sustainability

MDPI

Article

Does Intellectual Capital Disclosure Matter for Audit Risk? Evidence from the UK and Italy

Chiara Demartini [1] and Sara Trucco [2,*]

[1] Department of Economics and Management, University of Pavia, Via San Felice 5, Pavia 27100, Italy; mariachiara.demartini@unipv.it

[2] Faculty of Economics, Rome University of International Studies, Via Cristoforo Colombo 200, Roma 00147, Italy

* Correspondence: sara.trucco@unint.eu

Academic Editors: Rachel J.C. Chen and Marc A. Rosen

Received: 7 June 2016; Accepted: 11 August 2016; Published: 30 August 2016

Abstract: Disclosure theory argues that better information quality reduces audit risk, by decreasing information asymmetry in the market and consequently, information risk for firms. Extant literature on voluntary disclosure analyzes the relationships between Corporate Social Responsibility (CSR) and audit risk, finding that auditors charge lower fees and issue less going concern opinions to firms with good CSR performance. In this study, we test the relationship between intellectual capital disclosure (ICD) and audit risk and we assess the effect of ICD and audit risk on audit fees. To do so, we use data from the ESG Asset4 database (Thomson Reuters Datastream) on 166 UK and 27 Italian listed firms that issue stand-alone social and intellectual capital statements. The audit risk is measured from both a qualitative and a quantitative perspective. Panel data analysis on 2004–2011 years has been used to test our research hypotheses. Empirical findings from a sample of UK and Italian listed companies show that auditors estimate a lower qualitative risk, albeit a higher quantitative one, for those companies reporting higher ICD scores, compared to those ones with lower disclosure scores on the intellectual capital. Furthermore, we find that reputation risk contributes to the relationship between ICD and audit risk.

Keywords: intellectual capital disclosure; audit risk; audit fees; voluntary disclosure; country analysis

1. Introduction

Disclosing intellectual capital information may produce both beneficial and dysfunctional effects [1–3]. In fact, although a comprehensive theory of voluntary disclosure does not exist so far, companies find different economic and managerial incentives in disclosing more than mandatory information, especially with reference to intellectual capital information. As Ellie and Jacobson put forward, these benefits should be balanced against some costs, such as the loss of competitive advantage for giving away company's secrets, the provision costs for collecting, organizing and disclosing information and the exposure to manipulation of disclosed information, which eventually could turn out into litigation costs [3,4]. According to Guthrie and colleagues' literature review [5], auditing has received little attention within the field of intellectual capital accounting studies since the beginning of the 21st Century. Extant literature on voluntary disclosure and their effect on audit variables is mainly focused on the financial voluntary disclosure and audit risk [6] with some recent exceptions related to the link between CSR disclosure and audit risk [7]. Following Ball and others [6], voluntary disclosure and audited financial reporting are complements, not substitutes, in that the truthfulness of financial auditable information reduces the risk that non-auditable forward-looking voluntary disclosure is not reliable [8]. Disclosure theory argues that better information quality reduces audit risk by decreasing information asymmetry in the market and consequently, information risk for firms [9]. These findings

carried some authors to investigate the association between firms' reputation risk and audit risk. Even if several academics examine the determinants of the audit risk, there is little empirical evidence on the effects of the audit risk due to the ICD. Moreover, extant literature on voluntary disclosure and audit fees has not achieved consensus on the relationship between ICD and the amount of fees charged to the audited company. In particular, prior studies did not provide empirical evidence of the effect of ICD on audit fees.

In order to cover this gap in previous literature, this paper aims at investigating the relationship between ICD on both audit risk and audit fees. In doing so, we assessed the extent to which 164 UK and 27 Italian listed companies disclosed intellectual capital information on a stand-alone social or intellectual capital statement over the period 2004–2011. Then we ran panel data regressions to investigate the effect of ICD on both different components of audit risk and the amount of audit fees charged by auditors to their clients. We then pooled data by country and addressed further comments on the main models.

Following Bozzolan and others, we chose the UK and Italian listed companies to highlight differences in ICD in different national settings [10]. The UK is a common law country, while Italy is based on civil law. Furthermore, the Italian FTSE is relatively smaller than the London Stock Exchange (LSE) and with a lower presence of institutional investors compared to UK. Moreover, LSE and UK regulators place more emphasis, compared to Italy, on the kind and amount of information that companies should disclose [10].

Empirical findings aim at contributing to research in several ways. First of all, from a theoretical perspective, our findings enrich the non-financial voluntary disclosure field, in that this study is a first attempt to understand the role of ICD on the assessment of audit risk and audit fees charged to audited companies. Indeed, this study seeks to explore and point out whether the effort in disclosing intellectual capital information has a balancing effect on the fees that the client firm has to pay to the auditor. From a methodological perspective, we also advance some knowledge on audit risk measurement; in fact, we aimed at understanding whether audit risk can be conceived as a mix of both qualitative and quantitative features. In doing so, we hope to shed some light on the possible explanation of the mixed results achieved by prior studies on the link between audit risk and audit fees [7,11]. Finally, we contribute to the international literature on ICD by comparing the effect of ICD on audit risk and audit fees in both common law and civil law countries. Implications for practitioners are involved too. The awareness of the relevance of the ICD and the non-financial disclosure, at large, could be helpful for audit companies as well as their clients [12]. Auditor companies could benefit from the combined use of both mandatory and voluntary disclosure to assess their client's risk and better quote their audit remuneration [6].

The remainder of this paper is organized as follows: Section 2 provides an analytical literature review; Sections 3 and 4 define research design, sample and empirical models; Section 5 sets out empirical results; Section 6 proposes a final discussion; Section 7 addresses conclusions and suggests future research avenues.

2. Literature Review

2.1. Disclosure Theory and Non-Financial Voluntary Disclosures

Voluntary disclosures are "disclosures in excess of requirements" ([13], p. 555). They are not substitute but complementary to audited financial information disclosed by firms, since they contribute to the decrease in information asymmetry between managers and investors [6,14]. Therefore as stated by Beattie and Smith and according to the disclosure theory, companies have incentives to provide voluntary disclosures if their benefits offset their costs [3]. Voluntary disclosures can be both financial and non-financial information delivered through the annual report and other corporate channels. Earnings estimate is an example of voluntary financial information, while social and environmental disclosures are voluntary non-financial information. Although the literature on the voluntary financial

information is quite abundant, recent research is focusing on the effect of disclosing non-financial information, since no clear consensus has been achieved so far. As a matter of fact, on the one hand, CSR is found to decrease the cost of capital for those firms disclosing stand-alone reports on social activities [11], whereas on the other, Cho and Patten reports that environmental reporting is not positively related to enhance environmental performance, i.e., firms disclosing environmental information are not necessarily improving their environmental footprint [15].

Despite these controversial findings, some years ago some professional associations agreed that an increase of this kind of information should foster long-lasting value for the company. AIMR argued that this kind of disclosure could represent a good mean to communicate firm's progress and evolutionary paths to stakeholders [16]. To confirm this trend, some scholars underlined that even financial analysts perceive the relevance of non-financial information [17,18].

Based on these preliminary considerations, we aim to better understand the role of a specific area of non-financial voluntary disclosure, the intellectual capital disclosure.

2.2. Intellectual Capital Disclosure

Intellectual capital is the dynamic set of knowledge, capabilities, networks, operation processes, individual and organizational relations that contribute to creating a company's long-lasting value. During the last two decades scholars achieved a consensus on the main intellectual capital components, namely human capital, structural capital and relational capital [19]. An effective reporting of such critical success factors is aimed at satisfying a twofold need. On the one hand, ICD fulfils accountability needs [20], on the other it enables decision-making activity [9,10,21]. The motivation to focus on ICD rather than other types of non-financial reporting is grounded on the diffusion of such a voluntary disclosure. The literature on ICD, indeed, is abundant and investigates determinants and consequences of ICD in a wide range of countries, such as Canada [22], Australia [23], Italy [10], Ireland [24], Netherlands, France and Germany [25], Spain [26], China [27], Bangladesh [28], Sri Lanka [29], South Africa [30], Hong Kong [31], Romania [32] and many others. Although a thorough analysis of the positive and negative determinants and/or consequences of ICD is beyond the aims of this study, it is worth noting the patterns emerging from the literature, which are related to the disclosure theory. First, Brüggen and colleagues found no support to the disclosure theory assumption according to which firms disclose intellectual capital information to reduce the information asymmetry between managers and investors [33]. Nevertheless, some studies found that the value relevance of ICD does exist, although it is country specific. In fact, Vafaei and colleagues pointed out that British and Hong Kong listed companies benefited from disclosing information on their intellectual capital in terms of increased share price [34]. In Australia and Singapore instead, the ICD does not affect both the earnings per share and the value of the net assets. Second, ICD has a positive effect on the cost of equity capital. Mangena and his colleagues, indeed, found that the ICD is more negatively related to the cost of equity capital, compared to other voluntary financial disclosure in the UK [33]. Moreover, the same study reported a difference in the cost of capital between high and low ICD companies, which is even higher in capital-intensive sectors compared to other sectors [34,35].

Positive effects of ICD should be balanced against dysfunctional effects. Some scholars indeed warn that ICD can also have detrimental effects [36]. According to this perspective, ICD may influence managers' perception about the future, although it does not settle the future [37]. Furthermore, the American Institute of Certified Public Accountants argued that ICD may lead to competitive disadvantage because the firm is "giving away company's secrets" [38]. Moreover, results on a sample of UK CFOs identified information collection costs and litigation costs arising from ICD as further drawbacks to the disclosure of intellectual capital information [3].

2.3. Audit Risk

Dusenbury and his colleagues define audit risk as the likelihood that auditors fail to detect a material misstatement and thus, issue an unqualified opinion instead of a modified opinion [39].

SAS No. 39 and 47 [40] provides the auditors with the guide to assess the audit risk and define the audit risk model, identifying the key determinants of the audit risk, which are inherent risk, control risk and detection risk. Inherent risk is the likelihood that an account balance or class of transactions contains a material misstatement without considering the internal accounting controls; whereas control risk is the probability that a material misstatement will not be detected by the internal controls of a firm; and finally, detection risk is the likelihood that a material misstatement will not be caught by the auditor's procedures. The audit risk model may be expressed as follows:

$$\text{audit risk} = \text{inherent risk} \times \text{control risk} \times \text{detection risk} \quad (1)$$

or as follows:

$$\text{detection risk} = \text{acceptable audit risk} \div (\text{inherent risk} \times \text{control risk}) \quad (2)$$

According to the audit risk model, auditors need to set materiality and assess acceptable audit risk, inherent risk and control risk, whereas the detection risk is defined by solving the Equation (2).

Previous literature about the audit risk highlights the difficulties to assess it and to test the dependencies among components of risk [39,41–43]. Furthermore, corporate failures which have occurred since 2002, revealed the need to revise the audit risk model and the weakness of the methodology that auditors use to evaluate audit risk [44].

Despite these considerations, Shibano attempted to assess the overall audit risk and its components, by taking advantage from the game theory and the strategic-testing theory [45], whereas Strawser and Matarneh achieved similar results by means of a survey submitted to auditors [46,47]. Furthermore, previous literature attempts to identify the practical key determinants of the audit risk, like the client' business risk [48,49], the clients' internal corporate governance features [50,51], the litigation risk [52], book-tax differences [53] and the client financial condition [52]. Within this framework, some scholars identified proxies for each component of the audit risk; as for inherent risk, it seems to be associated to the nature of client's business, size, complexity, leverage and to significant accruals such as receivables and inventory [54–56]. Moreover, control risk has been found to be determined by the management's attitude toward internal controls, corporate governance quality and the audit committee quality expressed in terms of audit committee independence and audit committee financial experiences [57]. Both inherent risk and control risk have been found to be closely linked to audit adjustments [58]. Literature about the construction of the detection risk seems to be scantily addressed, even if the auditing standards suggest that detection risk may be especially associated to external auditor tenure [40].

2.4. Audit Fees

Prior literature concerning the audit fees indicates that in a competitive audit market, the audit fees may be considered as a proxy of the auditor's effort [7,59–61]. Wider literature concerning audit fees examines the relationship between audit risk and auditor effort, finding mixed results. Few scholars found no evidence about the relationship between audit plan and audit risk [55,62], whereas most scholars demonstrated the relationships between the level of audit fees and audit risk [60,63].

Hogan and Wilkins found an increase of audit fees for firms that have substantial internal control problems. This evidence also suggests that firms with internal control deficiencies have high levels of inherent risk and information risk and thus, these risks are positively related to the audit fees [64]. Houston et al. found that in the presence of errors, the audit risk model is linked to the audit effort during the engagement, whereas in the presence of irregularities, there is no such relationship [65]. Hay et al., through a meta-analysis, found that audit fees of a firm are determined by client size, client risk and client complexity [60]. Jiang and Son demonstrated that audit fees are especially linked to the control risk [63].

2.5. The Relationship Between Intellectual Capital Disclosure, Audit Risk and Audit Fees

Disclosure theories applied to intellectual capital pointed out that ICD should reduce information asymmetry and thus information risk [1,2]. Despite information risk has been found to predict audit risk [64], to our best knowledge of the literature on ICD and audit risk, the relationship between these two concepts has not been investigated yet. According to Guthrie and colleagues' literature review [5], auditing has received little attention within the field of intellectual capital accounting studies since the beginning of the 21st Century. Previous studies indeed, are mainly focused on the financial voluntary disclosure and audit risk [6] with some recent exceptions related to the link between CRS disclosure and audit risk [7]. Following Ball and others [6], voluntary disclosure and audited financial reporting can be conceived as complements, not substitutes, in that the truthfulness of financial auditable information reduces the risk that non-auditable forward-looking voluntary disclosure is not reliable [8]. Similarly, PCAOB suggests to auditors some measures in order to facilitate the use of non-financial disclosure to avoid fraud [66]. In this framework, Krishnan et al. argued that the choice of managers to disclose voluntary information is associated with the audit risk, since through that way, auditors could have more basis for their evaluation about the overall level of their clients' business risk and found a positive association between audit fees (which is considered as a proxy of audit risk) and some features of management's earnings forecasts such as likelihood, bias, error and frequency [67].

Furthermore, Chen et al. found that auditors use the CSR disclosure in assessing the client's audit risk; firms with a better CSR performance faced lower audit fees and their propensity to issue a modified audit opinion [7]. On a similar vein, Zhanxia et al. analyze the relationship between the ICD and audit results of public accounting firms, concluding that human capital and customer capital are key assets for the audit firms [68].

With regard to ICD and audit fees, extant literature has not achieved consensus on the relationship between ICD and the amount of fees charged to the audited company. Previous studies did not provide evidence of the effect of ICD on audit fees. Beattie and Smith indeed, conducted a survey to assess the importance that CFOs assign to ICD incentives and disincentives [3]. They factor analyzed the answers from 93 UK CFOs and found that ICD "reduces costs of obtaining auditors opinion in relation to consistency with financial statements" ([3], p. 484). On the one hand, the increase in effort that audit firms have to produce in order to check for more disclosed information should have a direct effect on the amount of audit fees [7,11] On the other, the disclosure of high quality voluntary information is a proxy for high transparency and credibility by the audited company [6], thus the auditors can exploit the voluntary information to double check the reliability of mandatory information [3].

3. Hypotheses and Research Questions

As mentioned in Section 2, non-financial disclosure is increasingly relevant for auditors and accountants for their decision-making processes [69]. We argue that higher levels of ICD should reduce the level of the audit risk, as auditors have more information as basis for their evaluations, due to the firms' propensity to be more transparent [7,70]. Thus, voluntary disclosure reduces audit risk, whether the company's credibility on financial information achieve satisfactory levels. Auditing standards, practitioners and scholars recently emphasized the relevance of examining also non-financial disclosure in order to evaluate audit risk [67].

From a methodological standpoint, audit risk is measured from a qualitative and quantitative point of view. Qualitative features are related to the corporate governance system that is in place within the firm and the quality of the internal control system. Other factors affecting the audit risk—quantitative ones—refer to the size of the company, usually measured by total revenues, total assets or total shareholders' equity [43]. Literature about this topic is limited and there is a call for more research to explore how different types of non-financial and voluntary information can play a role in the evaluation of the audit risk [67], therefore we formulate the following research hypotheses:

Hp1a: Auditors report a lower level of qualitative audit risk for those firms reporting more ICD.

Hp1b: Auditors report a lower level of quantitative audit risk for those firms reporting more ICD.

According to some literature streams and previous Hps, we follow that part of literature which argues that audit fees can be considered as a proxy of the auditors' effort and consequently as a proxy of the audit risk [60,64,65]. Scholars agree that higher audit risk is associated with greater audit effort and therefore higher audit fees. Furthermore, according to Hp1c, we argue that higher levels of ICD should reduce the level of the audit risk and thus, the audit fees. As a matter of fact, auditors' should be confident about audited firms, as they seem to be more transparent than firms with low quantity of ICD [7]. According to these considerations, we formulate the following research hypothesis:

Hp1c: Auditors charge lower audit fees to those firms reporting more ICD than those firms reporting lower ICD.

Literature about reputation is quite wide and several scholars attempted to put forward a definition. Fombrun defined reputation as the intangible outcome of shared socially impressions of a firm that should bring about tangible benefits within a firm and among stakeholders [71]. Following Scandizzo, reputation may be measured through either CDS (Credit Default Score) disclosed by Moody's or analysts' consensus on earning per share estimates on fiscal year *t*, and *t-1* [72]. However, the literature about the reputation risk and its effects on the audit risk is not very well developed. Therefore, we assume that auditors can ground also their evaluation of the audit risk on the external perception about the firm reputation.

According to these considerations, we argue that a low level of reputation risk should bring about a reduction of the two components of the audit risk. Based on this framework, we formulate the following research hypothesis:

Hp2a: Firms showing a lower reputation risk will also have a lower qualitative audit risk.

Hp2b: Firms showing a lower reputation risk will also have a lower quantitative audit risk.

According to the above mentioned literature streams, most scholars demonstrated that the audit fees could be considered as a proxy for the audit risk [60,64,65], whereas other scholars did not [55,62]. Based on the assumption that audit risk can be split into qualitative and quantitative factors, we expect audit fees to be affected differently by different components of the audit risk. We formulate the following research hypothesis in order to contribute to this research field:

Hp3a: Qualitative audit risk negatively directly affects audit fees.

Hp3b: Quantitative audit risk positively directly affects audit fees.

According to the Research hypotheses (Figure 1), we formulate the following research question:

RQ: Are auditors affected by the presence of the ICD in their assessment and quotation of the audit risk?

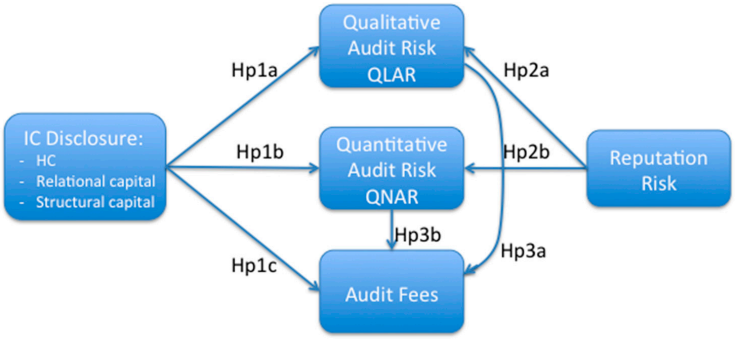

Figure 1. The research model.

4. Sample and Methodology

4.1. Sample Definition and Data Collection

In order to answer the research question and to test the research hypothesis we selected all the UK and Italian industrial listed firms from ESG Asset4 database (Thomson Reuters Datastream). We included both a civil law (Italy) and a common law country (UK) in our dataset, since previous studies found that there was an impact of the legal system on accounting practice [73,74]. In particular, we were interested in understanding the different impact of ICD and ICD components on the quality of the audit procedure. We excluded financial institutions, as they have particular features and they need to be dealt with separately. We identified 166 UK listed firms and 27 Italian listed ones that issue stand-alone, social and intellectual capital statements.

For each company, we collected the name of the auditor firm for our sample time period, which ranges between 2004 and 2011 and we decided to exclude 2 UK firms audited by non-big 4 audit firms to guarantee homogeneity of the sample. We ended up with a list of 191 industrial firms audited by big-4 firms in our sample time period.

For each company we collected data from ESG Asset4 referred to the following research variables: audit risk, audit fees, reputation risk, accruals and ICD.

To measure audit risk we followed professional and academic recommendations, as mentioned in Section 2.3 [56], and we split this research variable into two features according to results from the factor analysis (Appendix A): qualitative audit risk and quantitative audit risk.

The qualitative audit risk is related to: (a) the quality of the audit committee and top management; (b) the robustness of the overall internal control system; and (c) the effectiveness of the corporate governance. This governance is built by summing up the standardized values of the following indicators taken from ESG Asset 4 (each indicator can take a value from 1 to 100): (1) board functions audit committee independence; (2) board functions audit committee management independence; (3) board structure experienced board; (4) board structure independence board members; and (5) corporate governance score. When qualitative audit risk increases, the audit risk will decrease. As a matter of fact, high qualitative audit risk mirrors sound corporate governance and strong internal control.

The quantitative audit risk is related to the size of the client and the litigation expenses and it is built by summing the log-values of the following indicators taken from ESG Asset 4: (1) net sales or revenues; (2) total asset; (3) total shareholder's equity; and (4) litigation expenses. Audit risk will increase when quantitative audit risk increases.

According to the literature, the reputation risk is measured by the analyst stock recommendations. A value of between 1 and 1.49 is associated to "Strong Buy"; a value between 1.5 and 2.49 it is associated to "Buy"; a value between 2.5 and 3.49 is associated to "Hold"; a value between 3.5 and 4.49 is associated to "Underperform"; a value between 4.5 and 5 is associated to "Sell". A higher value issued by analysts indicates a higher Reputation Risk [75].

To measure the level of ICD we first reviewed the literature on ICD [10] and identified 20 items, which refer to the three components—relational capital, human capital and structural capital—of intellectual capital. Data on the 20 items was gathered from Thomson Reuters Datastream which provides either the item value on a 0–100 scale or available/not available information. We, then, developed dummy variables, assigning a value of 0 where the disclosure was not available or 1 for the items being disclosed. By adding the dummy variables related to the items of intellectual capital we identified the measure of ICD components and the overall ICD measure. For each component, the items included are shown in Table 1.

Furthermore, we built a control variable to test the firm's complexity, using the sum of the log-values of inventories and receivables, that we called accruals. Auditor's opinion is not included in the econometric model as an explanatory variable, since auditing standards states that audit risk and audit opinion should not be related.

Table 1. Items Included in ICD Variables.

Research Variable	Relational Capital (RC Disclosure)	Human Capital (HC Disclosure)	Structural Capital (SC Disclosure)
Items in the research variable	1. Brand value 2. Customer satisfaction 3. Customer satisfaction transparency 4. Consumer complaints 5. Shareholder loyalty	1. Average age 2. Average training hours 3. Employee satisfaction 4. Employee productivity 5. Internal promotion 6. Management training 7. Turnover of employees 8. Training cost total 9. Training hours total 10. Women managers	1. Cost of innovations 2. Lost time for injury rate 3. Total employee injury rate 4. Total accidents 5. Six Sigma and Quality Management Systems

4.2. Empirical Models

The first step of our empirical analysis was to perform a factor analysis (Appendix A) in order to build qualitative audit risk, quantitative audit risk and accruals items [76]. All statistical analyses were performed using STATA 11. Before performing factor analysis, we standardized each component of the qualitative audit risk and we created the logarithm of each component of the quantitative audit risk and the accruals [77]. As shown in Appendix A, the reliability results of this analysis is satisfactory for each item, so we proceeded to sum every component in order to create the three mentioned research variables. Table 2 shows some descriptive statistics of our research variables; in Table 3 correlation matrix and VIF to check for the presence of multicollinearity are reported. Low values of VIF index and correlation matrix entries allow us to reject the hypothesis of presence of multicollinearity [78].

Table 2. Descriptive Statistics of the Research Variables.

Variable	Min	Max	Mean	Standard Deviation	Obs.
ICD	0.000	18.000	7.621	2.921	1528
RC disclosure	0.000	5.000	2.086	0.871	1528
SC disclosure	0.000	5.000	2.008	0.802	1528
HC disclosure	0.000	10.000	3.527	1.732	1528
Qualitative Audit Risk	9.000	358.000	278.398	38.386	1431
Quantitative Audit Risk	9.227	57.003	27.697	7.132	1528
Accruals	0.000	67,692,128.000	2,040,207.000	5,747,811.000	1457
Reputation Risk	1.000	4.000	2.432	0.603	1528
Audit fees	24.000	13,913,000.000	17,499.280	380,048.000	1472

T-test for accruals = 12.845, *p*-value = 0.000.

Table 3. Correlation Matrix and VIF.

	VIF	*RC Disclosure*	*HC Disclosure*	*SC Disclosure*	ICD	Audit Fees	QLAR	Accruals	QNAR	Reputation Risk
RC disclosure		1.000								
HC disclosure		0.522 **	1.000							
SC disclosure		0.577 **	0.629 **	1.000						
ICD	1.38				1.000					
Audit fees		0.078 **	0.146 **	0.071 **	0.130 **	1.000				
QLAR *	1.31	0.537 **	0.413 **	0.562 **	0.560 **	0.069 **	1.000			
Accruals	1.03	0.086 **	0.209 **	0.130 **	0.188 **	0.144 **	0.053 *	1.000		
QNAR **	1.12	0.186 **	0.320 **	0.244 **	0.318 **	0.411 **	0.123 **	0.108 **	1.000	
Reputation Risk	1.07	0.196 **	0.132 **	0.203 **	0.192 **	−0.085 **	0.444	0.051	−0.085 **	1.00
Mean VIF	***1.18***									

Results are significant at the * 0.1; ** 0.05 and *** 0.01 level; QLAR * = Qualitative Audit Risk; QNAR ** = Quantitative Audit Risk.

In order to test our research hypotheses, we used a set of either OLS or GLS equations. The linear model, based on panel data analysis, is drawn as follows:

$$Y_{it} = \beta_0 + \beta_1[X_{1it}] + \beta_2[X_{2it}] + \ldots + \beta_n[X_{nit}] + \varepsilon_{it} \quad (3)$$

where $i = 1, \ldots, N$ identifies each firm in the panel data and $t = 1, \ldots, N$ refers to the sample time period.

Model 1 (Equation (4)) refers to Hp1a and Hp2a testing for the effect of ICD and reputation Risk on qualitative audit risk.

$$\text{QLAR}_{it} = \beta_0 + \beta_1\text{ICD} + \beta_2\text{ReputationRisk} + \beta_3\text{Accruals} + \varepsilon \quad (4)$$

Model 2 (Equation (5)) refers to Hp1b and Hp2b testing for the effect of ICD and reputation risk on quantitative audit risk.

$$\text{QNAR}_{it} = \beta_0 + \beta_1\text{ICD} + \beta_2\text{ReputationRisk} + \beta_3\text{Accruals} + \varepsilon \quad (5)$$

Model 3 (Equation (6)) refers to Hp1c, Hp3a and Hp3b testing for the effect of ICD and reputation risk on qualitative audit risk.

$$\begin{aligned}\text{AuditFees}_{it} = {} & \beta_0 + \beta_1\text{ICD} + \beta_2\text{ReputationRisk} + \beta_3\text{QNAR} + \\ & \beta_4\text{QLAR} + \beta_5\text{Accruals} + \varepsilon\end{aligned} \quad (6)$$

Each of the three synthetic econometric models has been run replacing the overall measure of ICD with relational, structural and human ICD also (extended models). Hausman test statistics for each panel data regression enabled us to rely on either the fixed-effects or the random-effects results. In order to avoid computational issues, before running the panel data analysis, ICD, audit risk and reputation risk variables have been normalized, while we computed the natural log of audit fees and accruals [79].

According to the literature, we performed the following tests to verify the robustness of each model: Modified Wald test for groupwise heteroskedasticity in fixed effect regression model; Breusch-Pagan test of independence; Skewness/Kurtosis tests for normality; and Wooldridge test for autocorrelation in panel data. Test results for each model and for panel regression are shown in Appendix B. As a result of testing (Appendix B, modified Wald test for groupwise heteroskedasticity in fixed effect regression model), we found evidence of both heteroscedasticity and serial correlations and thus we used robust coefficients to assure the validity of panel data results (see also Tables 4 and 5).

Table 4. Robust Coefficients of Panel Data Regressions (Italian and UK Firms).

	Model 1 (*y* = Qualitative Audit Risk) Robust Coefficients		**Model 2 (*y* = Quantitative Audit Risk) Robust Coefficients**		**Model 3 (*y* = Audit Fees) Robust Coefficients**	
	Synthetic	**Extended**	**Synthetic**	**Extended**	**Synthetic**	**Extended**
ICD	3.955 *** (0.206)		1.660 *** (0.208)		0.082 (0.043)	
HC disclosure		0.786 *** (0.194)		0.658 ** (0.262)		0.004 (0.038)
SC disclosure		1.931 *** (0.181)		0.379 (0.247)		0.041 (0.031)
RC disclosure		2.832 *** (0.219)		1.025 *** (0.292)		0.072 (0.044)
Reputation risk	0.676 *** (0.101)	0.831 *** (0.092)	−0.343 *** (0.125)	−0.360 *** (0.125)		
Accruals	0.239 (0.300)	0.064 (0.142)	0.364 ** (0.184)	0.376 ** (0.183)	0.433 *** (0.037)	0.434 *** (0.037)

Table 4. *Cont.*

	Model 1 (y = Qualitative Audit Risk) Robust Coefficients		**Model 2 (y = Quantitative Audit Risk) Robust Coefficients**		**Model 3 (y = Audit Fees) Robust Coefficients**	
	Synthetic	**Extended**	**Synthetic**	**Extended**	**Synthetic**	**Extended**
Qualitative Audit Risk					−0.017 *** (0.005)	−0.019 *** (0.005)
Quantitative Audit Risk					0.009 *** (0.003)	0.009 *** (0.003)
Constant	−4.800 *** (2.307)	−2.809 *** (1.8823)	22.862 *** (2.432)	22.680 *** (2.422)	1.721 *** (0.260)	1.718 *** (0.259)
R^2 (overall)	0.271	0.408	0.114	0.100	0.023	0.022
F (Wald-Chi^2)	150.930 ***	1142.730 ***	(78.230) ***	(82.790) ***	41.640 ***	28.160 ***
SE of regression	3.072	3.527	4.662	4.672	0.461	0.461
Rho	0.414	0.643	0.386	0.383	0.470	0.471
Hausman test (p-value)	FE 0.000	RE 0.000	RE 0.051	RE 0.080	FE 0.000	
Obs.	1267	1457	1371		1103	
Groups	189	190	189		179	

Robust coefficients are significant at the * 0.1, ** 0.05 and *** 0.01 level; Standard errors are in brackets.

Table 5. Results from the Pooled Panel Data Regressions.

Panel A: Italian Firms			
	Model 1 (y = Qualitative Audit Risk) Robust Coefficients	**Model 2 (y = Quantitative Audit Risk) Robust Coefficients**	**Model 3 (y = Audit Fees) Robust Coefficients**
ICD	3.634 *** (0.216)	1.219 ***	0.285 ** (0.118)
Reputation risk	0.479 ** (0.217)	−0.263 (0.350)	
Accruals	−0.075 (0.425)	−0.453 (0.622)	0.651 *** (0.199)
Qualitative Audit Risk			−0.072 *** (0.022)
Quantitative Audit Risk			0.025 ** (0.012)
Constant	−6.713 (6.178)	39.492 *** (8.980)	−2.772 (2.954)
R^2 (overall)	0.561	0.134	0.173
Wald-Chi^2 or F	336.120 ***	8.140 *	27.890 ***
SE of regression (Sigma e)	3.112	5.781	0.754
Rho	0.485	0.593	0.652
Hausman test (p-value)	RE	RE	RE
Obs.	210	195	137
Groups	27	27	24

Table 5. *Cont.*

Panel B: UK Firms			
	Model 1 (y = Qualitative Audit Risk) Robust Coefficients	**Model 2 (y = Quantitative Audit Risk) Robust Coefficients**	**Model 3 (y = Audit Fees) Robust Coefficients**
ICD	5.211 *** (0.200)	1.432 *** (0.249)	0.058 (0.036)
Reputation risk	0.915 *** (0.100)	−0.273 ** (0.128)	
Accruals	0.307 ** (0.145)	0.139 (0.191)	0.032 (0.028)
Qualitative Audit Risk			−0.002 (0.004)
Quantitative Audit Risk			
Constant			0.010 *** (0.0032789)
R^2 (overall)	−4.727 ** (1.886)	25.017 *** (2.4882)	6.868 *** (0.374)
Wald-Chi^2 or F	0.478	0.049	0.163
SE of regression (Sigma e)	848.690 ***	37.600 ***	17.220 **
Rho	3.5920.441	4.3700.306	03.5310.391
Hausman test (p-value)	RE	RE	RE
Obs.	1247	1176	1148
Groups	163	162	158

Robust coefficients are significant at the * 0.1, ** 0.05 and *** 0.01 level; Standard errors are in brackets.

5. Empirical Results

5.1. Effect of Intellectual Capital Disclosure on Qualitative Audit Risk

Empirical findings from the companies included in this sample show that the disclosure of intellectual capital and the company's reputation positively impact on the qualitative audit risk (Table 4; synthetic model 1). These results give support to Hp1a, stating that auditors report a lower level of qualitative audit risk for those firms reporting more ICD. As a matter of fact, the higher the level of voluntary disclosure in terms of ICD the company provides the better the qualitative features of audit risk and ultimately, the lower the risk. Surprisingly, reputation risk is positively related to the qualitative features of audit risk, therefore results don't support our Hp2a, which was aimed at testing whether firms showing a lower reputation risk will also have a lower qualitative audit risk. The explanatory power of the fixed-effects model is considerable (R^2 = 27.09%).

By splitting the overall ICD measure into its three components—human capital, structural capital and relation capital—we found that they positively impact on the qualitative side of the audit risk (Table 4; extended model 1), supporting in this way the Hp1a. By analyzing beta coefficients of each independent variable, it seems that disclosure about relation capital has the highest impact on our dependent variable. Still the explanatory power of the GLS model is high (R^2 = 40.84%).

5.2. Effect of Intellectual Capital Disclosure on Quantitative Audit Risk

The analysis of the relationship between the amount of ICD, reputation risk and the quantitative feature of audit risk produces a positive and strong effect of ICD on quantitative audit risk (Table 4; synthetic model 2). This means that the higher the level of ICD, the riskier the company from the

auditor's perspective. Therefore, empirical findings don't allow us to support our Hp1b, stating that auditors reported a lower level of quantitative audit risk for those firms reporting more ICD. Regarding the research hypothesis Hp2b—firms showing a lower reputation risk will also have a lower quantitative audit risk—the beta coefficient of the reputation risk is negative and statistically significant, which results in the lack of empirical support to our Hp2b too.

By splitting the disclosure of intellectual capital into its three components, we found that relational and human capital disclosures only seem to have a positive, strong and significant impact on the quantitative part of the audit risk (Table 4; extended model 2), whereas the other intellectual capital component—structural capital—does not achieve an acceptable level of statistical significance, even if the R^2 of this random-effects model is quite low. Furthermore, as in the previous synthetic model, reputation risk has a strong and negative effect on the quantitative audit risk, which is against our Hp2b.

5.3. Effects of Intellectual Capital Disclosure on Audit Fees

Evidence from the fixed-effects model testing the relationship between the disclosure of intellectual capital, audit risk and audit fees (Table 4, model 3) shows a low level of "goodness-of-fit" of the model, enabling us to put forward only preliminary arguments on the tested relationships. As for the relationship between audit risk and audit fees, results pointed out that there is a significant, although very small in magnitude, positive effect of the quantitative audit risk on the amount of audit fees, meaning that higher levels of audit risk are associated with higher fees charged to the audited company by the auditor, as predicted by our Hp3b, stating that quantitative audit risk positively directly affects audit fees. Nevertheless, the qualitative audit risk is negatively related to audit fees, meaning that higher levels of qualitative audit risk—which address lower levels of audit risk (see Section 4.1)—reduce the amount of audit fees charged to audited companies, as theoretically argued by Hp3a (qualitative audit risk negatively directly affects audit fees). A similar effect occurs when testing for the relationship between the disclosure of intellectual capital and audit fees (Hp1c—auditors charge lower audit fees to those firms reporting more ICD than those firms with lower ICD). The effect of ICD on audit fees is not significant. When testing for the extended fixed-effects model 3 (Table 4), which includes the components of ICD, the low level of statistical significance of the beta coefficients related to both human capital and relational capital components does not enable us to generalize results.

5.4. Further Findings: Sub-Sample Analysis

In order to assess the extent of country differences in our sample, we performed a pooled panel data analysis on models 3, 4 and 5 (in their synthetic version only; Table 5). In both sub-samples, model 1—testing the relationship between ICD, reputation risk and qualitative audit risk—achieved a very high level of goodness-of-fit and the signs of the beta coefficients of the main predictors are positive and significant in all cases. ICD disclosure and reputation risk showed a larger effect on the qualitative component of audit risk in the UK sample, compared to the Italian one.

The explanatory power of model 2 (Table 5)—testing the relationship between ICD, reputation risk and quantitative audit risk—is quite low in both countries. However, the highest effect on the quantitative component of audit risk is related to the ICD of UK companies. Reputation risk is positively related to the quantitative component of audit risk for both UK and Italian companies although in the Italian sub-samples results don't achieve a satisfactory level of significance.

The model testing the relationship between ICD, reputation risk, audit risk components and audit fees—model 3 (Table 5)—showed a barely acceptable level of goodness-of-fit in the two countries. The model related to UK companies does not achieve a good level of statistical significance of predictors, apart from the quantitative component of audit risk, showing a marginal positive effect on audit fees. The Italian sub-sample shows a positive and significant effect of ICD, quantitative audit risk and accruals on audit fees, while qualitative audit risk is negatively related to audit fees. Thus, country analysis addressed evidence that the UK sample showed a more theory-driven

pattern, in that quantitative audit risk could be assumed as proxy for audit fees. Evidence from the Italian sample instead, adds more knowledge to the extant theory since an increase in the qualitative component of audit risk reduce audit fees charged to audited companies.

6. Discussion

Empirical findings from the panel data analysis enabled us to put forward some preliminary arguments about the relationship between the disclosure of intellectual capital, the level of audit risk and the audit fees. First of all, results from the overall Italian and UK sample confirmed our main research question, i.e., ICD affects the audit risk and audit fees. Following this approach, ICD complements mandatory financial disclosure as well as voluntary financial disclosure [6]. This result contributes to the development of the disclosure theory with regard to the voluntary disclosure and their effect on audit risk. Previous studies indeed, did not find support to the signaling effect of ICD [33]. This study, instead, provides empirical evidence of the signaling effectiveness of ICD. ICD, indeed, aims at disclosing information—which cannot be available to external stakeholders if not voluntary disclosed—that is relevant for the assessment of the future viability of the company, such as intellectual capital [80]. Among the three ICD components, relational capital has the highest impact on audit risk, although it positively affects both the qualitative and the quantitative components of audit risk. Thus, on the one hand the disclosure of relational capital reduces qualitative audit risk, whereas on the other, it has a detrimental effect on the risk to be managed by auditors (that is, the quantitative side). This balanced effect could be due to the fact that firms with higher levels of relational capital disclosure are also keen to invest more on relational capital and this positively impacts on net sales [81], which ultimately increase the burden on the quantitative component of audit risk. Altogether, in order to shed more light on this topic more research in this field is needed.

Second, results from the study confirmed that reputation risk is a significant determinant of audit risk [82]. Indeed, auditors will face a lower both qualitative and quantitative audit risk when their clients show low levels of reputation risk, measured by the analysts' consensus to buy/sell company stock.

Third, in line with prior studies, incentives to ICD should be balanced against disincentives, such as information collection costs [3]. Empirical findings from the overall sample put forward that the effectiveness of ICD in reducing audit risk does not translate into lower audit fees. Nevertheless, this is a first attempt to contribute to the mixed results on the effect of audit risk on audit fees [3,7,48].

Fourth, by pooling the dataset we obtained country-specific results. Generally, the effect of ICD on the qualitative component of audit risk is higher for the UK companies, compared to the Italian sample, thereby suggesting that disclosing intellectual capital information produces a more beneficial effect in the UK than in Italy. This could be due to the fact that the UK stock market is more liquid and sensitive to voluntary information. Moreover, prior studies argue that there is an impact of the legal system on accounting practice [73,74]. In common law countries, companies deal with capital markets and numerous investors, without any specific written practice [83]. This produces a high demand for information from "anonymous" investors at a distance [73]. In civil law countries, there is a high level of insider [74] and crossover [72] ownership by banks or other organizations. Therefore management can directly access information [74,84]. We chose to include both common law and civil low settings to underline the differences between the two contexts. In particular, we were interested in understanding the different impact of ICD and ICD components on the quality of the audit procedure. As for the reputation risk, findings on the qualitative side provide a greater effect for the UK sample, compared to the Italian one. As a matter of fact, in the UK the resonance of some corporate failures focused public opinion and analysts' attention towards issues regarding the quality of corporate governance and the ownership structure [85]. Another country difference applies to the relationship between ICD and audit fees; in fact, the Italian sub-sample reports a greater positive effect, compared to the UK sub-sample. Again, this could be due to differences in the two legal systems. In civil law countries, accountants are used to rely more on written principles/standards, therefore they are allowed to use higher discretion

in the voluntary disclosure. In such a situation, since auditors cannot refer to a standard framework of audit risk assessment of voluntary disclosure, they charge the client for the increased effort they have to commit in auditing disclosure "in excess of requirements". Moreover, this result is consistent with previous research on the country-specificity of the ICD value relevance [34].

7. Conclusions

This paper aimed at explaining the relationship between ICD, audit risk and audit fees. Previous literature on this link, in fact is either lacking or provides mixed results. Empirical findings from this study contribute to the literature in several ways.

First of all, from a theoretical perspective, our findings contribute to the non-financial voluntary disclosure field [12] in that this study is the first attempt in understanding the role of ICD on the assessment of audit risk and audit fees charged to audited companies. From this standpoint this contribution enriches disclosure theory literature in that ICD can be conveniently used to communicate transparent and truthful information to external stakeholders, as other non-financial voluntary disclosures do [7]. As a matter of fact, this study contributes to the literature of value relevance of ICD, since it has been found that the effort in disclosing intellectual capital information has a balancing effect on the fees that the client firm has to pay to the auditor [3]. Our analysis has shed some light on the possible explanation of the mixed results achieved by previous literature on the link between audit risk and audit fees [7,11]. In fact, quantitative and qualitative components of audit risk should be investigated separately in order to understand the effect of each component on the amount of audit fees charged to the client firm. From a methodological perspective, we also advanced the knowledge on audit risk measurement, in fact, by analyzing the audit risk items we identified two audit risk components: qualitative and quantitative in nature.

Finally, we contributed to the international literature on ICD by comparing the effects of ICD on audit risk and audit fees in both common law and civil law countries. Results from this study pointed out some interesting insights on the different magnitude of the effects, that different variables have on both audit risk and audit fees in different countries. This assumption could address further research to investigate the mechanisms that translate the transparency and truthfulness features coming from ICD in the valuation of audit quality and then onto the amount of audit fees charged to companies operating in different cultural settings.

From this analysis, some practical and managerial implications may emerge. The awareness of the relevance of the ICD and the non-financial disclosure at large could be helpful for auditor companies as well as their clients. Audit firms could benefit from the combined use of both mandatory and voluntary disclosure to assess their client's risk and better quote their audit remuneration [6,12]. Companies needing an audit on their financial disclosure can rely more on ICD as a tool to manage their audit risk and ultimately, the fees they have to pay for financial auditing services. Furthermore, managing reputation risk becomes a main objective for both the auditor and the client firms, in order to keep the level of audit risk under control.

This study is not without its limitations. First, the study sample is cross-sectional so our analysis lacks any focus in terms of industry-specific control variables or comparison between different industries, such as knowledge-intensive and traditional ones. Also, the number of countries included in this study is too limited to provide a global overview of the investigated relationships, thus further analysis with larger datasets should be encouraged. As for control variables, we have controlled complexity with the amount of accruals only, without taking into account M&As, the number of foreign subsidiaries and markets served. Also, as for the measurement of ICD we relied on dummy variables only, without measuring the extent to which the amount of information disclosed is qualitative only or quantitative too [10].

Further studies could be addressed to extend our investigation on the effects of ICD on audit risk and audit fees. Further studies could corroborate these preliminary findings by splitting the audit risk into its qualitative and quantitative components. In particular, it seems to be relevant

to compare our results with other studies focused on the auditors' perception of the audit risk, taking advantage from a survey to audit firms. We are aware, indeed, that the construction of the audit risk is particularly hard without considering the human features and tenure achieved by each auditor. Moreover, further research could contribute to the analysis of the ICD value relevance in different national settings. Finally, it could also be interesting to analyze the effect of the global financial crisis, when auditors evaluate the voluntary disclosure to better assess the audit quality and charge for it.

Acknowledgments: An earlier version of this paper was presented to the 38th Annual Congress of the European Accounting Association, which was held in April 2015, in Glasgow. We would like to thank the anonymous reviewers and Editor-in-Chief for their useful comments on earlier versions of this paper, although we alone are responsible for the findings, recommendations and errors of the manuscript.

Author Contributions: Chiara Demartini and Sara Trucco conceived and designed the study; Sara Trucco and Chiara Demartini analyzed the data; Sara Trucco and Chiara Demartini contributed analysis tools; Chiara Demartini and Sara Trucco wrote the paper.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Factor analysis of the research variable.

Item	Factor Loading	Eigen Value	% of Variance	Cronbach's Alpha
Qualitative Audit Risk				
Board Functions Audit Committee Independence	0.937	3.429	68.585	0.865
Board Functions Audit Committee Management Independence	0.895		9.547	
Board Structure Experienced Board	0.628		2.064	
Board Structure Independent Board Members	0.740		5.137	
Corporate Governance Score	0.899		14.667	
Quantitative Audit Risk				
Net sales or revenues	0.781	2.518	17.720	0.770
Total assets	0.885		62.957	
Total shareholders'equity	0.771		12.480	
Litigation expenses	0.729		6.844	
Accruals				
Total inventories	0.913	1.667	83.337	0.787
Total receivables	0.913		16.663	

Appendix B

Table B1. Modified Wald Test for Groupwise Heteroskedasticity in Fixed Effect Regression Model.

TEST	Model 1 (y = QLAR)			Model 2 (y = QNAR)			Model 3 (y = Audit Fees)		
	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled
Chi2	2.8×10^{32}	34,923.930	408.74	5.2×10^{32}	1.8×10^{32}	25.560	2.3×10^{33}	2.8×10^{31}	25.590
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table B2. Breusch-Pagan Test of Independence.

TEST	Model 1 (y = QLAR)			Model 2 (y = QNAR)			Model 3 (y = Audit Fees)		
	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled
chi2	653.962	2699.187	0.000	226.391	1502.766	80.619	761.327	0.000	788.058
Pr	0.000	0.000		0.000	0.000	0.000	0.000		0.000

Table B3. Skewness/Kurtosis Tests for Normality.

TEST	Model 1 (y = QLAR)			Model 2 (y = QNAR)			Model 3 (y = Audit Fees)		
	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled
Pr(Skewness)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pr(Kurtosis)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table B4. Wooldridge Test for Autocorrelation in Panel Data.

TEST	Model 1 (y = QLAR)			Model 2 (y = QNAR)			Model 3 (y = Audit Fees)		
	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled	Synthetic	Extended	Pooled
F	216.027	176.145	216.027	22.793	22.272	216.027	23.081	22.967	23.070
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

References

1. Beattie, V.; McInnes, W.; Fearnley, S. *Through the Eyes of Management: Narrative Reporting across Three Sectors: Final Report*; Centre for Business Performance: London, UK, 2004; p. 139.
2. Holland, J. Fund management, intellectual capital, intangibles and private disclosure. *Manag. Finance* **2006**, *32*, 277–316. [CrossRef]
3. Beattie, V.; Smith, S.J. Evaluating disclosure theory using the views of UK finance directors in the intellectual capital context. *Account. Bus. Res.* **2012**, *42*, 471–494. [CrossRef]
4. Elliot, R.K.; Jacobson, P.D. Costs and benefits of business information. *Account. Horiz.* **1994**, *8*, 80–96.
5. Guthrie, J.; Ricceri, F.; Dumay, J. Reflections and projections: A decade of intellectual capital accounting research. *Br. Account. Rev.* **2012**, *44*, 68–82. [CrossRef]
6. Ball, R.; Jayaraman, S.; Shivakumar, L. Audited financial reporting and voluntary disclosure as complements: A test of the Confirmation Hypothesis. *J. Account. Econ.* **2012**, *53*, 136–166. [CrossRef]
7. Chen, L.; Srinidhi, B.; Tsang, A.; Yu, W. Corporate Social Responsibility, Audit Fees, and Audit Opinions. *Audit Fees Audit Opin.* **2012**. Available online: http://sa.shufe.edu.cn/upload/_info/2002000049/95384_1204050830422.docx (accessed on 29 May 2016).
8. Graham, R.E.; Ahn, A.C.; Davis, R.B.; O'Connor, B.B.; Eisenberg, D.M.; Phillips, R.S. Use of complementary and alternative medical therapies among racial and ethnic minority adults: Results from the 2002 National Health Interview Survey. *J. Natl. Med. Assoc.* **2005**, *97*, 535–545. [PubMed]
9. Verrecchia, R.E. Essays on disclosure. *J. Account. Econ.* **2001**, *32*, 97–180. [CrossRef]
10. Bozzolan, S.; Favotto, F.; Ricceri, F. Italian annual intellectual capital disclosure: An empirical analysis. *J. Intellect. Cap.* **2003**, *4*, 543–558. [CrossRef]
11. Dhaliwal, D.S.; Li, O.Z.; Tsang, A.; Yang, Y.G. Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *Account. Rev.* **2012**, *86*, 59–100. [CrossRef]
12. Wallage, P. Assurance on sustainability reporting: An auditor's view. *Audit. J. Pract. Theory* **2000**, *19*, 53–65. [CrossRef]
13. Meek, G.K.; Roberts, C.B.; Gray, S.J. Factors Influencing Voluntary Annual Report Disclosures by U.S., U.K. and Continental European Multinational Corporations. *J. Int. Bus. Stud.* **1995**, *26*, 555–572. [CrossRef]
14. Deumes, R.; Knechel, W.R. Economic incentives for voluntary reporting on internal risk management and control systems. *Audit. J. Pract. Theory* **2008**, *27*, 35–66. [CrossRef]
15. Cho, C.H.; Patten, D.M. Green accounting: Reflections from a CSR and environmental disclosure perspective. *Crit. Perspect. Account.* **2013**, *24*, 443–447. [CrossRef]
16. AIMR. AIMR Conference Proceedings, 1992. Available online: http://www.cfapubs.org/toc/cp.1/1992/2 (accessed on 25 May 2016).
17. Rogers, R.K.; Grant, J. Content analysis of information cited in reports of sell-side financial analysts. *J. Financial Statement Anal.* **1997**, *3*, 17–30.

18. Breton, G.; Taffler, R.J. Accounting information and analyst stock recommendation decisions: A content analysis approach. *Acc. Bus. Res.* **2001**, *31*, 91–101. [CrossRef]
19. Bontis, N. Assessing knowledge assets: A review of the models used to measure intellectual capital. *Int. J. Manag. Rev.* **2001**, *3*, 41–60. [CrossRef]
20. Nielsen, C.; Madsen, M.T. Discourses of transparency in the intellectual capital reporting debate: Moving from generic reporting models to management defined information. *Crit. Perspect. Account.* **2009**, *20*, 847–854. [CrossRef]
21. Sveiby, K.E. The Intangible assets monitor. *J. Hum. Resour. Costing Account.* **1997**, *2*, 73–97. [CrossRef]
22. Bontis, N. Intellectual capital disclosure in Canadian corporations. *J. Hum. Resour. Costing Account.* **2003**, *7*, 9–20. [CrossRef]
23. Clarke, M.; Seng, D.; Whiting, R.H. Intellectual capital and firm performance in Australia. *J. Intellect. Cap.* **2011**, *12*, 505–530. [CrossRef]
24. Brennan, N. Reporting intellectual capital in annual reports: Evidence from Ireland. *Account. Audit. Account. J.* **2001**, *14*, 423–436. [CrossRef]
25. Vergauwen, P.G.; Van Alem, F.J. Annual report IC disclosures in the Netherlands, France and Germany. *J. Intellect. Cap.* **2005**, *6*, 89–104. [CrossRef]
26. Ramírez-Córcoles, Y.; Manzaneque-Lizano, M. The relevance of intellectual capital disclosure: Empirical evidence from Spanish universities. *Knowl. Manag. Res. Pract.* **2015**, *13*, 31–44. [CrossRef]
27. Yi, A.; Davey, H. Intellectual capital disclosure in Chinese (mainland) companies. *J. Intellect. Cap.* **2010**, *11*, 326–347. [CrossRef]
28. Khan, H.-U.-Z.; Khan, R. Human capital disclosure practices of top Bangladeshi companies. *J. Hum. Resour. Costing Account.* **2010**, *14*, 329–349. [CrossRef]
29. Abeysekera, I.; Guthrie, J. An empirical investigation of annual reporting trends of intellectual capital in Sri Lanka. *Crit. Perspect. Account.* **2005**, *16*, 151–163. [CrossRef]
30. Wagiciengo, M.M.; Belal, A.R. Intellectual capital disclosures by South African companies: A longitudinal investigation. *Adv. Account.* **2012**, *28*, 111–119. [CrossRef]
31. Petty, R.; Cuganesan, S. Voluntary disclosure of intellectual capital by Hong Kong companies: Examining size, industry and growth effects over time. *Aust. Account Rev.* **2005**, *15*, 40–50. [CrossRef]
32. Dobre, E.; Stanila, G.O.; Brad, L. The Influence of Environmental and Social Performance on Financial Performance: Evidence from Romania's Listed Entities. *Sustainability* **2015**, *7*, 2513–2553. [CrossRef]
33. Brüggen, A.; Vergauwen, P.; Dao, M. Determinants of intellectual capital disclosure: Evidence from Australia. *Manag. Decis.* **2009**, *47*, 233–245. [CrossRef]
34. Mangena, M.; Pike, R.H.; Li, J. *Intellectual Capital Disclosure Practices and Effects on the Cost of Equity Capital: UK Evidence*; Institute of Chartered Accountants of Scotland: Edinburgh, UK, 2010.
35. Vafaei, A.; Taylor, D.; Ahmed, K. The value relevance of intellectual capital disclosures. *J. Intellect. Cap.* **2011**, *12*, 407–429. [CrossRef]
36. Murthy, V.; Mouritsen, J. The performance of intellectual capital: Mobilising relationships between intellectual and financial capital in a bank. *Account. Audit. Account. J.* **2011**, *24*, 622–646. [CrossRef]
37. Catasús, B.; Gröjer, J.-E. Indicators: On visualizing, classifying and dramatizing. *J. Intellect. Cap.* **2006**, *7*, 187–203. [CrossRef]
38. Armitage, S.; Marston, C. Corporate Disclosure and the Cost of Capital: The Views of Finance Directors [Internet]. ICAEW Centre for Business Performance London, 2007. Available online: https://www.icaew.com/~/media/Files/Technical/Research-and-academics/publications-and-projects/financial-reporting-publications/briefing-corporate-disclosure-and-the-cost-of-capital.pdf (accessed on 29 May 2016).
39. Dusenbury, R.B.; Reimers, J.L.; Wheeler, S.W. The audit risk model: An empirical test for conditional dependencies among assessed component risks. *Audit. J. Pract. Theory* **2000**, *19*, 105–117. [CrossRef]
40. American Institute of Certified Public Accountants (AICPA). Consideration of Fraud in a Financial Statement Audit, 2002. Available online: https://pcaobus.org/Standards/Auditing/pages/au316.aspx (accessed on 25 May 2016).
41. Fukukawa, H.; Mock, T.J. Audit risk assessments using belief versus probability. *Audit. J. Pract. Theory* **2011**, *30*, 75–99. [CrossRef]

42. Budescu, D.V.; Peecher, M.E.; Solomon, I. The joint influence of the extent and nature of audit evidence, materiality thresholds, and misstatement type on achieved audit risk. *Audit. J. Pract. Theory* **2012**, *31*, 19–41. [CrossRef]
43. Contessotto, C.; Moroney, R. The association between audit committee effectiveness and audit risk. *Account. Finance* **2014**, *54*, 393–418. [CrossRef]
44. Botez, D. Study Regarding the Need to Develop an Audit Risk Model. *Audit Financiar* **2015**, *13*, 69–74.
45. Shibano, T. Assessing audit risk from errors and irregularities. *J. Account. Res.* **1990**, *28*, 110–140. [CrossRef]
46. Strawser, J.R. *Examination of the Effect of Risk Model Components on Perceived Audit Risk*; American Accounting Associate: Sarasota, FL, USA, 1991; Volume 10, pp. 126–135.
47. Matarneh, G.F.A. The Commitment of Jordanian Auditors to Assess Audit Risks. *Int. J. Bus. Manag.* **2011**, *6*, 267. [CrossRef]
48. Bell, T.B.; Landsman, W.R.; Shackelford, D.A. Auditors' perceived business risk and audit fees: Analysis and evidence. *J. Account. Res.* **2001**, *39*, 35–43. [CrossRef]
49. Stanley, J.D. Is the audit fee disclosure a leading indicator of clients' business risk? *Audit. J. Pract. Theory* **2011**, *30*, 157–179. [CrossRef]
50. Bedard, J.C.; Johnstone, K.M. Earnings manipulation risk, corporate governance risk, and auditors' planning and pricing decisions. *Account. Rev.* **2004**, *79*, 277–304. [CrossRef]
51. Hogan, C.E.; Martin, R.D. Risk shifts in the market for audits: An examination of changes in risk for "second tier" audit firms. *Audit. J. Pract. Theory* **2009**, *28*, 93–118. [CrossRef]
52. Pratt, J.; Stice, J.D. The effects of client characteristics on auditor litigation risk judgments, required audit evidence, and recommended audit fees. *Account. Rev.* **1994**, *69*, 639–656.
53. Heltzer, W.; Shelton, S.W. Book-Tax Differences and Audit Risk: Evidence from the United States. *J. Accpunt. Ethics Public Policy* **2015**, *16*, 691–733.
54. Maletta, M.J.; Kida, T. The effect of risk factors on auditors' configural information processing. *Account. Rev.* **1993**, *68*, 681–691.
55. Mock, T.J.; Wright, A. An exploratory study of auditors' evidential planning judgments. *Auditing* **1993**, *12*, 39. Available online: http://search.proquest.com/openview/276b13f5c276dc60b9b1c4096a3f6f36/1?pq-origsite=gscholar&cbl=31718 (accessed on 25 May 2016).
56. Arens, A.A.; Best, P.; Shailer, G.; Fiedler, B.; Elder, R.J.; Beasley, M. Auditing and Assurance Services in Australia: An Integrated Approach. Available online: http://eprints.usq.edu.au/18601 (accessed on 24 May 2016).
57. Cohen, J.; Krishnamoorthy, G.; Wright, A. Corporate Governance in the Post-Sarbanes-Oxley Era: Auditors' Experiences. *Contemp. Account. Res.* **2010**, *27*, 751–786. [CrossRef]
58. Ruhnke, K.; Schmidt, M. The audit expectation gap: Existence, causes, and the impact of changes. *Account. Bus. Res.* **2014**, *44*, 572–601. [CrossRef]
59. Simunic, D.A. The pricing of audit services: Theory and evidence. *J. Account. Res.* **1980**, *18*, 161–190. [CrossRef]
60. Hay, D.C.; Knechel, W.R.; Wong, N. Audit Fees: A Meta-analysis of the Effect of Supply and Demand Attributes. *Contemp. Account. Res.* **2006**, *23*, 141–191. [CrossRef]
61. Han, S.; Rezaee, Z.; Xue, L.; Zhang, J.H. The Association between Information Technology Investments and Audit Risk. *J. Inf. Syst.* **2016**, *30*, 93–116. [CrossRef]
62. Mock, T.J.; Wright, A.M. Are audit program plans risk-adjusted? *Audit. J. Pract. Theory* **1999**, *18*, 55–74. [CrossRef]
63. Jiang, W.; Son, M. Do Audit Fees Reflect Risk Premiums for Control Risk? *J. Account. Audit. Finance* **2015**, *30*, 318–340. [CrossRef]
64. Hogan, C.E.; Wilkins, M.S. Evidence on the Audit Risk Model: Do Auditors Increase Audit Fees in the Presence of Internal Control Deficiencies? *Contemp. Account. Res.* **2008**, *25*, 219–242. [CrossRef]
65. Houston, R.W.; Peters, M.F.; Pratt, J.H. The audit risk model, business risk and audit-planning decisions. *Account. Rev.* **1999**, *74*, 281–298. [CrossRef]
66. Public Company Accounting Oversight Board (PCAOB). An Audit of Internal Control over Financial Reporting that Is Integrated with an Audit of Financial Statements. Available online: https://pcaobus.org/Standards/Auditing/pages/auditing_standard_5.aspx (accessed on 25 May 2016).
67. Krishnan, G.V.; Pevzner, M.; Sengupta, P. How do auditors view managers' voluntary disclosure strategy? The effect of earnings guidance on audit fees. *J. Account. Public Policy* **2012**, *31*, 492–515. [CrossRef]

68. Zhanxia, W.; Jie, Z.; Mengqi, L. An Empirical Study of Relationship between the Intellectual Capital and Audit Results: Based on Statistics of Domestic Accounting Firms in 2010. In Proceedings of the 2011 International Conference on Business Computing and Global Informatization, Shanghai, China, 29–31 July 2011.
69. Coram, P.J.; Monroe, G.S.; Woodliff, D.R. The value of assurance on voluntary nonfinancial disclosure: An experimental evaluation. *Audit. J. Pract. Theory* **2009**, *28*, 137–151. [CrossRef]
70. Orlitzky, M.; Benjamin, J.D. Corporate social performance and firm risk: A meta-analytic review. *Bus. Soc.* **2001**, *40*, 369–396. [CrossRef]
71. Fombrun, C. *Reputation: Realizing Value from the Corporate Image*; Harvard Business School Press: Boston, MA, USA, 1996.
72. Scandizzo, S. A framework for the analysis of reputation risk. *J. Oper. Risk* **2011**, *6*, 41–63. [CrossRef]
73. Ball, R.; Kothari, S.P.; Robin, A. The effect of international institutional factors on properties of accounting earnings. *J Account. Econ.* **2000**, *29*, 1–51. [CrossRef]
74. Hope, O.-K. Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *J Account. Res.* **2003**, *41*, 235–272. [CrossRef]
75. García-Meca, E.; Martínez, I. The use of intellectual capital information in investment decisions: An empirical study using analyst reports. *Int. J. Account.* **2007**, *42*, 57–81. [CrossRef]
76. Brown, T.A. *Confirmatory Factor Analysis for Applied Research*; Guilford Publications: New York, NY, USA, 2015.
77. Dawson, J.F.; Richter, A.W. Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. *J. Appl. Psychol.* **2006**, *91*, 917–926. [CrossRef] [PubMed]
78. Cohen, J.; Cohen, P.; West, S.G.; Aiken, L.S. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*; Routledge: London, UK, 2013.
79. Hausman, J.A. Specification tests in econometrics. *Econ. J. Econ. Soc.* **1978**, *46*, 1251–1271. [CrossRef]
80. Watson, A.; Shrives, P.; Marston, C. Voluntary disclosure of accounting ratios in the UK. *Br. Account. Rev.* **2002**, *34*, 289–313. [CrossRef]
81. Pena, I. Intellectual capital and business start-up success. *J. Intellect. Cap.* **2002**, *3*, 180–198. [CrossRef]
82. Deegan, C.M.; Samkin, G. *New Zealand Financial Accounting*; McGraw-Hill Higher Education: Sydney, Australia, 2008.
83. Bozzolan, S.; O'Regan, P.; Ricceri, F. Intellectual capital disclosure (ICD) A comparison of Italy and the UK. *J. Hum. Resour. Costing Account.* **2006**, *10*, 92–113. [CrossRef]
84. Jaggi, B.; Low, P.Y. Impact of culture, market forces, and legal system on financial disclosures. *Int. J. Account.* **2000**, *35*, 495–519. [CrossRef]
85. O'Sullivan, N. The impact of board composition and ownership on audit quality: Evidence from large UK companies. *Br. Account. Rev.* **2000**, *32*, 397–414. [CrossRef]

© 2016 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (http://creativecommons.org/licenses/by/4.0/).