

American Journal of Economics and Business Management

Vol. 9 Issue 3 | **pp.** 811-825 | **ISSN:** 2576-5973

Available online @ https://www.globalresearchnetwork.us/index.php/ajebm

Article

Business Valuation of Companies Based on International Credit Ratings

Giyos Toxirovich Tashpulatov[1]

1. doctor of Science (DSc), Graduate School of Business and Entrepreneurship under the Cabinet of Ministers of the Republic of Uzbekistan

* Correspondence: gtashpulatov@gmail.com

Abstract: Purpose. This study develops a transparent and reproducible approach to integrating international credit ratings into business valuation without treating ratings as direct measures of equity value. Design and methodology. Financial indicators for Microsoft, Oracle, IBM, Salesforce and Adobe for FY2021–FY2025 are compared using official filings. Revenue, operating cash flow, capital expenditure and a free-cash-flow (FCF) proxy inform a five-year discounted cash flow (DCF) model. Credit ratings are translated into analytical credit spreads, the cost of debt and weighted average cost of capital (WACC). Favorable and adverse scenarios adjust credit spreads by 35 basis points. Findings. Stronger credit quality reduces the assumed cost of debt and, other factors held constant, raises modeled enterprise value. However, operating scale, cash-flow generation, growth and capital intensity often exert a greater influence on differences between companies. The results are illustrative model estimates rather than observed market prices. Originality and practical implications. The proposed rating–spread–cost of debt–WACC–DCF framework links credit assessment to valuation assumptions and emphasizes documentation of sources, valuation dates and sensitivity tests. For unrated enterprises in Uzbekistan, a synthetic-rating approach based on financial stability, cash-flow quality, business profile, governance and external risks is proposed. Limitations. The analysis uses a small purposive sample, non-aligned fiscal year-ends, assumed spreads and an FCF proxy rather than fully adjusted unlevered free cash flow to the firm.

Keywords: business valuation, credit rating, DCF, WACC, credit spread, free cash flow.

Citation: Tashpulatov G. T. Business Valuation of Companies Based on International Credit Ratings. American Journal of Economics and Business Management 2026, 9(3), 811-825.

Received:4th Jan 2026
Revised: 10th Feb 2026
Accepted: 15th Mar 2026
Published: 26th Mar 2026

Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/)

1. Introduction

This situation increases the need to consider credit quality, financial stability and access to capital alongside forecast cash flows when valuing digital companies.

To address this problem, a credit rating should be integrated into the cost of debt through the credit spread and then into the weighted average cost of capital, WACC, rather than equated directly with business value.

The relevance of this topic to Uzbekistan is reinforced by the development of the national capital market, the transformation of major state-owned enterprises, privatization, the expansion of the corporate bond market and the need to raise capital for investment projects.

This study examines financial indicators and international credit ratings of five companies operating in the global software and enterprise information technology markets over 2021–2025.[1]

The financial indicators used in the study were obtained from the U.S.

Each observation in the cross-company analysis is therefore aligned with the relevant fiscal year-end. Non-aligned reporting periods may introduce differences in market and macroeconomic conditions; this is treated as a comparability limitation when interpreting the results.

Table 1 shows substantial differences in operating scale and capital expenditure among the selected companies. Microsoft leads in revenue, operating cash flow and the FCF proxy.

Table 1. Key Indicators of the Selected Companies for FY2025 [2]

Company	FY2025 year-end	Revenue	Operating income	CFO	CAPEX	FCF proxy
Microsoft	2025-06-30	281.72	128.53	136.16	64.55	71.61
Oracle	2025-05-31	57.40	17.68	20.82	21.21	-0.39
IBM	2025-12-31	67.53	0.00	13.19	1.09	12.10
Salesforce	2025-01-31	37.90	7.21	13.09	0.66	12.43
Adobe	2025-11-28	23.77	8.71	10.03	0.18	9.85

Note: FCF proxy = operating cash flow − capital expenditure. This is not fully adjusted unlevered FCFF; the after-tax treatment of interest expenses and certain classifications may differ across companies.

The procedures in Table 2 are designed to ensure traceability, comparability and reproducibility.

Table 2. Research Data Compilation and Quality Control Procedures[3]

Field	Content	Control
Object ID	Company–fiscal year	Unique
Valuation date	Reporting period-end	Required
Source	SEC XBRL and rating source	Primary
Price or value type	Model enterprise value	Not a market price
Income measures	Revenue, income, CFO	Standardized
Validation	Subsequent rating or transaction	Where available

2. Materials and Methods

The methodology comprises standardizing the selected companies' financial indicators, establishing baseline cash.

Revenue compound annual growth rates, CAGR, for 2021–2025 were calculated to determine forecast growth:

$$CAGR = \left(\frac{Revenue_{2025}}{Revenue_{2021}}\right)^{\frac{1}{4}} - 1$$

Here, $Revenue_{2021}$ and $Revenue_{2025}$ denote revenue in the initial and final fiscal years, respectively; four is the number of annual intervals between the observations.

This restriction reduces unsupported assumptions that high historical growth will persist indefinitely. The company is assumed to enter a stable state in the terminal period, with long-term growth set at g = 3%.

The cost of equity was calculated using the capital asset pricing model, CAPM:

$$K_e = R_f + \beta \times ERP$$

Here, K_e is the cost of equity; R_f is the risk-free rate; β measures the sensitivity of company share returns to market returns; and ERP is the equity market risk premium.[4]

The cost of debt was defined as the sum of the risk-free rate and the rating-based credit spread:

$$K_d = R_f + Spread_{rating}$$

Here, K_d is the pre-tax cost of debt and Spread_rating is the spread assigned to the relevant rating category.

WACC was calculated using the target capital structure weights of equity and debt:

$$WACC = \left(1 - \frac{D}{V}\right)K_e + \frac{D}{V}K_d(1 - T)$$

Alternatively,

where V = D + E:

Here, E is the market value of equity; D is the value of interest-bearing debt; V is total invested capital; and T is the corporate income tax rate. The baseline model assumes T = 21%. Multiplication of the cost of debt by (1 − T) incorporates the interest tax shield.

Because fully comparable FCFF components were not available for every observation, the empirical comparison uses a simplified cash flow measure, the FCF proxy:

$$FCF_{proxy} = CFO - CAPEX$$

Here, FCF proxy denotes the simplified free cash flow measure; CFO is cash flow from operating activities; and CAPEX is expenditure on property, plant, equipment and other long-term assets.[5]

To reduce excessive sensitivity to a single year's capital expenditure or working capital changes, baseline cash flow was set equal to the arithmetic average of the FCF proxies for 2023–2025:

$$FCF_0 = \frac{FCF_{2023} - FCF_{2024} + FCF_{2025}}{3}$$

The three-year average smooths one-off capital expenditure shocks and provides a relatively stable representation of normalized cash flows.

Forecast cash flows were calculated from baseline FCF and the assumed forecast growth rate:

$$FCF_t = FCF_0(1 + g_f)^t, \qquad t = 1, \ldots, 5$$

Here, FCF_t is free cash flow in forecast year t; FCF_0 is normalized baseline free cash flow; g_f is the assumed annual forecast growth rate; and t = 1, …, 5 denotes the five-year forecast horizon.

Enterprise value was determined as the sum of the present values of five years of forecast cash flows and terminal value:

$$EV = \sum_{i=1}^{5} \frac{FCF_t}{(1 + WACC)^t} + \frac{TV}{(1 + WACC)^5}$$

Here, EV is enterprise value; FCF_t is forecast free cash flow in year t; WACC is the weighted average cost of capital; TV is terminal value beyond the explicit forecast period; and five is the number of forecast years.

Enterprise value was calculated as the sum of discounted free cash flows over the five-year forecast period and the present value of terminal value at the end of that period. Both components were discounted to the valuation date using WACC.[6]

Terminal value was calculated using the Gordon constant-growth model:

$$TV = \frac{FCF_6}{WACC - g} = \frac{FCF_5(1+g)}{WACC - g}$$

Here, TV is terminal value at the end of the forecast horizon; FCF_5 is free cash flow in the fifth forecast year; FCF_6 is free cash flow in the first post-forecast year; and g is the long-term stable growth rate.

$$FCF_6 = FCF_5(1+g)$$

For the formula to be economically and mathematically meaningful, the following condition must hold:

$$WACC > g$$

Terminal value was calculated using the Gordon constant-growth model, assuming that cash flows grow steadily at the long-term rate g after year five. WACC must exceed the stable growth rate for the model to have economic meaning.

Here, EV is enterprise value; FCF_t is forecast cash flow in year t; TV is post-forecast terminal value; and g is the stable growth rate. The condition WACC > g must hold.

The effect of credit rating changes on enterprise value was assessed under baseline, favorable and adverse scenarios.

$$Spread_{positive} = Spread_{base} - 0{,}35\%$$
$$Spread_{negative} = Spread_{base} + 0{,}35\%$$

Here, Spread_base is the baseline spread, Spread_positive is the favorable-scenario spread and Spread_negative is the adverse-scenario spread. A change of 0.35 percentage points equals 35 basis points:

35 basis points = 0.35 percentage points

The favorable scenario reduces the baseline spread by 35 basis points to reflect improved credit quality.[7]

The cost of debt, WACC and enterprise value were recalculated for each scenario. The ±35-basis-point change is an analytical sensitivity parameter rather than a market forecast or a rating agency conclusion.

The assumed R_f = 4.25%, ERP = 4.50%, T = 21%, terminal growth g = 3% and rating-based spreads are not fixed regulatory benchmarks.

Baseline FCF is the average FCF proxy for 2023–2025, reducing the effect of a single-year capital expenditure shock.

The model assumes a risk-free rate of 4.25%, an equity risk premium of 4.50% and a tax rate of 21%. These parameters should be replaced with market data applicable at the valuation date.

5 Financial Trends over 2021–2025

Table 3 shows that Microsoft has the highest revenue and operating margin.

These results demonstrate the limitations of basing value on a single year's indicator. Companies experiencing rapid changes in capital intensity require normalized CAPEX, multiyear average cash flows and separate investment-cycle scenarios.

Table 3. Revenue and Profitability Trends of the Selected Companies over 2021–2025 [8]

Company	2021 revenue	2025 revenue	CAGR	Operating margin	FCF margin
Microsoft	168.09	281.72	13.8%	45.6%	25.4%
Oracle	40.48	57.40	9.1%	30.8%	-0.7%
IBM	57.35	67.53	4.2%	0.0%	17.9%
Salesforce	21.25	37.90	15.6%	19.0%	32.8%
Adobe	15.79	23.77	10.8%	36.6%	41.4%

Revenue growth creates value when incremental revenue converts into operating cash flow and generates returns exceeding the capital investment needed to support it.

6 Comparative Analysis of Credit Ratings

As Table 4 shows, Microsoft's AAA/Aaa rating represents the strongest credit profile in the sample.

Table 4. International Credit Ratings and Model Spreads of the Selected Companies [9]

Company	S&P	Moody's	Fitch	Model rating	Assumed spread
Microsoft	AAA	Aaa	NR	AAA	0.60%
Oracle	BBB	Baa2	BBB	BBB	1.75%
IBM	A-	A3	A-	A-	1.35%
Salesforce	A+	A2	NR	A+	1.10%
Adobe	A+	A2	NR	A+	1.10%

Three principles govern comparison: agency scales are broadly comparable but not identical; rating dates must match the valuation date; and incorporating subsequent rating changes into historical valuations creates look-ahead bias.

A higher rating does not necessarily imply the largest DCF value. Value depends on business scale, growth, margins and reinvestment needs, whereas ratings primarily reflect downside risk, liquidity and debt service capacity.

7 WACC and DCF Results

The enterprise values in Table 5 are illustrative outputs based on model parameters, not market capitalizations or investment recommendations.

Table 5. Rating Adjusted WACC and DCF Results [10]

Company	Baseline FCF	Growth	WACC	Baseline EV	Favorable EV	Adverse EV
Microsoft	68.39	8.3%	8.29%	1671.85	1676.31	1667.40
Oracle	6.63	5.5%	7.92%	154.80	157.02	152.63
IBM	12.40	3.0%	7.16%	306.73	311.91	301.72
Salesforce	9.42	9.3%	8.80%	219.03	219.89	218.18
Adobe	8.22	6.5%	8.70%	172.48	173.33	171.64

Microsoft has the largest model enterprise value because of its scale and stable cash flows.

8 Sensitivity Analysis and Stress Testing

An identical spread shock has a stronger effect where the debt share is higher.

The Table 6. model interprets a high rating as a factor reducing financing costs rather than automatically classifying a company as a good business. Low WACC alone cannot guarantee high value if profitability is weak or reinvestment is excessive.

Table 6. Credit Rating and Cash Flow Scenarios[11]

Scenario	Change	Description	Effect
Favorable	Spread −35 bp	Improved credit conditions	WACC ↓, EV ↑
Baseline	0 bp	FY2025 reference	Central estimate
Adverse	Spread +35 bp	Rating pressure	WACC ↑, EV ↓
CAPEX shock	Lower FCF	Infrastructure investment	Lower EV
Growth shock	g −1 pp	Slower subscription growth	Lower TV

3. Results and Discussion

The study yields three empirical conclusions.

Microsoft illustrates a strong value profile when credit quality and operating efficiency coincide.

The research contribution comprises integrating ratings through a transparent credit spread function rather than a.

10 Improvements for the Context of Uzbekistan

Many Table 7. enterprises in Uzbekistan lack international issuer ratings.

Table 7. Synthetic Rating Components and Preliminary Weights for Enterprises in Uzbekistan [12]

Component	Indicators	Weight
Financial stability	Net debt/EBITDA, interest coverage, CFO/debt	35%
Business profile	Market share, diversification, recurring revenue	20%
Cash flow quality	FCF margin, working capital volatility	20%
Governance and transparency	Audit, IFRS, related parties	15%
External risk	Currency, country, industry cycle	10%

The final score is mapped to a rating range but must be calibrated against local defaults and debt spreads. Where data are insufficient, valuers should avoid false precision and use wider ranges and higher risk premiums.

A Table 8. national rating–spread matrix should be updated quarterly using government yield curves, corporate bond transactions, bank loans and default statistics. Disclosure of sources, sample sizes and liquidity adjustments improves the verifiability of valuation reports.

11 Practical Procedure for Valuers

Table 8. Procedure for Applying a Rating Adjusted DCF Model[13]

Step	Action	Control
1	Define valuation date and basis of value	No look-ahead bias
2	Collect 3–5 years of audited data	Source passport
3	Normalize one-off items and CAPEX	Normalized FCF
4	Determine official or synthetic rating	Rating rationale
5	Map rating to a market spread	Date-consistent spread
6	Calculate CAPM, cost of debt and WACC	Disclosed formulas
7	Build a three-scenario DCF	Value range
8	Cross-check against multiples	Reasonableness check
9	Validate against subsequent events	Back-testing
10	Disclose limitations	Transparency

The Excel model automates calculations. Yellow cells contain user-adjustable assumptions; other calculations are linked by formulas. Valuers should replace rating spreads, beta, debt shares, forecast growth and terminal growth with market data applicable at the valuation date.

For rated companies, the agency assessment is a starting point and should be checked against actual bond yields. For unrated companies, synthetic ratings are developed using peer ratios. Dollar cash flows must be discounted at dollar rates and soum cash flows at soum rates.

12 Limitations and Future Research

Limitations include a sample of only five large U.S. issuers; an FCF proxy rather than fully adjusted FCFF;.

Future research could combine quarterly data, corporate bond option-adjusted spreads, rating outlook and watch status, CDS spreads, market capitalization and EV/Revenue and EV/EBITDA multiples.

For Uzbekistan, a Figure 1. priority is to assemble anonymized panel data on valued enterprises, bank loans, corporate bonds and subsequent actual transactions. This would support local calibration of synthetic ratings and out-of-sample testing of valuation errors.

13 A Methodology for Integrating Synthetic Ratings into Business Valuation in Uzbekistan[14]

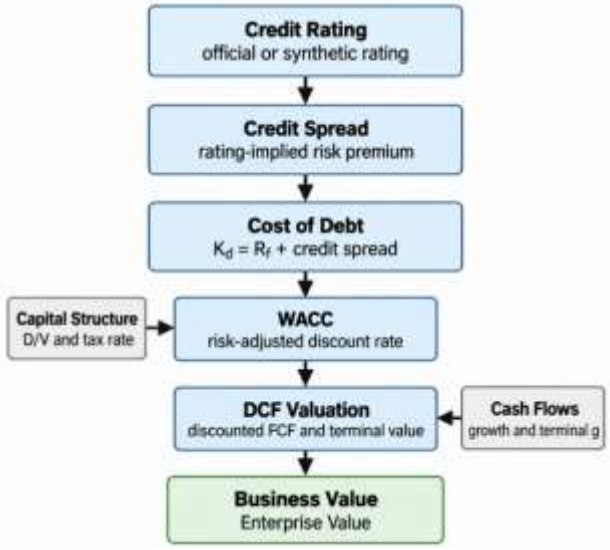


Figure 1. Logical Framework for Integrating Credit Ratings into Business Valuation

As Figure 1 shows, the proposed methodology has three interrelated modules.

The methodology can be applied to joint-stock companies, state-owned enterprises, private manufacturers and service businesses.

The valuation date is the common information cutoff for every module.

13.1 Data Preparation

At least three years of financial statements should be collected, preferably five.

The source hierarchy is audited IFRS statements; stock exchange and corporate disclosure portals; tax and statistical data; bank confirmations; management accounts; and expert information. A data passport records each figure's source, date, currency, audit status and adjustments.

14 Calculating a Synthetic Rating

For Table 9. enterprises without official ratings, a synthetic rating combines financial stability, cash flow quality, business profile, governance and external risks into one score.

Table 9. Indicators and Weights in the Extended Synthetic Rating Model[15]

Component	Indicators	Weight
Leverage	Net debt/EBITDA; Debt/Capital	20%
Debt service	EBIT/Interest; CFO/Interest	20%
Cash flow	FCF/Debt; CFO/Debt; FCF margin	20%
Profitability	EBITDA margin; ROIC; ROA	15%
Liquidity	Current ratio; Cash/short-term debt	10%
Business profile	Diversification; market share	10%
Governance	Audit; IFRS; disclosure	5%

Indicators are normalized to a 0–100 scale. The following expressions are applied to indicators for which higher or lower values, respectively, are preferable.

1. Indicators for which higher values are preferable:

$$S_{ij} = 100 \times \frac{X_{ij} - X_{min}}{X_{max} - X_{min}}$$

Here, S_{ij} is the normalized score of enterprise i for indicator j; X_{ij} is the observed indicator value; X_min and X_max are the sample minimum and maximum. Index i denotes the enterprise and j denotes the rating indicator.

This formula applies to indicators such as interest coverage, cash flow margins, profitability, liquidity and debt service capacity. A higher value produces a higher normalized score: the sample minimum receives zero and the maximum receives 100.

2. Indicators for which lower values are preferable:

$$S_{ij} = 100 \times \frac{X_{max} - X_{ij}}{X_{max} - X_{min}}$$

This formula applies to leverage, Net debt/EBITDA, Debt/Capital, cash flow volatility, currency risk and customer concentration.

If X_max = X_min, the denominator is zero and the indicator does not distinguish companies. It should therefore be excluded or assigned the same neutral score, such as 50, for every observation.

Normalization places indicators with different meanings and units on a common scale. These scores are then aggregated using specified weights to calculate the enterprise's composite synthetic rating score.

Normalized indicators are combined into a weighted composite rating:

$$IRS_i = \sum_{j=1}^{n} \omega_j S_{ij}, \sum_{j=1}^{n} \omega_j = 1$$

Here, IRS_i is the composite synthetic rating score of enterprise i; S_{ij} is its normalized score for indicator j; ω_j is the indicator weight; and n is the number of indicators. The weights must sum to one, or 100%.

The composite rating is calculated by multiplying normalized indicators by their assigned weights and adding the results. All weights must sum to one. A higher composite score indicates relatively stronger credit quality and financial stability.[16]

15 Translating Ratings into Credit Spreads

The credit spread is the main link between ratings and business value. It is defined as the difference between corporate and risk-free yields of the same maturity:

$$CS_{r,m} = Y_{corp,r,m} - Y_{rf,m}$$

Here, $CS_{r,m}$ is the spread for rating category r and maturity m; $Y_corp_{,r,m}$ is the yield on a corporate bond with that rating and maturity; $Y_rf_{,m}$ is the risk-free yield of the same maturity; r denotes the rating category and m the remaining term.

The spread is the difference between corporate and risk-free bond yields in the same currency and at comparable maturities. It represents the additional return investors require for the issuer's credit risk.

Where local observations are scarce, spreads are triangulated from corporate bonds, effective bank lending rates, international bonds issued by domestic companies and issuers in comparable countries.

The cost of debt incorporates the rating spread, a liquidity premium and additional specific risk:

$$K_d = R_f + CS_{rating} + LP + SP$$

Here, K_d is the pre-tax cost of debt; R_f is the risk-free rate; CS_rating is the rating-based spread; LP is the liquidity premium; and SP is an additional premium specific to the enterprise or debt instrument.

The cost of debt is the sum of the risk-free rate, rating-based spread, liquidity premium and specific risk premium.

For example:

$$K_d = 4{,}25\% + 4{,}00\% + 0{,}50\% + 0{,}25\% = 9{,}00\%$$

The resulting pre-tax cost of debt is 9%. Premiums already included in the credit spread must not be added again, as this would double count risk.

The after-tax cost of debt is calculated as follows:

$$K_{d,net} = K_d(1 - T)$$

Here, K_d,net is the after-tax cost of debt; K_d is the pre-tax cost; T is the corporate income tax rate; and (1 − T) captures the interest tax shield.[17]

16 A Local WACC and DCF Model

Business valuation in the local context requires consistency among the cost of capital, cash flows and long-term growth assumptions.

The cost of equity is determined from the risk-free rate, levered beta and relevant risk premiums:

$$K_e = R_f + \beta_L \times ERP + CRP + SCP$$

Where:

K_e is the cost of equity;

R_f is the risk-free rate;

β_L is beta adjusted for financial leverage;

ERP is the equity market risk premium;

CRP is the country risk premium;

SCP is an additional premium for company-specific risk not captured in other components.

CRP and SCP are added only where their effects are not already reflected in other components or cash flows and are separately substantiated.

Comparable company betas are adjusted for differences in capital structure. Assuming debt beta is approximately zero, unlevered beta is calculated as follows:

$$\beta_U = \frac{\beta_L}{1 + (1 - T) \times \frac{D}{E}}$$

The median unlevered beta is then relevered to the target capital structure:

$$\beta_{L,target} = \beta_{U,median} \left[1 + (1 - T) \times \left(\frac{D}{E}\right)_{target}\right]$$

Here, β_U is unlevered beta; β_L is levered beta; β_U,median is the median unlevered beta of peers; T is the relevant tax rate; D/E is the ratio of the market values of debt and equity; and target denotes the target capital structure.

These formulas apply when debt beta is assumed to be approximately zero.

WACC is calculated using the target capital structure weights of equity and debt:

$$WACC = \frac{E^*}{D^* + E^*} \times K_e + \frac{D^*}{D^* + E^*} \times K_d(1 - T)$$

Here, E* and D* are the market values of equity and debt under the target capital structure; K_e is the cost of equity; K_d is the pre-tax cost of debt; and T is the corporate income tax rate.

Free cash flow to the firm incorporates operating income, tax, depreciation and amortization, capital expenditure and changes in working capital. Revenue, margins, working capital and CAPEX are modeled separately over the five-year forecast horizon:

$$FCFF = EBIT(1 - T) + DA - CAPEX - \Delta NWC$$

Here, FCFF is free cash flow to the firm; EBIT is operating income before interest and taxes; T is the corporate income tax rate; DA is depreciation and amortization; CAPEX is capital expenditure; and ΔNWC is the change in operating net working capital.[18]

Equity value is derived by deducting net debt and other claims from enterprise value and adding non-operating assets:

$$V_{equity} = EV - Debt + Cash + Assest_{non-operating} - Claims_{other}$$

Here, V_equity is equity value; EV is operating enterprise value; Debt is interest-bearing debt; Cash is cash not.

Model results are assessed through sensitivity analysis of WACC, terminal growth, operating margins and capital expenditure, and are presented under baseline, favorable and adverse scenarios.

17 Applying the Methodology to UzAuto Motors JSC

The methodology was applied to the consolidated IFRS financial statements of UzAuto Motors JSC, prepared in U.S. dollars.

17.1 Financial Indicators and FCFF Normalization

Table 10. Revenue in 2024 was USD 4,239.6 million, operating income USD 383.3 million and net income USD 314.9 million.

Table 10. Key Financial Indicators of UzAuto Motors JSC for 2023–2024[19]

Year	Revenue	Operating income	Net income	Operating cash flow	CAPEX	FCF proxy
2023	4,609.6	469.2	333.8	−185.4	30.9	−216.3
2024	4,239.6	383.3	314.9	64.0	45.2	18.8

Normalized FCFF is calculated using an operating approach.

$$FCFF = EBIT(1 - T) + DA - CAPEX - \Delta NWC$$

17.2 Ratings the Cost of Debt and WACC

On 25 January 2024, S&P Global Ratings affirmed the company's long-term B+ and short-term B ratings and maintained a positive outlook.

For U.S. dollar cash flows, the assumptions are $R_f = 4.25\%$, $\beta = 1.10$, ERP = 4.50% and a country risk premium of 4.00%, giving $K_e = 13.20\%$.

$$WACC = 0.70(13.20\%) + 0.30(8.25\%)(1 - 0.166) = 11.30\%$$

17.3 DCF and Scenario Results

The Table 11. baseline assumes normalized FCFF of USD 360 million, annual growth of 4% over five years, terminal growth of 3% and WACC of 11.30%.

Table 11. Rating Adjusted DCF Scenarios for UzAuto Motors JSC[20]

Scenario	Rating	Credit spread	WACC	FCFF base	5-year growth	EV
Favorable	BB	3.25%	11.11%	378	5%	5,218
Baseline	B+	4.00%	11.30%	360	4%	4,658
Adverse	B	5.50%	11.68%	324	2%	3,543
Crisis	B−	7.00%	12.05%	288	0%	2,692

The Table 12. scenario analysis shows that rating effects pass through credit spreads into WACC, but much of the difference in value is generated by FCFF and growth trajectories.

18 Problems and Proposed Solutions

Table 12. Main Problems in Applying the Methodology and Proposed Solutions[21]

Problem	Effect	Solution
No official rating	Subjective K_d	Synthetic rating
Illiquid market	Limited spread observations	Source triangulation
Different IFRS line items	Poor comparability	Data dictionary
Currency mismatch	Incorrect discount rate	Currency-consistent R_f
Uncertain state support	Overstated rating	Assess support separately
CAPEX shock	Distorted FCF	Normalization
Double counting	Inflated WACC	Risk mapping
No validation	Unknown error	Back-testing

The principal problem is not the quantity of data but inconsistency in their economic meaning.

Expert weights can initially be established using the Delphi method or analytic hierarchy process and subsequently calibrated using logistic regression or survival models to improve default prediction. The reason for every expert override is documented in the report.

Ratings and WACC are endogenous: higher debt affects WACC and can also weaken ratings. One proposed solution is to calculate ratings, K_d, WACC and forecast interest coverage iteratively until the results stabilize.

19 Validation and Model Governance

Model validation covers three areas: the rating's ability to discriminate default risk, the calibration of predicted probabilities against observed default frequencies, and business valuation accuracy.

Default discrimination is assessed using ROC-AUC. The Brier score is used to assess probabilistic forecast accuracy:

$$BS = \frac{1}{n}\sum_{i=1}^{n}(p_i - y_i)^2$$

Here, p_i is the predicted default probability for a specified period; y_i equals one if default occurs and zero otherwise; and n is the number of observations.

Business valuation accuracy is measured using absolute percentage error:

$$APE_i = \frac{|\hat{V}_i - V_i|}{|V_i|} \times 100\%$$

Mean absolute percentage error is calculated as follows:

$$MAPE = \frac{1}{n}\sum_{i=1}^{n} APE_i$$

Here, $\hat{V}_i$ is model-estimated value and V_i is an independently observed transaction value adjusted for comparability.

Validation uses temporally separated data, for example calibration over 2018–2022 and testing over 2023–2025.[22]

Validation is separated over time, for example calibration using 2018–2022 data and testing over 2023–2025. Randomly mixing later-year observations of the same enterprise between training and test samples causes data leakage.

The model version, parameter dates, data dictionary, change log and independent review protocol are retained. The rating–spread matrix is reviewed quarterly, and ratio thresholds are reconsidered when sufficient new default observations have accumulated.

20 Institutional Solutions

Data from corporate disclosure portals, the stock exchange, credit bureaus, banks, rating agencies and valuers should be integrated in a standardized format. Confidential data are anonymized while enterprise identifiers preserve the ability to link observations over time.

A national data passport would require an object identifier, valuation date, reporting standard, audit status,.

The methodology is intended to disclose discount rate components and establish minimum evidence requirements rather than prescribe a single fixed rate. Valuers must disclose the rating, spread date, capital structure and alternative scenarios in their reports.

Implementation stages comprise selecting a pilot industry, preparing a data dictionary, calculating synthetic.[23]

21 Practical Conclusions

A synthetic rating is an intermediate result standardizing debt risk rather than a final value estimate.

The effect of a synthetic rating on valuation is expressed through credit spreads and the cost of debt:

$$K_d = R_f + C_s$$

Here, K_d is the pre-tax cost of debt; R_f is the risk-free rate in the relevant currency and at the relevant maturity; and CS is the credit spread.

The cost of debt enters the weighted average cost of capital:

$$WACC = \frac{E}{D+E} \times K_e + \frac{D}{D+E} \times K_d(1-T)$$

Here, E is the market value of equity; D is the market value of interest-bearing debt; K_e is the cost of equity; and T is the rate used to reflect the interest tax shield. The tax shield is included only where it can actually be utilized.

Enterprise value is determined by discounting free cash flows:

$$EV = \sum_{i=1}^{n} \frac{FCFF_{n+1}}{(1+WACC)^t} + \frac{TV_n}{(1+WACC)^n}$$

$$TV = \frac{FCFF_{n+1}}{WACC - g}, \qquad WACC > g$$

Here, FCFF is free cash flow available to all capital providers; n is the forecast horizon; TV_n is terminal value at the end of the horizon; and g is the long-term stable growth rate. The formulas assume constant WACC over the forecast period.

Cash flows and the discount rate must be consistent in currency and in nominal or real terms. The same risk must not be counted twice in cash flows and WACC. Results are presented under baseline, favorable and adverse scenarios.[24]

State ownership and concessional loans are assessed separately. Company-specific risks must not be double counted in cash flows and WACC. Without testing against subsequent actual transactions, no transaction-based empirical foundation emerges for improving model parameters.

For Uzbekistan, the proposed methodology involves building a synthetic rating from local data, translating it into.[25]

4. Conclusion

The study of business valuation based on international credit ratings demonstrates that credit ratings play an important role in assessing a company's financial stability, creditworthiness, and investment attractiveness. Ratings assigned by international agencies such as Standard & Poor's, Moody's, and Fitch provide investors, creditors, and other stakeholders with a structured assessment of a company's ability to meet its financial obligations. Although credit ratings do not represent a direct measurement of a company's market value, they provide valuable information for determining the cost of debt, estimating financial risk, and selecting appropriate assumptions for valuation models.

The analysis indicates that credit ratings can influence business valuation through several interconnected channels. First, a company's credit rating affects its borrowing costs and required returns on debt, which directly influence the weighted average cost of capital (WACC). Second, the rating reflects the perceived probability of default and the company's capacity to maintain stable cash flows under changing economic conditions. Third, credit ratings may affect investor confidence, access to capital markets, refinancing opportunities, and the company's long-term financial flexibility. Consequently, companies with stronger credit profiles may benefit from lower financing costs and more favorable conditions for attracting investment, while lower-rated companies generally face higher risk premiums and greater uncertainty in valuation.

An effective valuation framework should combine credit-rating information with fundamental financial analysis. Discounted cash flow (DCF) valuation, comparable-company analysis, and credit-risk assessment can be used together to develop a more comprehensive estimate of business value. In particular, the DCF method requires careful estimation of future cash flows, the cost of equity, the cost of debt, and the WACC. Credit ratings can support the estimation of debt-related risk premiums; however, they should not replace company-specific financial analysis or independent assessment of market conditions. Similarly, market-based valuation multiples should be interpreted in light of

differences in leverage, profitability, growth prospects, and credit quality among comparable companies.

The findings also emphasize that international credit ratings have certain limitations. Ratings are based on available financial information, qualitative assessments, and assumptions about future economic and business conditions. They may not fully capture sudden changes in market sentiment, industry-specific risks, technological disruption, or company-specific events. Moreover, rating agencies may revise their assessments as new information becomes available. Therefore, a company's valuation should not rely exclusively on its assigned credit rating. Instead, analysts should consider alternative scenarios, conduct sensitivity analysis, and assess the potential effects of changes in interest rates, operating performance, leverage, and credit spreads on the estimated enterprise value and equity value.

REFERENCES

[1] E. I. Altman, "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy," *The Journal of Finance*, vol. 23, no. 4, pp. 589–609, 1968, doi: 10.1111/j.1540-6261.1968.tb00843.x.

[2] B. Becker and T. Milbourn, "How did increased competition affect credit ratings?" *Journal of Financial Economics*, vol. 101, no. 3, pp. 493–514, 2011, doi: 10.1016/j.jfineco.2011.03.012.

[3] P. Bolton, X. Freixas, and J. Shapiro, "The credit ratings game," *The Journal of Finance*, vol. 67, no. 1, pp. 85–111, 2012, doi: 10.1111/j.1540-6261.2011.01708.x.

[4] A. Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset*, 3rd ed. Hoboken, NJ, USA: Wiley, 2012.

[5] J.-Z. Huang and M. Huang, "How much of the corporate–Treasury yield spread is due to credit risk?" *Review of Asset Pricing Studies*, vol. 2, no. 2, pp. 153–202, 2012, doi: 10.1093/rapstu/ras011.

[6] International Valuation Standards Council, *International Valuation Standards*. London, U.K.: IVSC, 2025.

[7] K. J. Kemper and R. P. Rao, "Do credit ratings really affect capital structure?" *Financial Review*, vol. 48, no. 4, pp. 573–595, 2013, doi: 10.1111/fire.12016.

[8] D. J. Kisgen, "Credit ratings and capital structure," *The Journal of Finance*, vol. 61, no. 3, pp. 1035–1072, 2006, doi: 10.1111/j.1540-6261.2006.00866.x.

[9] D. J. Kisgen, "Do firms target credit ratings or leverage levels?" *Journal of Financial and Quantitative Analysis*, vol. 44, no. 6, pp. 1323–1344, 2009, doi: 10.1017/S002210900999041X.

[10] D. J. Kisgen and P. E. Strahan, "Do regulations based on credit ratings affect a firm's cost of capital?" *The Review of Financial Studies*, vol. 23, no. 12, pp. 4324–4347, 2010, doi: 10.1093/rfs/hhq077.

[11] D. Kliger and O. Sarig, "The information value of bond ratings," *The Journal of Finance*, vol. 55, no. 6, pp. 2879–2902, 2000, doi: 10.1111/0022-1082.00311.

[12] T. Koller, M. Goedhart, and D. Wessels, *Valuation: Measuring and Managing the Value of Companies*, 7th ed. Hoboken, NJ, USA: Wiley, 2020.

[13] R. C. Merton, "On the pricing of corporate debt: The risk structure of interest rates," *The Journal of Finance*, vol. 29, no. 2, pp. 449–470, 1974, doi: 10.1111/j.1540-6261.1974.tb03058.x.

[14] M. Michelsen and C. Klein, "The role of credit ratings on capital structure and its speed of adjustment: An international study," *The European Journal of Finance*, vol. 24, no. 9, pp. 735–760, 2018, doi: 10.1080/1351847X.2017.1354900.

[15] F. Modigliani and M. H. Miller, "The cost of capital, corporation finance and the theory of investment," *The American Economic Review*, vol. 48, no. 3, pp. 261–297, 1958.

[16] F. Modigliani and M. H. Miller, "Corporate income taxes and the cost of capital: A correction," *The American Economic Review*, vol. 53, no. 3, pp. 433–443, 1963.

[17] S. C. Myers, "The capital structure puzzle," *The Journal of Finance*, vol. 39, no. 3, pp. 575–592, 1984, doi: 10.1111/j.1540-6261.1984.tb03646.x.

[18] H. Xiao, "How do credit ratings affect corporate investment efficiency?" *International Journal of Finance & Economics*, vol. 30, no. 1, pp. 330–351, 2025, doi: 10.1002/ijfe.2920.

[19] S&P Global Ratings, *Understanding Credit Ratings and Issuer Rating Materials*. 2025. [Online]. Available: S&P Global Ratings.

[20] Moody's Ratings, *Rating Symbols and Definitions*. 2025. [Online]. Available: Moody's Ratings.

[21] Fitch Ratings, *Corporate Rating Criteria*. 2026. [Online]. Available: Fitch Ratings.

[22] U.S. Securities and Exchange Commission, *Companyfacts XBRL API and Issuer Filings*, 2021–2025. [Online]. Available: SEC EDGAR Data.

[23] Microsoft Corporation, *Annual Reports and Investor Relations Materials*, 2021–2025. [Online]. Available: Microsoft Investor Relations.

[24] Oracle Corporation, *Annual Reports and SEC Filings*, 2021–2025. [Online]. Available: Oracle Investor Relations.

[25] International Business Machines Corporation, *Annual Reports*, 2021–2025. [Online]. Available: IBM Investor Relations.