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The Role of Sovereign Credit Default Swaps in Four Asian Stock Markets

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ABSTRACT

We investigated the role of sovereign credit default swaps as a hedge against or safe haven under conditions of risk according to the Asian Morgan Stanley Capital Index (MSCI) for China, Korea, Malaysia, and Thailand. To this end, we applied the bivariate DCC-GARCH model to daily CDS–MSCI pair data for 2002–2014. The empirical results showed that CDSs serve as an effective hedge against risk in four Asian stock markets. In addition, CDSs also play an important role as safe havens in times of extreme stock market volatility and during periods of financial crisis.

Keywords: credit default swaps, hedge, safe haven, dynamic conditional correlation

INTRODUCTION

Sovereign credit risk arises when a government fails to meet its debt covenants or to fulfil its obligations in the form of guarantees (Pokorná & Teplý, 2011). The 2008 global financial crisis (GFC), which was triggered by the 2007 subprime mortgage crisis in the United States and spread widely to global real economics, is an example of an extreme negative risk event that led to an increase in the sovereign credit risk in the Eurozone. Sovereign credit risk affects both risk premiums (e.g., borrowing costs) and a country's ability to access global debt markets. The nature of sovereign credit risk determines the flow and cost structure of capital as it moves across countries, and it diversifies the risk of global debt portfolios (Longstaff et al., 2011). This is referred to as the European sovereign debt crisis (ESDC).

Sovereign credit default swap (CDS) contracts function as insurance that allows investors to purchase protection in the event that a sovereign country defaults on or restructures its debt. The buyer (the bondholder) of a CDS makes regular premium payments to the seller, and the premium constitutes the spread charged by the seller to insure against a credit event (Hull et al., 2004). CDS spreads directly reflect the market's assessment of credit market risk (Blanco et al., 2005; Hassan, 2015; Longstaff et al., 2011).

Recently, sovereign CDS has become a popular topic in economic news directed not only at policy markets and market participants trying to hedge against increased sovereign credit risk, but also at speculators and arbitrageurs trying to profit from a change in the expected default risk of bonds from sovereign entities. However, we hypothesized that sovereign credit risk is correlated not only with the CDS spread on the underlying debt but also with the country's equity volatility. It was assumed that an increase in the country's credit risk would have a negative relationship with stock market volatility. Furthermore, according to this perspective, a CDS spread that is consistently and contemporaneous would introduce new information to the equity market, including during periods of market turmoil (Byström, 2006).

The existence of sovereign CDSs provides an opportunity to examine the relationship between CDSs and equity markets. Following Baur and Lucey (2010), this relationship can be explained by the three potential

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roles played by CDSs in the context of stock volatility: (1) an effective hedge, which is defined as an asset that is consistently uncorrelated or negatively correlated with stock price volatility; (2) a safe haven, which is an asset that is consistently uncorrelated or negatively correlated with stock volatility during periods of market turmoil; and (3) a diversifier, an asset with a positive but imperfect correlation with stock prices.

The Asian sovereign CDS market emerged with the rapid growth of the underlying bond market. Although the Asian CDS market is relatively small and illiquid compared to its counterparts in Europe and the United States, attempts to standardize CDS contracts, which started with fixing CDS coupons at the end of 2009, should increase the volume and liquidity of this market. Thus, the role of CDSs as protectors against risk in Asian stock markets should be investigated.

This paper utilizes a dynamic conditional correlation-autoregressive conditional heteroskedasticity (DCC-GARCH) model to investigate the role of sovereign CDSs as hedges, safe havens, or diversifiers under conditions of risk in four Asian stock markets (China, Korea, Malaysia, and Thailand). This study offers two main contributions to the existing literature. First, to the best of our knowledge, we are the first to examine the co-movement of stocks and CDSs in Asian countries. Despite its small and illiquid market, the Asian CDS market is greatly expanding in the context of strong economic growth and financial development. Thus, the development of CDSs plays an important role in reducing the risk in Asian stock markets. Second, we examined the role of CDSs as both hedges and safe havens in the context of the risks posed by extreme stock market volatility and periods of financial crisis. CDSs are unique financial assets with strong and persistent negative correlations with stocks, implying that they can serve as a hedge or safe haven to reduce stock market risk. Understanding the link between volatility in stock returns and CDS spreads is important not only for risk managers using CDSs for hedging purposes but also for anyone trying to profit from arbitrage possibilities in the CDS market.

BRIEF LITERATURE REVIEW

A considerable body of literature has focused on the relationship between corporate credit risk and stock markets. Merton (1974) proposed the first structural credit risk theory, which pointed out the relationship between an increase in a firm's stock price and a reduction in its bond yield. This relationship becomes stronger with an increase in a firm's debt ratio (default risk). Following Merton's (1974) theory, Kwan (1996) empirically found a negative contemporaneous correlation between a firm's stock returns and changes in its bond yield using a vector error correlation model (VECM). The author also detected a lead–lag relationship in which credit-sensitive securities were dominated by stock returns. However, Byström's (2006) examination of a link between the iTraxx CDS index market and the stock market revealed that stock volatility was positively correlated with CDS spreads, which increased (decreased) with the increase (decrease) in the volatility of stock prices.

In terms of price discovery, Forte and Peña (2009) investigated the credit risk discovery process in the bond, CDS, and stock markets of North American and European companies. They indicated that stocks led CDSs and bonds more frequently than the opposite was the case. Norden and Weber (2009) analyzed the relationship between CDS and bond and stock markets, and found that stocks led both CDSs and bonds. Importantly, the authors also reported that the CDS market contributed more to price discovery than did the bond market.

This relationship between the sovereign CDS and stock markets becomes relatively more important during periods of market turmoil. In practice, the two recent financial crises (GFC and ESDC) resulted in more integration between the sovereign CDS and stock markets due to capital structure arbitrage, which is one of the most recent hedge fund strategies based on Merton's theory. Chan et al. (2009) investigated the dynamic relationship between sovereign CDS spreads and stock prices in seven Asian countries for the period from January 2001 to February 2007 using the VECM. They found strong evidence of a negative correlation between the sovereign CDS spread and the stock index for most Asian countries. Indeed, CDS markets played a leading role in five of seven countries. Coronado et al. (2012) revisited co-movement between sovereign CDS and stock markets in eight European countries. They found a negative lead–lag relationship between both markets, which were dominated by stock indices during the entire sample period (2007–2010). However, they also noted that sovereign CDSs led stock markets during the ESDC (January 2010–July 2010). This finding suggests that the price discovery process depends on the market condition (bull vs. bear).

More recently, several empirical studies have focused on the role of CDSs in protecting against risk in stock markets. Calice et al. (2013) explored the benefits of the diversification of CDS positions using a variety of corporate CDS data for United States firms from 2004 to 2010. They concluded that holding CDSs offers the opportunity to investors to hedge against catastrophic events by exploiting the negative relationship between CDSs and other asset returns (stock and commodity and foreign exchange instruments) during times of financial crisis. Ratner & Chiu (2013) examined the risk-reducing benefits of CDSs in United States stock market sectors from 2004 to 2011. They indicated that CDSs serve not only as effective hedges but also as safe havens in times of extreme stock market volatility and during periods of financial crisis.

EMPIRICAL METHODOLOGY

We assumed that the return-generating process can be described by an autoregressive model (AR) in which the dynamics of the current sample returns are explained by their lagged returns. The AR (1) model was defined as follows:

$$r_t = \mu + \varphi r_{t-1} + \varepsilon_t, t \in N \; with \; \varepsilon_t = z_t\sqrt{h_t}, and \;\; z_t \sim N(0,1), \tag{1}$$

where $|\mu| \in [0, \infty), |\varphi| < 1$, and the innovations $\{z_t\}$ are an independently and identically distributed (i.i.d.) process. The conditional variance h_t is positive, with a probability of 1, and is a measurable function of the variance–covariance matrix.

We also assumed that the conditional variance can be described by the standard GARCH(p, q) model of Bollerslev (1986) as follows:

$$h_t = \omega + \alpha(L)\varepsilon_t^2 + \beta(L)h_t, \tag{2}$$

where $\omega > 0, \alpha \geq 0, \beta \geq 0$, and L denote the lag or backshift operator, $\alpha(L) \equiv \alpha_1 L + \alpha_2 L^2 + \cdots + \alpha_q L^q$ and $\beta(L) \equiv \beta_1 L + \beta_2 L^2 + \cdots + \beta_p L^p$. In Equation (2), the persistence of conditional variances is measured by the sum $(\sqrt{\alpha} + \sqrt{\beta})$. A common empirical finding is that this sum is quite close to 1, thereby implying that shocks are infinitely persistent, which corresponds to the integrated GARCH (IGARCH) process of Engle and Bollerslev (1986).

We applied a bivariate GARCH model to test the time-varying volatility correlation between the Asian Morgan Stanley Capital Indexes (MSCIs) and their sovereign CDSs. The structure of conditional correlations was modelled using the DCC approach of Engle (2002), allowing investigation of the time-varying correlations between the two markets, while ensuring positive definiteness in the variance–covariance matrix (H_t) under the simple conditions imposed on specific parameters. In the multivariate case we used, the variance–covariance matrix of residuals was defined as follows:

$$H_t = D_t R_t D_t, \tag{3}$$

where D_t is a 2×2 diagonal matrix of the time-varying conditional standard deviations of the residuals obtained by taking the square root of the conditional variance modelled by the univariate AR(1)-GARCH(1,1) model. R_t is a matrix of time-varying conditional correlations given by:

$$R_t = (diag(Q_t))^{-1/2} Q_t (diag(Q_t))^{-1/2}. \tag{4}$$

The covariance matrix $Q_t = [q_{ij,t}]$ of the standardized residual vector $\varepsilon_t = [\varepsilon_{1,t}, \cdots, \varepsilon_{n,t}]'$ is denoted as:

$$Q_t = (1 - \alpha_{dcc} - \beta_{dcc})\bar{Q} + \alpha_{dcc}(\varepsilon_{t-1}\varepsilon_{t-1}{}') + \beta_{dcc}Q_{t-1}, \tag{5}$$

with $\alpha_{dcc} > 0, \beta_{dcc} > 0$, and $\alpha_{dcc} + \beta_{dcc} < 1$. $\bar{Q}_t = [\bar{q}_{ij,t}]$ denoting the unconditional covariance matrix of ε_t. The coefficients α_{dcc} and β_{dcc} are the estimated parameters depicting the conditional correlation process. $diag\{Q_t\} = \sqrt{q_{ii,t}}$ is a diagonal matrix containing the square root of the i^{th} diagonal elements of Q_t. The dynamic correlation can be expressed as follows:

$$\rho_{12,t} = \frac{(1 - \alpha_{dcc} - \beta_{dcc})\bar{q}_{12} + \alpha_{dcc}\varepsilon_{1,t-1}\varepsilon_{2,t-1} + \beta_{dcc}q_{12,t-1}}{\sqrt{\left[\left((1 - \alpha_{dcc} - \beta_{dcc})\bar{q}_{11} + \alpha_{dcc}\varepsilon_{1,t-1}^2 + \beta_{dcc}q_{11,t-1}\right)\right]\left[\left((1 - \alpha_{dcc} - \beta_{dcc})\bar{q}_{22} + \alpha_{dcc}\varepsilon_{2,t-1}^2 + \beta_{dcc}q_{22,t-1}\right)\right]}}. \tag{6}$$

The significance of α_{dcc} and β_{dcc} implies that the estimators obtained from the DCC-GARCH model are dynamic and time-varying. α_{dcc} indicates the short-run volatility impact, implying the persistence of the standardized residuals from the previous period. β_{dcc} measures the lingering effect of the impact of a shock on conditional correlations, which indicates persistence in the conditional correlation process. $\rho_{ij,t}$ indicates the direction and strength of the correlation. If the estimated $\rho_{ij,t}$ is positive, the correlation between the return series is positive and vice versa (see Engle (2002) for further details).

We further investigated CDSs as hedges and safe havens under conditions of risk in the stock market based on the regression analysis of Ratner and Chiu (2013). To this end, the pairwise DCC, $\rho_{ij,t}$ were regressed on dummy variables representing market turmoil to test CDSs as hedges and safe havens:

$$\rho_{ij,t} = \gamma_0 + \gamma_1 D(r_{stock} q_{10}) + \gamma_2 D(r_{stock} q_5) + \gamma_3 D(r_{stock} q_1), \quad (7)$$

where D represents dummy variables that capture extreme movements in the MSCI stock returns at the 10%, 5%, and 1% quantiles of the most negative stock returns. CDSs are weak hedges if γ_0 is zero and are strong hedges if γ_0 is negative for the MSCI. CDSs are weak safe havens if one of the quantile coefficients γ_1, γ_2, or γ_3 differs insignificantly from zero, or are strong safe havens if it is negative.

We also examined the impact of financial events on the DCC between the four Asian MSCIs and their sovereign CDSs. We generated two financial event dummies: (1) the GFC dummy is the period of the global financial crisis (1 August 2007 to 31 March 2009)[1], and (2) the ESDC dummy is the period of the Eurozone sovereign debt crisis (5 November 2009 to 31 December 2011)[2]. The regression model was specified in the following equation:

$$\rho_{ij,t} = \delta_0 + \delta_1 D(GFC) + \delta_2 D(ESDC). \quad (8)$$

If the coefficient δ_1 or δ_2 is significantly negative, CDSs are safe havens in the respective crisis period. If the coefficient is positive, CDSs co-move with the stock market and do not meet the criteria for safe havens.

DATA

This paper considers the daily closing price index series for four Asian stock markets, China, Korea, Malaysia, and Thailand, as well as their sovereign CDS prices from 3 January 2002 to 9 October 2014. The Asian stock market prices were extracted from the MSCI database (www.msci.com). The sovereign CDS spreads were based on the most liquid 5-year tenor provided by the database of Markit Group (www.markit.com), which collects corporate and sovereign CDS quotes from more than 30 large banks on a daily basis.

It is well known that, prior to September 2008, the CDS spreads were generally stable in almost all countries. The critical crisis threshold for sovereign CDSs was the Lehman bankruptcy on 15 September, 2008, after which spreads for all of the countries increased very sharply. The bankruptcy of Lehman Brothers was the most important event in recent financial markets, such that this clear difference before and after September 2008 reflects a structural change in the time series. Unlike the price trend for CDSs, all of the Asian MSCIs sharply decreased from early 2007 to the summer of 2008. In early 2009, the global markets experienced a macroeconomic deterioration, and then a phase of stabilization and tentative signs of recovery in late 2009. Subsequently, the price trend stalled due to the onset of the ESDS during early 2010–2012.

Table 1 presents descriptive statistics regarding the daily return series for four Asian MSCIs (Panel A) and their sovereign CDSs (Panel B). As shown in panel A of **Table 1**, the Thai stock market yielded the highest average returns, followed by the Chinese stock market. In terms of risk, the Korean stock market showed the highest standard deviation (volatility). According to Panel B in **Table 1**, all of the sovereign CDSs yielded negative returns except those from China. In terms of volatility, measured by standard deviation, the Chinese stock market showed the highest volatility, whereas Korean CDSs showed the lowest.

[1] Source: Official timelines of the Federal Reserve Board of St. Louis (2009) and the Bank for International Settlements (BIS, 2009).
[2] Source: Official timelines of the European Central Bank (https://www.ecb.europa.eu/ecb/html/crisis.en.html).

Table 1. Descriptive statistics

Country	China	Korea	Malaysia	Thailand
Panel A: MSCI				
Obs.	2,926	2,963	2,949	2,819
Mean	0.00045	0.00040	0.00037	0.00066
Max.	0.1481	0.2498	0.0857	0.1793
Min.	-0.1331	-0.2067	-0.1127	-0.1808
Std. dev.	0.0192	0.0206	0.0104	0.0183
Panel B: CDS				
Obs.	2,926	2,963	2,949	2,819
Mean	0.00019	-0.00013	-0.00011	-0.00001
Max.	1.0692	0.7386	0.7404	1.1787
Min.	-1.0692	-0.7386	-0.7404	-1.238
Std. dev.	0.0591	0.0498	0.0507	0.0532

Table 2. Estimation results of the AR(1)-DCC-GARCH(1,1) model between Asian four MSCI and their CDS

Country	China-CDS		Korea-CDS		Malaysia-CDS		Thailand-CDS	
	China	**CDS**	**Korea**	**CDS**	**Malaysia**	**CDS**	**Thailand**	**CDS**
Panel A: Estimation results of AR(1)-DCC-GARCH (1,1) model								
Const.(m)	0.0789*** (0.0279)	-0.0754 (0.0909)	0.0392 (0.0271)	-0.1234* (0.0672)	0.0604*** (0.0195)	-0.0009 (0.0006)	0.1159*** (0.0359)	0.0284 (0.1028)
AR(1)	0.0292 (0.0203)	-0.0464* (0.0252)	0.0169 (0.0197)	-0.0174 (0.0455)	0.0988*** (0.0219)	-0.0659** (0.0247)	0.0567** (0.0276)	-0.0074 (0.0318)
Const.(v)	0.0699 (0.0423)	0.1091 (0.1468)	0.0407*** (0.0119)	1.4882*** (0.3661)	0.0173* (0.0093)	0.1384 (0.1034)	0.0928 (0.0586)	1.0179 (0.6617)
ARCH(1)	0.0806*** (0.0174)	0.0740** (0.0208)	0.0163* (0.0088)	0.2775*** (0.0765)	0.0848*** (0.0248)	0.0796*** (0.0143)	0.1481* (0.0797)	0.2343*** (0.0761)
GARCH(1)	0.8983*** (0.0249)	0.9362*** (0.0225)	0.9129*** (0.0130)	0.7219*** (0.0563)	0.9030*** (0.0260)	0.9244*** (0.0148)	0.8406*** (0.0726)	0.7546*** (0.0731)
Panel B: Dynamic conditional correlation estimates								
Average CORij	-0.5005 (0.0825)***		-0.4289 (0.0629)***		-0.6206 (0.0639)***		-0.4617 (0.0613)***	
α_{dcc}	0.0210 (0.0041)***		0.0365 (0.0103)***		0.0273 (0.0078)***		0.0422 (0.0104)***	
β_{dcc}	0.9731 (0.0050)***		0.9502 (0.0135)***		0.9662 (0.0090)***		0.9360 (0.0172)***	
Panel C: Diagnostic tests results								
$Q(30)$	29.433 [0.4949]	19.704 [0.9240]	39.946 [0.1059]	30.512 [0.4396]	26.740 [0.6368]	43.111 [0.0572]	35.843 [0.2132]	35.100 [0.2389]
$Q^2(30)$	16.205 [0.9809]	7.4538 [0.9999]	22.226 [0.8456]	13.641 [0.9954]	14.824 [0.9906]	22.499 [0.8352]	14.990 [0.9897]	17.169 [0.9704]
Hosking^2 (30)	42.282 [1.0000]		98.310 [0.9060]		118.32 [0.4742]		56.721 [0.9999]	
McLeod-Li^2 (30)	46.714 [1.0000]		98.470 [0.9040]		118.14 [0.4788]		57.119 [0.9999]	

Notes: Hosking (1980) and McLeod and Li (1983) multivariate Portmanteau statistics test the null hypothesis no serial correlation on squared standardized residuals. The p-values are in brackets and the standard errors are in parentheses. ** and *** indicate significance at the 5% and 1% levels, respectively.

RESULTS OF EMPIRICAL ANALYSIS

Estimation Results of AR-DCC-GARCH Model

The following section examines the time-varying conditional correlation between Asian MSCIs and their sovereign CDSs. Table 2 presents the estimates derived from the following bivariate model: AR(1)-DCC-GARCH(1,1)[3]. The sum of ARCH and GARCH terms are even higher than unity, implying the high level of persistence in the Asian stock market and their sovereign CDSs.

[3] Note that the lag order (1,1) was chosen by minimizing the information criteria, including the Akaike information criteria (AIC) and the Schwarz information criteria (SIC).

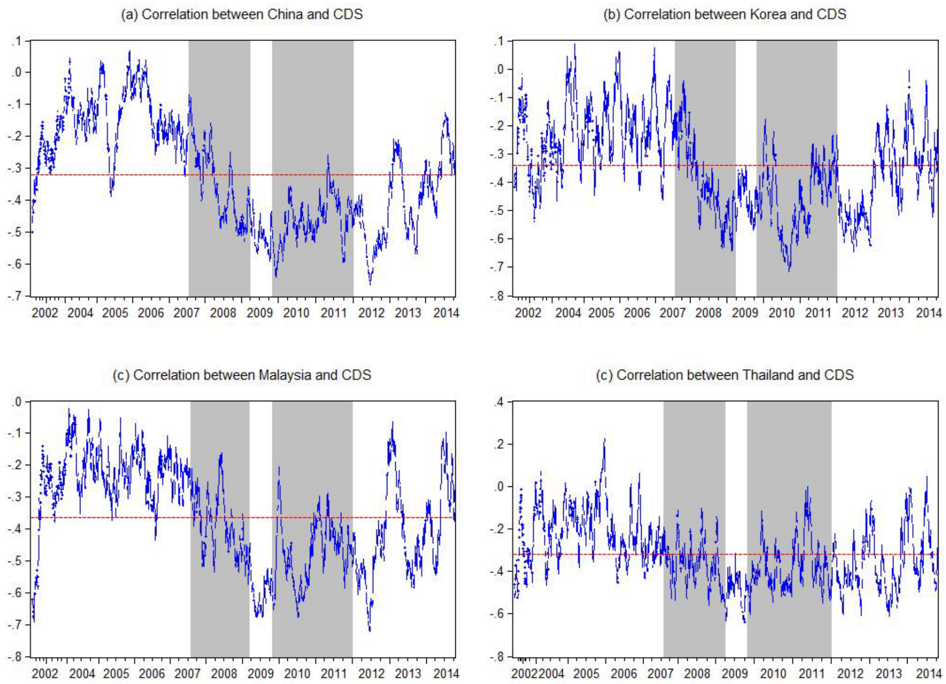

Figure 1. Time-varying DCC between the four Asian MSCIs and their sovereign CDS

Panel B of **Table 2** presents the estimates of the AR(1)-DCC-GARCH(1,1) model. All of the MSCI-CDS pairs exhibit significant and negative average correlations, suggesting that the sovereign CDSs played a role as hedge in Asian stock markets. In addition, the sum of the parameters (α_{dcc}) and (β_{dcc}) in the model is close to unity, and this reflects a persistent correlation. According to the diagnostic tests (Panel C), the Hosking (1980) and McLeod and Li (1983) test results do not reject the null hypothesis of no serial correlation in the bivariate DCC-GARCH models; therefore, there is no evidence of statistical misspecification in the bivariate DCC-GARCH models.

Figure 1 presents the conditional correlation coefficients ($\rho_{ij,t}$) obtained from the bivariate DCC-GARCH model from January 2002 to October 2014. Note that the horizontal dotted line is the average value of ($\rho_{ij,t}$) in each stock–CDS pair. The trends of the correlations are almost universally negative for all pairs. That is, there is a negative relationship between each of the four Asian MSCIs and its respective sovereign CDS. This indicates that increases in CDSs are associated with declines in MSCIs, which is indicative of a potential portfolio hedge. Since the 2007 United States subprime mortgage crisis, all pairs of correlation coefficients have become increasingly negative in magnitude, reaching their most negative during the two periods that correspond to the two financial crises (GFC and ESDC), respectively.

Analysis of Hedge and Safe-haven Effects

Table 3 summarizes the estimates derived from the quantile regression model. The DCC coefficients $\rho_{ij,t}$ were regressed on a constant and three dummy variables representing levels of extreme stock volatility, quantiles of 10%, 5%, and 1% of the most negative MSCI returns. The hedge role represents the model constant γ_0, which shows a negative relationship between CDS and MSCI with significance at the 1% level. It seems that significant negative values indicate that sovereign CDSs are strong hedges against risk in the Asian stock market, which is consistent with the finding reported by Ratner & Chiu (2013).

Table 3. CDS as a hedge and safe haven in extreme market conditions

	Quantile				Wald test
	Hedge (γ_0)	**10% (γ_1)**	**5% (γ_2)**	**1% (γ_3)**	
China	-0.3202 (0.0033)***	-0.0133 (0.0143)	0.0030 (0.0209)	-0.0047 (0.0355)	0.4776 [0.6972]
Korea	-0.3402 (0.0031)***	0.0020 (0.0136)	-0.0115 (0.0198)	-0.0869 (0.0198)***	3.5422 [0.0140]**
Malaysia	-0.3623 (0.0030)***	-0.0269 (0.0132)**	-0.0012 (0.0193)	0.0513 (0.0323)	2.7360 [0.0421]**
Thailand	-0.3152 (0.0029)***	-0.0286 (0.0129)**	0.0124 (0.0189)	-0.0147 (0.0321)	2.2957 [0.0753]*

Notes: The Wald x^2 test is based on statistic. The null hypothesis is $\gamma_1 = 0, \gamma_2 = 0, and\ \gamma_3 = 0$. The p-values are in brackets and the standard errors are in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 4. CDS as a hedge and safe haven during the financial crises

		Financial crises		Wald test
	Hedge (δ_0)	**GFC (δ_1)**	**ESDC (δ_2)**	
China	-0.2726 (0.0034)***	-0.0849 (0.0081)***	-0.1933 (0.0073)***	368.34 [0.000]***
Korea	-0.1014 (0.0033)***	-0.1014 (0.0079)***	-0.1595 (0.0070)***	40.962 [0.000]***
Malaysia	-0.3042 (0.0033)***	-0.0869 (0.0074)***	-0.1735 (0.0058)***	454.08 [0.000]***
Thailand	-0.2898 (0.0033)***	-0.0769 (0.0079)***	-0.0813 (0.0069)***	95.966 [0.000]***

Note: The null hypothesis of Wald is $\delta_1 = 0$ and $\delta_2 = 0$. See also footnote of Table 1.

The quantile regression coefficients ($\gamma_1, \gamma_2, \gamma_3$) represent the safe haven characteristics of CDSs and the risk associated with the Asian stock market. Negative and significant coefficients indicate that CDSs are strong safe havens, within the 10% quantile, in Malaysia (-0.0269) and Thailand (-0.0286). Insignificant coefficients indicate that CDSs are weak safe havens, in the 5% quantile. In the 1% quantile, the Korean sovereign CDS is the only strong safe haven at the 1% significance level. However, China's CDSs are weak safe havens, at the 10%, 5%, and 1% quantiles, indicating that Chinese CDSs do not reduce risk during periods of extreme volatility in the Chinese stock market. Overall, the Wald test results confirm the role of sovereign CDSs as safe havens. Except for China, the null hypothesis was rejected at the 10% significance level, implying that the CDS market in all countries except China acts as an effective safe haven.

Table 4 presents the estimates regarding the role of CDSs as safe havens during two financial crises. The consistently significant negative values of the estimation coefficients, δ_1 and δ_2, suggest that sovereign CDSs acted as effective safe havens that provided protection against stock market prices during the financial crises, GFC and ESDC. The Wald test results confirm the role of CDSs as effective safe havens during two financial crises.

CONCLUSIONS

We examined the potential risk-reducing benefits of sovereign CDSs as hedges or safe havens under conditions of risk in four Asian stock markets (China, Korea, Malaysia, and Thailand). By definition, the average correlation among portfolios is negative (hedge role) during periods of market stress or turmoil (safe haven). The empirical analysis utilized the bivariate DCC-GARCH model to calculate the time-varying dynamic conditional relationship between sovereign CDSs and MSCIs.

The major findings are as follows. First, CDSs demonstrated both strong and weak safe haven characteristics during periods of extreme stock market volatility. In fact, Korean CDSs acted as effective safe havens at the 1% level of significance during periods of extreme volatility. This finding indicates that the Korean CDS market is most responsive to extreme downturns in the stock market, and may reduce portfolio volatility. Second, regression analysis showed that CDSs provided strong safe havens against risk in four Asian stock markets during two financial crises (GFC and ESDC). Thus, CDSs also play important roles as hedges and safe havens in times of extreme stock market volatility and during periods of financial crisis.

The empirical results support the role of sovereign CDSs as strong hedges against risk in four Asian stock markets. Investors should purchase sovereign CDSs to protect against the risk of default (systematic) in stock markets. In addition, we distinguished between a weak and strong form of the safe-haven effect in the context of extreme stock market volatility and during periods of financial crises. A weak safe haven protects investors to the extent that it does not move in tandem with stocks in response to negative market shocks. Conversely, by moving against the trends followed by stocks during periods of market turmoil, a strong safe haven reduces the overall default risk for investors.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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