



Complex Made Simple

Estimating Borrowing Rates

Executive Summary

Pre-tax cost of debt is used in financial reporting in accounting for leases and application of effective interest rate method in accounting for debt. Buildup method can be applied to determine cost of debt with certain modifications as compared to the similar approach used to determine cost of equity. Generally, buildup method for cost of debt has two steps, i.e., determining the risk free rate and borrower specific credit risk premium. Determining cost of debt for a private company can be complex as existing borrowing arrangements (if any) may have unique financial and non-financial debt covenants and many private companies do not have an established credit rating.

Most sources of information about debt yields cover marketable or traded debt instruments, not private debt. The difference in yields between the marketable and non-marketable debt is a discount for lack of marketability (DLOM). Existing DLOM studies and estimates were developed in relation to cost of equity, not cost of debt. Specifically, empirical studies are based on analysis of restricted stock data. Despite notable differences between debt and equity instruments, certain characteristics of a private company, such as lower or no liquidity, less stringent financial reporting requirements apply to debt instruments just as they do to equity. Key inputs used to determine DLOM per Stout DLOM CalculatorTM would likely serve as key inputs and impact DLOM in a similar way when applied to determine debt DLOM, not just equity DLOM. The inputs include 1) the issuing firm's estimated financial and market risk; (2) the level of stock market volatility prevailing around the transaction date; and (3) the degree of liquidity of the securities. In our opinion, *conceptually*, DLOM can apply to measurement of private company debt similar to how it applies to measurement of equity. However, it would not be reasonable to assume that specific amounts of DLOM calculated using stock prices would also apply to debt. Although we believe that DLOM determined for shares should not be applied to debt instruments without additional considerations, equity based DLOM can be used as a reasonableness check in assessing valuation results obtained by applying other valuation methods.

Foreign currency risk adjustment to cost of debt can be determined by adjusting U.S. based rate by the difference in projected inflation of the two currencies. Actual inflation data can be used to adjust the U.S. based rate, if it is considered a reasonable estimate of future expected inflation.

Introduction

In the ever-evolving world of finance and investment, accurate valuation is paramount for businesses and investors alike. Among the critical components of valuation, the cost of debt plays a pivotal role in determining a company's overall financial health and investment attractiveness. Calculating the cost of debt is essential for various financial decisions and analyses: investment evaluations, financial planning, debt management, and overall capital structure optimization. It is a key component in assessing a company's cost of capital and is critical for making informed financial and investment decisions.

In GAAP reporting, companies often use a "special case" of the cost of debt as part of application of lease accounting per Accounting Standard Codification (ASC) 842, *Leases*. Lessees and lessors should discount future lease payments using the rate implicit in the lease. If the information required to determine the rate implicit in the lease is not readily available, a lessee should use its incremental borrowing rate (IBR)¹. Accounting Standard Update (ASU) 2021-09 allows lessees which are not public business entities to use risk free rate. The Financial Accounting Standards Board Accounting Standards Codification ("ASC") Topic 842 defines an IBR as follows:

The rate of interest that a lessee would have to pay to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment².

IBR does not reflect deductibility of interest expense, In other words, unlike “cost of debt” IBR is not tax effected. Otherwise, the two concepts, i.e., IBR and cost of debt are similar.

In this publication, we will provide some considerations covering estimating IBR by non-public business entities, including the use of Discount for Lack of Marketability (DLOM) and currency adjustment. We will try to explain the logic behind the use of DLOM in relation to debt instruments overall and lease liabilities specifically. We will also cover determination of cost of debt as it would apply to foreign currency cash flows.

But let's start with a bit of theory.

When we need to calculate the cost of debt, we utilize various valuation techniques such as review of company’s existing borrowing arrangements, market information covering debt and

¹ ASC 842-20-30-3

² FASB ASC 842-10-20, *Glossary*

interest rates. To determine the cost of debt, valuation specialists do not usually apply the buildup method or DLOM discounts. Usually, DLOM is applied due to the lack of marketability or liquidity to determine equity or share price. In the case of the buildup method, we "build" the price from the risk-free return towards the specific company risk premium, again, generally reflecting return on equity. Let's try to see how these concepts can be applied to debt instruments, including lease liabilities.

Understanding the Buildup Method

When it comes to valuing a company, understanding its cost of debt is essential. The cost of debt directly impacts the weighted average cost of capital (WACC), which is a fundamental parameter used in various valuation models, including the discounted cash flow (DCF) model. The DCF model discounts future cash flows to present value, and the cost of debt, is one of the components used to determine the discount rate.

By accurately calculating the cost of debt, analysts can more precisely determine the impact of company's capital structure on its estimated fair value.

A higher cost of debt translates to higher interest expenses and, consequently, lower cash flows available to equity holders, thus affecting equity valuation. Conversely, a lower cost of debt reduces the cost of financing and may lead to a higher equity valuation.

Company's cost of debt (or equivalent) is also used in GAAP financial reporting. Examples include use of incremental or risk free rate in lease accounting under ASC 842, *Leases* as well as application of effective interest rate method in accounting for debt under ASC 470, *Debt* and loans issues (receivables) under ASC 310, *Receivables*. Note that determination of the effective interest rate as part of accounting for debt and loans involve, in theory, determination of relevant market rate³. In other words, the effective rate is not only based on the rate stated in the specific borrowing agreement.

Use of the buildup method in relation to cost of equity involves determining components of specific company's cost of equity. Cost of equity also represents a discount rate applied to discounting of future cash flows available to equity holders. Application of the build-up method in relation to cost of equity is illustrated in Table 1⁴.

³ PwC guide Loans and investments, 2016, section 6.4 Determining the effective interest rate.

⁴ Gary R. Trugman Understanding Business Valuation 6th Edition Page 482, section Components of a Discount Rate

Table 1

Components of Cost of Equity	
Risk-free rate	5.0%
Equity risk premium	6.0%
Size premium	5.0%
Company-specific risk pr	4.0%
Discount Rate- Equity	20.0%

A conceptually similar build-up method can be applied to cost of debt. From this perspective, cost of debt can be determined as follows:

$$\text{Cost of Debt} = \text{Risk Free Rate} + \text{Company's Specific Risk Premium}$$

Current use of buildup method in relation to cost of debt does not involve analysis of as many individual components as cost of equity does. However, Company's specific risk premium can be further broken down by, for example, interest rate premium reflecting company's size, industry, financial performance and other relevant factors considered separately as part of the build-up method.

As noted above, the above formula reflects pre-tax cost of debt, i.e., it does not reflect benefits associated with the tax shield. This is consistent with GAAP definition of the incremental borrowing rate.

Use of the buildup method to determine cost of debt involves the following steps:

Step 1: Gather Data: Financial analysts begin by collecting relevant data on the risk-free rate, the industry-specific risk and company's credit risk. The risk-free rate is often times obtained by observing returns from government securities, while the company's credit risk is assessed based on factors such as credit rating, financial performance and market perception. Industry-specific risk can be viewed as part of company's specific credit risk. Industry risk can be evaluated through review of industry benchmark data, industry reports and trends.

Step 2: Determine the Risk-Free Rate: Risk Free Rate reflects time value of money and inflation as described by G. Trugman below:

In theory, this is the minimum return that an investor would accept for an investment that is virtually risk free. It is the pure cost of money plus the rate of inflation anticipated by those who deal in these types of transactions⁵.

The rate is often time approximated by U.S. Treasury rates. In theory, the chance of a default by the U.S. government has historically been pretty slim, although recent events may call the above statement in question. As of August 2, 2023, Fitch credit rating on the U.S. stands at AA+

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or a one notch below the top grade of AAA. The downgrade occurred weeks after U.S. president and the Congress came close to a historic default. Given the downgrade, a debt instrument with a triple-A rating should be a better representation of a risk free rate.

Curious observation: on 8/4/22 a 20-25 year certain U.S. publicly traded bonds with AAA credit rating had an effective yield of 4.87%. The bonds in question were included in the fixed income rating ICE BofA AAA US Industrial Excluding Financial, Telecom, Transportation & Utility Index. All bonds regardless of maturities, i.e., 86 in total, included in the same index had an effective yield of 4.77%⁶. On the same date, 20 year treasury yield was 4.36% while 30 year yield was 4.21%⁷. Overall, it appears that despite the downgrade, long-term treasury rates are still lower than high-quality U.S. corporate bonds.

Some valuation analysts believe they can use other sources to determine risk-free rates, including high quality corporate bonds, prime rates as published by Wall Street Journal⁸ or London Interbank Offered Rate (LIBOR). Historically, the above rates have not been as good as Treasury bond rates.

Step 3: Assess the Company-Specific Credit Risk Premium: Company's specific risk is an additional rate of return that compensates investors for the unique risks associated with investing in specific company. It reflects the risks specific to company's operations, industry, company's size, financial condition, management quality, growth prospects, and other company-specific factors. The risk is typically derived from the company's historical performance, analysis of financial statements, industry outlook, other quantitative and qualitative assessments.

In some cases, size premium is determined separately as part of equity risk. The size premium, in finance and investment analysis, is an additional rate of return that investors expect to earn for investing in smaller companies compared to larger, more established companies. Generally, cost of debt analysis does not include size premium as a separately component. From this perspective, company's specific risk is supposed to be an all-encompassing (at least as compared to its equity counterpart) component reflecting various components impacting company's creditworthiness.

In theory, Company's specific credit risk is represented by a credit rating. Credit ratings are established by credit agencies. Top three credit agencies in the U.S. are Fitch, Moody's and S&P.

⁶ <https://indices.ice.com/>

⁷ https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily_treasury_yield_curve&field_tdr_date_value=2023

⁸ <https://www.wsj.com/market-data/bonds/moneyrates>.

Prime rate is the rate U.S. banks give to their best, most creditworthy corporate customers in the U.S. Prime rate reflects certain amount of credit risk associated with financially stable borrowers. The rate is tied to the U.S. Federal Funds Rate. At the time of preparing this publication, the prime rate was approximately 8.25%. However, 1 year treasury rate is approximately 5.4%, thus 2.85% (calculated as 8.25 % – 5.40 %) reflects the credit spread.

Fitch and Fitch use similar rating designations (AAA, AA+, etc) are generally similar. Moody's uses a somewhat different rating scale.

Generally, credit ratings are assigned to publicly traded debt, e.g., bonds, not private debt.

It is important to note that the buildup method, like any valuation approach, is subject to inherent uncertainty and potential variations. As such, conducting sensitivity analysis is vital to understand how changes in individual components of the cost of debt may impact the overall valuation. Sensitivity analysis helps identify key drivers of valuation and allows stakeholders to make informed decisions under different scenarios.

Cost of Debt- Private Companies

In certain cases, estimating cost of debt for a private business can be performed using company's existing borrowing arrangements. However, this approach does not work when company does not have any debt. Some private companies have debt that cannot be used to determine company's cost of debt as of a specific date as, for example, the debt was issued at an earlier date and the rate is fixed, i.e., not adjusted subsequent to the initial issuance. In other cases when existing debt arrangements do not help, the amount of debt per the borrowing agreement is not comparable with the amount used in the valuation. Some debt agreements contain certain financial and non-financial covenants. Existence of this covenants or special debt terms likely to impact the interest rates. In such cases, interest rates used in a debt agreement may not be representative of company's cost of debt without applying additional adjustments. Adjustments to interest rate reflecting the impact of specific (and numerous!) debt covenants are hard, if not impossible to validate.

When the company cannot use existing debt arrangements to estimate its cost of debt, valuation specialists try to use other market information, e.g., observable interest rates. The rates depend on issuer's creditworthiness generally represented by a credit rating. This brings us to the topic of private company's credit rating.

Most debt issued by private companies does not have a formal credit rating. Some privately held businesses have a credit rating provided by Dun & Bradstreet Inc. However, predominant majority of private companies do not have a reliable credit rating assigned. Many privately held companies determine what credit grade applicable to publicly traded debt would apply to them. The determination is made by analysis of company's financial performance (including financial ratios), review of known credit rating methodologies and consultations with a credit rating specialist. Once the credit rating is established, the Company can use an interest rate that would apply to a publicly traded debt with the same rating. Such information can be found at ICE Index Platform operated by Intercontinental Exchange, Inc. (<https://indices.ice.com/>).

Note that incremental borrowing rate for lease accounting or market rate used to determine effective interest rate should be determined as of specific date. For lease accounting the date is when the lease has commenced or the lease commencement date. Incremental borrowing rate should also be determined for a hypothetical lending period consistent with the lease term.

Even if a valuation specialist will be able to find interest rate information about debt issued by private companies, the information will not be as time, credit rating and industry specific as information available for issues of publicly traded debt. Therefore, such information will be of limited use by a privately held reporting entity.

Note that information provided by ICE Index Platform is available for all business days, various maturities, industries and credit ratings.

Kroll's Cost of Capital Navigator provides industry-level cost of debt for approximately 90 industries in the U.S. and internationally. International information covers four global economic areas: (i) the World, (ii) the European Union, (iii) the Eurozone, and (iv) the United Kingdom. Each of the four global economic area's industry analyses are presented in three currencies: the Euro, the British pound, and the U.S. dollar.

Understanding Discount for Lack of Marketability (DLOM)

Here is the time to meet with our next guest - DLOM.

We are accustomed to the use of DLOM in the valuation of privately held companies or companies with limited liquidity as a discount factor applied to share price.

Calculating DLOM can be a complicated process that requires careful consideration of various factors and methodologies. Different valuation practitioners use different approaches based on the available data and the specific characteristics of the company being valued. Here are some common methods used to estimate DLOM:

Restricted Stock Studies: This method involves analyzing transactions of restricted or closely held shares compared to freely traded shares of the same company. The difference in their prices is used to estimate DLOM.

Pre-IPO Studies: Similar to restricted stock studies, pre-IPO transactions involve analyzing the prices of shares sold in private placements before a company goes public. Differences between pre- IPO and IPO or post- IPO prices used to estimate DLOM.

Option Pricing Models: Certain option pricing models, such as Black-Scholes model, can be adapted to estimate the value of restricted or illiquid shares compared to freely tradable shares.

Stout DLOM Calculator™: This is a more comprehensive study based on analysis of 750 restricted stock transactions with distinct transaction and company characteristics on which comparisons to a subject company can be made. Analysis performed by Stout suggests that the most

important determinants of DLOM are: (1) the issuing firm's financial and market risk; (2) the level of stock market volatility prevailing around the transaction date; and (3) the degree of liquidity of the securities. More specifically, the discount is negatively correlated with issuing firm's market value of equity, revenue, total asset, book value of equity and net profit margin. Stout has determined that the discount is positively correlated with issuing firm's stock price volatility, the size of placement and market to book ratio (market value of share divided by book value per share). The calculator uses the above information as inputs to determine amount of DLOM in specific cases.

It is important to note that DLOM estimates may vary depending on the purpose of the valuation, the industry, the company's financial performance, and other relevant factors. As such, engaging qualified professionals with experience in business valuation and DLOM estimation can ensure a robust and well-founded valuation result.

Historically, DLOM was applied as part of valuation of private company's equity. The question is whether and how DLOM can be applied to debt. Let's take a step back and consider important legal and economic differences between debt and equity instruments. The two are different in the areas related to redemption, dividend, voting rights, covenants as well as conversion rights. Generally, debt has specific maturity, i.e., a redemption date, pays interest at a determinable rate while equity instruments do not have a fixed maturity and pay discretionary dividends. **Appendix A** Debt and Equity-Like Characteristics illustrates debt and equity-like features in more detail.

Despite notable differences between debt and equity instruments, certain characteristics of a private company, such as lower or no liquidity, less stringent financial reporting requirements apply to debt instruments just as they do to equity. Although specifics of risk profiles of debt and equity instruments differ, variables impacting DLOM per Stout DLOM Calculator™, *in principle*, apply to both types of instruments. In other words, cost of debt would depend on the issuing firm's financial and market risk, estimated volatility and degree of liquidity of issued debt.

Overall, if market share price represents value of equity shares, effective interest rate paid on debt represents the value or cost of the debt instrument. As an example, debt with the effective interest rate of 8% is considered twice as "expensive", from the borrower's perspective, as debt paying the effective rate of 4%. 100% premium in the above example may be attributed to such factors as liquidity, longer maturity, lower credit rating, etc. If each of the above factors was assigned equal weight in the overall premium 100%, the quantitative impact of each factor would be 25.992% (calculated as follows: $\sqrt[3]{8\%/4\%} - 1$). The impact of all three factors used as multipliers applied to a base rate of 4% can be illustrated as follows:

$$4\% * 1.25992 * 1.25992 * 1.25992 = 8\%$$

As a refresher, effective interest rate is defined in GAAP as the rate that would be applied to a debt balance at the beginning of a reporting period, e.g., month over multiple periods, e.g., on a monthly basis so that ending debt balance is equal the repayment value⁹. The rate reflects initial debt issuance costs, impact of detachable warrants or separated conversion options, if any. From this perspective, the effective rate reflects company's cost of debt ignoring the impact of income taxes.

Based on the above considerations, *conceptually*, DLOM can also apply to measurement of private company debt. However, all studies supporting specific DLOM amounts were performed using stock prices, not debt prices. DLOM is a relative measure in the sense that it expresses the difference between traded and non-traded stock as a percentage of traded stock. Use of this relative measure may negate certain differences between debt and stock prices. However, it would not be reasonable to assume that specific amounts of DLOM calculated using stock price would also apply to debt. Would, as an example, 30% DLOM related to stock be approximately the same, lower or higher than DLOM applicable to debt? Additional studies would have to be performed to determine DLOM specifically applicable to debt.

Although we believe that DLOM determined for shares should not be applied to debt instruments without additional considerations, equity based DLOM can be used as a reasonableness check in assessing valuation results obtained by applying other valuation methods. We provide an example of such validation below.

Example 1: Applying DLOM in relation to private debt

A privately held company needs to determine its cost of debt as part of application of ASC 842 lease accounting for the lease that commenced on 1/1/2023. The company is in the business of processing payments, which corresponds to the following classification, using GICS sub-industry classification: 45102020, Data Processing & Outsourced Services¹⁰.

The company decided not to apply the accounting exemption allowing the use of risk-free rate by non-public interest entities. The company does not have any debt agreements that could be used to determine company's incremental borrowing rate on or around 1/1/2023.

Management believes that using the lower tier of investment grade ratings, specifically BBB, per Standard & Poor and Fitch classification appropriately reflects Company's credit rating. Company estimated its 5 year interest rate with BBB credit rating using Kroll's Cost

⁹ ASC 310-10-20, *Receivables- Overall- Glossary*

¹⁰ <https://www.msci.com/documents/1296102/11185224/GICS+Methodology+2020.pdf/9caadd09-790d-3d60-455b-2a1ed5d1e48c?t=1578405935658>. Global Industry Standard Classification (GICS) is becoming widely accepted in the valuation industry as compared to other historical classifications, i.e., Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS).

of Capital Navigator. The pre-tax rate at 1/3/2023, which is first business day after 1/1/2023 was estimated to be 7.8%.

The company performed a reasonableness check of the above valuation results. The Company extracted interest rates rated to publicly traded bonds with BBB rating and 5 year maturity at 1/3/2023 as provided by Intercontinental Exchange, Inc. The bonds were included in the index ICE BofA BBB US Corporate Index (COA4) at indices.ice.com. 4-5 year bonds included in the index had an effective yield of 5.64%. Bonds with 5-6 maturity had the same effective yield. Effective yield for financial services industry was 6.3%, technology & electronics industry- 5.73%. The company decided to use 5.64% rate as it represents the assumed duration of debt even though the yield is not industry specific.

The company used Stout DLOM Calculator to estimate company's DLOM at 1/1/2023. As part of the process the company entered the following inputs in the calculators: revenue for 12 months ending 12/31/2022, total assets at 12/31/2022, book shareholder value at 12/31/2022, net income for 12 months ended 12/31/2022. The company used its judgement to determine the impact of market volatility and private equity adjustments. Overall, the company estimated DLOM to be 30%. DLOM applies to marketable value as follows:

$$\text{Non-marketable Value} = \text{Marketable Value} * (1 - \text{DLOM})$$

Private company debt rate is higher than public company rate. The relations between the two rates can be expressed as follows:

$$\text{Private Company Rate} = \text{Public Company Rate} * (1 + \text{DLOM})$$

Therefore, estimated private company equivalent interest rate would be: $5.64 \% * 1.3 = 7.33\%$, which is not materially different from 7.8% determined using Kroll's Cost of Capital Navigator. The Company will use 7.8% as its 5 year pre-tax cost of debt at 1/1/2023.

Risk-Free Rate with Foreign Currency Adjustment

In certain cases, foreign subsidiaries of a U.S. based parent may sign leases denominated in a foreign currency. For example, a U.S. based parent specializing in payment processing may have a subsidiary set up and operating in Russia. The subsidiary signed a leases agreement with the local landlord where lease payments are denominated in Russian Rubles.

When a lease is denominated in a foreign currency, cost of debt should reflect the adjustment reflecting specific currency risk¹¹. Following the above example, the debt denominated in USD is likely to have a different effective interest rate as compared to the interest rate that would

¹¹ See section 7.1.2 Incremental Borrowing Rate, Deloitte guide A Roadmap to Applying the New Leasing Standard

apply a debt denominated in Russian Rubles. The question is how to determine the interest rate on a foreign currency debt, e.g., a debt denominated in Russian Rubles.

ASC 842-20-55-20 allows the subsidiary to use parent's incremental borrowing rate when the parent "conducts treasury operations for the consolidated group". The idea is that if the group has a centralized treasury, it is the credit rating of the parent, not individual subsidiaries' that determines group's incremental borrowing rate. Note that centralized treasury generally includes cash pooling arrangements whereby the parent regularly "sweeps" cash to the centrally manage liquidity. Use of parent's borrowing rate may also be more relevant in cases when the lease signed by the subsidiary is legally guaranteed by the parent. In this case, the amount of lease payments which, in theory, include interest and the principal are linked to the creditworthiness of the parent.

When subsidiary's, not parent's borrowing rate is used, the rate should be determined by references to subsidiary's credit rating and economic environment that in which it operates. Using the above example, Russian subsidiary would have to determine the borrowing rate it would pay at lease commencement date for a period of time comparable with the lease term.

When U.S. parent rate is used, the foreign subsidiary would have to determine the rate that would be payable by the U.S. parent on a debt denominated in a foreign currency. Such rates may not be directly observable given the infrequent amount of borrowing by U.S. companies in the specific foreign currency.

Companies can determine the foreign currency rate payable by the U.S. parent using three steps described below:

Step 1: Determine the rate as it would apply to a USD borrowing;

Step 2: Determine currency adjustment;

Step 3: Apply the adjustment to the USD borrowing rate;

Currency risk adjustment will depend on the expected change in the exchange rates between USD and the foreign currency in question. Some reporting entities believe it would be reasonable to assume that the key driver behind the exchange rate is inflation. Higher inflation makes a currency weaker, suppressing investment, and thus negatively impacting the exchange rate. When inflation is low, a currency is stronger, improving its exchange rate. Other factors impacting exchange rates include interest rates, economic growth, trade deficit or surplus as well as speculative considerations. Additional studies may have to be performed to determine the key variable (or variables) impacting exchange rates. Such studies can be performed using statistical regression analysis as it applies to historical exchange rates, inflation, trade information, etc. Regression analysis will likely have to be performed separately for a specific currency.

We believe the following information can be used to determine the currency adjustment as it would apply to USD borrowing rate:

- a) Projected inflation;
- b) Historical inflation;
- c) Projected currency exchange rates;

Reliable projection would generally be more relevant as compared to historical information. This is because a reasonable lender would be concerned with the future exchange rate, i.e., the rate that would apply to future debt payments. However, historical information can be a good approximation of future expected trends. Selection of the appropriate measure, including the use of historical or projected inflation would depend on individual facts and circumstances.

The choice between the use of future projections or historical information is discussed in detail in ASC 718-10-55-21 through 25 in relation to volatility and other estimates used as inputs in Black-Scholes model. Similar considerations apply to the process of selecting between historical S&P 500 data or projections used to determine market equity risk premium, as discussed by G. Trugman¹². Conceptually similar considerations apply in situations, which are different from the practical perspective.

If projected inflation is used, currency adjustments would be determined by comparing expected inflation for the U.S. and the foreign country. The difference between the two is used to adjust the U.S. currency rate. Example 2 below illustrates practical application of the above approach.

As noted above, ASC 842 allows lessees, which are not public business entities to use risk-free rate instead of the incremental borrowing rate (ASC 842-20-30-3). The rate would be determined at the relevant date, i.e., a lease commencement or lease modification date and for a period of time similar to a lease term. For leases denominated in foreign currencies, risk free rate should still be adjusted to reflect the currency risk¹³. As an example, if, at 1/3/2023, 5 year USD risk-free rate was determined to be 3.5% and the currency adjustment was determined to be 3%, the risk-free rate to be applied to the foreign currency lease should be 6.5% or $3\% + 3.5\%$. In such cases, currency adjustment could be determined using the same approach as illustrated in Example 2.

Example 2: Currency Adjustment to Parent Interest Rate

A U.S. based parent has a subsidiary located in Russia. Russian subsidiary signed a lease agreement with the local lessor denominated in Russian Rubles. The lease agreement

¹² Gary R. Trugman Understanding Business Valuation 6th Edition Page 484-488, section Equity Risk Premium

¹³ Example 5.6.40, KPMG handbook Leases

commences on 1/1/2023 and has a lease term of 5 years. The group has a centralized treasury function with daily cash sweep and all financing activities centrally managed by the parent. Therefore, Russian subsidiary will use parent's incremental borrowing rate to determine the discount rate applicable to its lease.

Parent's 5 year incremental borrowing rate at 1/1/2022 was determined to be 5%. The rate was determined using parent's borrowing agreement with the bank entered into around the valuation date of 1/1/2022. Russian subsidiary decided to use inflation forecast to determine the currency adjustment as it would apply to a USD borrowing rate.

Management identified a 3 year inflation forecast for Russia as published by the Organization for Economic Co-operation and Development (OECD)¹⁴. Average annual forecasted inflation covering three years, i.e., 2022, 2023 and 2024 was 8.11%. Management concluded that the use of average measure is reasonable and appropriate in all material respects.

For the U.S., management used the inflation forecast prepared by Federal Reserve Bank of Cleveland¹⁵. Average annual projected inflation for three years at 1/1/2022 was 1.79%.

The difference between Russian and U.S. inflation was calculated to be 6.32% or 8.11% – 1.79%. The difference is the estimated value of the currency adjustment as it would apply to a USD rate.

The incremental borrowing rate for the 5 year lease denominated in Russian Rubles at 1/1/2022 was determined to be 5 % + 6.32% = 11.32%.

Management has reviewed methodology and assumptions used to prepare both forecasts and concluded that they appear to be reasonable.

¹⁴ <https://data.oecd.org/price/inflation-forecast.htm>

¹⁵ <https://www.clevelandfed.org/indicators-and-data/inflation-expectations#background>

Appendix A*
Debt and Equity-Like Characteristics

Feature	Equity	<-----	----->	Debt
<i>Redemption</i>	Perpetual	Puttable (at holder's option) on a contingent event	Puttable (at holder's option) with the passage of time	Mandatorily redeemable
<i>Dividends</i>	Cumulative participating (and noncumulative participating)	Noncumulative fixed rate (and indexed variable rate)		Cumulative fixed rate (and cumulative indexed variable rate)
<i>Voting Rights</i>	Votes with common on as-converted basis	Votes with common on as-converted basis on specific matters	Votes only on matters related to the specific instrument	Nonvoting
<i>Covenants</i>	Does not include provisions that are substantively protective covenants		Includes provisions that are substantively protective covenants	
<i>Conversion Rights</i>	Mandatorily convertible	Optionally convertible		Not convertible

*Based on the diagram provided in section 3.2.6.1.1 Weighing terms and features of EY Issuer's accounting for debt and equity financings.

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