

INNOVATION SCIENCE AND TECHNOLOGY



Scopus || Electronic journal specializing in Scopus

ISSUE 12



Acceptance of papers **December, 2025**



**Acceptance of
papers**

Published monthly



Topics

economics,
technology, social
sciences

ISSN 3060-5229

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THE SCIENTIFIC-POPULAR ELECTRONIC JOURNAL "INNOVATION SCIENCE AND TECHNOLOGY" HAS BEEN REGISTERED UNDER THE NUMBER C-5669633 BY THE AGENCY FOR INFORMATION AND MASS COMMUNICATIONS (AOKA) OF THE REPUBLIC OF UZBEKISTAN, EFFECTIVE FROM OCTOBER 9, 2024.

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The scientific electronic journal "Innovation Science and Technology" has been included in the list of scientific publications recommended for the publication of main scientific results of dissertations for the award of PhD and DSc degrees in economics and technical sciences, in accordance with the Resolution No. 370 of the Presidium of the Higher Attestation Commission of the Republic of Uzbekistan, dated May 8, 2025.

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CREDIT DEFAULT SWAPS AS A WAY TO HEDGE AGAINST FORTHCOMING FUTURE UNCERTAINTIES IN THE DEBT MARKET OF UZBEKISTAN



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Abstract: The main purpose of issuing this article is to underline a specific shortage in Capital Market of Uzbekistan. In greater detail, the absence of derivatives for debt instruments, in particular, corporate bonds as well as banking loans, and this could clearly reduce the entire attractiveness of Uzbek Capital Market for foreign investors. Besides, Uzbekistan's international credit rating (based on S&P Global) is "BB-", meaning "Non-investment grade or speculative". For these reasons, it is advisable to take measures to introduce credit default swaps in order to protect not only investors' portfolios but also commercial banks' balance sheets from the defaults of borrowers. In our work, we have carried out some statistical researches in the following indicators of economy: NPLs ratio (non-performing loans) between 2020-2025; Annual inflation rate between 2016-2025 and National currency value between 2016-2025.

Key words: Credit default swaps (CDS), capital market, S&P global, annual inflation, banking loans.

Annotatsiya: Ushbu maqolani nashr etishdan asosiy maqsad O'zbekiston kapital bozoridagi o'ziga xos tanqislikni ta'kidlashdir. Batafsilroq aytganda, qarz vositalari, xususan, korporativ obligatsiyalar, shuningdek, bank kreditlari uchun derivativlarning yo'qligi va bu O'zbekiston kapital bozorining xorijiy investorlar uchun jozibadorligini sezilarli darajada pasaytirishi mumkin. Bundan tashqari, O'zbekistonning xalqaro kredit reytingi (S&P Global asosida) "BB-" bo'lib, "Investitsiyasiz daraja yoki spekuliyativ" degan ma'noni anglatadi. Shu sabablarga ko'ra, nafaqat investorlarning portfellarini, balki tijorat banklarining balanslarini ham qarz oluvchilarning defoltlaridan himoya qilish uchun kredit defolt svoplarini joriy etish choralarini ko'rish tavsiya etiladi. Biz o'z ishimizda iqtisodiyotning quyidagi ko'rsatkichlari bo'yicha ba'zi statistik tadqiqotlar o'tkazdik: 2020-2025 yillar oralig'ida muammoli kreditlar nisbati (muammoli kreditlar); 2016-2025-yillar oralig'idagi yillik inflyatsiya darajasi va 2016-2025-yillar oralig'idagi milliy valyuta qiymati.

Kalit so'zlar: Kredit defolt svoplari (CDS), kapital bozori, S&P global, yillik inflyatsiya, bank kreditlari.

Аннотация: Основной целью данной статьи является выявление определённого дефицита на рынке капитала Узбекистана. Более конкретно, отсутствие производных финансовых инструментов на долговые инструменты, в частности, на корпоративные облигации, а также банковские кредиты, может, безусловно, снизить общую привлекательность узбекского рынка капитала для иностранных инвесторов. Кроме того, международный кредитный рейтинг Узбекистана (по данным S&P Global) составляет «BB-», что означает «неинвестиционный уровень или спекулятивный». По этим причинам целесообразно принять меры по внедрению кредитных дефолтных свопов (CDS) для защиты не только портфелей инвесторов, но и балансов коммерческих банков от дефолтов заёмщиков. В нашей работе мы провели статистические исследования следующих экономических показателей: уровень NPL (неработающих кредитов) в период 2020-2025 гг.; годовой уровень инфляции в период 2016-2025 гг. и курс национальной валюты в период 2016-2025 гг.

Ключевые слова: кредитные дефолтные свопы (CDS), рынок капитала, S&P Global, годовая инфляция, банковские кредиты.

INTRODUCTION

First and foremost, it is necessary to walk the reader through the crux of credit default swaps or briefly CDS, in other words, how they are generally structured, how they do function and other related factors. According to the Internet source a credit default swap (CDS) is a financial derivative that allows an investor to swap or offset their credit risk with that of another investor. A protection buyer buys a CDS from a protection seller, who agrees to reimburse them if the borrower defaults. Most CDS contracts are maintained via an ongoing premium payment, similar to the regular premiums due on an insurance policy. A lender who is worried about a borrower defaulting on a loan often uses a CDS to offset or swap that risk¹. In more detail, the credit default swaps or CDS, function like insurance products and the main purpose is to protect an insurance buyer from the default of underlying asset, and mainly it could be any debt product such as corporate bonds, MBS (Mortgage-backed securities), CDOs (Collateralized debt obligations) even banking loans and others. Thus, Credit default swaps or CDS contracts are a tool for managing credit risk. Moreover, this derivative instrument could easily provide exposure to credit markets for investors to diversify own portfolios, that is to say, even without directly owning the underlying debt instruments. CDSs provide speculation opportunities for investors to generate profit, and consequently it is important mention that CDS contracts are customizable since they are flexible in terms of structuring to meet investors' needs. However, there are some disadvantages of credit default swaps, in particular, they might be complex for inexperienced investors, they are traded over-the-counter market, due to the absence of centralized clearinghouses the CDS market are less regulated compared with other financial markets. However, now it is time to introduce these credit derivatives to Uzbekistan since its debt market has been growing significantly which might result in higher risk of insolvencies by borrowers. Therefore, the construction of credit default swaps might ease the future probable insolvencies in the debt market.

LITERATURE REVIEW ON THE TOPIC

D.Duffie and K.Singleton[1] study perfectly summarizes the academic and practical foundations of pricing, measuring and managing credit risk. The authors analyze the intensity and structural approaches to modeling credit derivatives, including CDSs, propose methods for estimating model parameters using market data, and explain the methodology for separating the dominant liquidity and spread components. This work provides a theoretical foundation for evaluating CDSs as a risk hedging tool in the government or corporate debt market.

D.Lando[2] in his scientific work has summarized the theoretical and statistical approaches to modeling credit risk in a mature manner. The book covers in detail intensity-based (reduced-form) models, rating-transfer processes, and methods for calculating the correlation of several bonds. Lando offers practical formulas and dependency modeling methods for determining the value of CDS, CDOs and other credit derivatives, which serve as an invaluable tool for designing hedging strategies in emerging markets — for example, the debt market of Uzbekistan.

R.Merton[3] in his study explains the risk structure of corporate debt prices using a classical structural model. The elements of Merton's model are the main theoretical foundation for structurally assessing CDS pricing and default probability. Merton expresses the relationship between a firm's assets and debt obligations using option theory, which is useful in assessing the sustainability of government or corporate debt and the effectiveness of hedging instruments — including CDS. For emerging markets, Merton's approach allows for strategic analysis of credit structure.

F.Longstaff et al.[4] in their article separates the default and liquidity components of corporate spreads using the CDS market. They use CDS data to draw a clear empirical conclusion: in many cases, a large part of the spread is due to default risk, but liquidity conditions also change over time. These results are important for markets like Uzbekistan — CDSs not only help hedge against default, but also help measure and manage market liquidity shocks.

J.Hull[5]'s work on credit derivatives provides a practical overview of the construction of CDSs, forward CDSs, CDS options, and credit valuation (CVA/DVA). Hull's work presents how to use CDSs in the context of central clearing, counterparty risk, and market practices, and provides hedging strategies — essential for assessing the institutional and operational aspects of CDS implementation in emerging debt markets like Uzbekistan.

RESEARCH METHODOLOGY

In this part of our article, we are exploring meticulously how the credit default swaps are constructed in general. Most importantly, we are suggesting to engineer new type of CDS product that would not only

1 <https://www.investopedia.com/terms/c/creditdefaultswap.asp>

cover up the insolvencies of fixed-income products but also could be an appropriate hedging instrument in the loan market, in other words, nowadays there is a gradual increase in the number of non-performing loans (NPLs) in the balance sheets of commercial banks of Uzbekistan. Even, there have been mentioned in the Findings of Financial System Stability Assessment by the Financial Sector Assessment Program (FSAP) team (IMF): «However, stress tests indicate vulnerability to credit risk, which is amplified by the under-reporting of nonperforming loans. The capital adequacy ratio of many banks, especially state-owned banks, would fall below the required minimum under the adverse stress testing scenario resulting in significant recapitalization costs»². Consequently, this is one of the main concerns why we are obsessed about this idea of engineering credit default swaps in Uzbekistan for the purpose of mitigating the risk of defaults not only in fixed-income debts products but also prevent insolvencies in retail banking loans. First and foremost, a roadmap of CDS implementation should be based on the following algorithm: 1) a group of state-owned insurance companies should allocate funds to create syndicated special purpose vehicle that would be in charge of generating credit default swaps targeting at debt instruments regardless of their features, in other words, these swap contracts would ensure not only the liquidity of a bond issuer, but also minimize the risk of insolvencies in retail banking loans. Certainly, this project should be led by the National Agency of Perspective Projects or briefly (NAPP). 2) Legislation could be backed by means of «Regulatory Sandbox» framework which was pointed in the Resolution of the President of the Republic of Uzbekistan RP № 291 «On Additional Measures for the Development of the Capital Market»³. 3) Initially, launching process should be done by selling those credit default swaps to the state financial institutions (state-owned banks, investment companies and others) in the experimental level. 4) After the succeeding in the experimental level, private financial institutions (banks, investment companies or brokerage firms) and retail local investors could also be allowed to take part in purchasing those credit insurance contracts. 5) Finally, foreign institutional investors would be permitted to invest into CDS products. In general, regarding the structure of credit default swaps, there should be engineered two different types of CDS contracts:

- 1) Credit Default Swaps for Fixed-income products or briefly (CDSF);
- 2) Credit Default Swaps for Banking loans or briefly (CDSB); (Figure 1).

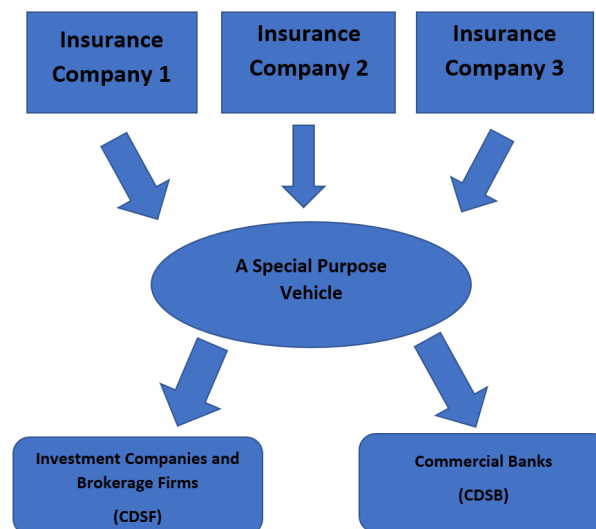


Figure 1. The hierarchy of the entire system

So, a short interpretation of the above Fig.1: let's say three state insurance companies would be responsible to establish A Special Purpose Vehicle that would be in charge of engineering Credit Default Swaps, as mentioned previously, only two types of CDS products such as CDSF credit default swaps for fixed-income products (corporate bonds) and CDSB credit default swaps for banking loans (both corporate as well as retail ones). A Special Purpose Vehicle considered as (Protection seller) and those entities which invest in CDS, regardless of their size, would be (Protection buyers). Certainly, all these procedures should be under the control of the National Agency of Perspective Projects by means of «Regulatory Sandbox». Corporate borrowers would be considered as «reference entities» and retail borrowers would be called as «reference individuals». The structure of each CDS product would be engineered based on the underlying debt instrument,

² <https://www.imf.org/-/media/Files/Publications/CR/2025/English/1uzbea2025003-print-pdf.ashx#:~:text=Policy%20advice:%20The%20authorities%20should,May%2027%2C%202025>

³ <https://lex.uz/ru/docs/7559507>

for instance, an investor purchases X company's a 5-year corporate bond (in UZS) that yields 20.5% coupons annually, but the investor is concerned about X company defaulting. For this reason, A Special Purpose Vehicle would construct CDSF based on the request of the investor, and according to the international standards set by ISDA (International Swaps and Derivatives Association) a protection buyer would in charge of make quarterly payments till a credit event (default) happens, in our example above the investor would be responsible to make quarterly payments until a credit event happens, if the reference entity (X company) does not default on its a 5-year corporate bond, the investor would lose partially yields from the bond. The calculation would be run in the following form: 2.5% quarterly payments out of 20.5% yields of the X company's corporate bonds: $2.5\% \times (4 \times 5) = 50\%$. In total, the investor should pay 50% out of 105.2% total return (20.5% annually x 5 years), and in case of default, the protection seller (SPV) would be obliged to offset a notional principal of the X company's corporate bonds to the investor. Regarding CDSB (Credit Default Swaps for Banking loans), a protection buyer (commercial bank) should make a quarterly payment from a loan interest that is paid monthly by a borrower.

ANALYSIS AND RESULTS

We gathered some historical statistics about annual inflation rate, exchange rate, a number of non-performing loans (NPL), to represent the necessity of CDS products to be engineered in Uzbekistan. Besides, we ran a Modified Poisson Regression model in Stata to find out risk ratios between economies with CDS market and economies without CDS market. Simultaneously, in Stata software, we managed to run Log Binomial Regression model to identify the relationship among Average Lending Rates (Y) with Inflation Rate (X_1), Interest Rates (X_2) between 2014-2025 years to display how far it is crucial to introduce CDSB (Credit Default Swaps for Banking loans) contracts for the purpose of eliminating insolvency problems in the banking sector of Uzbekistan. First and foremost, statistics about annual inflation rate between 2016-2025 in Uzbekistan, that clearly illustrates how far the inflation rate has been unpredictable, in other words, a monetary policy of Uzbekistan has not been effective to bring inflation down to a target, hence this could adversely affect macroprudential policy⁴ of the economy. As a consequence, commercial banks have been charging higher interest for loans regardless of their types, corporate as well as retail ones, for instance, according to official statistics, in 2024, average corporate loans ranging from approximately 24% to 36% per annum (Figure 2).

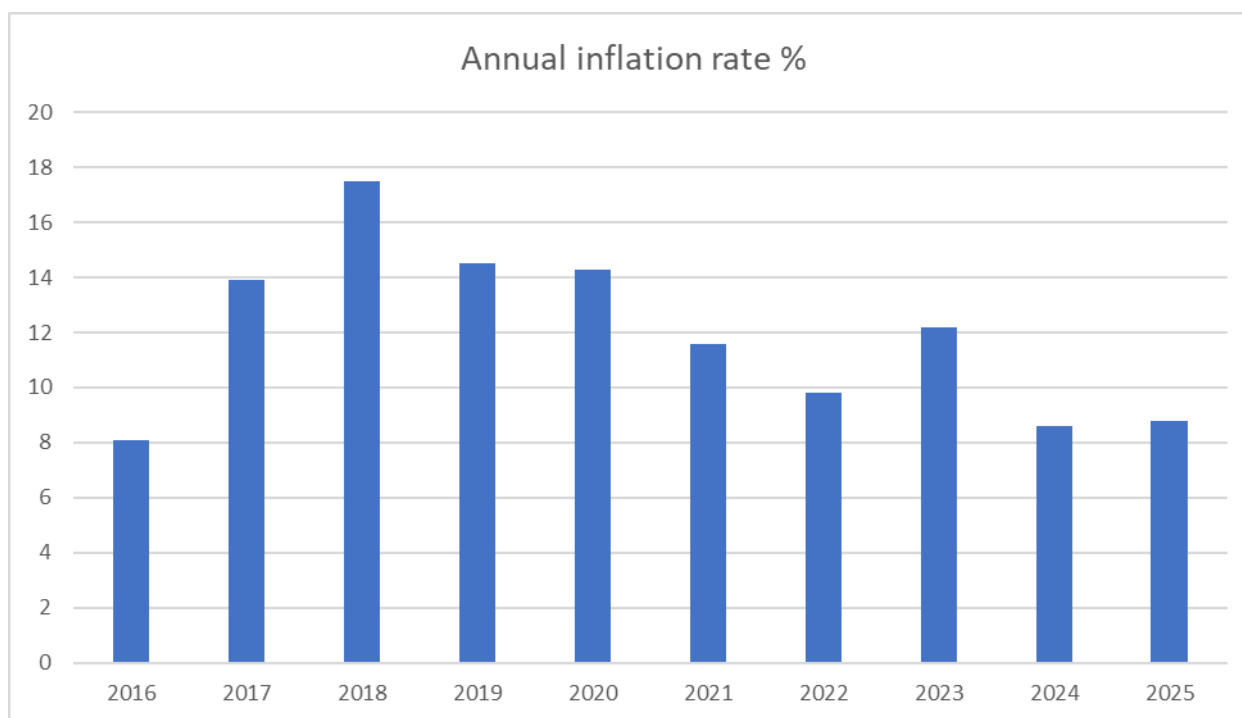


Figure 2. Annual Inflation Rate in Uzbekistan (2016-2025).

The bar graph above does illustrate annual inflation rate in Uzbekistan for almost a decade period between 2016-2025 years. Overall, what stands out from the graph is that in 2018 the economy experienced the highest

⁴ Macroprudential policy involves regulations and measures designed to reduce systemic risk and strengthen the overall resilience of the financial system to shocks.

inflation rate in the given chart, accounting for 17.5%. The lowest inflation rate transpired last year, in 2024, made up just over 8.5 percent, based on the bar graph. As it is clear that in 2016, our economy recorded exactly 8% of annual inflation rate, but abruptly this proportion reached 13.9 percent in the following year, by 2017, being remarkably more than a previous rate. And this growing trend was captured in 2018, that is to say, annual inflation rate peaked at 17.5 percent, as it was mentioned prior, it was by far the largest inflation rate recorded in the given chart. However, by 2019, Central bank could somehow have managed to decrease annual inflation rate to nearly 14% (14.5), and from that period our monetary policy succeeded to decline annual inflation rate till 9.8% by 2022. Nevertheless, suddenly, in 2023, annual inflation rate accelerated and grew 12.2 percent, and that is due to geopolitical tensions in the world, in other words, the entire global economy collided with a high inflation rate caused by rising oil prices in the world. All in all, the latest data shows that annual inflation rate made up 8.8% which is still higher than target rate (5%). To be more precise, the main purpose of depicting this data is to disclose how far is annual inflation rate plays a key role in borrowing cost of debt instruments which might lead to a high insolvency rate of debtors (borrowers) in the economy, consequently it results in the significance of developing Credit Default Swaps in the economy.

Next is a table of exchange rate or foreign currency value against national ones US dollars against Uzbek Soums (USD/UZS) between 2016-2025 (Table 1).

Table 1. Currency value USD/UZS (2016-2025)

Date	Currency value (USD/UZS)
01.09.2016	3,020.00
01.09.2017	8,076.00
01.09.2018	8,085.00
01.09.2019	10,321.21
01.09.2020	10,692.00
01.09.2021	11,004.94
01.09.2022	12,205.00
01.09.2023	12,734.99
01.09.2024	12,734.99
01.09.2025	12,160.00

This table is one of the important datasets that shows why it is so necessary to introduce Credit Default Swaps so as to hedge against volatility in currency exchange since many businesses have issued USD-denominated bonds in the foreign Capital Markets such as (London Stock Exchange, Vienna Stock Exchange and others). Initially, in 01.09.2016 1 USD cost 3,020.00 UZS, but by next analogous year, 1 USD sharply appreciated by 8,076.00 UZS which was caused by currency liberalization reforms in the country⁵, and this rate remained stable around 8,085.00 UZS in the following year of 01.09.2018, only increasing to 9 UZS from the previous exchange rate. However, abruptly 1 USD remarkably appreciated to 10,321.21 UZS, making it difficult to serve USD-denominated debt instruments in the market of 01.09.2019. By 01.09.2020, US dollar increased to 10,692.00 UZS, which was expensive more than 370.79 UZS compared to the previous exchange rate in 2019. Again, it is visible how US dollar strengthened against national currency, and it reached 11,004.94 UZS for 1 USD, data as of 01.09.2021. Following this upward trend in USD, by 01.09.2022, 1 USD cost already 12,205.00 UZS, and this exchange rate stayed flat at 12,734.99 UZS between 01.09.2023 and 01.09.2024, respectively. Finally, by 01.09.2025, UZS gained value against USD, in other words, by this date, 1 USD = 12,160.00 UZS, but it is important to mention that there is a stable daily fluctuation in the exchange rate (Table 2).

5 <https://www.worldbank.org/en/country/uzbekistan/publication/economic-update-summer-2019#:~:text=Uzbekistan%20is%20implementing%20ambitious%20market,for%20both%20firms%20and%20individuals.>

Table 2. A number of Non-Performing Loans as of Total Loan Portfolio (2020-2025)

Years	Total loan portfolio	NPL
2020	249 756	5 887
2021	302 693	18 889
2022	346 390	16 936
2023	430 227	15 743
2024	500 644	20 820
2025	576 247	22 554

And this table provides a number of Non-performing loans as of Total loan portfolio in the commercial banks of Uzbekistan between 2020-2025 years. In general, it can be seen that there is a positive correlation between total loan portfolio as well as NPL numbers, in other words, as the loan portfolio has increased, and consequently there has been an upward trend in the number of non-performing loans in turn. Surely, this a normal trend, that is to say, many countries have been facing with this problem, but it is important to mention that the average lending rate differs from 22,5% to 30%, even some foreign banks in Uzbekistan might charge from 40% up to 49% for lending. Thus, it is about time to contemplate to engineer CDSB (Credit Default Swaps for Banking loans) instruments to hedge against the default of borrowers for their loans.

As we mentioned above, we also ran a couple of regression models by means of Stata software to analyze correlations between variables, in particular, we opted for two regression models: 1) Modified Poisson Regression model which combines a log Poisson regression model with robust variance estimation, it provides a robust method for estimating relative risks and prevalence ratios in binary outcome analyses. 2) Log Binomial Regression model which is a generalized linear model used to study how predictor variables affect a binary (yes/no) outcome. And all these models run in Stata software. In the first model, which is a modified Poisson regression, we collected historical dataset of risk ratio which is (Y) dependent variable and economies with CDS market (X_1) first independent variable and economies without CDS market (X_2) second independent variable for 2004-2025 years. To find out a robust method for estimating relative risks in two independent variables (X_1, X_2) and their prevalence ratios in binary outcome analyses (Figure 3).

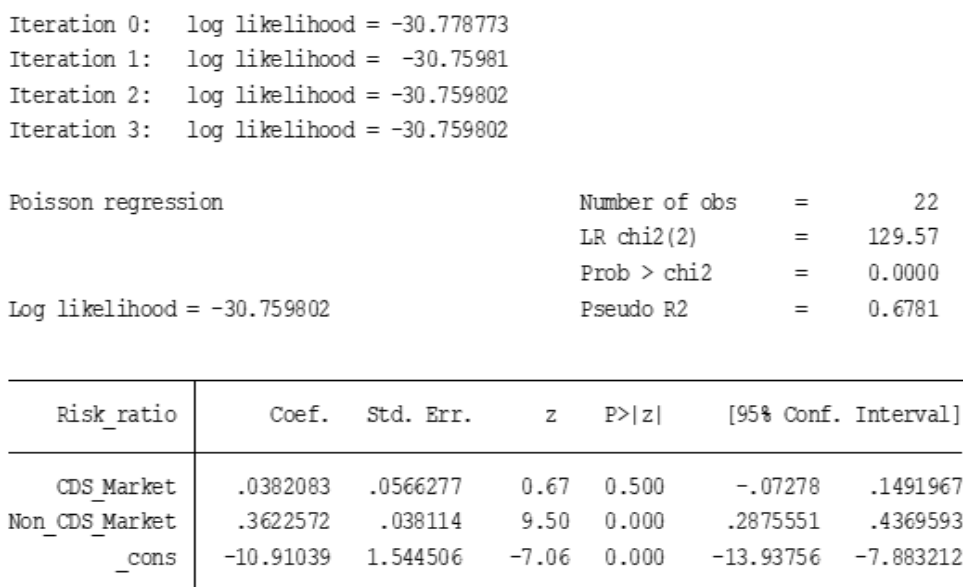


Figure 3. Modified Poisson Regression Model.

Here, in the model, Risk ratio is Y which is dependent variable, CDS Market is X_1 (first independent variable), and of course Non CDS Market is X_2 being the second independent variable. Firstly, a number of iterations ranges from 0-3 and log likelihood is equal to -30.7 which is negative, indicating a model fit. Number of observations is 22, next is LR ch2(2) is a likelihood-ratio test comparing a full model to a nested model

with two fewer predictors, indicating whether those two predictors' coefficients are jointly significant (not equal to zero). In our test, $LR\ ch2(2) = 129.57$ that means the model significantly fits the data. Pseudo R-squared provides a measure of how well the chosen Poisson model fits the observed count data. According to our test, Pseudo R-squared = 0.6781, suggesting that the model's covariates explain a significant portion of the variation in the dependent count variable, signifying a good relative fit of the model to the data. By looking at the table it is visible there are 5 main columns that depict the outcome of model. First is Coef. Which stands for Coefficient and represents the estimated change in the log of the expected count for each one-unit increase in a predictor variable, holding other predictors constant. For instance, based on our model, if a number of Non-CDS Market (X_2) increases to one unit, and this would lead to 0.3622572 units or 36 % of upward trend in Risk-ratio (Y) in the world economy, in other words, the probability of default risk notably rises due to the absence of CDS (credit default swaps) instruments in the economy to 36%. On the other hand, if a number of CDS Markets (X_1) increases to 1 unit, this would result in 0.0382083 units or 4 % in Risk-ratio (Y) in the global economy. To be more precise, the probability of default risk constitutes only 4% due to the existence of CDS (credit default swaps) instruments in the economy. Meanwhile, Standard Error shows 0.0566277 and 0.038114 for both independent variables, suggesting an extremely unlikely result, often indicating an issue like a lack of variation in the predictor variable, meaning the variable is constant for all observations. Next is the "z" in "z-score" refers to a test statistic, calculated as the estimate of a regression coefficient divided by its standard error. A larger |z-score| (greater than 1.96 for a 95% confidence level) suggests that the predictor variable has a statistically significant effect on the outcome. And regarding our model z-score for X_1 makes up 0.67 units so it denotes that there is not a significant relationship between Risk-Ratio (Y) and CDS Markets (X_1), but Non-CDS Markets does account for 9.5 which suggests there is a statistically strong relationship between Risk-Ratio and Non-CDS Markets (X_2), in other words, as long as the absence of CDS instruments is high, there is a high probability of default risk in the economy (Figure 4).

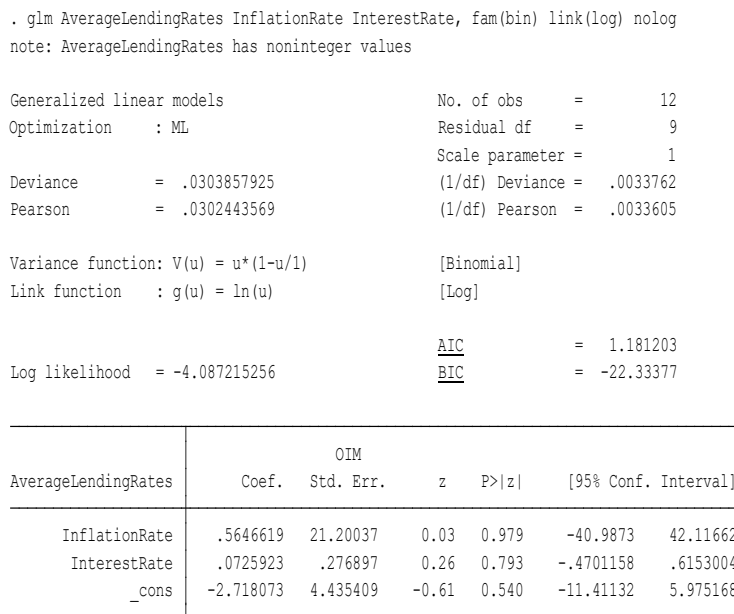


Figure 4. Log Binomial Regression Model

Here, in the model, Average Lending Rates is Y (dependent variable), Inflation Rate is X_1 (first independent variable) and Interest Rate is X_2 (second independent variable). We ran this model to identify which independent variable affects more dependent variable, in greater detail, to analyze whether inflation rate or interest rate has a strong significant relationship with average lending rates. According to the outcome of the model, Coef. which is coefficient, suggesting if inflation rate (X_1) increases to 1-unit average lending rate goes up to 0.5646619 or 56%, and this means that there is a significant correlation between X_1 and Y, in other words, inflation rate highly affects the variation of average lending rates. Meanwhile, interest rate does not have much influence on average lending rates since based on the model if interest rate rises to 1-unit then average lending rates climbs to 0.0725923 or just 7%. In respect of Standard Error (Std. Err.), there is a high standard error being 21.2 for X_1 , and it signifies high uncertainty in the model's estimate of a particular coefficient, meaning the coefficient's true value is likely far from the estimated value. However, there is a low standard error in X_2 that suggests greater precision for that specific coefficient, implying the estimate is

a reliable representation of the true relationship between the predictor and the outcome. In general, it is visible how far inflation highly affects average interest rates, which means central bank's interest rate does not have sufficient influence on the average lending rates in the economy.

To sum up, all these indicators represent that it is important to introduce credit default swaps to the economy of Uzbekistan to prevent future uncertainties in the financial sector. What is more, it is noteworthy that a corporate bond trading volume at Tashkent Stock Exchange for the first half of the year amounted to 493.10 billion soums, more than eight times higher than the same period last year. The average daily trading volume on this market was 4.01 billion soums, with an average number of transactions of 34. The total market value of bonds included in the quotation list was 1.46 trillion soums. Seventeen bond issues were listed. And this data shows that there is a tremendous growth in the issuing corporate bond numbers in the economy, meaning there should be developed CDS instruments to hedge against insolvency problems in the debt market.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, credit default swaps (CDS) can be an important tool in reducing future uncertainties, managing credit risk, and increasing the stability of the investment environment in the Uzbek debt market. The analysis shows that in the absence of a CDS market, hedging opportunities are limited, as a result of which government and corporate debt issuers remain sensitive to price fluctuations in international financial markets. International experience shows that the use of CDSs provides an additional mechanism for determining credit quality, assessing the probability of default, measuring liquidity risk, and providing investors with an additional protection mechanism. The CDS market also plays an important institutional role for the transparency of debt instruments and the correct formation of risk premiums

Based on the analysis, the following proposals are put forward:

- ❖ Creating the necessary legal and institutional framework for the use of credit derivatives, in particular CDS instruments, in the Uzbek financial market;
- ❖ Develop methodological guides for regulators, banks, and corporations on CDS pricing, credit risk modeling, and hedging;
- ❖ Improve credit ratings in collaboration with international rating agencies, and create a transparent database of debt instruments;

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Proofreader: Zokir ALIBEKOV

Layout and Designer: Oloviddin Sobir ugli

2025. № 12

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