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Unlocking Credit Default Swaps (CDS) to the Retail Investors to boost Liquidity and Minimize Risk

Jyothi Kumar,
Associate Professor & Coordinator,
Department of Management Studies,
Christ University, Bangalore, India.
E-mail: jyothi.s@christuniversity.in

Yekanth Reddy,
Research Scholar,
Christ University,
Bangalore, India.

Abstract

*This research investigates analytically by probing existing Credit Default Swaps market and mechanism, and identifies the gaps, to develop or derive alternative financial product to unlock CDS market to the retail investors/investments in order to boost the liquidity and to establish robust platform which helps to minimize the default risk. Financial tsunami in the year 2008, alarmed researchers and financial institutions across the globe to emphasize on the need of strong liquidity and further risk diversification models for CDS market reformation and the development along with creating superior confidence levels in the market. Literature review of this research work identified that the existing financial institutions and researchers analyzed and articulated the need of the retail investor's participation in the CDS market to create a strong liquidity and mitigate default risk. The new financial product or alternative model development through this research work helps to reform and to maintain the development of the CDS market and also provoke superior confidence levels to boost strong liquidity and option to diversify risk. The new or alternative financial product also indirectly motivates the investment in the debt market and enhances the capital markets and economies around the globe. 250 debt instruments has been selected from the NYSE (New York Stock Exchange) for the study as US bond market is considered to be the biggest debt market in the world. The debt instrument values are denominated in US dollars. Bonds are selected which mature in 2014 and above in order to calculate the bid and ask prices by employing Exchange Traded Credit Default spreads (ETCDS) pricing model. Another criterion is the coupon rate which is greater than 4% variable in nature because there is scope for huge heading strategies. The selected 250 bonds are traded in 2012. From the 250 debt instruments our study calculated the buy and sell prices using Black Scholes model (BSM) of ETCDS in order to carefully examine the liquidity strength based on the bid-ask spread and the number of contracts. Therefore our research work test liquidity of the ETCDS with the help of below constructed regression skeleton: ETCDS Liquidity (Bid-Ask Spread) = β0 * + β1*Spot Value of the Bond + β2*Volumes+ β3*Risk Free Rate*

Keywords: *Unlocking, Credit Default Swaps (CDS), Retail Investors/Investments, Liquidity and Risk Diversification*
JEL Classification*: L810, G320*

1. Introduction

2008 global financial crisis described as Financial Tsunami and considered to be the worst since 1930's Great Depression. As a result, top performing investment banks, insurance companies and other financial institutions has written off holdings on financial instruments (especially on debt instruments), raised hands for the bailout packages, sprinkled pink slips to its dearest employees, some of them closed doors permanently and sold them self to their own competitors, to name few Bear Stearns and Merrill Lynch.

History substantiate that every failure thought new lesson (s) and motivated to investigate to create tool(s) or methodologies or model(s) to mitigate unforeseen abnormal events for the future sustainability, there is no exception to the 2008 crisis. As the credit bubble geared up researchers, economists, regulators, sovereigns and financial institutions to enter into a new era to emphasize on need of realistic strong liquidity and risk diversification or mitigation aspects through reformation and development of markets along with creating superior confidence levels.

The heights of the crisis pushed markets and economies into great recession, till date (2013) most of the economies not recovered to step towards growth phase, however the frequent statements and news in the air sounds growth numbers which is not real in nature because of the accumulated high bride numbers between 2000 to 2008. The last five years including 2012 was still years of unprecedented events in the global credit markets, marked by sovereign downgrades, most the Greece debt crisis. Table 1.1 represents that, 53 global corporate issuers defaulted in 2011, 81 defaults in 2010 and the record high of 265 defaults in 2009.

However, between 2004 to 2007 the corporate defaults are recorded only double digits and which is lower compared to pre 2004 and post 2007, this is the phase where credit default swaps market surprised the market watchers by marking approximately 100% growth and it is very evident and supports the recent ISDA (International Swaps and Derivatives Association) involvement to prevent exchanges to enter along with market regulators, as the market is dictated by major investment banks to make profits.

2. Review of literature:

The research born out of 2008 crisis, as there are too many arguments and analysis prepared around the world among financial markets, academic researchers, etc. The reason is the crisis impact was huge and moved major economics across the globe into depression; as a result the impact was spread across other economies. The entire play was termed as credit bubble, subprime crisis, financial crash, etc.

Only few researches or studies highlighted the need of retail investors to the credit default swaps market but not prepared a road map to allow retail investors into market nor

recommended in a similar lines our research work too started with strong opinion that the need of retail investors entry into market, then we took deviation and begun to investigate on the possible road maps which retains the purpose of the existing mechanism but to allow retail investors. Though the information on allowing retail investors to the credit default swaps or studies on credit default swaps are inadequate due to the market nature, as there are no sufficient information available or accessible to the outside market participants and also the data cost to high and exposure such market is very limited in the field of research.

There are no base articles amiable which can be used for our research, hence the study is exploring and moving towards experimental study with available information. Hence the research investigates realistically by probing the maximum existing and available studies which is related or which falls under somewhat close to our work. As a result we anticipate the outcome might force us restructure the existing mechanism or possible innovative alternate models in order to boost the liquidity and to establish robust platform which helps to minimize the counterparty risk. Some of the assumed studies are reviewed and represented as base for our study.

J.P. Morgan, and The RiskMetrics Group, (1999 -2000). The J.P. Morgan Guide to Credit Derivatives. Highlighted CDS market milestones and stressed on the associated risk. The use of credit derivatives has grown exponentially since the beginning of the decade. Transaction volumes have picked up from the occasional tens of millions of dollars to regular weekly volumes measured in hundreds of millions, if not billions, of dollars. Banks remain among the most active participants, but the end-user base is expanding rapidly to include a broad range of broker-dealers, institutional investors, money managers, hedge funds, insurers, and reinsures, as well as Corporates.

Dodd, R. (2005). Rumors and News: Credit Derivatives Trigger Near System Meltdown. Stated that ABN Amro and AXA investment managers chose to role out a credit derivatives fund aimed at attracting retail investors.

Jakola, M. (2006). Credit Default Swap Index Options - Evaluating the viability of a new product for the CBOE. Stated that exchange-traded CDS options would increase the liquidity in the CDS option market and allow retail and smaller investors to trade credit risk much more easily than with current products, as individual CDS or the CDS indexes are cost-effective hedges for most of the players.

Mengle, D. (2007). In his study on Credit Derivatives: An Overview. Addressing the need of retail investor's participation, growth and innovation of credit derivatives could occur along several dimensions: new market participants i.e. retail investors.

Eriksson, P. (2007). In his work on Overcoming the Challenges in the Credit Derivatives Market. Argued that the user base that trades credit product is primarily limited to banks,

insurance houses, buy-side institutions such as hedge funds and to some extent asset managers. In order to further increase its footprint the credit market may need to attract the broader mass of both corporate and retail investors. Although some corporates participate in the credit market they are few compared to the larger players and hardly add to the overall diversification.

Mark Carey, M. & Stulz, R.M. (2007). The Risks of Financial Institutions. Emphasize on the consensus view of systemic risk in the financial system that emerged in response to the banking crises. This view held that the main systemic problem is runs on solvent banks leading to bank panics. A new consensus has yet to emerge. The dramatic rise of modern risk management has changed how the risks of financial institutions are measured and how these institutions are managed.

Yaru, C. (2007). What Explains Credit Default Swaps Bid-Ask Spread?. Explains that still there is room for enhancement of liquidity in the CDS market. Bid-ask spreads is commonly used as a proxy of liquidity. Study confirms that CDS bid-ask spread has explanatory power to CDS premium. Then investigate the liquidity component in CDS bid-ask spreads. The study used the bond age, bond amount, and bond time-to-maturity as the liquidity measure. Study confirms that the bond market and CDS market are closely correlated.

Yan, H. & Tang. D. Y. (2007). Liquidity and Credit Default Swap Spreads. Sense that a better understanding of the liquidity structure and its impact on the pricing of credit derivatives is critical to improving the efficiency and stability of ¯financial markets and the overall health of the economy.

Hirtle, B. (2008). Credit Derivatives and Bank Credit Supply. Expressed greater use of credit derivatives is associated with greater supply of bank credit for large term loans—newly negotiated loan extensions to large corporate borrowers, the impact is primarily on the terms of lending—longer loan maturity and lower spreads.

Global Credit Derivatives Markets Overview: Evolution, Standardization and Clearing. (2010). Examined broader availability of credit protection encourages lending, which supports the expansion of global economies. As lenders and investors consider ways to improve credit risk evaluations, CDS spreads have proven to be a more dynamic indicator of the creditworthiness of an institution rather than credit ratings agencies' ratings alone.

Duffie, D. Li, A & Lubke, T. (2010). Policy Perspectives on OTC Derivatives Market Infrastructure. Reviewed and analyzed over-the-counter (OTC) market that OTC derivatives have been blamed for increasing systemic risk. Although OTC derivatives were not a central cause of the crisis, the complexity and limited transparency of the market reinforced the potential for excessive risk-taking, as regulators did not have a clear view into how OTC

derivatives were being used and how the New York Fed and other regulators could improve weaknesses in the OTC derivatives market through stronger oversight and better regulatory incentives for infrastructure improvements to reduce risk and bolster market liquidity in the financial system.

Stulz, R M. (2010). Credit Default Swaps and the Credit Crisis. Investigated how credit default swaps may have contributed to the 2008 credit crisis by reviewing CDS market and models and concluded that, economists have generally believed that financial derivatives increase economic welfare by facilitating risk-sharing among investors, These arguments certainly apply to credit default swaps.

Bülbül, D. & Lambert, C. (2012). Credit portfolio modeling and its effect on capital requirements. Presented in the Basel III and Beyond: Regulating and Supervising Banks in the Post-Crisis Era conference and highlighted that the subprime crisis revealed that the adoption of suitable systems for the management of credit risk is of utmost concern.

International Organization of Securities Commissions report, (2012). Highlighted the significance of retail investors in the equity and exchange traded derivatives market strength in terms of liquidity and alternatives to diversify the various risk aspects among investors to create win-win platform and finally referencing CDS market that even CDS market have potentiality to attract retail investors to grow itself by creating higher confidence levels to convert existing CDS market more efficient equal to the other markets perhaps equity and exchange traded derivatives.

3. Methodology for the Study

CDS instruments are negotiated in the OTC market(s) and the counterparties are highly exposed to the liquidity and default risks due to the limited participants i.e. only institutions and obligations are associated with huge notional amounts which triggers institutions to pay huge amounts and end their business when reference entity defaults, the classical example is 2008 credit crisis, though market participants formed ISDA association to monitor and control the CDS market but failed to establish effective control measures due to lack of predictability, the fastest growth rate in terms of number of contracts and outstanding notional amounts, lack of reporting standards and drastic usage of CDS contracts to create fancy money i.e. monetizing practices to improve profit margins in the quarterly profit and loss statement.

Hence our study intended to innovate or develop a new alternative product within CDS instruments or extensive of existing CDS concept which opens doors to the retail investors, as it is empirically and fundamentally proved that, mass participants can enhance the market confidence levels in terms of frequency of buy and sell actions which will increase the liquidity levels and also offers to mitigate risk from one participant to another participant due investors nature of perceiving risk aspects in the different ways at the same time. The

predicted new product in our research going offer more comprehensive risk mitigation avenues to hedge at every situations.

The research used fundamental concepts to the test the effectiveness of the new product ability to boost confidence levels among the investors and the CDS & Debt markets in terms of liquidity and risk mitigation strategies. The fundamental concepts are dirty price of the bonds which are actively traded in the NYSE exchange, federal average monthly risk free interest rate and the probability of corporate bonds default cumulative percentage from the moody's and S&P predications. This study constructed liquidity proxies which are accepted worldwide and very fundamental proxies in nature instead of building fancy proxies based on the assumptions which is high bred and complex to match with real world.

The research work developed a new product which is extension of existing CDS contract, hereby we would name new product as ETCDS (Exchange Traded Credit Default Swaps), and we will test the liquidity with widely accepted proxies that Bid-Ask spread of ETCDS with the help of econometric regression model.

It is believed and accepted that every investors in the modern era are more focused on the hedging strategies either it is institutional or individual investors, there are plenty of alternatives available for the equity segment and its open for all type of investors comparatively than other segments in the investment world, hence market consists with greater depth of volumes and tighter bid-ask spreads which made equity market as more liquid and offers number of risk management strategies. However Fixed Income or debt market is very limited and institutions plays a major role, limited individual investors made debt market less attractive in terms liquidity and alternative risk management tools or strategies, hence our research is more focused to trigger an evolutionary in the debt and CDS market with new product ETCDS concept, which establish higher confidence levels in the market for both borrowers and lenders and gives access to wider population to trade in the debt instruments as in equity market.

3.1 Data Source

The biggest challenge of this research is to identify the right data source, data collection and processing the collected data or transforming into useable or meaningful parameters, especially the bond market is ruled and controlled by limited member's hence earning wider data is difficult due limited access to the data. However the research managed to spot 5962 bonds which are listed in the NYSE exchange platform for the trading. The data collected from the NYSE exchange which includes only corporate bonds. We have cautiously analyzed the 5962 bonds and preferred only 108 bonds for the further analysis and to use it in the ETCDS pricing model. The major parameters considered are the activeness of the bond, the first parameter is the bonds which is traded in the most recent times as we can manage to

extract latest market price to logically test the ETCDS effect to boost liquidity in turn which measures the confidence levels of the debt and CDS market, so the bonds which are traded in the year of 2012 and 2013. The second parameter is the maturity period of the bonds, the work considered the bonds whose maturity is from one year to 20 years and eliminated the remaining population. The logic behind is that long term i.e. more than twenty years bond numbers are very high and the mathematical calculation build up huge complex tables. And finally, the third parameter is the interest rate, the bonds which are below 5% and above 10% interest rate are eliminated from the list by assuming that the bonds which pay less than 5% and more than 10% are exceptions and that financial unsoundness. Finally 108 bonds finalized for this research analysis by eliminating the bonds based the three set parameters.

U.S. corporate bonds default rates are derived from the U.S. Municipal Bond Fairness Act, 2008, the cumulative historic corporate bonds default rate based on the bond ratings which is originally constructed by Moody's and S&P.

Table 3.1 Cumulative Historic Default Rates (in percentage)

Cumulative Historic Default Rates (in percent)		
Rating category	**Moody's**	**S&P**
AAA	0.52	0.6
AA	0.52	1.5
A	1.29	2.91
BBB	4.64	10.29
BB	19.12	29.93
B	43.34	53.72
CCC-C	69.18	69.19
Investment grade	2.09	4.14
Non-investment grade	**31.37**	**42.35**

Source: U.S. Municipal Bond Fairness Act, 2008

The research work considered the Non-investment grade default rate for further study and to test the expected outcomes from the ETCDS, as one of the important objective of the ETCDS is to build strong confidence levels in the debt and CDS market and confidence levels are the fundamental need for any financial market to sustain long-term, hence to live-up to and face any future unexpected events which have direct and indirect effect on the bonds default, the study used the non-investment grade average default rate.

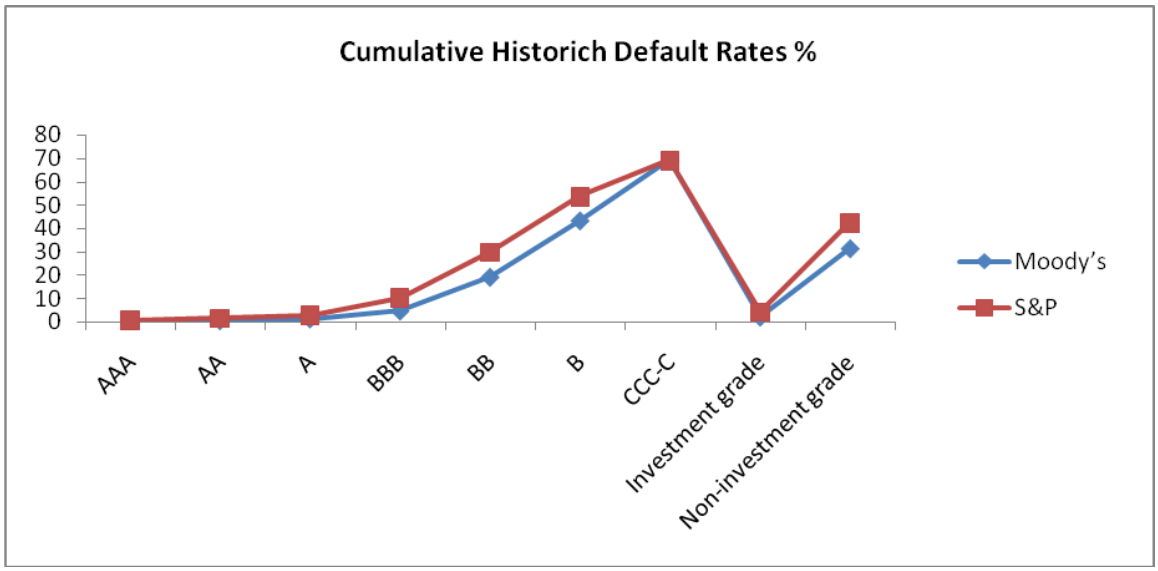

Fig 3.1 Cumulative Historic Default rates in Percentage

Both Moody's and S&P's cumulative historic default rates are very closely matching in the A to AAA rating segment, B to BBB are represented with slightly different from both institutions, also the S&P calculated cumulative default numbers from 1981 to 2008 so it's evident that, the data consists from the great depression and also recovery phase from depression, hence we conclude based on the above table and graph, we used the average rate which represent the complete U.S. corporate bonds market to define the pricing model for ETCDS.

The average default rate is derived as follows

$$E\bar{D} = \text{Moody's cumulative default \%} + \text{S\&P cumulative default \%}$$

E = Expected value

$\bar{D}$ = Average default rate (%)

The expected average default rate is 36.86% which is derived from the 31.37% cumulative default rate from Moody's and 42.35% cumulative default rate from S&P. The default rate is very critical for the research to define pricing model for the ETCDS which is optimistic in nature in terms of investment decisions.

Risk free rate is the U.S. treasury interest rate, the data extracted from the U.S. Department of the Treasury, daily published 20 year CMT (Constant Maturity Treasury) interest rates. The data available on daily basis, however the research transformed the daily data into average monthly data from January 2012 to February 2013. The rationale behind transforming daily data into average monthly is to make analysis easier to understand the effect on month on month ETCDS contract(s), however we recommend to use daily U.S. treasury rates for pricing. The risk free rate is very significant in any investment decision

making which helps to derive actual profits to compensate assumed risk; hence the research is used U.S. treasury rate to price the ETCDS which helps to manage risk exposures on daily basis by marking to U.S. treasury market i.e. mark to market.

The interest rates extracted is twenty-year CMT (Constant Maturity Treasury), as the bonds selected for the analysis have maturity ranging from one year to twenty years and also pricing ETCDS based on the long term risk free interest rate is gives an opportunity to consider unforeseen events in the economy which can have potential impact on the U.S. corporate bonds in terms inflation and economic growth.

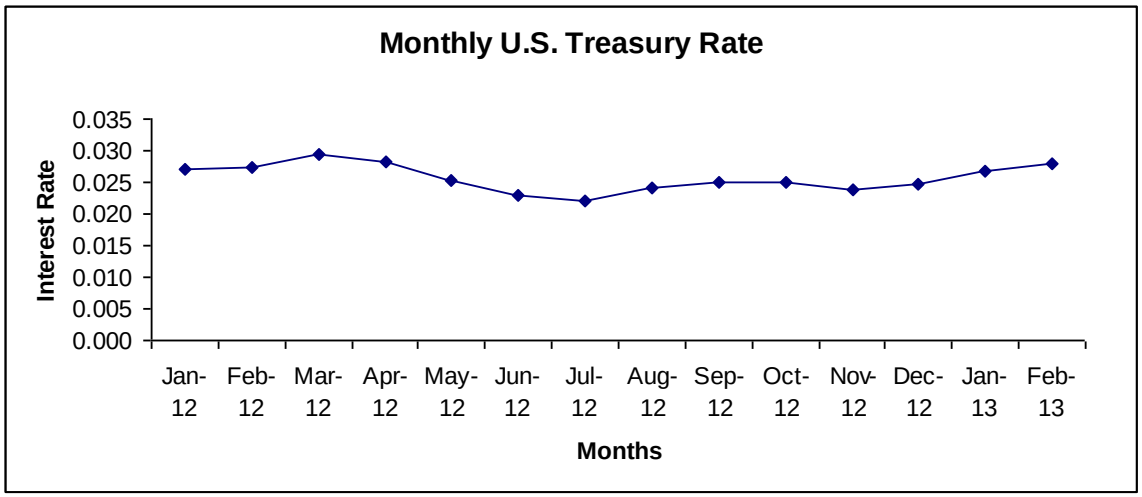

Fig 3.2 Monthly US Treasury Rate

From the primary analysis, the research observed average rate is 2.6% and the graph represents that there is no extreme movements in the direction of the interest rate move. However the actual interest rate of the bonds vary from bond to bond, hence pricing ETCDS considers the actual or real interest risk associated with each bonds and helps to derive the price to sell or buy protection against such debt instruments. The lower the bond interest rate lower cost to buy or sell protection to hedge aligned with unforeseen events or risk aspects visa versa.

3.1.1 Construction of Liquidity Proxies

There are numerous definitions and statements developed on the liquidity; one of the loosely used definitions is that any security or investment can be bought or sold without effecting the price, as if, there is no change in the price then it's obvious that why unnecessary transactions are required to add the operational cost and this clearly marked that there is no logic for the term investment, if there is no profits or capital appreciation. However our research defines liquidity is the price recovery phase of the asset, the width of the bid and ask price, our research believes that the tighter the bid and ask width (spread) the asset is more liquid, hence we test the impact of the ETCDS on liquidity by using primarily the bid and ask spread and this is accepted by worldwide as primary parameter to measure the liquidity. In

order to derive the bid and ask spread the research initiated to build few parameters to implement in the mathematical calculations. For example, Bond A's offer price is $95 and bid price is $93, the difference between bid and ask is $2 and where bond B's offer price is $115 and bid price is $114.5, the difference between bid and ask is $0.05, there bond B is more active in the market and investor can convert his holdings very quickly than bond A, hence the width of the bid and ask defines the liquidity levels of any asset.

3.1.2 Constructions Parameters

Our primary analysis demanded us to building some of the meaningful parameters, as the study is intended to experiment with the concept of ETCDS and which is something not exposed in the past nor the concept is not existing. The objective of building parameters is to assemble in the Black Scholes pricing model used to price the ETCDS, there the research study further to test the impact on the market in terms liquidity.

Spot Price: The spot price of the bonds are derived from the NYSE exchange as of February 2013, it is real market value detonated in U.S. dollars.

Strike Price: No data available within accessible limits for the selected bonds; however the research predicted the strike price by adopting the dirty price concept by considering the three months period which is one of the assumptions in this research to frame the ETCDS pricing model. The dirty price is the price of the bond including the accrued interest. Therefore, the dirty price is

DP = SP*I(N)
DP = $115*8%(3/12)
DP = $117.3
DP = Dirty Price
SP = Spot Price
I = Interest Rate
N = Time Frame

Probability of Default: The research work investigated and identified the corporate bonds cumulative probability percentage which is estimated from the historical data from 1981 and 2008 by Moody's and S&P, The published by U.S. Municipal Bond Fairness Act, 2008. The primary objective of assuming the corporate bonds cumulative default rate is the default rates are calculated from 1981 which is considered the great depression in the 1980's, hence the research not developed customized methodology to define the probability of default and we strongly believed to assume the cumulative default percentage to establish compressive pricing methodology to the realistic dynamic financial industry considering optimistic and pessimistic scenarios.

Risk Free Interest: The historical statistics are mined from the U.S. Department of the Treasury published on daily basis, however for the research analysis; the data has been

converted into monthly average rates from January 2012 to February 2013 to implement in our work more compressive manner.

Maturity: We have defined the maturity time period based on the standard assumptions referencing the CDS market periodical fee payments which happens first week of each quarter i.e. March, June, October and December.

ETCDS Spread: The research adopted the Black–Scholes pricing model and derived the ETCDS protection sell and buy price by incorporating the research defined parameters, hence the spread is equivalent to the difference between protection sell and buy price, therefore it is expressed with the below equation.

ETCDS Spread = ETCDS PSP – ETCDS PBP

ETCDS PSP = Exchange Traded Credit Default Swap protection sell price

ETCDS PBP = Exchange Traded Credit Default Swap protection buy price

3.1.3 Econometric Specification to test Liquidity of ETCDS:

Our research study carefully verifies the liquidity strength of the ETCDS by adopting the Regression model. Linear regression is model based technique to study the impact of independent variables (x) on the dependent variable (y), however there are N numbers of approaches in the research world to define and build regression models but our research approach with simple multiple liner regression to build the relationship between the liquidity of the ETCDS (ETCDS Spread-dependent variable) and the spot price of the bond, strike price of the bond, risk free rate of interest and probability of corporate bonds default (independent variables) by fitting linear equation to the experimental data (n).

Each value of the independent variables is associated with the value of the dependent variable. The regression line for n observed independent variables x1, x2, …..xn is defined to be $\mu y = \beta 0 + \beta 1x1 + \beta 2x2 + \ldots. \beta nxn$. This line represents how the mean response μy changes with the independent variables. The observed values for y vary in relation to their means μy and are understood to have the same standard deviation σ. The fitted values estimate the parameters $\beta 0, \beta 1, \beta 2, \ldots..\beta n$ of the population regression line.

In simple words, the model is expressed as DATA = FIT + RESIDUAL, where the "FIT" represents the expression of $\beta 0 + \beta 1x1 + \beta 2x2 + \ldots. \beta nxn$. The "RESIDUAL" term represents the deviations of the observed values y from their means μy, which are normally distributed with mean 0 and variance. To conclude, the multiple linear regression model for the observed values in this research is

ETCDS Liquidity (Bid-Ask Spread) =$\beta 0^* + \beta 1^*$Spot Value of the Bond+ $\beta 2^*$Strike Price of the Bond+$\beta 3^*$Risk Free Rate+$\beta 4^*$Probability of default

Note: The regression model excluded the error term from the equation, as dependent variable is calculated from the ETCDS pricing model with the help of established parameters

from the historic data, hence the dependent variable value remains constant in this experimental test, however the equation have power to explain the impact of the each independent variables.

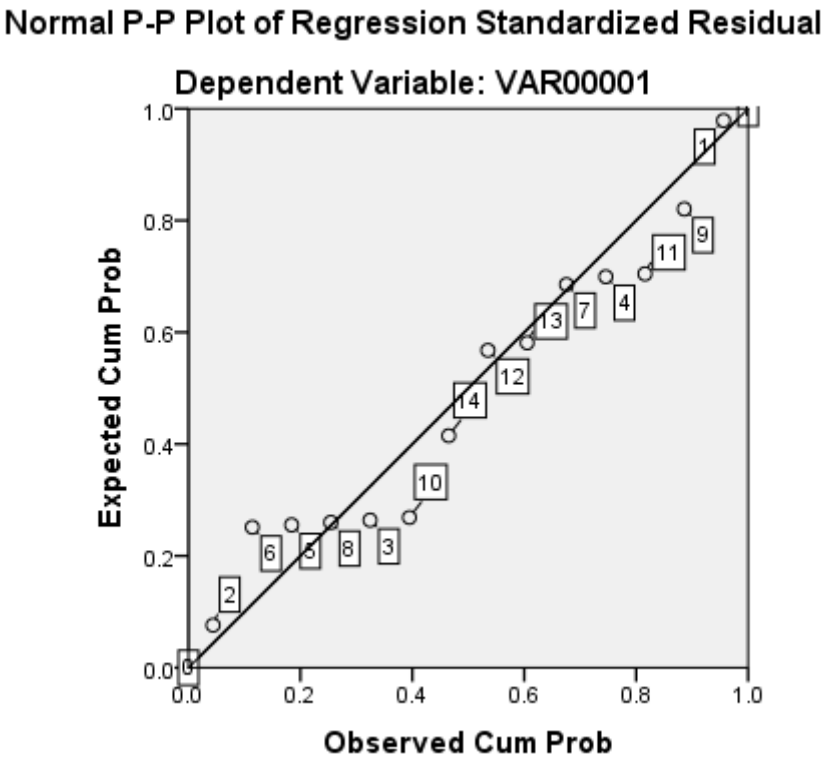

Fig 3.3 Normal Residual plot of Regression

Predictor or control variable in our research is Bid-Ask spread (BAS) Liquidity and the response or predicted variables are Bid-Ask spread (BAS) and volumes or depth of the market.

In general, researchers use correlations and regressions interchangeably, however correlation used to study the relationship between validating variable and one or more informative or supporting variables, however our research work intended to predict the degree of liquidity of the innovated ETCDS financial product.

Therefore our research work test liquidity of the ETCDS with the help of below constructed regression skeleton.

ETCDS Liquidity (Bid-Ask Spread) = β0 * + β1*Spot Value of the Bond + β2*Strike Price of the Bond+ β3*Risk Free Rate+ β4*Probability of default

Table 3.2 Model summary of model fit

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square	F Change	df1	df2	Sig. F Change	

					Change					
1	.998[a]	0.996	0.994	0.00519	0.996	753.996	3	10	0	2.438

The R^2 is 0.996, which indicates that, the dependent variable ETCDS spread is closely lined to the independent variables such as spot price, strike price, the maturity term, risk free interest rate and probability of U.S. corporate bonds, along with $R^{2,}$ adjusted R square is closely match with and evidence that, the model is fit to explain the defined equation.

The variables are closely liner and the below linearity graph proves the same.

3.2 Data Analysis

Based on the regression outcome for ETCDS, we articulated the independent variables impact on the dependent variables. The dependent variable is ETCDS spread which assumed to measure the liquidity and degree of risk.

Strike price has been excluded from the regression equation, as the price is constant which is calculated based on the dirty price of the bond concept. However still the equation explains independent variables impact (spot price, probability of default and risk free interest rate) on the ETCDS spread i.e. dependent variable.

Scatter-Plot Matrix: Have self explanatory power to explain the impact of the selected independent variables on dependent variable and also shows how closely linear the dependent variable and independent variables are:

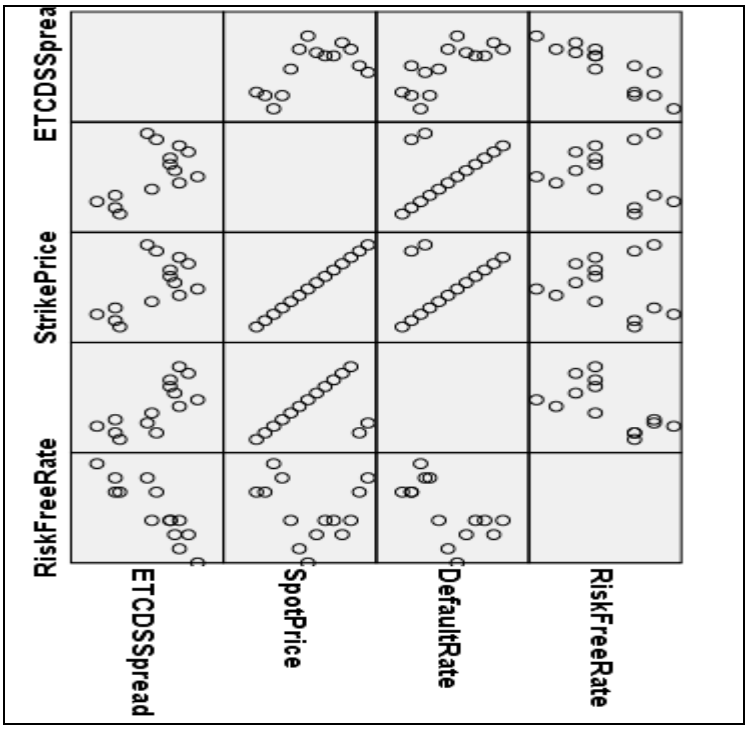

Figure 3.4: Scatter-Plot Matrix

We stressed ETCDS spread is key parameter to measure the degree of the liquidity and risk attributes of any financial product or contract based on the fundamental concept, it is evident that the shorter the length between bid and ask prices the product considered to be more liquid and less risk. The analysis based on the scatter-plot matrix clearly indicates that, the spot price, strike price, probable default rate and risk free interest rate have liner relationship with the ETCDS spread. The spread is closely and positively linear with independent variables, except risk free interest rate.

Spot Price of the Bond: The linear relationship between ETCDS and spot price is positive, means every unit decrease in the price of the bond increases the value of buying protection (sell ETCDS), as the decreasing bond value is an indication of the poor performance or poor credit rating or poor credit worthiness of the issuer which is more exposed to the probable default risk, hence the cost of the hedging or insurance against possible default in the future become costlier to compensate the possible size of the losses. Hence decrease in the spot will have an impact on the ETCDS spread, hence the spot price variable have exploratory power in the defined regression equation.

Example: Assume XYZ Bank issued bonds at $100 on 1 December 2010, which is in business outsourcing business and later years i.e. in 2012, XYZ failed to generate expected profits or made losses, the losses definitely impact its credit rating, hence the bonds value experience the down trend in the market, it is obvious that investors seek an insurance in this scenario, the insurance sellers demand high premiums.

Probability of Default: Is differs among the buyers and sellers; however the high probability of default increase the cost of the protection both the sides but depends on the perception of the participants.

Example: The protection sell price is $7.75 and buy price is $9.13 for XYZ bond when the spot price is $114.35, strike price $116.28, probability of default is 36% and risk free interest rate is 1.9%, if default rate increase by 40%, then the protection sell price increase to $8.47 and buy price increase to $9.85.

Risk Free Rate: Is the assumed rate of return in all derivative contracts by keeping other parameters aside, an increase in interest rate decrease the protection buy value, as the assumed returns improves from the current rate of return, hence the protection buyers negotiate with lowers prices to buy protection but the protection seller tries demand higher price considering small marginal change in the interest rate which is unreasonable for the longer term and consider other impacting factors into consideration.

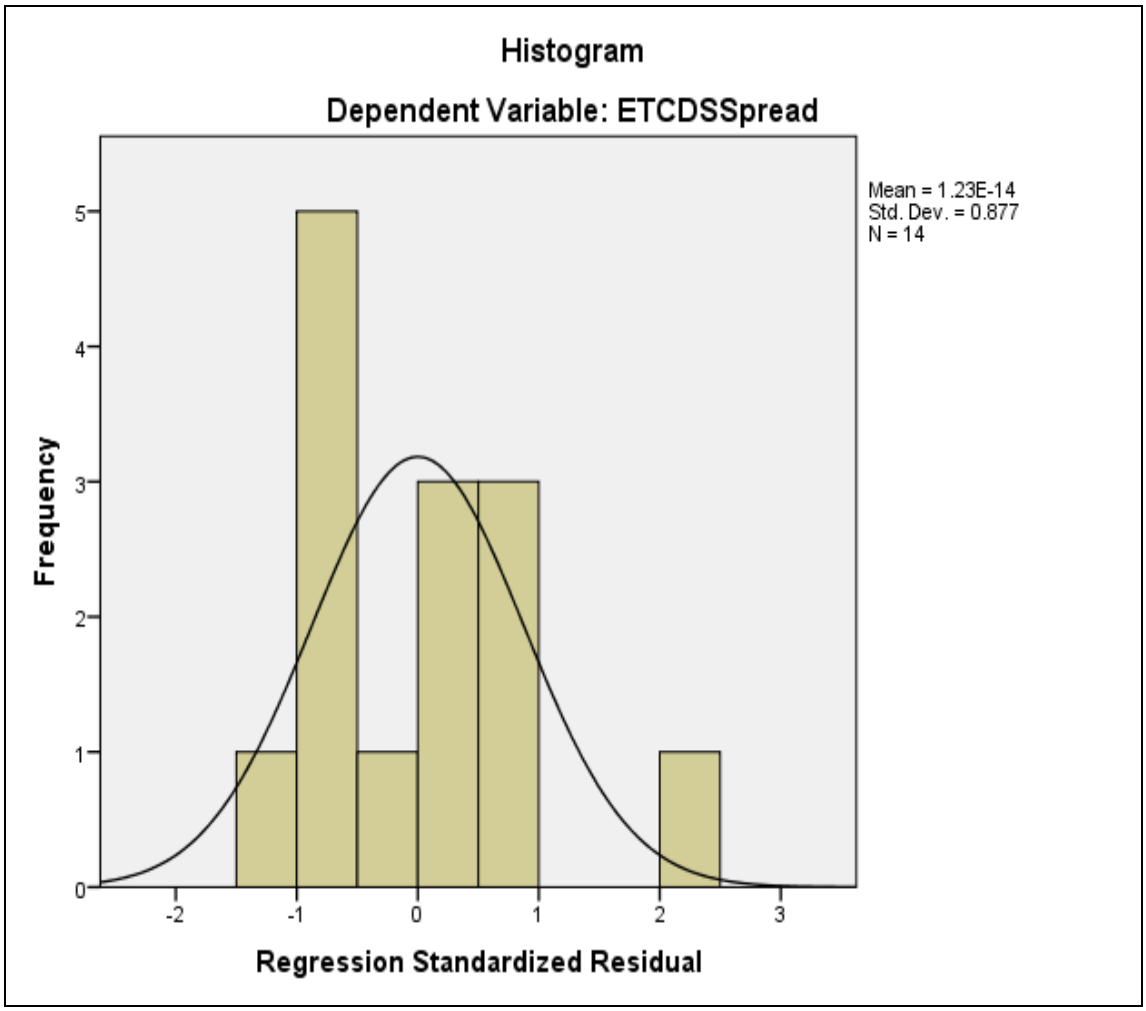

Figure 3.5: Histogram to check normality

Based on the coefficients of the regression output, as the spot price increases or decrease by one dollar increase or decrease 12 cents in the spread by holding other independent variables constant. 27 cents are very minimal change and it concludes that the spread keeps very closely tight. The smaller the tightness the market is more liquid.

Table 3.3: Co-Efficents of Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.425	.114		3.711	.004
	Spot Price	**.012**	.001	.452	18.249	.000
	Default Rate	**.274**	.300	.029	.915	.382
	Risk Free Rate	**-26.055**	.921	-.783	-28.297	.000

a. Dependent Variable: ETCDS Spread

When the strike price moves upward or downward will have change of 27 cents change in the spread plus or minus. 27 cents plus or minus also not notable change which keeps the

spread movement tighter, hence the ETCDS spread represent the strong liquidity presence in the market by keeping other variables constant.

Risk free rate is negatively linear, whenever there is increase in the rate will decrease the spread and when decreases in it will have negative impact such as increases the spread to compensate the actual rate to buy or sell protection, as risk free rate generally represents the inflation rate of the economy, hence there is no drastic changes can happen, however each basis point change in risk free rate will have 27 basis points or 0.0027% change in the spread. It is negligible or even considering the small marginal change keeps the market still liquid.

Table 3.4: Regression Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.998[a]	0.996	0.994	0.00519

The R^2 is 0.996, which indicates that, the dependent variable ETCDS spread is closely liners to the independent variables such as spot price, strike price, the maturity term, risk free interest rate and probability of U.S. corporate bonds, along with $R^{2,}$ adjusted R square is closely match with and evidence that, the model is fit to explain the defined equation.

Table 3.5: Regression Model Durbin-Watson Summary

Model Summary						
Model	Change Statistics					Durbin-Watson
	R Square Change	F Change	df1	df2	Sig. F Change	
1	0.996	753.996	3	10	0	2.438

The regression model derived Durbin-Watson value is 2.4 which explains the model holds strong significance.

The correlations among variables collinear, hence the standard errors very minimal so the models is significant to express the relationship between ETCDS spread and spot price, strike price, default rate and risk free interest rate.

Table 3.6: Coefficients of the Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.425	.114		3.711	.004	.170	.679					

Spot Price	.012	.001	.452	18.249	.000	.010	.013	.617	.985	.383	.718	1.394
Default Rate	.274	.300	.029	.915	.382	-.394	.942	.754	.278	.019	.445	2.248
Risk Free Rate	-26.055	.921	-.783	-28.297	.000	-28.107	-24.004	-.888	-.994	-.594	.575	1.740

a. Dependent Variable: ETCDS Spread

4. Findings

The results of the regression model and analysis proved that ETCDS have significant power to keep market more liquid and degree of risk at much lower limits by allowing retail investors/investments to unlock credit default swaps market from the traditional institutional participants.

Liquidity: the outcome of the regression analysis evident that the ETCDS product helps to keep bid and ask spreads more tightly, as the foray of retail investors increase the depth of the market.

Degree of Risk: The tighter bid and ask spread defines the accuracy of the possible loss from the underlying assets and derivative contract, as the increase in participants enables the market to create tighter spreads with higher demand and supply, as a result decrease the losses comparatively from the traditional credit default swaps market.

Market Growth: The stronger liquidity and lower degree of risk create superior confidence levels among the extended participants which lead to real development of the credit default swaps market, hereinafter referred as exchange traded credit default swaps market by transforming the market from private places to an organized exchange platform. The organized exchange platforms provide access to the mass investors to access the infrastructure to deal with default heading product. Still the market is open for institutional investors without any fundamental changes in order to buy and sell insurance for the assumed future defaults.

Debt Market: Exchange traded credit default swaps encourage retail investors to develop positive attitudes towards debt market, hence the debt market moves to more transparency to compete with equity markets. The movement establishes investment equilibrium where it controls the major traditional players in the market from the unethical practices.

Regulations: The total transformation process with the help of retail investors helps the exchanges to adhere with regulators policies and guidelines and also forces the regulators to interfere in order to protect the interests of the investors. The reporting structure become very

transparent and helps to avoid any abnormal events in the future with all possible precautionary measures.

5. Conclusion

Exchange traded credit default swaps proved through regression analysis that, it can potentially boost the liquidity and bring down the risk of the existing credit default swaps market. The ETCDS unlocks doors to the retail investors by keeping the existing market objective of insuring default risk. As outlined in the earlier chapters, the research went beyond the traditional boundaries and developed restructured mechanism and named ETCDS product which will fulfill the objectives of the research by boosting confidence levels among the traditional CDS market participants, regulators and economic experts. The retail investors can bring the reforms in the market which riggers strong liquidity and reduces the degree of counterparty risk.

Hence, we strongly recommend securities regulators around world to review ETCDS, test and approval to implement in the real market through organized exchanges and this process will ensure transparency in terms of buying and selling activities, price discovery, and information to formulate decisions to stop future uncertainties.

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