Corporate Finance Bundle

Return on Invested Capital + Cost of Capital

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July 2023 Uden/ The Netherlands

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Return on Invested Capital (ROIC)

Analysing ROIC (return on invested capital)

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Kersten Corporate Finance: M&A advisory in The Netherlands + Business Valuations + Valuation training over the globe.

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

Introduction

A company creates value when the present value of the cash flows, from the investment, is higher than the cost of the investment.

This happens when the return of the investment is higher than the cost of capital of the investment.

To study this in a little more detail, we need to know how to calculate a measure called ROIC (return on invested capital).

ROIC (return on invested capital)

ROIC is calculated by dividing NOPAT (net operating profit after tax) by IC (invested capital).

Let's first look at what NOPAT is, and means.

And then let's look at what IC entails.

NOPAT

NOPAT is the numerator in the ROIC calculation.

It is the cash earnings a company has when it does not have debt or excess cash.

So NOPAT is the same whether a company is financed with debt or equity.

So removing the concept "capital structure" in NOPAT enables it to compare NOPAT across different companies.

NOPAT starts with earnings before interest and taxes (EBIT).

You then add amortisation from acquired intangible assets.

And you add the embedded interest component of the operating lease expense. And you do this because this is not an operating item, but a financing item.

At last you subtract cash taxes, and this includes the tax provision, deferred taxes and the tax shield.

So summarized: NOPAT = EBITA -/- cash taxes.

A little more detail on NOPAT: Amortisation

Maybe it is strange to add back amortisation but not depreciation.

But the reason is that depreciation is an operating expense.

And amortisation of acquired intangibles just reflects "accounting".

When for example a company acquires a customer list, the list would be put on the balance sheet as an intangible asset and amortised over its useful life.

But the money spent to maintain and grow the list is an expense in the income statement.

So the company should not be panellised twice with both the expenses and amortization.

(more about intangible assets, and amortisation, later in this ROIC blog series, in upcoming weeks)

Embedded interest in lease

Adding back embedded interest from operating lease is a relatively new adjustment.

Most companies nowadays under US GAAP and IFRS must reflect operating lease on the balance sheet.

This was not the case in the old days.

(I am from The Netherlands, and under Dutch GAAP we still have operating lease not capitalised on the balance sheet)

Under US GAAP, the entire lease expense including embedded interest is still expensed.

And under IFRS the lease payments are allocated under depreciation and the interest expense.

So for companies under US GAAP you need to separate the lease payments into these two parts (deprecation & interest), and "embedded interest" needs to be adjusted in NOPAT.

Cash tax

The cash tax calculation has three components:

-Tax provision;

-Deferred taxes;

-Tax shield.

With the tax provision you start with what you see in the income statement.

But you need to adjust this number for "unusual items" like for example a restructuring charge.

And with companies that spend a lot on R&D, in the US this needs to be amortised, instead of being expensed straight away.

Then there are deferred taxes.

A company has 2 annual statements, one for tax purposes and one for financial reporting.

Typically straight line depreciation is used for financial reporting, and accelerated depreciation for tax purposes.

This creates timing differences, that results in a company's reported tax that is higher than the cash taxes.

(with accelerated depreciation you have less profit = less tax)

Eventually this tax needs to be paid, and this is captured as a deferred tax liability (DTL) on the balance sheet.

The increase in the DTL reduces cash taxes.

(so take the DTL increase from the reported tax, in order to arrive at cash tax)

At last, the tax shield is removed from NOPAT, because NOPAT is not influenced by capital structure.

And the tax shield comes from interest deductible for corporate tax.

So this increases cash taxes for leveraged companies, in order to be able to compare them well with other companies.

Concerning taxes, the quick and dirty way to deal with it is by taking EBITA * (1 -/- cash tax rate). And the cash tax rate is as a (very rough) rule of thumb 95% of reported tax.

Invested capital

IC (invested capital) is the denominator of ROIC, and this can be calculated in 2 ways.

You can look at net assets (operating approach), and you can look at how these assets are financed (financing approach).

IC – Operating approach

With this approach we start with net working capital; a measure of liquidity, and this is calculated as current assets minus NIBCL's (non interest bearing current liabilities).

Within the current assets accounts receivables and inventories are the largest components.

But you need to subtract excess cash and marketable securities from the current assets, since this is not "operating".

NIBCL's are basically all current liabilities that are not debt, and the main components are accounts payables and other current liabilities.

Then we add PP&E (property, plant & equipment).

(Concerning intangible assets, I will discuss this issue in great detail in this blog sequence on ROIC in the upcoming weeks)

Leases longer than a year also are shown on the balance sheet, and stand for the right to use the asset.

Accountants quantify this by estimating the present value of future lease payments.

Next we add intangible assets and goodwill from M&A transactions.

At last, all other long term (operating) assets need to be taken up.

So invested capital should reflect all the assets needed for a company to run its operating business.

NON operating assets like access cash, marketable securities, equity investments, non consolidated securities, finance subsidiaries, overfunded pension funds, tax loss carry forwards etc., should be taken care of in the "equity bridge of valuation" and NOT in IC !

IC – Financing approach

Within this perspective we start with all the sorts of interest bearing debt.

Operating lease obligations also need to be taken into account.

And we need to add shareholders equity, preferred stock and other equity linked securities.

At last, other long term liabilities like deferred tax, underfunded pension funds, unearned revenue etc. should also be taken up.

When both NOPAT and IC is calculated, we can calculate ROIC !

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

ROIC linked to growth !

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Kersten Corporate Finance: Buy side and sell side M&A in The Netherlands (deals: 5 – 50 million euro enterprise value) + Business Valuations + Corporate Finance training over the globe.

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

Investments in growth

The value of a company can be calculated by projecting the free cash flows (FCF) and discounting it back to the present.

And FCF equals NOPAT -/- the investments for future growth.

Investments in future growth capture:

-Changes in net working capital;

-Capital expenditures net of depreciation;

-Other investments like acquisitions.

So investments in future growth are equivalent to the change in IC (invested capital).

Link to a DCF model

The observations above give us a nice link to a DCF model.

When you have estimated your initial IC, and your DCF model is estimating future NOPAT, and additional investments (capex net of depreciation + net working capital), than you can easily calculate ROIC in any future year.

This by taking future NOPAT and dividing it by future IC, both will be created by your DCF model.

For example, a company has a NOPAT of 100 USD, and IC of 500 USD, than ROIC is 20%.

With 10% NOPAT growth, your NOPAT in 2 years is 100 USD * 1,10 ^ 2 = 121 USD.

When you assume investments (capex net of depreciation + NWC) are 25 USD per year, than ROIC in 2 years is:

121 / (500 + 25 + 25) = 22%.

ROIC linked to valuation

ROIC is linked to valuation by "economic profit".

This is a measure of "residual income", and this means income after all costs have been taken into account, even including the cost of capital !!!

The cost of capital is the same as WACC (weighted average cost of capital).

Economic profit can be calculated in 2 ways (with similar outcomes):

-Economic profit = (ROIC -/- WACC) * invested capital;

-Economic profit = NOPAT -/- (invested capital * WACC).

ROIC linked to growth

ROIC is also linked to growth.

This because ROIC is the maximum supportable growth rate of a company WITHOUT external financing !

Let's take a look at this with a simple numerical example, but first let's look at a formula:

-Growth = ROIC * (1 -/- payout ratio).

The payout ratio is the part of NOPAT a company pays out to its shareholders in the form of dividends and share buybacks.

And of course, this leaves less money available to reinvest.

With 100 USD NOPAT, and IC of 500 USD, ROIC was 20%.

Without any payout, the 100 NOPAT makes again: 20% * 100 = 20 USD (additional NOPAT).

In total: 500 IC + 100 IC (from nopat) = 600 IC.

600 IC * 20% ROIC = 120 NOPAT (100 + 20).

And another year later:

720 IC (600 + 120) * 20% ROIC = 144 USD NOPAT (100 * 1,20 ^ 2)

Growth rates higher/ lower than ROIC

Companies with a growth rate lower than ROIC will be able to payout cash without compromising on growth.

For example, if the company of the example only grows with 10%, than it can pay out 50 USD of NOPAT.

100 NOPAT / 500 IC = 20% ROIC

When growth is 10%:

NOPAT * (1 + 10%) = 110 NOPAT

110 / 20 * 100 = 550 IC is needed.

So 50 can be paid out: 100 nopat + 500 IC -/- 50 pay out = 550 IC needed

On the other hand, companies with growth above ROIC need additional financing.

With a growth of 2 times ROIC, NOPAT grows with 40%.

100 nopat * (1 + 40%) = 140 nopat

140 / 20 * 100 = 700 IC needed.

700 IC needed -/- 500 IC -/- 100 NOPAT = 100 IC (additional capital needed)

But of course, a ROIC of 20% is likely above WACC, so getting 100 new IC most likely creates lots of value in this example !!

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

Valuation: Issues with calculating ROIC

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Kersten Corporate Finance: M&A Advisory Netherlands (mid caps/ small caps) + Business Valuation (large caps/ mid caps/ small caps) + Valuation/ Financial Modelling training over the globe (New York, London, Middle East, Asia)

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

Practical issues

When making ROIC calculations there are a few practical issues:

1. Excess cash & marketable securities;
2. Restructuring, write offs and litigation charges;
3. Minority interests;
4. Share buybacks.

Let's now discuss these issues.

Excess cash & marketable securities (1)

Companies hold cash for their operations, they simply need some liquidity in order to do business.

Young businesses need a little more cash for this, because for them access to capital can be more difficult.

A (very rough) rule of thumb is to take 2% of revenue as cash needed for the operations, and then the rest is excess cash.

With a M&A deal the exact number of excess cash is calculated with the DD (due diligence), based on an average level of net operating working capital.

For less predictable companies with larger growth prospects, a ratio of cash to revenue up to 5% can be more suitable to use.

Restructuring (2 A)

Companies take restructuring charges when they plan to change the organisation of their business.

For example to cut costs by reducing the work force or by closing facilities.

And these charges mostly require a cost upfront.

Workforce reduction costs show up in the income statement, and this reduces NOPAT. And additional capital expenditures come up as a liability, affecting invested capital.

An asset write off reduces invested capital, and an additional capital expenditure increases invested capital.

In this case, it would make sense to cut out the "accounting adjustments" for the restructuring, but to leave in the actual additional capital spending.

(so restructuring charges are seen as one offs, but be careful here, these charges need to be studied in detail first)

Further, most likely the restructuring comes along with cost savings, and these need to be taken up (when they make sense obviously) in future NOPAT calculations.

Write offs (2B)

A write off occurs when a company recognises that it overstated an asset's useful life.

Reasons could be failing to consider 1) technological obsolescence and 2) inflation.

Depreciation is often used as a proxy for maintenance capital spending.

And gaps between real maintenance CAPEX and accounting depreciation is a predictor of future asset write offs.

For companies that write off assets regularly, adding it back to invested capital is suitable.

And when occurrence is rare, then you can let it go without an adjustment to invested capital.

Concerning goodwill and intangible impairment charges, it should be added back to invested capital.

This since management should be held accountable for past capital allocations in the form of M&A.

Litigation (2C)

Concerning litigation, companies add the estimated liability on the balance sheet.

This provision reduces equity, and comes back as debt, so invested capital is not changed (total of equity + debt).

NOPAT can be affected do by damage of reputation, and this is a matter of professional judgement.

Minority interests (3)

If a company owns part of the firm you are analysing, you can deal with ROIC as usual. There only might be a few tax implications.

At last, with DCF valuation, you minus this minority interest by another firm (in market value), from the enterprise value.

When the company you are analysing has a minority stake in another business, then you can also normally calculate ROIC, apart from some potential tax issues.

Although be careful, when the proceeds from the minority stake are not in NOPAT, then take out the minority interest from invested capital, otherwise the calculation goes wrong.

With DCF valuation, you add the (market value) of the minority stake on top of enterprise value.

Share buybacks (4)

When excess cash is used to buyback shares, buybacks have NO impact on ROIC.

This because then neither NOPAT or invested capital is affected.

Funding a buyback with debt also does not influence NOPAT, and invested capital.

Buybacks can influence "return on equity", but this only happens through changes in the capital structure (leverage).

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

Valuation: Intangible assets & ROIC

Author: Joris Kersten MSc/ Owner Kersten Corporate Finance

Kersten Corporate Finance: M&A advisory + Business Valuation + Valuation Training

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

Tangible versus intangible assets

Accountants record tangible investments on the balance sheet as assets.

And these assets are depreciated over their useful lives.

So these investments show up in the "invested capital" (IC) of a company.

And also depreciation is taken up in NOPAT.

On the other hand, accountants treat most intangible investments as expenses.

Take R&D as an example.

Accountants decided that companies should expense R&D because the benefits were uncertain.

And the link between R&D costs and sales was unclear.

And this logic applied to R&D was extended to:

-Advertising;

-Employee training;

-Creation of software.

Capitalising intangible assets

The above creates a situation where (on average) companies that are "tangible asset intensive" have high NOPAT and high invested capital.

And companies that are "intangible asset intensive" have low NOPAT and low invested capital. These companies are called "asset light companies".

But this does not enable us to compare company ROICs consistently !

So in order to do this you need to put the intangible assets on the balance sheet and amortise them over their useful lives.

And therefore you need to estimate the percentage of the various SG&A items (e.g. R&D, sales & marketing, general & administrative etc.) that should be considered an intangible investment.

This including their yearly amortisation !

By these adjustments, both NOPAT and invested capital, will be higher.

ROIC obviously is the ratio between the two.

And capitalising intangibles lowers ROIC for most profitable companies !

An important point to mention is that "free cash flow" will NOT change !

This because NOPAT and invested capital increase by the same amount.

So capitalising intangible investments does not change the value of the business.

But it does provide us with better insights into the company returns, and timing of the returns !

And it enables us to compare normal and asset light companies.

Source used: Morgan Stanley Investment Management: Counterpoint Global Insights/ Return on Invested Capital/ How to calculate ROIC and handle common issues. October 2022. M.J. Mauboussin, D. Callahan.

Cost of Capital (WACC)

Valuation: The cost of debt !

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Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

Introduction

In this blog series I will talk about:

-The cost of debt;

-The cost of equity;

-Betas;

-WACC;

-Capital structure.

But let's first start with the cost of debt !

Effective after tax rate

The cost of debt is the effective after tax rate a company has to pay on its long term debt.

The yield to maturity on a company's long term option free bonds is a good estimate for the pre tax cost of debt.

And this for a company with securities rated as "investment grade".

This is debt with a relatively low risk of default and therefore receives a higher rating from the credit agencies:

-Baa or above from Moody's;

-BBB or above from S&P Global and Fitch.

Indirect approach

For companies with only short term or illiquid debt, you can take some steps to estimate the cost of debt indirectly.

Here fore determine the credit rating on the company's unsecured long term debt first.

Then look at the average yield to maturity on a portfolio of bonds with a similar credit rating.

Bond investors often express this as a spread over a treasury rate, usually the 10 year note.

And the treasury yield is a proxy for the so called risk free rate.

Some companies finance themselves mostly with short term debt.

The problem here is that short term debt rates do not reflect expectations about long term inflation.

And the time horizon for estimating the cost of capital should match the time horizon of the forecasted cash flows.

This is in practise seldom less than 10 years.

The long term debt rate is a better estimation of the interest costs, and long term rates also capture the costs of repeated (short term) borrowing.

So when a company majorly relies on short term debt, then use its credit rating to estimate the cost of long term debt.

Tax shield

Net operating profit after taxes (NOPAT) less investment needs is equal to "free cash flow".

But this does not reflect (financial) leverage !

Debt creates a valuable tax shield, because interest expense is generally tax deductible (at least to some extent).

To capture this you adjust the debt rate from a pre tax to a post tax number.

And you do this with the "marginal tax rate", and this is the tax rate a company pays on its last dollar of taxable income.

Yield to maturity

The book value of debt is mostly a good estimate for the market value of debt.

But make an adjustment when the debt is trading at a substantial premium or discount to par.

And the yield to maturity is a fair estimate for the pre tax cost of debt. This for companies with debt rated as investment grade.

And the yield is expressed as a spread over a risk free rate.

Components of a estimated return include:

-The real yield on the 10 year US treasury note;

-inflation expectations;

-For example the BBB credit spread.

And the nominal yield on the 10 year US treasury note equals: Real yield + inflation expectations.

High yield debt/ debt rated below investment grade

Yield to maturity overstates the pre tax cost of debt for companies issuing high yield debt, or below investment grade rated debt.

This since high yield bonds have a significant probability of default.

The base rate of default over 10 years is about 2% for an investment grade bond (BBB- or higher).

But 23% for a speculative grade bond (BB+ or lower).

So here the cost of debt is somewhere between the promised yield and the risk free rate.

Leases

Leases should also be considered as debt.

Nowadays the accounting principles mostly require to reflect leases longer than one year on the balance sheet.

With US GAAP the entire lease payment, including embedded interest, is reflected in the calculation of EBIT.

But with debt, the interest expense shows up below EBIT.

So a company that leases will have a lower EBIT than a company that finances the asset with debt, even though pre tax income will stay the same.

So this lease interest needs to be separately analysed !

At last, total net debt should includes:

-Leases;

-Unfunded retirement benefits;

-Minus excess cash.

And as a rule of thumb, you can treat cash & marketable securities above 2% to 5% of revenue as "excess cash".

Summarised, estimating the cost of debt is very do-able, but it will get more complex with debt rated below investment grade, and when a company has significant leases !

Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

Valuation & the equity risk premium

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Kersten Corporate Finance: M&A advisory + Business Valuations + Valuation Training

Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

Cost of equity model

The cost of equity is the expected total return on a company's stock.

The cost of equity is higher than the cost of debt since equity is a junior claim on the value of the firm.

We can not observe the cost of equity directly, so we need an asset pricing model.

The best known model is the "capital asset pricing model" (CAPM).

Financial executives rely on CAPM, but in the investment community (quantitative funds) models with more variables are used.

Let's now look at CAPM since this is the model most practitioners use.

CAPM

The CAPM estimates the expected return of a security by multiplying the equity risk premium (ERP) with the security's Beta.

And the risk free rate (RFR) is added on top.

The ERP equals the difference between the expected return for the market and the RFR.

Think about it as a "credit spread".

The ERP is the same for all stocks in the CAPM because it captures what is known as "systematic risk".

This means risk that can not be diversified away.

And Beta measures how a company's risk contributes to the portfolio risk.

And this is "unsystematic risk" and can be reduced through portfolio diversification.

Risk free rate & equity risk premium

A proxy for the risk free rate is a yield on a long term default free government fixed income security.

The yield on the 10 year US treasury note is suitable for businesses in the US.

The ERP is the difference between the return on the equity market and the return of the risk free asset.

Surveys show that ERP estimates are in a range from 3% to 10%.

Other insights provide an estimate range from 0 to 7% with an average of about 4%.

(check the article I have used as a source for this blog for full details, find this source below, or above, this blog)

Equity risk premium estimates

There are 3 common approaches to estimate the ERP:

1. One can look at historical results and assume the future will be similar to the past;
2. One can survey investors about their expectations;
3. One can estimate a rate the market implies by reverse engineering assumptions.

Historical results are supported by lots of data but are heavily influenced by time period selection, and they include "survivorship bias", and they are different when using "arithmetic" or "geometric" averages.

Expectations by experts provide snapshots of attitudes at a specific moment.

And an ERP implied by the market uses current prices, but requires forecasts for drivers such as cash flow growth and return on capital.

Historical ERP

For valuation ERP's are needed that look forward, but it is still helpful to study the past for historical averages.

To study the past judgement is needed for:

1. Which RFR to use;
2. Time period to use;
3. Arithmetic or geometric returns.

Damodaran finds that the historical ERP falls in the range of 3 % to 12 % depending on how is measured.

For equity less bond returns in the US from 1928 – 2022 the arithmetic return was 6,6 % and the geometric return was 5,1 %.

ERP by market prices

One can also estimate the ERP by market prices.

The idea is that the key drivers of value, including earnings & dividends, follow long term trends that are predictable to some extent.

By estimating future cash flows, and knowing the current price, it is possible to solve for the "discount rate".

When looking at august 2008 to 2022, Damodaran used the 10 year treasury note as the risk free rate and estimated the ERP.

The average ERP over this period was 5,5% with a high of 7,7% and a low of 3,9%.

Expected return (RFR + ERP) ranged from 10,7% and 5,1% in this time period.

These numbers are not adjusted for inflation.

Damodaran on the ERP: Overall insights

Aswath Damodaran posts an updated estimate of the risk premium on his website every month.

He has annual estimates for the ERP from 1961.

The range goes from 2,1 % to 6,5 %.

These estimates are not adjusted for inflation.

Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

Betas & Valuation

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Kersten Corporate Finance: M&A advisory + Business Valuations + Valuation Training

Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

Beta & popularity

CAPM (the capital asset pricing model) is very popular among practitioners.

But the concept of "Beta" has been challenged on both empirical & intellectual grounds.

The empirical problem is that beta does not predict expected returns the way it should.

Specifically, stocks with low betas generate higher returns than the model predicts.

And stocks with high betas deliver lower returns than the model predicts.

And the intellectual issue is that "volatility" is a poor way to measure risk.

Value investors generally define risk as potential permanent loss of capital.

And they argue that the volatility of asset prices does a poor job on capturing that risk.

The measure Beta

Beta measures the return of an individual security relative to the return on the market index.

It reflects the "financial elasticity".

You calculate a historical beta by doing a regression analysis with the market's total returns as the independent variable (X-axis).

And the asset's total returns as the dependent variable (Y-axis).

And now the slope of the best fit line is the beta.

The slope of the regression line is the rise (up or down) over the run (left to right).

And the beta is 1.0 for a security that goes up and down the same as the market.

The beta is 2.0 for a security that goes up and down at a percentage twice that of the market.

So this security is considered riskier than the market.

And the beta is 0.5 if the security goes up and down at a rate that is one half of the market's percentage.

So this security then is less risky than the market.

Measuring Beta

Similar to the ERP (equity risk premium), beta should be a measure that looks forward.

But this is unobservable.

Therefor we have to examine historical relationships and make some adjustments to remove some "noise".

In order to calculate beta a few judgements have to be made, like:

1. Which index to compare to;
2. How far back in history to go;
3. Measurement history (e.g. daily, weekly, monthly, quarterly or at a yearly basis).

The S&P 500 is a sensible index for investors in the United States.

And the benefit of going back further in time is that there is more data, and the regression result is more reliable.

The drawback is that the company may over time has changed its:

- Business model;
- Business mix,
- Level of financial leverage;
- Or the company simply may have matured.

A longer time period to measure beta is better for companies with stable business models and stable capital structures.

And you can consider a shorter time period if you notice that the beta changes materially during the period you measure.

At last, more frequent measures create more data.

But a good place to start with measuring beta is by monthly returns over 60 months (5 years).

Industry beta

You can improve beta by using an industry beta rather than the beta of an individual company.

The rationale is that "business risk" (the variability of the cash flows), is the same for all companies within an industry.

For an industry beta you need to take three steps:

1. Unlever the industry company betas;
2. Calculate the average unlevered beta for the industry;
3. Relever the beta for the specific company.

A company's beta combines business risk + financial risk.

We want to measure business risk first, so we need to remove the effect from "financial leverage" from the industry betas.

The formula is:

Beta unlevered = Beta levered / (1 + D / E * (1 -/- Tc))

Then calculate the average unlevered beta for the industry.

And the trick is here to define "the industry".

Ideally, it is a group of companies:

1. With similar business risk because they are exposed to the same markets;
2. That create comparable products;
3. That deal with similar customers.

And the average can be weighted by market capitalisation.

And taking the "median" helps to check for outliers that might distort the average.

Unlevering betas isolates the "business risk", but we still need to set back the "financial risk".

This is done by using the target company's "expected long term capital structure".

And the formula to relever beta is:

Beta levered = Beta unlevered * (1 + D / E * (1 -/- Tc))

And this levered beta can then be used for your specific target company.

At last, the motivation to calculate an industry beta is to come up with a (more) accurate and (more) stable estimate of a company's risk.

Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

WACC & Capital Structure

Author: Joris Kersten MSc/ Owner Kersten Corporate Finance

Kersten Corporate Finance: M&A advisory + Business Valuations + Valuation Training

Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

WACC

WACC (Weighted Average Cost of Capital) combines the opportunity cost of the sources of capital (debt & equity) based on target weights.

An average WACC for companies in the Russel 3000 from 1985 to 2022 was about 8 %.

(see the source I have used for this blog - Morgan Stanley - Counterpoint Global Insights)

WACC is used to discount the future free cash flows of a firm.

This is called free cash flow to firm, and outcome is the "Enterprise Value" (EV).

Please never forget that the weighting of debt and equity should be done based on market values !

And NOT on book values !

So you need to use a "target capital structure" here, based on market values !

The debt to total capital ratio for the Russell 3000 from 1985 to 2022 was on average 30 %.

So roughly 30 % market value of debt, and roughly 70 % market value of equity, on average.

The Russel 3000 shows a decline in debt levels from 2008 to about 18% debt to total capital in 2022.

Debt & equity are by far the largest sources of capital for US public companies.

And by the end of 2022, the total value of corporate debt (and leases) was roughly USD 10 Trillion.

And the market value of equity was roughly USD 40 Trillion.

(roughly 20 % debt / roughly 80 % equity at the end of 2022)

Debt to total capital ratio

In general, businesses with low "business risk" are good candidates to use debt.

Business risk reflects the volatility of operating profits and is measured with "unlevered beta".

The valuation expert; Aswath Damodaran, analyses the relationship between unlevered beta and the ratio of debt to total capital.

He does this for more than 90 industries.

And as the theory predicts, the outcomes are:

- Companies with low business risk (low unlevered beta) tend to have higher debt to total capital ratios than firms with high business risk (high unlevered beta).

This is consistent with so called "trade off theory".

This theory tells us that firms will use a significant level of debt, if possible, because debt is cheaper than equity.

And this lowers the WACC !

But of course, you can only use debt to a certain extent.

On debt you pay interest.

And think of interest as a fixed cost, it declines operating profit, and can result in losses, when there is too much debt (interest).

Low risk businesses can handle this (interest) cost better, as above research shows.

So they have an intention to use more cheap debt !

Capital structure

Concerning capital structure, you can finance a business internally through cash from operations.

And you can raise debt and/ or equity.

A company can rely on internal financing when its (NOPAT) growth rate is equal, or lower, than its return on invested capital (ROIC).

(see my previous blogs on ROIC to find out how this works mathematically, I have explained this extensively before)

Expert valuator Aswath Damodaran tested this.

The hypothesis was that (with holding growth constant):

- Businesses with high ROICs have lower debt to total capital ratios compared to businesses with low ROICs.

Reason would be that companies would use internal financing before debt financing, because it comes first in the "pecking order".

So this way of reasoning is called “pecking order theory”.

And research shows that this (basic pattern) holds true:

Many of the best businesses in the world (as measured by ROIC), have very conservative capital structures !

Source used: Morgan Stanley Investment Management, Counterpoint Global Insights: Cost of Capital – A practical guide to measuring opportunity cost. 2023. M.J. Mauboussin & D. Callahan.

Corporate Finance - Various

M&A in stages/ The Pre-Exit Strategy

Author: Joris Kersten MSc/ Owner Kersten Corporate Finance

Kersten Corporate Finance: M&A boutique in The Netherlands, focus: sell side & buy side deals with an EBITDA of in between 1 million euro and 5 million euro (enterprise value 5 to 50 million euro) in all industries.

Kersten CF also provides business valuations, and provides training in valuation all over the globe (new york, london, middle east, asia etc.)

Source used: Article – Pre-exit: een gefaseerde bedrijfsverkoop, 2019, Menno Stuker, Tijdschrift Familie Bedrijven.

Introduction

With a pre-exit transaction an entrepreneur sells a part of his company to an investment firm.

This to cooperate with the investor in order to sell the full company 4 to 6 years later.

In general a new holding is set up (newco) that buys the company, and this newco is financed by equity of the investment firm, equity of the entrepreneur, and bank financing.

Let's say bank financing counts for 50% of the transaction, and the rest is done by the current entrepreneur and the investment company in the form of equity.

This would imply that the entrepreneur, and investment company, both hold 50% of the shares in the Newco. And in addition the newco attracts 50% bank debt for the purchase price.

With an equity purchase price of 7 million euro, the current entrepreneur would still hold 50% of the shares for 1,75 million euro (7 -/- 3,5 debt = 3,5. 50% * 3,5 = 1,75).

The investment firm would also hold 50% of the shares for 1,75 million euro, and the newco attracts 3,5 million euro bank financing for the transaction.

The transaction

This transaction results in that the entrepreneur would save a large part of his capital that actually was trapped in his company.

The equity purchase price was 7 million euro, and he keeps for 1,75 million euro shares in his company. This implies that he receives 5,25 million euro (7 -/- 1,75).

This comes from the bank (3,5 million) plus from the investment company (1,75 million).

Also note that the investment company buys 50% of the company shares by brining in only 25% (1,75 / 7 * 100%) of the equity purchase price.

Let's now take a look at the financial dynamics more closely !

Internal rate of return

Let's take a look at another example to analyse the financial dynamics.

An entrepreneur sells 70% of his company to an investment firm. (so he keeps 30% of the company)

The EBITDA is 1,5 million, there is 500k debt, and the EBITDA multiple is 5.

5 times EBITDA = 7,5 million enterprise value.

Enterprise value minus debt = 7,5 -/- 0,5 = 7 million for 100% of the company.

The deal is financed for 50% with debt = 3,5 million.

7 million -/- 3,5 million debt = 3,5 million equity value.

30% for the entrepreneur = 1,05 million equity (30% * 3,5 million).

70% for the investment company = 2,45 million equity (70% * 3,5 million).

This implies that the entrepreneur receives 5,95 million at the moment of the transaction (3,5 bank financing + 2,45 from the investment firm = 5,95).

And this obviously is the price of the transaction minus the amount he keeps in the company (7 -/- 1,05 = 5,95).

But now we are curious about total future returns, and the expected IRR (internal rate of return) of this deal !

Expected EBTIDA + future Debt

The value of the shares of a company is calculated out of an enterprise value.

Enterprise value = EBITDA * factor.

Value of the shares = enterprise value -/- net debt.

When the entrepreneur and the investment company can together grow the company from an EBITDA of 1,5 million to an EBITDA of 2,5 million, then they are (likely) creating value !

And higher EBITDA companies (in general) also have a higher EBITDA multiple!

So when they can sell the company in 5 years (after the initial transaction) for 6 times the EBITDA, this would result in 6 times 2,5 million EBITDA = 15 million enterprise value.

And when debt is build down in this 5 year time period, and when cash accumulated due to net profits (taking CAPEX and net working capital into account), then ideally also some cash is generated in these 5 years.

Let's assume that after paying back debt, CAPEX, and net working capital, 2 million in cash is generated.

Value of the shares at exit then is:

15 million minus -/- 2 million (accumulated cash) = 17 million for 100% of the shares.

30% is exit value for the entrepreneur: 5,1 million (30% * 17m)

70% is exit value for the investment firm: 11,9 million (70% * 17m)

The IRR then is calculated by comparing "equity in" and "equity out":

IRR entrepreneur: (5,1 / 1,05) ^ (1 / 5 years) = 37 % IRR

IRR investment firm: (11,9 / 2,45) ^ (1 / 5 years) = 37 % IRR

Total return for the entrepreneur:

5,95m at the initial transaction + 5,1m at exit = 11,05 m in total.

So this was a numerical example of a staged M&A by using a so called pre-exit strategy.

Source used: Article – Pre-exit: een gefaseerde bedrijfsverkoop, 2019, Menno Stuker, Tijdschrift Familie Bedrijven.

Business Valuation & Debt Leverage

Author: Joris Kersten MSc / Owner Kersten Corporate Finance

Kersten Corporate Finance:

M&A boutique (incl. Business Valuations) in the Netherlands with deal focus of 5 million to 50 million enterprise value (EBITDAs from 1 million to 5 million) in all industries, both sell side and buy side.

Source used: Article – De impact van schuld op de waardering, Chris Denneboom, januari 2021, Tijdschrift Familie Bedrijven.

Introduction

With discounted cash flow (DCF) valuation returns are very important next to free cash flows.

With DCF valuation there are different returns:

WACC = weighted average cost of capital;

CEU = cost of equity unlevered;

CEL = cost of equity levered.

In a company with a yearly free cash flow of 150, this free cash flow is available for the suppliers of the capital of the company.

When 50% of this free cash flow is available for the equity holders, and 50% for the debt holders (in the form of debt repayment and interest), then the free cash flow would be divided in 75 for equity and 75 for debt.

When the free cash would be 10% lower, so 135 (150 -/- 10%) instead of 150, then still 75 would be for the debt holders and 60 (135 -/- 75) would be for the equity holders.

So then the return of the equity holders lowers with 20% (15 / 75 * 100%), while the free cash flow only lowers with 10% !

This is the result of debt leverage, in other words, the return on equity becomes more risky with the use of debt.

Modigliani & Miller 1958

In 1958 Modigliani & Miller published an article with new insights on investment theory.

One of the most important insights tells us that the economic value of a company is not influenced by its capital structure, when we live in a world without taxes.

According to this theory, the equity holders should receive an additional return when debt is attracted by a company.

And this extra return is captured in the CEL with the following formula:

CEL = CEU + (CEU -/- Cd) * debt/ equity

Cd = cost of debt

Debt/ equity = The market value of debt / the market value of equity

(do not forget to use market values here !!)

Let's say the CEU is 15% for a specific business, Cd is 3%, the market value of debt is 125, and the market value of equity is 360, then we can calculate the CEL:

CEL = 15% + (15% -/- 3%) * (125 / 360) = 19,17 %

When we calculate the WACC, the formula is:

WACC = CEL * (equity / TC) + Cd * (debt / TC) * (1 -/- tc)

TC = Total capital based on market values

tc = corporate tax

In first instance we calculate the WACC without corporate tax:

WACC = 19,17% * (360 / 485) + 3% * (125 / 485) * (1 -/- 0) = 15 %

With this calculation the essence of the Modigliani & Miller theory is given.

With any capital structure, the weighted average return is equal to CEU !

The additional risk for the equity holders, by attracting debt, is taken care of in the CEL.

And herewith WACC always stays the same, including the value of a company !

But this is the situation of a theoretical world without taxes.

Taking tax into account

Now we have to take corporate tax into account.

Let's say corporate tax is 25%, and then the casus would be as follows:

WACC = 19,17% * (360 / 485) + 3% (125 / 485) * (1 -/- 25%) = 14,81 %

This results in a lower WACC.

Lower WACC = higher company value.

This due to the ability to deduct the interest expense for corporate tax.

So debt increases the value of the company (a little), and this depends on the capital structure, interest rate and corporate tax level.

Although, take into account that from a tax perspective there can be limits on tax deductibility.

Source used: Article – De impact van schuld op de waardering, Chris Denneboom, januari 2021, Tijdschrift Familie Bedrijven.

Article: Why is EBITDA so popular ???

Author: Joris Kersten MSc

Kersten Corporate Finance:

Joris Kersten (1980) buys and sells companies in The Netherlands with an enterprise value of in between 5 million and 50 million euro (SME market + mid market). Moreover he conducts lots of Business Valuations for all kinds of settings.

Introduction

Earnings before interest tax depreciation and amortisation (EBITDA) is used all over the globe for business valuation with for example M&As (Mergers & Acquisitions).

But why is EBITDA so popular ?

When we look at the profit & loss statement (P&L) of a company it all starts with revenue.

Revenue

Revenue is P * Q (price times quantity) of for example a product that you sell.

But we all know that there are costs involved: COGS (costs of goods sold) and OPEX (operating expenses).

And revenue minus COGS is the gross margin.

First, something funny happens with revenue, because so called "revenue recognition" applies.

This basically means that you can speak of revenue under certain circumstances, for example when you are sure the product is sold (even when the money is not paid yet).

So it is very important that you know for every company that you analyse when, and how, revenue is recognised.

This since this number comes up in the P&L (again, even when the money is not paid yet).

COGS

With product sales, at the moment when revenue is recognised, also the COGS need to be matched with the revenue recognised.

So when you can legally recognise the sales of 10 products (even when the money is not yet paid by the customer), you need to match the "buy in price" for the 10 products as well in the COGS (even when they are not paid yet to the supplier).

And what is left is called the gross margin !

And by the way, this matching of costs is called the "matching principle".

So be careful, it is possible that money is not yet paid by the customers, and it is possible that the company has not paid their suppliers either.

Gross margin

Another thing with gross margin is that depending on how cost price is set (variable costing or absorption costing), more or less costs can be taken up in the COGS, which will result in hard to compare gross margins of different companies.

Some take up additional costs in the COGS, and other companies take them in the SG&A (sales, general and administrative expenses).

So revenue misses the important involved costs (COGS + OPEX), and gross margins are difficult to compare because cost prices are calculated differently.

SG&A

Out of the SG&A we need to clean D&A (depreciation and amortisation).

Depreciation is writing down tangible assets and amortisation is writing down intangible assets.

We call these costs, but no cash outs, so we want to neglect them (for now), because D&A is a bookkeeping concept.

Gross profit minus (SG&A -/- D&A) = EBITDA.

At EBITDA basically the most important costs are taken in the form of COGS and OPEX (SG&A).

So EBITDA seen as a percentage of revenue really tells something about the operating efficiency of a company !

Again, be careful, the matching principle also applies for SG&A, so some costs are matched in the P&L (so also in EBITDA), but they might not be paid yet !

EBIT

We can still go further down to EBIT, and here we take the D&A from EBITDA.

But the problem with D&A is that it is still subjective, because it is set by the board (although signed off by the auditors).

And on top of that D&A is a cost but not a cash out (is has a little effect on corporate tax do).

So basically at EBIT we are down one step too far.

EBT

EBIT minus interest is EBT (earning before tax), but here interest comes into play.

And we do not like interest !

Because interest has to do with capital structure, and capital structure is a decision of the board, and it has not much to do with the operations.

Net income

Here it becomes even worse, because here also tax has been deducted.

But the amount of tax paid is also a decision of the board.

Companies have an "effective tax rate" (ETR) depending on how much tax optimalisation they are tolerating, again this has not much to do with operations.

EBITDA

So maybe you now start to understand that EBITDA is the "least bad" line in the P&L.

I consciously say "least bad", because EBITDA says nothing on:

-When customers pay, and when suppliers and stakeholders get paid (net working capital);

-How, and when, capital expenditures (CAPEX) are done;

-With how many assets this EBITDA is made;

-A normal level of corporate tax, and interest, that always needs to be paid.

Introduction Kersten Corporate Finance

Kersten Corporate Finance is an independent M&A consulting firm in The Netherlands.

Deal segment: Middle sized and SME companies. So companies with an Enterprise Value (EV) of in between 5 million euro and 100 million euro @ The Netherlands and Benelux.

Activities:

1. Selling companies;
2. Buying companies;
3. Business Valuation & Financial Modelling;
4. Financing of acquisitions with bank loans and/ or private equity firms;
5. Buy & Build strategies for strategic buyers and private equity;
6. Searching & selecting acquisition targets;
7. Finding multiples for precedent M&A transactions in a certain field.

Website M&A consulting: **www.kerstencf.nl**

Website M&A training: **www.joriskersten.nl**

M&A training:

Business Valuation & Deal Structuring – 6 day training – Spring of every year – Location: Hotel Amsterdam/ The Netherlands – Also online available on live stream. 29 PE points for Registered Valuators (RV) from NIRV;

In addition, Joris provides valuation training all over the globe on (bulge bracket) investment banks and universities in: New York, London, Hong Kong, Singapore, Dubai, Saudi Arabia, Kuwait, Mongolia, Surinam and Peru.

130 references on M&A training: **https://www.joriskersten.nl/nl/reviews**

You can book me for keynotes, training sessions & presentations on M&A and Valuation all over the globe.

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Introduction Joris Kersten

J.J.P. (Joris) Kersten MSc BSc RAB (1980) is owner of "Kersten Corporate Finance" in The Netherlands, and this is an independent M&A boutique (Mergers & Acquisitions) in consulting on M&As and valuations of medium sized companies.

Joris performs business valuations, prepares pitch books, searches and selects candidate buyers and/ or sellers, organises financing for takeovers and negotiates M&A transactions in a LOI and later in a share purchase agreement (in cooperation with (tax) lawyers).

Moreover, Joris is associated to 'AMT Training London' for which he provides training in Corporate Finance & Financial Modelling at leading ("bulge bracket") investment banks in New York, London and Hong Kong.

And Joris is associated to the 'Leoron Institute Dubai' for which he provides finance training at leading investment banks and institutions in the Arab States of the Gulf. This for example at Al Jazira Capital in Saudi Arabia and TAQA in Saudi Arabia.

In addition, Joris provides lecturing in Corporate Finance & Accounting at leading Universities like: Nyenrode University Breukelen, TIAS Business School Utrecht, the Maastricht School of Management (MSM), the Luxembourg School of Business and SP Jain School of Global Management in Sydney.

Moreover, he provides lecturing at partner Universities of MSM in: Peru, Surinam, Mongolia and Kuwait. And at partner Universities of SP Jain in Dubai, Mumbai and Singapore.

Joris graduated in MSc Strategic Management and BSc Business Studies, both from Tilburg University. In addition, he is (cum laude) graduated as "Registered Advisor Business Acquisitions" (RAB), a 1-year study in the legal and tax aspects of M&A's.

Currently Joris is following the "Executive Master of Business Valuation" to obtain his title as "Registered Valuator" (RV) given out by the "Netherlands Institute for Registered Valuators" (NIRV). This title will enable Joris to give out business valuation judgements in for example court cases.

Website M&A consulting + Valuations: **www.kerstencf.nl**

Website M&A training + Valuation training: **www.joriskersten.nl**

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