Wherever possible, the validity of answers provided by respondents to this survey was reviewed by reference to the relevant websites and the properties of web-based PDF files. Instances of erroneous assertions were found in relation to the default security of PDF documents, especially whether the external audit opinion was located on the website server, and whether it would be possible to alter the wording of the opinion, or indeed any part of an online annual report. The mistaken perceptions of respondents as to the inherent security of PDF files may explain why only a minority of the web-based financial reports have document security features enabled, both in 2001 and 2004.

There are several reasons to utilise PDF file security. Firstly, permitting opportunities to edit PDF financial reports without appropriate authorisation is inherently undesirable from the company's perspective and should therefore be prevented or discouraged wherever possible. Making generic data files such as spreadsheets available for download and further analysis by stakeholders is quite different, in terms of reputation risk or the potential to mislead, from providing opportunities to edit branded PDF annual reports that are official records of corporate activity.

Secondly, whilst it makes little intuitive sense that anyone, whether internal or external to the company, would choose to edit softcopy annual report due to the absence of any obvious gain, financial reports could be edited for reasons other than instrumental benefit. The possibilities of inadvertent error by someone internal to the organisation, mere opportunism on the part of someone external to the organisation, or malice on the part of disaffected stakeholders provide logical reasons to utilise PDF security features. Thirdly, whilst external auditors may verify that web-based annual reports contain the same information as hardcopy reports at the date of audit sign off, unsecured online documents remain dynamic for as long as they are available on corporate websites, which may be long after audit sign off. Lastly, whilst it is likely that wider controls over access and security to any part of a corporate website also apply to online PDF files, these controls would not prevent unsecured files from being downloaded, altered and disseminated via any number of third party websites, Internet chatrooms, weblogs or discussion groups.

Comments by some questionnaire respondents suggest that a lack of knowledge of Adobe software products rather than policy choice is more likely to explain why many online PDF files are unsecured. To secure a PDF file is a straightforward process using Acrobat 6.0 Standard. It is therefore feasible as well as desirable from a corporate governance perspective to eliminate unnecessary risks to the integrity of PDF files or IFR generally. Responsibility for the security of corporate website content obliges senior management to ensure they have appropriate knowledge of the software used on the website.

Thirty eight percent of questionnaire respondents were unable or unwilling to confirm the receipt of consent from the auditor to post the audit opinion on the website. Nineteen percent were unaware that the audit opinion was on the website. Only forty three percent, in responding to the questionnaire, could confirm that, to their knowledge, the external auditor verifies the content of the online annual report to be the same as the hardcopy version. It could be argued that lack of knowledge of external audit procedures is not particular to IFR and is not even particularly significant given the extent of PDF file replication of audited paper reports. Neither would it be unusual for senior management to have less than detailed knowledge of many of the specific audit procedures undertaken by an external auditor. The role of the external auditor has also been simplified by an IFR reporting environment that replicates paper reports rather than one which makes full use of the technological possibilities envisioned by corporate reporting technophiles in the 1990s. Matters of file security, coordination with external auditors, and legal disclaimers may therefore be argued to be of little significance if the purpose of IFR is merely to replicate reliable paper-based documents.

This line of reasoning implicitly accepts that IFR, from a preparer's perspective, is a secondary source of information. This reasoning could be attributed to those respondents who included comments that IFR controls referred to in the questionnaire were not implemented because they regard existing corporate governance frameworks to be sufficiently robust to include IFR within existing procedures. In short, because IFR amounts to no more than PDF replication, existing corporate governance procedures plus website disclaimers suffice for IFR purposes. The plausibility of these claims however is based on the limited extent of current IFR practice. Notwithstanding limited current practice, the findings of this study indicate that the integrity of current IFR could still be enhanced by greater use of Acrobat certification and file-locking functions.

Arguments that play down the significance of web-based file security or the role of the external auditor in IFR, or that accept corporate and external auditor website disclaimers are also counter balanced by the fact that 95% of respondents stated that IFR is likely to play a greater role in future business reporting activities. In these circumstances, the plausibility of claims that existing corporate governance frameworks are adequate, and the sufficiency of the input of the external auditor may be more open to question, particularly if the future of IFR is something other than PDF replication. Lymer and Debreceny (2003) comment in detail on the gaps between the utilisation of technologies (for example HTML, XML or XBRL) and the responses of the auditing profession. The evidence from this study is that those gaps have not necessarily been covered by senior management. Senior management of quoted companies may claim to like the idea of making greater use of Internet technologies, but as yet have not been explicitly obliged or motivated to do so. Furthermore, regardless of whether IFR remains primarily a process of PDF file replication or develops into a more substantial and distinguishable financial reporting process, broader corporate governance requirements such as those included in the Sarbanes-Oxley Act 2002 in the US are likely to oblige senior management to engage with the corporate governance implications of IFR to a greater extent than has been the case thus far.

6. LIMITATIONS OF THIS STUDY AND SUGGESTIONS FOR FURTHER RESEARCH

This study is an exploratory investigation of the integrity of IFR by reference to the existence of IFR-specific corporate governance procedures in large European companies. Discussion and conclusions are based on an investigation of isolated aspects of corporate governance frameworks. Whilst this study provides information about a number of issues, it also raises questions that may be addressed through further research. In particular, the totality of corporate governance implemented by companies could provide further assurance on IFR integrity. Additional research on the existence of comprehensive controls that mitigate IFR risks highlighted by this study is therefore recommended.

Questionnaire responses were interpreted in this study as reflecting the level of IFR corporate governance knowledge within the whole company. It is possible that some respondents answered on the basis of personal knowledge, which may explain ‘don’t know’ answers in some instances and may have influenced the inferences drawn. However, given that respondents were identified as senior officers with financial reporting and/or information risk responsibilities at the outset, it is arguable that, if they did not know answers to some questions, they perhaps should have known.

Notwithstanding the applicability of the UKLA Listing Rules to all companies in the sample, this study has a UK bias in terms of the number of UK companies in the sample as well as references to UK legislation, financial reporting and auditing guidance. The number of UK companies in the sample reflects the economic significance of the companies concerned. UK legislation and guidance was referred to in this study on the basis that UKLA Listing Rules require financial reporting to be underpinned by accounting, auditing and corporate governance standards acceptable in the UK. International Standards provide an alternative basis, but their requirements, in the current context, are no more demanding than UK standards.

The role of the external auditor in IFR has been investigated from the perspective of the preparers of financial reports. A study of the role of external auditors from the perspective of the external auditor is also desirable to investigate the possibility of an expectations gap with regard to the role and responsibilities of external auditors in relation to IFR.

7. CONCLUSIONS

The advent of the Internet as a business reporting medium initially elicited claims of paradigm shifts in business reporting models (Spaul 1998; Wallman 1997). Actual changes have been largely incremental with new technologies conservatively implemented. The findings of this study are consistent with prior research which found that, whilst use of IFR is standard practice for large companies, the nature, format and content of disclosure does not differ noticeably from paper-based disclosures.

Prior research attributes the slow pace of development of IFR to the absence of a developed legal and regulatory framework (APB 2001; Richardson and Scholz 2000). This study suggests that the slow development of IFR is compounded by limited engagement with IFR by senior management of large organisations. Erroneous assumptions and claims made by respondents, absence of awareness of IFR external audit work, and reliance on website disclaimers indicate a lack of knowledge of the distinguishing features of IFR.

Attention is drawn in this study to the question of whether preparers regard IFR as a primary or secondary source of information. This question is part of a broader issue of what the business reporting community wants specifically from IFR in terms of the utilisation of available technologies. The potential of IFR is well documented but the extent to which that potential should be realised and how it should be done has received comparatively little attention. However, even if IFR amounts to little more than replication of paper reports, it is reasonable to expect the integrity of the information communicated to be protected from risks potentially posed by the medium of communication. The results of this study question the integrity of the current IFR environment given the absences of IFR knowledge at individual level and of coherent corporate governance procedures at organisational level.

8. REFERENCES

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Notes

1. http://www.londonstockexchange.com/en-gb/pricesnews/prices/ [July 2004]

2. The expected cumulative frequency distributions were based on company size, country of origin and economic sector data in Appendix A. Economic sector categories are those used on the LSE. In the case of company size, 21 questionnaire responses suggested an expected frequency distribution of approximately one in every five companies. Appendix A was therefore divided into 20 size categories with an expected frequency of five companies per category. Actual frequencies were classified on the same bases.

3. The higher the significance level, the lower the probability of accepting a null hypothesis when it is false (Type II error). In the case of this study, it is preferable to mitigate the possibility of a Type II error, hence $\alpha = 0.2$.

4. Bank of Scotland and Halifax merged to form HBOS. National Grid and Lattice merged to form National Grid Transco. Powergen, Energis and Lafarge were not quoted on the LSE in July 2004. The weblink to Thomson-CSF's investor information and contacts were dead links in July 2004.

Appendix A: Top 100 EU companies by market capitalisation

Rank	Name	Origin	Sector	Internet Homepage
1	BP Amoco	UK	Oil - Integrated	http://www.bpamoco.com/
2	Vodafone	UK	Wireless Telecommunications	http://www.vodafone.com
3	GlaxoSmithKline	UK	Pharmaceuticals	http://www.gsk.com
4	Royal Dutch Petroleum	Netherlands	Oil - Integrated	http://www.shell.com
5	HSBC	UK	Banks	http://www.hsbc.com
6	Total Fina Elf	France	Oil - Integrated	http://www.totalfinaelf.com
7	Astrazeneca	UK	Pharmaceuticals	http://www.astrazeneca.com
8	Shell Transport and Trading	UK	Oil - Integrated	http://www.shell.com/
9	Allianz	Germany	Other Insurance	http://www.allianz.com
10	Royal Bank of Scotland	UK	Banks	http://www.rbs.co.uk
11	Siemens	Germany	Electrical Equipment	http://www.siemens.com
12	Banco Bilbao	Spain	Banks	http://www.bbva.es
13	Lloyds TSB	UK	Banks	http://www.lloydstsb.com
14	Barclays	UK	Banks	http://www.barclays.com/
15	Telefonica	Spain	Fixed-Line Telecommunication	http://www.telefonica.com
16	Ericsson	Sweden	Telecommunications Equipment	http://www.ericsson.com
17	British Telecommunications	UK	Fixed-Line Telecommunication	http://www.bt.com
18	Deutsche Bank	Germany	Banks	http://www.deutsche-bank.de
19	Orange	France	Wireless Telecommunications	http://www.orange.fr
20	Philips Electronics	Netherlands	Electronic Equipment	http://www.philips.com
21	Banco Santander	Spain	Banks	http://www.bsch.es
22	Diageo	UK	Beverages - Distillers & Vintners	http://www.diageo.com
23	Bayer	Germany	Chemicals - Commodity	http://www.investor.bayer.com
24	CGNU	UK	Life Assurance	http://www.aviva.com
25	Unilever	Netherlands	Food Processors	http://www.unilever.com
26	ABN-AMRO	Netherlands	Banks	http://www.abnamro.nl
27	Electrolux	Sweden	Household	http://www.electrolux.com
28	BASF	Germany	Chemicals - Commodity	http://www.basf.com
29	Tesco	UK	Food & Drug Retailers	http://www.tesco.com
30	Anglo American	UK	Mining Finance	http://www.angloamerican.co.uk
31	Halifax	UK	Banks	http://www.halifax.co.uk
32	Abbey National	UK	Banks	http://www.abbeynational.plc.uk
33	BSkyB	UK	Cable & Satellite	http://www.bskyb.com
34	Prudential	UK	Life Assurance	http://www.prudential.co.uk
35	Unilever	UK	Food Processors	http://www.unilever.com
36	Rio Tinto	UK	Other Mineral Extractors & Mines	http://www.riotinto.com
37	Cable & Wireless	UK	Fixed-Line Telecommunication	http://www.cw.com
38	Fortis B	Belgium	Other Insurance	http://www.fortis.com
39	Danone	France	Food Processors	http://www.danonegroup.com
40	Aegon	Netherlands	Life Assurance	http://www.aegon.com/
41	Reuters	UK	Publishing & Printing	http://www.reuters.com
42	Elan	Ireland	Pharmaceuticals	http://www.elan.ie

43	BAT	UK	Tobacco	http://www.bat.com/
44	Compass	UK	Restaurants, Pubs & Breweries	http://www.compass-group.com
45	Pearson	UK	Publishing & Printing	http://www.pearson.com
46	BG	UK	Oil - Integrated	http://www.bg-group.com/
47	Standard Chartered	UK	Banks	http://www.standardchartered.com
48	BAE Systems	UK	Defence	http://www.baesystems.com
49	Fortis NL	Netherlands	Other Insurance	http://www.fortis.com
50	Centrica	UK	Gas Distribution	http://www.centrica.co.uk
51	Marconi	UK	Telecommunications Equipment	http://www.marconi.com
52	Cadbury Schweppes	UK	Food Processors	http://www.cadburyschweppes.com
53	Bank of Scotland	UK	Banks	http://www.bankofscotland.co.uk
54	Novo Nordisk	Denmark	Pharmaceuticals	http://www.novonordisk.com
55	Akzo Nobel	Netherlands	Chemicals - Commodity	http://www.akzonobel.com
56	Compagnie de St-Gobain	France	Building & Construction	http://www.saint-gobain.com
57	Scottish Power	UK	Electricity	http://www.scottishpower.com
58	Commerzbank	Germany	Banks	http://www.commerzbank.com
59	WPP	UK	Media Agencies	http://www.wpp.com
60	Legal & General	UK	Life Assurance	http://www.landg.com
61	Reed International	UK	Publishing & Printing	http://www.reed-elsevier.com
62	National Grid	UK	Electricity	http://www.ntgroup.com
63	Amvescap	UK	Asset Managers	http://www.amvescap.com
64	Marks & Spencer	UK	Retailers - Multi Department	http://www2.marksandspencer.com
65	KPN	Netherlands	Fixed-Line Telecommunication	http://www.kpn.com
66	J Sainsbury	UK	Food & Drug Retailers	http://www.j-sainsbury.co.uk
67	Billiton	UK	Other Mineral Extractors & Mines	http://www.bhpbilliton.com
68	Skandia Insurance	Sweden	Life Assurance	http://www.skandia.com
69	TNT Post	Netherlands	Business Support	http://www.tpg.com
70	Royal & Sun Alliance	UK	Insurance - Non-Life	http://www.royalsunalliance.com
71	3I	UK	Venture & Development Capital	http://www.3i.com/
72	Elsevier	Netherlands	Media Agencies	http://www.reed-elsevier.com
73	Schering	Germany	Pharmaceuticals	http://www.schering.de
74	BAA	UK	Airlines & Airports	http://www.baa.co.uk
75	Kingfisher	UK	Retailers - Multi Department	http://www.kingfisher.co.uk
76	Alstom	France	Electrical Equipment	http://www.alstom.com
77	AIB	Ireland	Banks	http://www.aib.ie
78	Bank of Ireland	Ireland	Banks	http://www.bankofireland.ie
79	Lafarge	France	Building & Construction	http://www.lafarge.com
80	RTL	Luxembourg	Broadcasting Contractors	http://www.rtl-group.com
81	Bass	UK	Restaurants, Pubs & Breweries	http://www.interbrew.com
82	Reckitt Benckiser	UK	Household	http://www.reckittbenckiser.com
83	Boots	UK	Retailers - Multi Department	http://www.boots-plc.com
84	CRH	Ireland	Building & Construction	http://www.crh.ie
85	ThyssenKrupp	Germany	Engineering - General	http://www.thyssenkrupp.com
86	Dixons	UK	Retailers - Hardlines	http://www.dixons-group-plc.co.uk
87	Scottish & Southern Energy	UK	Electricity	http://www.scottish-southern.co.uk

88	Old Mutual	UK	Life Assurance	http://www.oldmutual.plc.uk
89	GKN	UK	Auto Parts	http://www.gknplc.com
90	Colt Telecom	UK	Fixed-Line Telecommunication	http://www.colt-telecom.com
91	Great Universal Stores	UK	Retailers - Multi Department	http://www.gusplc.co.uk
92	Hays	UK	Business Support	http://www.hays-plc.com
93	Lattice Group	UK	Gas Distribution	http://www.ntgroup.com
94	Granada	UK	Broadcasting Contractors	http://www.itv.com
95	Energis	UK	Fixed-Line Telecommunication	http://www.energis.co.uk
96	BOC	UK	Chemicals - Commodity	http://www.boc.com/
97	Thomson-CSF	France	Defence	http://www.thalesgroup.com
98	Invensys	UK	Engineering - General	http://www.invensys.com
99	Powergen	UK	Electricity	http://www.powergen.co.uk
100	Land Securities	UK	Real Estate	http://www.landsecurities.co.uk

Appendix B: Questionnaire

Questions 1 - 15 deal with the roles of the external auditor and legal disclaimers relating to the financial information on your website. Question 16 deals with the general significance of Internet-based financial reporting in your corporation. Where a question requires an answer other than ‘yes’ or ‘no’, please insert the answer in the ‘Comment’ column. If you wish, you may insert comments for any question if you think your answer needs to be put in context.

	Security and independence of external audit	*Yes*	*No*	*Comment*
1	Is the external audit opinion relating to the statutory financial statements located on the corporate website?			
2	In relation to question 1, if the answer is yes, has the express permission of the external auditor to include the audit firm’s name and audit opinion on the corporate website been obtained?			
3	In relation to question 1, if the answer is yes, would it be possible for someone within your corporation to alter the wording of the external audit opinion?			
4	Is there a policy in place to ensure that the Internet-based financial information, with which the audit firm’s name is associated, is clearly distinguished from other information on the corporate website?			
5	Does the corporate website include a disclaimer to advise a viewer that audited financial information is being exited where hyperlinks to other unaudited parts of the website are used?			
6	If changes are to be made to the Internet-based financial information with which the audit firm’s name is associated, is there a policy to ensure that changes are made only after agreement of the audit firm?			
	Scope of external audit procedures	*Yes*	*No*	*Comment*
7	To your knowledge, does the external auditor perform any security tests on the website to assess the risk of damage by hackers?			
8	To your knowledge, does the external auditor perform any substantive tests to ensure that the financial information on the corporate website is the same as the financial information in the paper-based annual report?			
9	To your knowledge, does the external auditor monitor changes on the corporate website up to the date of the audit opinion?			

10	To your knowledge, if there are hyperlinks included in the audited financial information, does the external auditor ensure that any information so hyperlinked has in fact been audited?			
11	Have legal advisors been consulted to discuss the appropriateness of including legal disclaimers about the accuracy, timeliness and completeness of the financial information disclosed on the corporate website?			
12	Does the corporate website contain a legal disclaimer in relation to the accuracy, timeliness and completeness on the financial information disclosed on the corporate website?			
13	Does the corporate website include a disclaimer to advise a viewer that the corporate website is being exited where hyperlinks to third party sites are used?			
14	Is the first page of each document posted to the corporate website dated to advise a viewer of the currency of the information?			
15	Is financial information clearly segregated from other material on the corporate website?			
	General	*Yes*	*No*	*Comment*
16	Does the top management of your corporation see the website playing a greater role in financial reporting activities in the future?			