

Economic and Market Factors versus Credit Rating Announcements, on Credit Default Swap Spreads

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Abstract

A country's economic stability and growth is linked to its credit worthiness and the related terms of public and private sector finance. To this end, credit default swap (CDS) spreads affect greatly this process. This paper investigates the association of rising CDS spreads with economic and market factors as well as with credit rating announcements in the short run, for the Greek economy, by examining the evidence for the September 2008 - October 2010 period. The empirical results are interesting since they provide an indication that CDSs are more associated with market factors than with economic factors or credit rating announcements. The latter account for a lesser extent than the one believed. CDS spreads are associated with information already spread to the capital markets, and not vice versa, lessening the critique on rating agencies for rising CDS spreads. These findings are generally in line with those in other markets.

Keywords: Credit Risk, Credit Default Swaps, Credit Rating

JEL classification: G14, G24, D8

1. Introduction

A country's economic stability and growth relies heavily on its credit worthiness. The latter is of paramount importance for obtaining finance, either for the public or the private sector, affecting both the volume and the interest rate of debt finance. At the same time, along with the issue of debt, a financial instrument is being created, the credit default swap (CDS) dealing with the protection against risk in case of emerging inability of debt repayment. A CDS refers to a swap contract in which the protection buyer of the CDS makes a series of payments, often referred on CDS fee or spread, to the protection seller and, in exchange, receives a payoff if a credit instrument – a bond or a loan – experiences a credit event. CDS spreads rise when there are signs that repayments can not be met, increasing the fears of default of the entity that issues the underlying debt instrument. A default is referred as a credit event and includes such events as failure to pay, restructuring and bankruptcy. CDSs have existed since 1990s, and since then the market has grown at an extremely rapid pace. From approximately \$200 billion in 1997, the market increased tremendously starting in 2003. By the end of 2007, the outstanding amount was \$ 62,2 trillion failing to \$ 38,6 trillion by the end of 2008. CDSs derive their value from the price movements of the underlying reference asset, corporate or sovereign bonds. The complex structure of CDSs though requires an intrinsically multifaceted method. One variable, among others, that contributes to their valuation, to the CDS spread, is the credit rating of the reference entity that is supposed to reflect the credit risk of a firm. If credit ratings represent the relative credit quality of a firm, then it would make sense for a correlation to exist between CDS spreads and credit ratings of the underlying reference entity.

Recent discussion seems to indicate that credit ratings may not correspond to credit risk assignments. Following the subprime crisis starting in the summer of 2007, rating agencies have come under much scrutiny, mainly, because the market began to question the validity of the ratings they were issuing. Thus, despite the effects of economic and market factors, many would say that the rating agencies have played a role in the mis-pricing of credit risk. However, as much of the scrutiny on the rating agencies centers on their inability to properly rate mortgage credit, one would think that such an inability could spill over to the corporate credit market. This seemed especially plausible at a time when the market entered a phase of abundant credit, exuberant growth and low volatility. Following the subprime meltdown, investors became more risk averse and sceptical of all credit products regardless of their credit rating or their perceived creditworthiness. Investors who were interested in credit products began demanding more compensation for taking on the default risk of the issuing entity. These market conditions have only added to the variation in CDS spreads on firms with the same credit rating. Thus, current market conditions add interesting

dynamics to the study of the relationship between CDS spreads and credit ratings.

As noted by Callen et al (2007), although CDS premia are related to credit ratings issued by rating agencies, there is quite a wide variation in CDS spreads that is observed for firms having a given rating. This relationship can be depicted in the market by looking at CDS premia associated with a given rating. If CDS spreads reflect a component of pure credit risk, that is a risk of loss associated with default of the reference entities on their debt, and credit ratings quantify the relative likelihood of a corporate defaulting on its debt, then not all CDS on reference entities with a given credit rating should be priced similarly. Thus, further research should be done to determine some of the causes of this variation, if it is shown that such a variation exists.

To some extent, the change in market sentiment can be seen by observing the upward shift in the level of the CDS indices, starting around January 2008, probably due to the credit crunch, the subprime debacle, the drop in the equity markets, and the consecutive increasing risk in weak economies of the EU zone. This shift represents a market in which the demand for a high level of compensation for taking on additional risks, by market participants, asks for the examination of the effect of other variables on the value of the CDSs.

The relation between CDS indices and volatility, as well as the relation of CDS indices to credit rating has been studied extensively in various sovereign markets, as well as in corporate bond markets. Hull, Predescu, and White (2004) and Norden and Weber (2004) analyzed the CDS market response to rating announcements and revealed significant response to downgrades and negative reviews. Micu, Remolona, and Wooldridge (2006) extended these results to upgrades and positive reviews. Pan and Singleton (2008) investigate the association between risk premiums on CDS spreads of Mexico, Turkey, and Korea and the U.S. CBOE VIX option volatility index, a key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices viewed as a measure of event risk, the spread between the ten-year return on U.S. BB-rated industrial corporate bonds, the six-month U.S. Treasury bill rate, viewed as a measure of both U.S. macroeconomic and global financial market developments, and the volatility in the own-currency options market. Their evidence corroborates the economic interpretations of the temporal changes in risk premiums in the sovereign CDS markets. This evidence is consistent with premiums for credit risk in sovereign markets being influenced by spillovers of real economic growth from the U.S. to other regions of the world. Equally notable is that their findings suggest that, during some sub periods, a substantial portion of the co-movement among the term structures of sovereign spreads across countries was induced by changes in investors' appetites for credit exposure at a global level, rather than to reassessments of the fundamental strengths of these specific sovereign economies.

Norden (2008) reaffirms the response of the CDS market to downgrades and negative reviews and incorporates the market's pre-event behavior to the flow of public and private information to this market. Namely, he investigates if and how the CDS market responds to credit rating announcements conditional on public and private information prior to these events. He derived that CDS markets significantly react to rating downgrade announcements and, even stronger, to reviews for downgrade, which confirms results from related studies, now with data from a longer and more recent period. Galil and Sofer (2008) found also that announcements about companies, preceded with similar rating actions by other rating agencies, result in statistically significant adjusted spread changes. Jacobs et al (2010) who investigated corporate CDS spreads, found that after controlling for market returns, market volatility and interest rates, CDS spreads increase with the subordination of the debt instrument, the put-implied volatility or deteriorating credit quality of the reference entity. Observed discrepancies between credit ratings and spreads can be partly explained by stock market returns, levels of the VIX index, short-term and long-term interest rates as well as credit quality, although a substantial share of the difference between credit ratings and CDS spreads is not found to be attributed to either market or reference entity related variables.

The Greek economy is undergoing a significant economic restructuring package aiming at remedying significant macroeconomic disequilibria, hopefully retrieving economic stability and growth. The precarious stage of the Greek economy often disrupts the endeavors to establish stable financial flows, to secure market liquidity and state and company finance. The frequent opening of CDS spreads contributes greatly to this undesirable situation. What is more, this CDS spread rise is frequently attributed to non-economic and non-market factors, as its cause is put on the announcements by credit rating agencies which periodically analyze the credit worthiness of the Greek economy, as they do for other countries of the globe. The answer to this question is important as if these agencies alone are to be blamed, then a way can be found to either downgrade them and or replace them with other more reliable organizations. If on the other hand it is economic and market factors that count more for the rising spreads, implying that information is already spread to the economy and capital markets, then it would seem that it is these variables that would need to be improved, reducing in turn CDS spreads. So, this study investigates whether CDS spreads are associated with credit rating announcements in the short run, in the Greek market. If credit rating announcements are the main factor that leads to significant change of CDS spreads, then there is some rationale for

blaming rating agencies that are responsible for rising CDS. On the opposite, if credit rating announcements are not the main factor that leads to significant change of CDS spreads, then the critique over the role of credit rating agencies in creating credit crises seems unjustifiable, at least for the Greek sovereign market.

2. Data Issues and Methodology

Credit announcements and CDS spreads are examined for the period from September 2008 to October 2010, by using weekly observations. The credit ratings and credit warnings on Greece examined are from the four available rating agencies, namely Standard and Poor(S & P), Fitch, Moody's and Rating and Investment Information, Inc. (R&I). They are illustrated on Table1, and refer to the date, rating type, rating and relevant action. In total, 19 announcements took place by these institutions during the period under review, 10 of which referred to rating downgrades, 6 to watch down, 2 to credit warnings, and 1 to rating affirmed.

It is investigated whether the change of CDS spreads is associated, in a statistically significant way, with credit rating announcements and economic and market variables. Regression analysis is used, incorporating the most significant variables utilised in previous studies, to investigate this association by defining the coefficients of the following equations:

$$\text{CDSspr} = \alpha + \beta_1 \text{Rat} + \varepsilon \quad (1)$$

$$\text{CDSspr} = \alpha + \beta_1 \text{Rat} + \beta_2 \text{USTreas} + \varepsilon \quad (2)$$

$$\text{CDSspr} = \alpha + \beta_1 \text{Rat} + \beta_2 \text{USTreas} + \beta_3 \text{GrShares} + \varepsilon \quad (3)$$

$$\text{CDSspr} = \alpha + \beta_4 \text{AmVol} + \varepsilon \quad (4)$$

$$\text{CDSspr} = \alpha + \beta_5 \text{EuroCDS} + \varepsilon \quad (5)$$

$$\text{CDSspr} = \alpha + \beta_1 \text{Rat} + \beta_5 \text{EuroCDS} + \varepsilon \quad (6)$$

$$\text{CDSspr} = \alpha + \beta_1 \text{Rat} + \beta_4 \text{AmVol} + \varepsilon \quad (7)$$

$$\text{CDSspr} = \alpha + \beta_1 \text{Rat} + \beta_4 \text{AmVol} + \beta_5 \text{EuroCDS} + \varepsilon \quad (8)$$

$$\text{CDSspr} = \alpha + \beta_1 \text{Rat} + \beta_2 \text{USTreas} + \beta_3 \text{GrShares} + \beta_4 \text{AmVol} + \beta_6 \text{SwapRates} + \quad (9)$$

$$\beta_7 \text{DepRate} + \beta_8 \text{GrRates} + \beta_9 \text{YCDif} + \varepsilon$$

Given that:

CDSspr, is the weekly change of Greek 5-year CDS rates

Rat, is a dummy variable, having the value 1 if there is negative change in rating, zero otherwise

GrShares, is the weekly percentage change in Athens Exchange (ATHEX) stock market General Index

AmVol is the weekly change of American index VIX

SwapRates, is the weekly change in the five-year interest rate swap rates in Euro

DepRate, is the weekly change in the five-year deposit rates in Euro

USTreas is the weekly change of CDS rates of United States five-year Treasuries

EuroCDS is the weekly change of the I-TRAX index that is tracking CDS spreads in 5YR EURO-Senior Debt

GrRates is the weekly change of long terms five-year interest rates in Greek government bonds

YCDif is the yield curve difference, the weekly change of five-year over two-year rates in Greek government bonds

ε is the error term.

In the above model, weekly changes in values are estimated and then regressions (1) to (9) are run to investigate the association of CDS spread rates to economic and market factors, and to credit rating changes.

3. Results

Table 2 presents the regressions and the relevant statistics. The results provide an indication that rating downgrades or credit rating warnings are associated with increasing CDS spreads, in the short run. However, the main source of increasing spreads does not seem to be credit rate announcements. The most significant explanatory variables refer to American volatility changes and changes in European CDS spreads. Given that both American volatility, as expressed by VIX index, and the changes in European CDS spreads, as expressed by European i-Trax index, are both market rather than economic indices, the most striking conclusion of this study seems to be that it is increasing market fears that drive increasing CDS spreads in the Greek market.

Initially, it is examined whether rating changes lead to increasing CDS spreads, in the short run. It is found that

credit warnings or credit downgrades lead to an average 3.2% increase on Greek CDS spreads on government bonds. This increase is statistically significant at 1% level, while credit rating changes, as a stand-alone factor, can explain approximately 6% of the variation on Greek CDS spreads.

Then, by examining changes in Athens Exchange (ATHEX) stock market General Index, changes in five-year interest rate swap rates in Euro, changes in five-year deposit rates in euro, the weekly change of CDS rates of United States five-year treasuries, the weekly change of five-year interest rates in Greek bonds and the weekly change of five-year over two-year rates in Greek government bonds, it is derived that none of these factors seems to be a significant explanatory variable for this model. Besides, when incorporating these factors to one regression, no statistical significance at 10% level is found for any of these factors. On the other hand, American volatility, as expressed by the VIX index, is found statistically significant at 1% level even after accounting for all the other factors. In particular, an increase of American volatility by 10% leads to 4.8% increase in Greek CDS spread rates. American volatility correlates to other factors, so when European CDS spreads are accounted for, the increase of American volatility by 10% leads to a 3% increase in Greek CDS spread rates, while if one accounts for all above mentioned economic and market factors, then the increase of American volatility by 10% leads to 1.8% increase in Greek CDS spread rates. Again, American volatility is the single most important factor associated with Greek CDS spreads. Greek shares, can also be a significant explanatory variable. A decrease by 10% of Greek share prices, as expressed by ATHEX general index, leads to an increase by 9.7% of CDS spread rates, even when rating announcements are taken into account. However, the volatility of Greek share prices is mainly incorporated to American volatility, as the panel statistics indicate. Yield curve differences exert a positive effect on CDS spread rates, although this is not found statistically significant. The increase of long term interest rates leads to a spread increase, but not statistically significant. Finally, the increase of interest rates for 5-year US Treasuries is followed by an increase on CDS spread rates, again not statistically significant.

Overall, three explanatory variables, namely, American volatility, European CDS spreads and credit rating announcements can explain roughly 50% of Greek CDS spreads, which seems to indicate that these three factors incorporate a significant part of the necessary information for the valuation of CDS spreads. This may be due to liquidity concerns, as described by cash-in-advance models that relate aggregate private monetary endowment to short-term nominal interest rates and the supply of money by the central bank (Clower, 1967, Lucas and Stokey, 1983 and Dubey and Geanakoplos, 1992). According to Espinoza et al (2009), in a state of nature with low liquidity, trade becomes low and the opportunity cost of transferring money increases in order to induce consumers to reduce trade, something that is reflected through increasing market volatility and rising long-term rates above the historical average of future spot rates, even with nonexistent aggregate real risk.

These findings lead to interesting conclusions. Firstly, credit ratings capture only a small part of CDS spread changes, in the short run. Therefore, blaming credit rating entities for rising CDS rates is not strongly supported by this paper's findings. The second conclusion is that American share price volatility is the single most important factor explaining Greek sovereign CDS spread changes. Thirdly, price movements on the Athens Exchange are negatively associated to CDS spread changes. However, the effect of share price movements on CDS spreads becomes weak when considering American volatility. Also, the European CDS spreads movements are positively associated to Greek CDS spread changes. Their effect is significant even after considering for American volatility.

Finally, these results are in line with studies in other markets. Concerning the relation of ratings to CDS spreads, this study provides evidence that is consistent with the findings of Hull, Predescu, and White(2004), Micu, Remolona, and Wooldridge(2006), Norden (2008) and Jacobs et al (2010), that CDS markets react to rating downgrade announcements and reviews for downgrade. In addition, this study examined other factors that may be significant to explain CDS spread changes. It was found that American volatility, as expressed by the VIX index, is found statistically significant at 1% level, even after accounting for all the other factors. This finding on CDS spreads in Greece is in line with other studies, mainly with Pan and Singleton (2008) who investigate the association between risk premia on CDS spreads in Mexico, Turkey, and Korea and with Jacobs et al (2010), who investigated CDS and credit ratings in US corporations.

4. Conclusions

EU officials are worried about the possibility of manipulation in the sovereign CDS market by credit rating agencies. This paper, by estimating weekly changes in values, investigated the association of CDS spread rates to credit rating changes and to market and economic factors. While it was derived that rating downgrades or credit rating warnings are associated with increasing CDS spreads, in the short run, the main source of increasing spreads seems not to be these credit rate announcements. CDS spreads seem to be associated with information already spread to the capital market and not vice versa, lessening the criticism on rating agencies for rising CDS spreads. The most significant

explanatory variables refer to American volatility changes and to changes in European CDS spreads. In particular, it was found that credit warnings or credit downgrades lead to an average 3.2% increase on Greek CDS spreads on government bonds. At the same time, credit rating changes as a stand-alone factor can explain approximately 6% of variation on Greek CDS spreads. It is concluded that credit ratings capture only a small part of CDS spread changes, in the short run. Therefore, referring to credit rating authorities for rising CDS rates is not strongly supported by these findings, while American share price volatility is the single most important factor explaining Greek sovereign CDS spread changes, along with the effect of European CDS spread movements which is also statistically significant. These results, which reinforce market than economic factors, are in line with studies in other markets. Furthermore, none of the series of the remaining local and international economic and market variables exerts a significant explanatory power to the model as a stand-alone factor.

These findings are interesting for regulators and market participants as well. If changes in credit rating recommendations are not the single most significant factor affecting CDS spreads, then credit rating agencies seem unable to affect significantly the bond market. Therefore, investor, speculator and short-seller decisions over sovereign debt investments should be mainly based on market AND economic criteria, as the hypothesis that credit rating agencies are responsible for speculation over EU countries debt seems to be partly unjustified or at least not strongly justified when regarding the Greek debt during the examined turbulent period.

References

- Callen, J. L., Livnat J. & Segal D. (2007). *The Impact of Earnings on the Pricing of Credit Default Swaps*. SSRN: 949322.
- Clower, C. (1967). A Reconsideration of the Microfoundations of Monetary Theory. *Western Economic Journal*, V 6, I 1, 1-9.
- Dubey, P. & Geanakoplos J. (2003). Monetary Equilibrium with Missing Markets. *Journal of Mathematical Economics*, Vol. 39, 585-618. doi:10.1016/S0304-4068(03)00018-1, [http://dx.doi.org/10.1016/S0304-4068\(03\)00018-1](http://dx.doi.org/10.1016/S0304-4068(03)00018-1)
- Espinoza, R., Fornari, F. & Lombardi, M. (2009). The Role of Financial Variables in Predicting Economic Activity in the Euro Area. IMF Working Paper 09/241.
- Galil, K. & Soffer, G. (2008). *The Conditional Response of CDS Markets to Rating Announcements*. SSRN: 1343719.
- Hull, J., Predescu M. & White A. (2004). The Relationship between Credit Default, Swap Spreads, Bond Yields, and Credit Rating Announcements. *Journal of Banking and Finance*, Vol. 28, 2789–2811. doi:10.1016/j.jbankfin.2004.06.010, <http://dx.doi.org/10.1016/j.jbankfin.2004.06.010>
- Jacobs, M., Karagozoglou, A. & Peluso C. (2010). Measuring Credit Risk: CDS Spreads vs. Credit Ratings. FMA Meeting proceedings, New York.
- Lucas, R. & Stokey, N. (1983). Optimal Fiscal and Monetary Policy in an Economy Without Capital. *Journal of Monetary Economics*, Vol. 12, 55-93. doi:10.1016/0304-3932(83)90049-1, [http://dx.doi.org/10.1016/0304-3932\(83\)90049-1](http://dx.doi.org/10.1016/0304-3932(83)90049-1)
- Micu, M., Remolona, E., Wooldridge, P. (2006). The price impact of rating announcements: which announcements matter? BIS Working Paper No 207, June.
- Norden, L. (2008). Credit derivatives, corporate news and credit ratings. Working paper, University of Mannheim.
- Norden, L. & Weber, M. (2004). Informational efficiency of credit default swap and stock markets: the impact of credit rating announcements. *Journal of Banking and Finance*, Vol. 28, 2813-2843. doi:10.1016/j.jbankfin.2004.06.011, <http://dx.doi.org/10.1016/j.jbankfin.2004.06.011>
- Pan J. & Singleton K. (2008). Default and Recovery Implicit in the Term Structure of Sovereign CDS Spreads. *The Journal of Finance*, Vol. 63, 2345–2384. doi:10.1111/j.1540-6261.2008.01399.x, <http://dx.doi.org/10.1111/j.1540-6261.2008.01399.x>

Table1. Credit Ratings and Credit Warnings Examined

| | Date | Agency | Rating Type | Rating | Action |
|----|-------------|---------------|--------------------|---------------|----------------------|
| 1 | 14/01/2009 | S & P | LT Issuer | A- | Rating Downgraded |
| 2 | 08/05/2009 | R & I | Outl | Negative | Credit Warning |
| 3 | 12/05/2009 | Fitch | Iss Outl | Negative | Credit Warning |
| 4 | 22/10/2009 | Fitch | LT Issuer | A- | Rating Downgraded |
| 5 | 29/10/2009 | Moody's | LT Issuer | A1 | Rating On Watch Down |
| 6 | 07/12/2009 | S & P | LT Issuer | A- | Rating On Watch Down |
| 7 | 08/12/2009 | Fitch | LT Issuer | BBB+ | Rating Downgraded |
| 8 | 11/12/2009 | R & I | LT FC Iss | A+ | Rating Downgraded |
| 9 | 16/12/2009 | S & P | LT Debt | BBB+ | Rating Downgraded |
| 10 | 22/12/2009 | Moody's | LT Issuer | A2 | Rating Downgraded |
| 11 | 24/02/2010 | R & I | LT LC Iss | D | Rating On Watch Down |
| 12 | 16/03/2010 | S & P | LT Issuer | BBB+ | Rating Affirmed |
| 13 | 09/04/2010 | Fitch | LT Issuer | BBB- | Rating Downgraded |
| 14 | 19/04/2010 | R & I | LT LC Iss | D | Rating On Watch Down |
| 15 | 22/04/2010 | Moody's | LT Issuer | A3 | Rating Downgraded |
| 16 | 27/04/2010 | S & P | LT Issuer | BB+ | Rating Downgraded |
| 17 | 28/04/2010 | R & I | LT LC Iss | D | Rating On Watch Down |
| 18 | 20/05/2010 | R & I | LT LC Iss | BBB- | Rating On Watch Down |
| 19 | 14/06/2010 | Moody's | LT Issuer | Ba1 | Rating Downgraded |

Table 2. Regression statistics

| Panel A : $CDS_{spr} = -0.007 + 0.037 \text{ Rat} + \varepsilon$ | | | | | | | | | | | | | |
|--|-----------|----------|--------------|------------|----------|----------|----------|----------|--------|----------|-------------------|------|--------|
| Predictor | Intercept | Rating | | | | | | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | -0.007 | 0.037 | | | | | | | | 6.62% | 5.73% | 7.4 | 107 |
| t Stat | -1.091 | 2.729 | | | | | | | | | | | |
| Panel B : $CDS_{spr} = -0.010 + 0.034 \text{ Rat} + 0.596 \text{ US Treas} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | Rating | | | | US Treas | | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | -0.010* | 0.034*** | | | | 0.596*** | | | | 33.86% | 32.58% | 26.4 | 107 |
| t Stat | -1.775 | 3.022 | | | | 6.508 | | | | | | | |
| Panel C : $CDS_{spr} = -0.008 + 0.032 \text{ Rat} + 0.362 \text{ US Treas} - 0.971 \text{ Gr Shares} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | Rating | Greek Shares | | | US Treas | | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | -0.008* | 0.032*** | -0.971*** | | | 0.362*** | | | | 46.66% | 45.09% | 29.7 | 107 |
| t Stat | -1.558 | 3.096 | 4.946 | | | 3.803 | | | | | | | |
| Panel D : $CDS_{spr} = 0.002 + 0.479 \text{ Am Vol} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | | | | | Am Vol | | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | 0.002 | | | | | 0.479*** | | | | 34.16% | 33.53% | 54.0 | 107 |
| t Stat | 0.389 | | | | | 7.345 | | | | | | | |
| Panel E : $CDS_{spr} = -0.001 + 0.757 \text{ Euro CDS} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | | | | | Euro CDS | | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | -0.001 | | | | | 0.757*** | | | | 36.39% | 35.79% | 60.1 | 107 |
| t Stat | -0.220 | | | | | 7.751 | | | | | | | |
| Panel F : $CDS_{spr} = -0.006 + 0.0312 \text{ Rat} + 0.737 \text{ Euro CDS} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | Rating | | | | Euro CDS | | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | -0.006 | 0.031*** | | | | 0.737*** | | | | 40.97% | 39.84% | 36.1 | 107 |
| t Stat | -1.255 | 2.841 | | | | 7.779 | | | | | | | |
| Panel G : $CDS_{spr} = -0.005 + 0.038 \text{ Rat} + 0.466 \text{ Am Vol} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | | | | | Am Vol | | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | 0.002 | | | | | 0.479*** | | | | 34.16% | 33.53% | 54.0 | 106 |
| t Stat | 0.389 | | | | | 7.345 | | | | | | | |
| Panel H : $CDS_{spr} = -0.006 + 0.033 \text{ Rating} + 0.488 \text{ Euro CDS} + 0.301 \text{ Am Vol} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | Rat | | | | Am Vol | Euro CDS | | | R Square | Adjusted R Square | F | Sample |
| Coefficients | -0.006 | 0.033*** | | | | 0.301*** | 0.488*** | | | 51.08% | 49.65% | 35.8 | 107 |
| t Stat | -1.190 | 3.398 | | | | 4.613 | 4.770 | | | | | | |
| Panel I : $CDS_{spr} = -0.002 + 0.014 \text{ Rat} + 0.109 \text{ US Treas} - 2.017 \text{ Gr Shares} + 0.180 \text{ Am Vol} - 0.190 \text{ Swap Rates} - 0.053 \text{ Deposit Rates} + 2.140 \text{ LTGr Rates} + 1.439 \text{ YCDif} + \varepsilon$ | | | | | | | | | | | | | |
| Predictor | Intercept | Rat | Gr Shares | Swap Rates | Dep Rate | Am Vol | US Treas | Gr Rates | YC Dif | R Square | Adjusted R Square | F | Sample |
| Coefficients | -0.002 | 0.014 | -2.017 | -0.190 | -0.053 | 0.180*** | 0.109 | 2.140 | 1.439 | 70.30% | 67.87% | 29.0 | 107 |
| t Stat | -0.554 | 1.478 | -1.531 | -0.848 | -0.407 | 3.330 | 1.534 | 1.497 | 1.105 | | | | |

An asterisk, two asterisks and three asterisks indicate statistically significant results at 10%, 5% and 1% level, respectively.