Credit default swaps, investor protection, and audit cost: international evidence

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Abstract

Purpose – Credit Default Swap (CDS) trading alters equilibrium interactive monitoring of external corporate monitors due to a possible change in private lenders' incentive to monitor client firms. This study explores how audit fees change in response to CDS trade initiation on client firms and how this effect is moderated by investor protection.

Design/methodology/approach – With 6,052 cross-country firm observations, the author conducts estimations in the systems dynamic general methods of moments framework.

Findings – The author documents that audit fees rise on average after CDS trade initiations with and/or without investor protection. Meanwhile, change in auditors' risk perception result in increased audit costs when CDS trade initiation and investor protection interact. The effect of CDS trading on audit fees remain after controlling for firm, audit, and auditor features are robust to different proxies of audit cost.

Practical implications – The need for firms in high investor protection jurisdictions to initiate CDS trade to implement policies in order to maximize their gains from investor protection activities to lessen the overall impact of any increased audit cost that may arise. Furthermore, CDS regulation may be strategically targeted to lessen the effect of increased audit costs on firms after initiation. This would ensure that the resulting increase in audit cost may not materially impact the cash or profitability position of such firms.

Originality/value – This study is distinct from previous ones by focusing on variation in private lenders incentive to monitor after CDS trade initiation after controlling for possible monitoring by short-term creditors. Given that monitoring is not costless for private lenders and CDS trading on their borrowers causes a change in this cost structure, the author documents how auditors react to such changes in incentive to monitor.

Keywords Audit pricing, Credit default swaps, Investor protection, Interactive monitoring

Paper type Research paper

1. Introduction

Interactive monitoring – a situation in which multiple corporate observers have the task of examining various actions of firms presents spillover effects of actions of one group of monitors on monitoring effort of others [1]. Banks mitigate the information asymmetry and moral hazard associated with firms such that a credit relationship with banks and other private lenders who are considered expert monitors alters concerns of insider opportunism (Gallimberti *et al.*, 2017). Lower bond spreads and positive abnormal returns for firms after their bank loan announcements (Li and Ongena, 2015) as well as varying demand for disclosure by shareholder monitors after changes in firm-bank relations (Chen and Vashishtha, 2017) are empirical evidence of bank monitoring value to other stakeholders of a firm.

Auditors also value the monitoring of banks and other expert monitors like rating agencies. The monitoring effort of these expert institutions has a direct effect on the control

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risk of auditors. The general control environment of a client firm mitigates managers incentive for opportunistic behavior and misreporting. Auditors charge premiums for their engagement risk after internal monitoring failures (Ashbaugh-Skaife *et al.*, 2008; Hogan and Wilkins, 2008), while they charge lower fees for firms with additional external monitors – rating agencies and short term debt providers (Gul and Goodwin, 2010). The evidence that the monitoring environment of client firms may relate to their audit fees is not without empirical inferential challenges since several endogeneity concerns undermine prior documented evidence. A typical concern is that firms have an incentive to choose one capital provider and timing over another. The varying types and levels of agency problems in firms motivate firms to choose intense monitoring from banks and private lenders over general public debt monitoring or equity holders monitoring (Lin *et al.*, 2013). Similarly, credit ratings are paid for by firms before raising credit capital. Despite the possible differences in the control environments of firms with and without bank relationships, it is unclear if any changes in audit fees are a result of the varying expert monitoring or fundamental features of the firm which influences the decision to seek such funding or rating.

Furthermore, the argument that managerial opportunism is lower in high investor protection countries (Cao *et al.*, 2017) suggest that varying auditors' control risk perception in countries with differing agency problems could influence the extent to which credit default swaps (CDS) trade affect audit costs. Since investor protection could result in differing levels of auditory perception, a moderated relationship between CDS trade and the cost of audits could be envisaged. I draw insights from Simunic *et al.* (2016), who model the disparities in auditors' response to auditing standards in different legal regimes on the premise that legal enforcement, interpretation of auditing standards and consequent damages awarded against audit failure differ across countries. Hence, I expect auditors to react differently to similar risk factors based on investor protection levels.

In this study, I reexamine the possible relation between audit fees and private creditor monitoring by using a variation in lenders' incentive to monitor after CDS trading begins on client firms. The variation in lenders incentive to monitor is exogenous to borrower firms who are termed reference entities in CDS contracts. CDS contracts are similar to insurance contracts that lenders can purchase to protect against the credit risk of their borrowers. According to the contract, lenders pay a premium to a CDS seller who promises to pay a face value triggered by a credit event of a reference entity. This contract, which can be sold over-the-counter, has increasingly become a very popular financial instrument over the years with $62.2 trillion notional outstanding value in 2007 (ISDA, 2013). After the onset of CDS trading on a firm, its lenders can reexamine their monitoring costs, namely, the opportunity to transfer or hedge credit risk associated with the firm. This can significantly change the monitoring incentive of lenders. Under this setting, I am able to test whether or not auditors consider and price monitoring efforts of private lenders in their audit engagements and distinguish this effect from other risk factors that may influence client firms' choice of private lenders over other capital providers.

Two contrasting theoretical predictions motivating this study include the argument that banks become empty creditors and lack the incentive to screen and monitor their borrowers when they have the opportunity provided by CDS to transfer credit risk (Subrahmanyam *et al.*, 2017) and the other view that banks have a reputation to keep as expert monitors at least so to maintain lower premium payments on repeated business with CDS contract sellers (Parlour and Winton, 2013). If auditors perceive an increase in their control risk induced by the empty creditor problem associated with CDS trading, then we expect them to charge a premium to cover this risk. However, if auditors do not perceive a change in the monitoring effort of lenders after CDS trade initiation, then audit fees are expected to remain unchanged. Which of these two stories or predictions would be borne by the data is an empirical question examined in this study?

Using audit fee information for 6,052 unique firms spread across 16 countries over a 17-year period starting 2000, in my systems dynamic panel research design, I document that audit fees increase significantly after CDS trade initiation, consistent with the argument that auditors perceive increased control risk due to private lenders disincentive to monitor client firms. Following the argument that managerial opportunism is lower in high investor protection countries (Cao *et al.*, 2017), I also test if auditors' control risk perception vary in countries with differing agency problems. The results show that auditors' reaction to CDS trade initiation is relatively higher for firms located in high investor protection countries. Impliedly, agency problems and the incentive for opportunistic insider action with associated misreporting may not necessarily be mitigated by the institutional setup and legal enforcement characterized with investor protection.

CDS trade initiation, my treatment variable, occurs at different times for different firms allowing the same firms to be included in both control and treatment samples at different times. This allows the same firms to serve as their own controls, thus apart from CDS trade initiation, the sampled firms have similar characteristics mitigating the concern of fundamental differences among firms driving my results. Despite similarities in firm characteristics, I include firm, audit, and auditors' features shown by prior studies to affect audit fees. In addition, I employ a modeling technique that caters for the firm, time, industry and country effects to assume away possible heterogeneities at firm, industry and country levels as well as any time trend in audit fees. Understanding the dynamic nature of audit costs is essential. The cost of audit incurred in the current year may most likely determine, in part, the audit cost for the next period and, hence, audit cost is not static.

It is instructive to note that although CDS trading may cause auditors to increase their fees due to the perception of increased engagement risk, there are a few concerns that are likely to undermine such the specification of a model. First, it is likely that audit fees have a generally upward trend over the years including the sampled period and coincides with CDS trade initiating on most firms. For example, due to macroeconomic downturns, firms have increased incentive to misrepresent their bottom-line, a risk that auditors perceive and increase their fees consequently. Secondly, perhaps some risk factors or need for increased effort unique to firms induces auditors to increase fees, which may correlate with CDS trade. These unique risk factors can be industry-specific too; thus, influencing audit fees for all firms in a similar industry, and these result in endogeneity issues.

To mitigate the endogeneity concerns noted above, the application of appropriate estimation techniques – which would influence the model specification – is essential. The systems dynamic general method of moments is, hence, employed. By its application, the dynamic model is more appropriate than the static model since the dependent variable is dynamic, and, independent variables may not be strictly exogenous such that they are likely to be correlated with past and possibly current error terms (Asiamah *et al.*, 2022a, b). Unlike a static model, employing a dynamic estimation technique for a study on this subject would correct for omitted variable bias, control for the endogeneity problem of the lagged dependent variable, and also control for differences across panels (Bossman *et al.*, 2022). Moreover, a dynamic model would use more observations and therefore, makes it more efficient relative to a static model (Tackie *et al.*, 2022).

The following contributions to the literature are noteworthy. First, I document evidence on interactive monitoring. I distinguish this study from notable existing studies (e.g.Gul and Goodwin, 2010; Chen and Vashishtha, 2017) by focusing on variations in private lenders' incentive to monitor post-CDS trade initiation after controlling for possible monitoring by short-term creditors. Given that monitoring is not costless for private lenders and CDS trading on their borrowers causes a change in this cost structure, I document how auditors react to such changes in incentive to monitor. Second, I document a channel through which developments in the capital affect audit pricing. I show that increased control risk associated

with CDS trading is associated with an increase in audit fees. My result extends Martin and Roychowdhury's (2015) evidence that reporting policies change after CDS trading to the context of auditors. I show how auditors react to changing reporting incentives following developments in the capital market.

The rest of the paper is organized as follows. Section 2 discusses related literature leading to the development of my hypotheses. Section 3 describes the research design specifying models used to test each hypothesis explored and our data collection process. Empirical results and their discussion are presented in Section 4 while Section 5 concludes.

2. Literature review and hypotheses development

Banks and other private lenders engage in extensive private information production before granting loans to borrowing firms. The possibility of high-risk firms pooling together with those with acceptable risk profiles – information asymmetry – motivates lenders to screen their clients before any loan initiation. Successful borrowing firms earn the reputation of having low business risk. Consistent with this expectation, other capital market participants react favorably to bank-firm relationships. For example, public debt providers charge lower spreads for firms with prior bank loans (Datta *et al.*, 1999). Similarly, Li and Ongena (2015) provide evidence of positive abnormal stock returns for firms after bank loan announcements.

In addition to the low business risk certification indicated above, banks have an incentive to monitor their clients after granting them credit. Bank monitoring includes frequent site visits, demand for timely financial reports and clarification of some accounting numbers (Martin and Roychowdhury, 2015). This monitoring role of banks matters not only to capital providers (Beatty *et al.*, 2012; Zhang, 2019) but to other stakeholders and external monitors including auditors. The value of bank certification and monitoring increases with the information asymmetry and agency costs of firms. Consistent with the argument that the need for an expert monitor like bank creditors is lesser for firms with low agency costs and information asymmetry, Beatty *et al.* (2012) provide evidence of delegated monitoring for firms with high discretionary accruals.

Foroughi *et al.* (2019) show that agency costs decrease with the level of investor protection such that there are usually low free cash flow problems in high investor protection countries. Follow-up studies document for firms in higher investor protection countries, better investment efficiency; differential executive compensation plans; performance-driven CEO turnover; and a generally low opportunistic insider behavior crucial to outsiders including auditors (Bryan *et al.*, 2010; Haw *et al.*, 2011; McLean *et al.*, 2012). Therefore, it is expected that certification and monitoring by banks may be less valuable or needed in jurisdictions with higher investor protection.

2.1 Bank monitoring and audit risk

An auditor's total engagement risk consists of the inherent risk associated with the client firm's business or operating environment; control risk influenced by both internal and external control or monitoring environment of the client firm; and the auditor's risk of failing to detect material misreporting – detection risk. Given a client firm's inherent risk, auditors have the incentive to increase effort to lower detection risk (DeFond *et al.*, 2016). The control environment of a client firm influences the level of managerial opportunistic behavior. Gleason *et al.* (2019) show that the accruals quality of firms that report internal control weakness are low compared to firms that do not report such weaknesses. Consequently, auditors adjust fees to reflect increased effort in providing opinions on financial reports in such situations (Hogan and Wilkins, 2008).

Given that auditors are expert monitors who certify financial reports and the going concern possibility of client firms (Fama, 1980), this fact does not preclude auditors reliance on other monitors of the firm like banks creditors and rating agencies. As pointed out in Triantis and Daniels (1995) monitoring can be interactive. A bank's acceptance to start or renew credit facilities for a client firm can signal the quality of the firm, given that banks assure themselves of acceptable future operational outcomes and good management before granting credit – certification role of banks. Auditors are likely to lower control risk associated with such clients with such control mechanisms. This interactive monitoring underpins the inclusion of rating agencies in the audit fee model. Gul and Goodwin (2010) show that audit fees are lower for firms with credit ratings because ratings provide an additional monitoring mechanism that lowers the auditors' control risk. The exit of a bank from a prior credit relationship with a client firm elevates the engagement risk of the auditor.

Having shown the interaction in monitoring levels of auditors and bank creditors, I extend the argument to when auditors rely more or less on bank monitoring. Banks' incentive to monitor increases with the amount of credit provided. At first glance, it seems auditors rely more on bank monitoring when banks provide substantial credit to a client firm. Indeed banks' incentive to monitor increases with their economic interest in the borrower; however, financial risks associated with high debt levels increase auditors' litigation risk in case of bankruptcy (Bhaskar *et al.*, 2017; Boone *et al.*, 2015; DeFond *et al.*, 2016). An increase in the amount of bank credit does not necessarily imply high levels of monitoring from banks. Typically, lenders hedge against the credit risk of their clients through loan syndication and/or buying CDS which have become popular recently. CDS allow lenders to transfer credit risk associated with their clients to a third party who for a premium agrees to pay compensation triggered by a credit event of the borrowing firm.

2.2 Credit default swaps, bank monitoring and audit pricing

Thus far, I have shown how bank certification and monitoring can lower auditors' control risk. Banks have a strong incentive to mitigate information asymmetry and moral hazards associated with their clients through screening and continuous monitoring. However, Subrahmanyam *et al.* (2017), in their theoretical work, show that banks have less incentive to monitor borrowers after buying CDS to transfer the credit risk of their clients. They refer to this decline in monitoring incentive as the "empty creditor problem". Amiram *et al.* (2017) provide empirical evidence of an increase in loan spreads and loan share retained by a lead arranger after CDS trade initiation on a reference entity. From their diagrammatic presentation, if lead arranging banks in a loan syndicate were indeed screening clients for reduced business risks, there should be a decrease (an increase) in loan spreads (share of loan retained) of any loan arrangements after CDS trade initiation. The evidence of increased loan spreads provided by the authors is consistent with CDS trade reducing any screening and/or monitoring effectiveness of banks.

If auditors rely on the monitoring role of banks as shown above to assess the audit risk of their clients, do they (auditors) alter the extent of this reliance following CDS trade initiation by the banks? Theoretical prediction on this question is not unambiguous. Parlour and Winton (2013) model the effect of reputation in mitigating the possible disincentive to monitor after banks layoff their credit risk by buying CDS. This contrasts with the empty creditor conclusion in Bolton and Oehmke (2011). According to Parlour and Winton (2013) model, banks continue their monitoring role after buying CDS on their borrowers to maintain their reputation with CDS sellers such that they (banks) do not have to pay increased premiums for insuring their loans in the future.

Given that auditors respond to increased audit risk by increasing their effort or charging a fee premium, both of which are proxied by audit fees (Gul and Goodwin, 2010), audit fees are

expected to increase after CDS trade initiation if auditors view CDS trading as an increase in audit risk due to increased financial risk and reduced monitoring. In the other instance, where auditors are more likely to view bankers as playing certification and monitoring roles which is unaffected after CDS trade initiation, there should be no relation between CDS trade initiation and audit fees. In sum, if auditors' negative view of CDS trading dominates the unrelated view then on average, an increase in audit fees will be observed, otherwise, no significant association should be observed. I, therefore, present the following non-directional hypothesis:

H1. Audit fees change after bank loan initiations.

2.3 The effect of investor protection on audit pricing and CDS trade relation

Based on evidence documented by Cao *et al.* (2017) and subsequent studies providing evidence of low agency problem and managerial opportunism in high investor protection countries, it is expected that the relation between audit fees and CDS trade initiation should be affected by the level of investor protection. In low investor protection countries, a marginal decline in monitoring is expected to increase managerial or general insider opportunism and agency costs more than for a similar decline in monitoring for high investor protection countries. This is because the higher likelihood of managerial opportunism being uncovered and punished mitigates the incentive to act opportunistically ex ante. Therefore, if we observe a positive association between CDS trading and audit fees from above, we expect this relationship to be constrained in high investor protection countries. However, we expect a positive relation between audit fees and CDS trade initiation for low investor protection countries. Thus, the investor protection status of a firm could limit the relationship between CDS trade and audit cost. This is presented in the hypothesis below:

H2. The association between audit fees and CDS trade initiation is moderated by investor protection.

3. Methods and data

3.1 Methods

The study assessed the effect of CDS trade initiation on audit fees after controlling for firm-specific fee determinants and country-level variables likely to influence audit fees as well as general financial viability and client-specific risks perceived by auditors, using the system dynamic general methods of moments (GMM) technique. The study included audit fee information for 357 unique firms spread across 16 countries over a 17-year period between 2000 and 2016. The basic model specifies the effect of CDS trade initiation with the basic control variables. The basic model is supplemented by another model with the inclusion of investor protection to assess its influence on audit cost. Furthermore, I modeled the moderating effect of investor protection on the relation between audit fees and CDS trade initiation as hypothesized by *H2*. Proxied by audit fees, Equations (1) and (2) represent the basic models while Equation (3) represent the moderating effect model. These models influenced the modeling of similar relationships using the ratio of audit fees to sales as a second proxy for audit cost.

$$InAudfees_{it} = \beta_1 InAudfees_{it-1} + \beta_2 CDstrade_{it} + \sum_{3}^{14} \beta Controls_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

$$InAudfees_{jit} = \beta_1 InAudfees_{jit-1} + \beta_2 CDstrade_{jit} + \beta_3 CDstrade_j + \sum_{4}^{15} \beta Controls_j + \mu_i + \varepsilon_{it} \quad (2)$$

$$InAudfees_{jit} = \beta_1 InAudfees_{jit-1} + \beta_2 CDstrade_{jit} + \beta_3 CDstrade_j + \beta_4 (CDSTrad \times protection_j) + \sum_{5}^{16} \beta Controls_{jit} + \mu_i + \varepsilon_{it} \quad (3)$$

Where the variables and their meanings are as captured in Table 1 below.

Equations (1), (2), and (3) were estimated using Roodman's (2009a, b) estimation technique for systems dynamic panel. The use of this technique creates room for the presence of the lag dependent variable (Agyei *et al.*, 2021) to help assess the autoregressive nature of audit cost measured by the natural logarithm of lnAudfees and lnAudF2Sales. The introduction of biases by way of differencing as propagated by Arellano and Bond (1991) for catering for the issue of endogeneity brought about by the presence of the autoregressive variable is also corrected by Roodman's technique.

Furthermore, endogeneity is resolved by this technique through the application of the instrumental variable approach and lessens overidentification in the course of accounting for cross-sectional dependence (Agyei *et al.*, 2021). Thus, the system GMM approach by Roodman (2009a, b), popularized by Agyei *et al.* (2020, 2021), Boateng *et al.* (2018), and Bossman *et al.* (2022) was found appropriate for the study given that the sampled firms used for estimating each of the models were more than the number of years. The general form of the system GMM estimation used is specified in Equations (4) and (5).

$$InAudfees_{it} = \gamma_0 + \gamma_1 InAudfees_{it-\tau} + \sum_{n=1}^{n} \gamma_h W_{h,it-\tau} + \theta_i + \mu_i + \varepsilon_{it} \quad (4)$$

Variable	Variable meaning/construction (data source)
lnAudfees	Log transformation of annual audit fees paid by client firms. (World scope)
l.lnAudfees	The lag dependent variable representing the first lag of lnAudfees
CDSTrade	Equal to one in the year and after the record date of CDS trade initiation and zero otherwise. (Markit)
lnTA	Log transformation of total assets of client firms. (World scope)
Lev	The ratio of total liabilities to total assets. (World scope)
WSPTB	Equal to price-to-book ratio. (World scope)
ROA	Net income divided total assets. (World scope)
OCF2TA	The ratio of net operating cash flows to total assets. (World scope)
FS2TSales	Foreign sales to total sales ratio. (World scope)
STCredMon	Short-term creditor monitoring
InvRec2TA	The ratio of the sum of total receivables and total inventories to total assets. (World scope)
big_5	Indicator variable equal to one if a firm is audited by a Big 5 auditor (PwC, KPMG, Ernst and Young, Deloitte, PKF (Pennell Kerr Foster)) and zero otherwise. (World scope)
economyclass	Economic classification of countries: 1 (0) for developed (developing)
protection	The indicator variable equals 1 if a firm's country of location is labeled as high investor country by La Porta *et al.* (2000) and 0 otherwise. Based on the Global Competitiveness index
CDSProt	Interaction of CDS trade and protection, i.e. $CDSTrade_{it} \times protection_j$

Source(s): By Author

Table 1. Variables and their meanings

$$InAudfees_{it} - InAudfees_{it-\tau} = \gamma_1(InAudfees_{it-\tau} - InAudfees_{it-2\tau}) + \sum_{n=1}^{n} \gamma_h W_{h,it-\tau} - W_{h,it-2\tau}) + (\mu - \mu_{t-\tau}) + \varepsilon_{it-\tau} \quad (5)$$

where $InAudfees_{it}$ is the audit cost for firm i in time t; γ_0 is a constant; W is a vector of control variables; τ represents the coefficient of autoregression which is one for the specification, μ_t is the time-specific constant, θ_i is the firm-specific effect, and ε_{it} the error term.

Following Agyei *et al.* (2020, 2021), and Bossman *et al.* (2022), the explanatory indicators are defined as suspected endogenous or predetermined and only time-invariant variables are considered to be strictly exogenous (Roodman, 2009b). The results from Sargan overidentification and the Hansen J tests reported in Tables 4 and 5 support the strict exogeneity of the time-invariant variables.

3.2 Data

I begin by collecting all publicly traded firms with non-missing audit fee data and data to compute control variables from World scope for the period 2000–2016. This returns 168,557 observations with 27,157 unique firms spread across 68 countries. I merge the World scope audit fee data with Markit to identify firms on which CDS is traded. According to the database user guide, Markit is a contributor-based database with more than 22 global banks who are dealers contributing data on CDS trades across the world as of 2012. Based on data contributions from its numerous partners, Markit calculates a composite CDS spread if it receives prices from at least three different dealers after some data cleaning process. This process suggests that the date a reference firm first appears in the Markit database may mismeasure the actual date on which CDS begins trading on the firm. However, this problem seems trivial because auditing is done typically on annual basis. Auditors have enough time to become aware of CDS trading on a client firm. Also, the Markit database contains CDS contracts written on bonds, not private loans which are the actual focus of this study. But due to the general illiquidity of loan CDS, private lenders often use CDS contracts written on bonds to hedge their risk (Amiram *et al.*, 2017). Despite the few problems with Markit's CDS data, it is widely used in prior CDS studies and shown to be most reliable compared to other databases providing CDS trading data (Mayordomo *et al.*, 2014).

Following prior studies, I note the date of a firm's first appearance in the Markit database as its CDS trade initiation date. I assume that firms in the World scope sample not appearing in the Markit database do not have CDS trading and mark my treatment variable in the models above as zero. In the final sample used to estimate the models, 357 unique firms with corresponding 6,052 firm-years spread across 16 countries and have CDS trading in the sample period were considered. I present a summary of the sampling procedure in Table A1.

3.2.1 Descriptive statistics. Table 2 shows the descriptive statistics of the sample. About 6% of the full sample have CDS trading which should make it difficult to document any significant relationship between our treatment variable and audit fee. On average, firms in the sample have more than 21% leverage and positive ROAs with the average firm reporting negative operating cash flows during the period. Over eighty-nine percent of the sampled firms belong to developed economies whiles about forty percent of the sampled firm-years have short-term creditor monitoring.

3.2.2 Correlation matrix. I evaluate the existence of multicollinearity among the explanatory variables – which may impact the reliability of the models – using the

Variable	Observations	Mean	Std. Dev	Min	Max
WSAuditfees	6,052	3.154941	27.911	0	1610.73
AudF2Sales	6,052	0.0039747	0.0505367	0	3
CDSTrade	6,052	0.0601454	0.2377757	0	1
WSPTB	6,052	2.692227	9.60823	−289.68	238.72
TA	6,052	4515.826	15549.77	0.07	304819.3
ROA	6,052	0.0457411	0.6514856	−18.15126	45.55738
InvRec2TA	6,052	0.3106406	0.1885262	0	0.9654658
FS2TSales	6,052	4.438656	150.9345	0	10,000
STCredMon	5,083	0.3961483	0.3350278	0	1
Lev	6,052	0.2143717	0.4314681	0	26.93705
OCF2TA	6,052	−0.0861452	12.94394	−1006.857	0.8261937
big_5	6,052	0.8342697	0.3718691	0	1
economyclass	6,052	0.8960674	0.3051983	0	1

Note(s): Variable names are as defined in Table 1
Source(s): By Author based on data taken from World scope, Markit, and World Bank

Table 2. Descriptive statistics of the sample

correlation matrix to ascertain the pairwise correlations between the regressors. The results were presented in Table 3.

With the rule of thumb of 0.7 as the cut-off point for determining the presence of multicollinearity, the results suggest that the existence of multicollinearity among the explanatory variables is low. I observe a low-to-moderate correlation between the regressors. Hence, their inclusion in the specified models in Equations (1), (2), and (3) is appropriate.

4. Empirical results

In this section, I present the results of tests of the two hypotheses developed for the study. I first present evidence on H1, which focuses on the effect of CDS trade initiation on audit fees. Next, I present evidence of the moderating effect of investor protection as argued and summarized in H2.

The regression outputs of the system GMM estimations were summarized in Tables 4 and 5. Contained in Table 5 are Models 1, 2, and 3 as labeled in the columns. The effect of CDS trade initiation on audit cost without investor protection is explained by model 1. Model 2 caters for the model's inclusion of investor protection while model 3 incorporates the interaction variable between CDS trade and investor protection. In Table 5, these three sub-models are reproduced in models 4, 5, and 6 using a different proxy (i.e. the ratio of audit fees to sales) for audit cost.

From the tabulated results, the diagnostics – in terms of autocorrelation, Sargan, and Hansen J-tests, and the number of instruments vis-à-vis the number of observations and cross-sections – suggest that exogenous instruments were used in the study and the models were not constrained by instrument proliferation. As a result, to a large extent, there is an indication that the models were well specified.

4.1 The average effect of CDS trade initiation on audit fees

The regression results in Tables 4 and 5 suggest that the current levels of audit fees are informed by their previous (lagged) levels. All the lagged proxies for audit cost revealed a positive and significant relationship at a 1% significance level with their respective current values except for Models 5 and 6 whose significance levels are at 5%. Specifically, when proxied by audit fees, the current year audit cost is predicted by approximately 0.53 and 0.55 of their previous levels for models 1 and 2. Similarly, when proxied by the ratio of audit fees to

Table 3.
Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) lnAudfees	1.000												
(2) lnAudF2Sales	−0.006	1.000											
(3) CDSTrade	0.187***	0.001	1.000										
(4) WSPTB	0.036***	0.006	0.019	1.000									
(5) lnTA	0.809***	−0.425***	0.143***	0.012	1.000								
(6) ROA	0.005	−0.026**	−0.005	0.041***	0.012	1.000							
(7) InvRec2TA	−0.175***	−0.123***	−0.048***	0.008	−0.346***	0.000	1.000						
(8) FS2TSales	−0.052***	0.164***	0.077***	−0.002	−0.072***	−0.018	−0.040***	1.000					
(9) STCredMon	−0.384***	0.060***	−0.075***	−0.026**	−0.406***	−0.012	0.261***	0.080***	1.000				
(10) Lev	0.145***	−0.021	0.023*	−0.001	0.086***	−0.184***	−0.080***	−0.007	−0.072***	1.000			
(11) OCF2TA	0.029**	−0.053***	−0.051***	0.029**	0.053***	0.017	0.018	−0.045***	−0.112***	0.006	1.000		
(12) big_5	0.416***	−0.099***	0.047***	0.030**	0.366***	0.014	−0.040***	−0.007	−0.201***	−0.011	−0.005	1.000	
(13) economyclass	0.245***	0.293***	0.086***	0.018	0.035***	−0.014	−0.028**	0.010	−0.165***	0.000	−0.005	0.220***	1.000

Note(s): [1%], [5%], and [10%] significance levels are denoted by [***], [**], and [*], respectively. Variable names are as defined in Table 1
Source(s): By Author based on data taken from World scope, Markit, and World Bank

Variables	(1) lnAudfees	(2) lnAudfees	(3) lnAudfees
L.lnAudfees	0.531***	0.545***	0.518***
	(0.196)	(0.165)	(0.136)
CDSTrade	0.185***	0.201***	−0.194
	(0.0535)	(0.0690)	(0.139)
protection		−0.369	−0.128
		(0.854)	(0.398)
cdsprot			*0.439***
			(0.154)
WSPTB	−0.00118***	−0.00136**	−0.00137***
	(0.000365)	(0.000545)	(0.000452)
lnTA	0.311**	0.286**	0.311***
	(0.147)	(0.136)	(0.110)
ROA	0.364**	0.415**	0.347*
	(0.158)	(0.196)	(0.183)
InvRec2TA	−0.200	−0.349	−0.317
	(0.275)	(0.405)	(0.361)
FS2TSales	0.00388***	0.00323**	0.00339**
	(0.00140)	(0.00126)	(0.00147)
STCredMon	0.0161	0.0110	0.0166
	(0.0475)	(0.0515)	(0.0490)
Lev	0.450**	0.492**	0.425*
	(0.200)	(0.248)	(0.234)
OCF2TA	−0.335***	−0.353***	−0.347***
	(0.114)	(0.125)	(0.118)
big_5	0.308	0.305	0.417
	(0.352)	(0.437)	(0.475)
economyclass	0.0941	0.374	0.359
	(0.731)	(0.824)	(0.773)
Constant	−2.594*	−2.304*	−2.771**
	(1.354)	(1.395)	(1.210)
AR(1)	0.001	0.000	0.000
AR(2)	0.104	0.118	0.103
Hansen OIR	0.170	0.244	0.257
DHT for Instruments			
GMM Instruments for levels			
H excluding group	0.139	0.222	0.218
Diff(null, H = exogenous)	0.961	0.458	0.821
Fisher	1002.29***	950.53***	1506.21***
Instruments	42	37	42
Observations	4,773	4,668	4,668
Number of Firms	344	343	343

Note(s): Variable names are as defined in Table 1
Source(s): By Author based on data taken from World scope, Markit, and World Bank

Table 4. Regression results when audit cost is proxied by audit fees

sales, the current audit cost increases but in a lower magnitude relative to the other proxy. Under models 4 and 5, present audit cost is influenced by 0.265 and 0.276 respectively of the previous year's levels for when investor protection is uncontrolled and controlled for. Thus, for both proxies, the magnitude of the predicted audit cost intensifies after controlling for investor protection. The implication is that audit costs follow a partial adjustment process but the speed of adjustment is proxy-dependent. Therefore, managing present audit costs informs their future levels.

Variables	(4) lnAudF2Sales	(5) lnAudF2Sales	(6) lnAudF2Sales
L.lnAudF2Sales	0.265***	0.276**	0.278**
	(0.0856)	(0.127)	(0.127)
CDSTrade	0.220***	0.212***	−0.745
	(0.0848)	(0.0716)	(1.084)
protection		−0.529	−0.561
		(1.535)	(1.407)
cdsprot			*1.062*
			(1.198)
WSPTB	−0.00123**	−0.00160**	−0.00176**
	(0.000516)	(0.000818)	(0.000832)
lnTA	−0.142**	−0.162***	−0.167***
	(0.0555)	(0.0534)	(0.0546)
ROA	0.478*	0.300	0.279
	(0.285)	(0.346)	(0.341)
InvRec2TA	−1.286***	−1.512***	−1.643***
	(0.337)	(0.587)	(0.529)
FS2TSales	0.0213***	0.0204***	0.0198***
	(0.00677)	(0.00596)	(0.00654)
STCredMon	−0.00611	0.0173	0.00436
	(0.0597)	(0.0833)	(0.0733)
Lev	0.633*	0.412	0.389
	(0.364)	(0.410)	(0.412)
OCF2TA	−0.651***	−0.660***	−0.701***
	(0.177)	(0.173)	(0.181)
big_5	0.476	0.548	0.576
	(0.511)	(1.126)	(1.047)
economyclass	−0.501	−0.300	−0.500
	(1.200)	(1.068)	(0.987)
Constant	−3.715***	−3.137*	−2.859*
	(1.210)	(1.615)	(1.631)
AR(1)	0.000	0.001	0.001
AR(2)	0.209	0.208	0.198
Hansen OIR	0.733	0.702	0.794
DHT for Instruments			
GMM Instruments for levels			
H excluding group	0.703	0.814	0.797
Diff(null, H = exogenous)	0.523	0.104	0.339
Fisher	44992.09***	42903.70***	43334.86***
Instruments	34	32	33
Observations	4,773	4,668	4,668
Number of Firms	344	343	343

Note(s): Variable names are as defined in Table 1
Source(s): By Author based on data taken from World scope, Markit, and World Bank

Table 5. Regression results when audit cost is proxied by the ratio of audit fees to sales

I test whether or not audit fee changes after CDS trade begins on a firm and how using the model specified in Equations (1) and (2) above. The results for all specifications of the model in Tables 4 and 5 consistently show a significant increase in audit fees after the initiation of CDS trade on a client firm, confirming the position of H1, that, audit fees change after CDS initiation. In Models 1 and 3, when investor protection is 'uncontrolled for', audit cost increases by approximately 0.185 and 0.220, respectively, with CDS trade initiation. Similarly, when investor protection is controlled for, audit cost increases by 0.201 and 0.212, respectively, in response to CDS trade initiation. These findings, in part, communicate the

effect of investor protection audit cost on amid CDS trade and support the conclusion of Cao *et al.* (2017).

It is instructive to note that the models control for other known firm and auditor characteristics in the audit cost models, yet, the results divulge significant increment in fees of firms in my cross-country sample subsequent to CDS trade initiation on them. These results are consistent with the argument that auditors perceive a decline in bank creditors' incentive to monitor which increases the control risk of auditee firms (Martin and Roychowdhury, 2015). It is important to note that the significance of my results does not disappear after controlling for investor protection in Models 2 and 5.

The relation of audit fees with the bunch of control variables included in my model is generally consistent with that documented in prior audit fee studies. Indicatively, my results also show that audit fees increase with the ratio of a firm's foreign sales to total sales, profitability, and leverage level. Similar relations have been documented both in the US, non-US and cross-country studies (see, e.g. Choi *et al.*, 2008, 2009; Gul and Goodwin, 2010; Kim *et al.*, 2012). Notwithstanding, I report that audit cost reduces with growth proxied with market-to-book ratio and the ratio of operating cash flow to total assets. Impliedly, the cost incurred on audits may not be overly material to companies with rapidly growing operating cash flows and those firms at their growth stage. This makes the negative relationship between audit cost and firm growth (proxied with market-to-book ratio) and the ratio of operating cash flow to total assets practically reasonable.

4.2 Moderating effect of investor protection

I now discuss the results on the moderating effect of investor protection on the relationship between audit cost and CDS trade. The results of the moderating hypothesis, i.e. *H2*, are presented in the last columns of Tables 4 and 5 as Models 3 and 6. In Table 4, when audit cost is proxied by audit fees, the results suggest that the variable, $CDSTrade_{it} \times protection_j$ has a significant positive effect ($\beta = 0.439$; $p < 0.01$) on audit cost, indicating a 0.439 average increase in audit fees for firms in high investor protection countries. A similar observation is reported in Table 4 (when audit cost is proxied by the ratio of audit fees to sales) where the interaction variable has a positive but statistically insignificant effect ($\beta = 1.062$; $p > 0.05$).

The results suggest that from the perspective of auditory perception and skepticism, more investor protection activities in my cross-country sample would result in extended audit procedures to enable auditors to scrutinize the activities of investor protection in the various firms. From the perspective of agency costs, my findings are rather counterintuitive but justifiable. Although agency costs decrease with the level of investor protection such that there are usually low free cash flow problems in high investor protection countries (Foroughi *et al.*, 2019), my findings divulge that in the presence of both CDS trade initiation and investor protection, there is the tendency that audit costs may rise when investor protection activities deepen in countries in which firms are situated. The implication is that, based on skepticism, auditors may exercise caution despite high degrees of investor protection in a given country. Thus, extra charges are likely to be introduced by auditors to intensively conduct effective audits on client firms in high investor protection countries. For instance, as documented by follow-up studies (see, e.g. Bryan *et al.*, 2010; Haw *et al.*, 2011; McLean *et al.*, 2012) that firms in higher investor protection countries may be characterized by better investment efficiency, differential executive compensation plans; performance-driven CEO turnover; and a generally low opportunistic insider behavior crucial to outsiders including auditors, it is not surprising that audit costs may rise to reflect the increased audit activities on such firms.

Largely, the findings support those of Simunic *et al.* (2016) who modeled the differences in auditors' response to auditing standards in different legal regimes. According to them, legal enforcement, interpretation of auditing standards and consequent damages awarded against audit

failure differ across countries. This phenomenon derives varying auditor responses to similar rules in different legal regimes. I view this in the light of the auditor's risk perception. Similar to moderating effect of legal regime on audit behavior, I argue that auditors react differently to similar risk factors given levels of investor protection. As argued above and summarized in my second hypothesis (*H2*), auditors' perception of risk associated with CDS trading on client firms in high versus low investor protection countries differ. Hence, I maintain that the association between audit fees and CDS trade initiation is moderated by investor protection.

5. Conclusion

Under the systems dynamic general methods of moments paradigm, I investigated the effect of CDS trade initiation on the audit cost of client firms with 6,052 cross-country firm samples from 357 firms over the period 2000–2016. Two contrasting theoretical predictions advanced include one, auditor perceive an increase in control and bankruptcy risk after CDS trade initiation on client firms. By controlling for firm, audit and auditor features (viz. firm size, leverage, profitability, inventory intensity, short-term creditor monitoring, economy class, and audit firm size), the I proxy audit cost by the natural logarithm of audit fees and the ratio of audit fees to sales, to first ascertain the effect of CDS trade initiation on audit cost without investor protection, and second, the effect of CDS trade initiation on audit cost amid investor protection.

I present results consistent with the argument that auditors perceive increased engagement risk after the initiation of CDS trading on a client firm. The evidence provided extends beyond the US market which has been the primary focus of most prior audit studies. These findings are robust when investor protection is introduced in the various Models. In addition, I test if the increase in audit fees response to CDS trade initiation is moderated by investor protection. I show that the level of investor protection, which varies across countries, moderates my primary results. Auditors' perception of increased engagement risk and the associated increase in audit fees is higher for countries with high investor protection and this may be ascribed to skepticism on the part of auditors and the relative intense audit activities that may be done on firms in high investor protection countries.

It is prudent, therefore, for firms in high investor protection jurisdictions who have also initiated CDS trade to implement policies that ensure that they continue benefiting from among others, investment efficiency, differential executive compensation plans, and a generally low opportunistic insider behavior crucial to outsiders including auditors, which result from investor protection activities. This would ensure that the resulting increase in audit cost may not materially impact the cash or profitability position of such firms.

Note

1. Diamond (1984) model how equity shareholders delegate costly monitoring to banks who are considered expert monitors. Prior evidence suggests that shareholders' demand for disclosure varies with bank monitoring (Chen and Vashishtha, 2017; Vashishtha, 2014)

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Appendix

	Firm-years	Unique firms
Firms with audit fee data from World scope for 2000–2016	236,911	35,929
Drop observations with missing data for an audit fee model	68,354	8,772
	168,557	27,157
World scope observations with non-missing audit fee model data recorded in Markit database	6,052	357

Source(s): By Author

Table A1.
Sample construction

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