



M.Sc. in Corporate Finance

The Extent Use of the WACC
by Companies in Iceland

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Declaration of Research Work Integrity

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature of any degree. This thesis is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by giving explicit references. A bibliography is appended.

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Abstract

In this paper, the results of a quantitative research among CFOs in companies in Iceland on their usage of valuation techniques are presented. Chief Financial Officers (CFOs) in Icelandic companies were asked, in a questionnaire, whether they are using the Cost of Capital estimations to evaluate their operations. Other CFOs were also asked, in qualitative research, if they are using the Cost of capital estimations, and then if not then which methods are they using either instead or along with it.

The Cost of Capital estimations refer to the calculations for the Weighted Average Cost of Capital (WACC). That is a financial calculation method for the WACC that gives CFOs clear picture to be able to evaluate their companies' operation or a new project. To calculate the WACC the Capital Asset Pricing Model (CAPM) is used, which describes the relationship between expected return of assets and systematic risk (Investopedia, N/A).

There are European (Brounen, De Jong & Koedijk, 2004), U.S. (Graham & Harvey, 2001) and Australian (Truong, 2008) researches that are all studying similar topic as in this research thesis. In the Australian research, there are results showing that the most popular techniques used for valuation of a business are the Net Present Value (NPV), the Internal Rate of Return (IRR) and the Payback period. The Weighted Average Cost of Capital (WACC) is most often used for discounting, with the assumption that the life of the project would be constant with same discount rate across departments. In this research thesis it is analysed whether companies in Icelandic do prefer to use the WACC as their valuation technique or if there are any other methods more used. The Australian research is a prefiguration of this research and the results are compared to the results of that research. The main results in this research thesis is that the WACC is used in 41% of the companies that participated in the research. CFOs are mainly using the Payback period method for evaluation in their companies, but also the Net Present Value method along with the WACC.

Keywords: WACC, Weighted Average Cost of Capital, CAPM, Capital budgeting, Payback period, Iceland.

Prologue

This research is a Master thesis for a M.Sc. degree in Corporate Finance at Reykjavik University in spring 2017. The thesis applies for 30 ECTS credits as the final project in the postgraduate studies. The author of the project is Lilja Björg Guðmundsdóttir. The research is a study to analyse whether financial managers in companies in Iceland are using the calculation method for the Weighted Average Cost of Capital (WACC) to evaluate their businesses.

The supervisor of this project is Már Wolfgang Mixa whom I would like to thank for all his assistance. I am very grateful. I appreciate the assistance from CreditInfo for choosing randomly the sample of the participants for the quantitative research and for providing the e-mail addresses to send the survey to the participants. I also want to thank Lea Kristín Guðmundsdóttir and Linda Jónsdóttir for the read-through of the project. At last, thanks to my family who has been so patient and encouraging.

Reykjavik, May 15th 2017

Lilja Björg Guðmundsdóttir

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The Extent Use of the WACC by Companies in Iceland

A key issue in corporate finance is capital budgeting. How can financial managers know which method they should be using to evaluate their company's operation? This question is very simple to some financial managers, who often use the same tool on a regular basis without considering other methods that might be better to use. Others find it, however, difficult to decide which method is the most efficient one to use. Brealey, Myers & Allen (2016) show financial calculation methods for managers to use to evaluate their companies' operations, or new projects. They say that the most common method is the Weighted Average Cost of Capital (WACC). The importance of these calculations is implicit because they can lead managers to the correct decision making for new investments or decisions related to their operation. This method is very efficient to use for making decisions on a new project and on a regular basis to see how the operation is going. They say the Cost of capital estimations are very important and relevant to all companies in all business sectors. To be able to compare the operation between time periods, the calculations must be done on a regular basis. The same applies when comparing a new project to an older one (Block, 2011).

Even though the calculation method for the WACC can be difficult to adapt to, to keep assumptions comparable, it is just as important for all sectors of business. It is important to have the same assumptions every time to be able to compare the result to the results from previous calculation. To be able to calculate the WACC there are several assumptions needed. Cost of debt and Cost of equity are figures needed, at a predetermined percentage, for the calculations, which are figures that can be either calculated or can be found on several websites where valuation validity for each sector in business is daily updated. These assumptions need to be received from the same valuation database or to be calculated the same way to be comparable each time the WACC method is used. It can be calculated by either the financial manager of a company or by a subordinate, if the person has the knowledge and dedication for the method and the numbers (Block, 2011).

The WACC method as a capital budgeting technique is generally accepted as being very important and relevant. It became interesting to study whether this method of

calculating the WACC, and using it to evaluate businesses, is being used in companies in Iceland. It is interesting to know how often these calculations are performed and what other methods are used either along with the WACC or instead of it. When studying the literature about this material there were different opinions on the WACC method between time periods. In the 70's the WACC was often used but in the literature since 2004 the WACC calculations are, by that time, rarely used for evaluation in companies. The companies that are still using the WACC method, in the last 10-15 years, are mostly using other evaluation methods along with the WACC (Brounen, De Jong & Koedijk (2004).

In this research, Chief Financial Officers (CFOs) or executives of financial departments of companies in Iceland were sent a survey by e-mail that included 18 questions. They were asked background questions about their education, period of employment in the occupation, the size of the company they are working for and its business sector, etc. They were also asked whether they are using the calculations for the WACC on regular basis and what assumptions they use. They were then asked, if they are not calculating the WACC, which methods are they using instead to evaluate their business. There were also interviews with six managers, regarding usage of the Cost of Capital methods, for retrieving more information than from the survey. The objective to this research is to see whether the calculations for the WACC are being used for evaluation of businesses in Iceland. It is the author's interest of the extent of use of the WACC method that drove this research to reality. There are expectations that the results of this research will be beneficial to provide a knowledge of the usage of the WACC and which other capital budgeting techniques are being used in companies in Iceland. If the WACC is not being used, then which method is the most commonly method used in companies in Iceland? It is also interesting, in general, to see if there is much difference between the methods companies in different sectors are using. That will be reviewed in the results chapter of both Study I, which is the survey, and Study II, which are the results from the interviews.

Procedure of the research

This research shows whether Cost of capital estimations with the WACC are made on a regular basis in companies in Iceland. The research question sounds as follows:

Are companies in Iceland using Cost of capital calculations to evaluate their operation?

Answers to the following four research sub questions are obtained to provide a fuller picture of the subject:

- How many companies are using these calculations on a regular basis?
- How often are these calculations executed?
- Who performs the calculations?
- What other calculation methods are companies in Iceland using along with or instead of the WACC calculations?

The objective for these four sub questions is to make the results of the main research question comparable to an Australian research of this topic (see paragraph 2.3). The Australian research is the prefiguration for this research and the design of the questions in the survey. The objective of the first and second sub questions is to show whether the calculations of the WACC are being performed on a regular basis and then how often they are done. The objective of the third sub question is to see who it is that executes the WACC calculations; whether it is the CFO, a subordinate or someone working outside of the company. The survey should answer these three sub questions. The last sub question is being answered by the interviews with CFOs of companies in Iceland and the objective of that question is to see what other calculations are being used in companies in Iceland, other than the WACC.

The structure of this thesis will be as follows. First, there is a discussion on what Cost of capital is and then a description on the Weighted Average Cost of Capital (WACC) and its calculations. Secondly, literature is reviewed, about other researches on the topic. After that, the research questions will be put forward and the research methodology of the thesis. Following that, the main results of the research will be addressed, both results of the survey and interviews. Finally, there will be discussion about what the results of the research, what it entails and possible continuation of the research.

1 Literature review

There is literature that shows the importance of using the WACC as capital budgeting method for evaluation of companies. There is also a lot of literature that shows there are other methods just as common as the WACC, or even more commonly used. First, several Cost of capital methods will be analysed. Secondly, Merton Miller and Franco Modigliani won the Nobel Prize for their capital structure theory of irrelevant proposition theorem and their theory will be reviewed. Then, the WACC will be presented along with the necessary assumptions for the WACC calculations and examples given. Then there are a few researches from abroad on the material and their results are being overlooked. Lastly, there are only a few of the largest companies in Iceland that have the WACC in their annual report and they will be mentioned.

1.1 Cost of Capital methods

Companies that have funds use the cost of the financial resources, either of bank loans or issuing bonds, to raise funds in their businesses. That is called the cost of capital. In the most basic sense, the cost of capital refers to the weighted cost of equity and cost of debt. This refers to cost of debt when a company is only financed with debt but there is cost of equity if the company is only equity financed. Most companies use a combination of the two, equity and debt, to finance their businesses. Then the cost of capital is obtained with weighted average of all these capital sources, known as the Weighted Average Cost of Capital (WACC). Cost of capital represents a hurdle rate, which is the minimum rate of return on a project that is required by a manager before making an investment. A company must overcome the hurdle rates before it can create value, so its cost of capital is thoroughly used in the process of capital budgeting to decide whether a company should proceed with an ongoing project or starting new ones (Schmidt, 2017).

The expected return on company's portfolio, of its existing securities, is another way of defining the company's cost of capital. Company's cost of capital is the opportunity cost of capital for investment in the company's assets, so it is its appropriate discount rate for the company's average risky projects, or projects that have the same risk as the overall business of the company. The company's cost of capital is not only equal to the cost of equity or the cost of debt. When a firm has no outstanding debt ($r_D = 0$), then the cost of capital is the expected rate of return in the companies' stock (r_E). If a new project, which is being evaluated, is either riskier or less risky than the company's

existing business, then it is not correct to use the company's cost of capital as a discount rate. Every new project should be evaluated on its own opportunity cost of capital (Brealey, Myers & Allen, 2016).

There are other Cost of capital methods than the WACC calculations that are being used in companies to evaluate businesses. Managers have different opinions on several methods, which one of them shows the best picture or are most simple to use. Those other methods mostly used are the Internal Rate of Return (IRR), the Net Present Value (NPV) and the Payback period (Gallo, 2015).

1.2 The Weighted Average Cost of Capital (WACC)

In almost every capital budgeting textbook, there is a chapter about the Weighted Average Cost of Capital (WACC). Even though the textbooks are satisfying, they do not show the accurate description of how companies do operate in practice.

The WACC is one of the most important methods for Cost of capital. The WACC is an average cost of a company's acquirement for a capital it needs to have sustainable business. Companies have several ways of gaining their capital. Owners can put in capital for the business or the company can keep some of its profit instead of paying it out as dividend to its owners. Most companies have long-term or short-term loans from financial institution or they have loans in form of goods or service from their suppliers that enables them to postpone payments. Most loans have regular interest payments and owners of companies require capital gains of their company's equity. The cost of raising funds depend on which method is valued being a better choice. If the weighted average of the cost of each funding method where the weights are equal to its proportional weights of each funding method, then the WACC is found (Gylfi Magnússon, 2002).

The WACC is a financial metric that is used to evaluate the company's cost of capital. It is most commonly used to show the discount rate in the evaluation for a new financed project. It tells how much the cost of a new investment is and thereby it shows the cost of financing the capital. When the Discounted Cash Flow (DCF) is being used in the DCF valuation model, the WACC is used to decide the discount rate for it. The DCF valuation is a tool to be used to estimate an actual value. Then the expected asset value is used as the Present Value (PV) of the expected Cash Flows on the assets (WSO, n.d.). The following formula is used for the DCF calculation (Damodaran, 2006):

$$\text{Value of asset} = \frac{E(CF_1)}{1+r} + \frac{E(CF_2)}{1+r^2} + \dots + \frac{E(CF_n)}{1+r^n}$$

This method of DCF Valuation will be reviewed in paragraph 1.3.4.

Some features of the WACC are executed without tax adjustments, while others use the after-tax WACC. The hardest part of the calculation of the after-tax WACC is the estimation of the cost of equity. The Capital Asset Pricing Model (CAPM) is most commonly used by large, public companies but the reason for that is not known. The method might be too complicated for some managers to execute or they need more knowledge about the method. The company's Beta (β) is usually estimated from past rates of return for the market and for the common stock. Their estimation is checked against the average Beta of similar companies in the same industry (Brealey et al., 2016).

The before-tax cost of debt (r_D) is usually estimated by either method; bond rating¹ or yield to maturity². Because interest payments are generally deductible for tax, then the after-tax cost of debt is the real efficient cost of debt to the company. The after-tax WACC is found by discounting the cost of debt with the tax rate ($r_D * (1-\text{tax})$) and then is the after-tax cost of debt used as r_D in the equation for the WACC. High debt levels may motivate managers to work harder, if the debt leads to an expensive financial urgency in companies (Clayman, Fridson & Throughton, 2002).

Before going further into the discussion of the WACC, it is necessary to introduce the CAPM model.

1.2.1 The CAPM

To be able to calculate the WACC there are assumptions needed as input for the formula. First, the Capital Asset Pricing Model (CAPM) is being used to find the cost of equity. The CAPM shows that expected return of a security, or a portfolio, is equal to the rate on a risk-free security added to a market risk premium multiplied with Beta (β). The market risk premium can be estimated in different ways. Because all investors have their own and different expectations to the market risk premium, it can then be

¹ Bond ratings is the grade of bonds which indicates the credit quality of the bond (Investopedia, n.d.).

² Yield to maturity is the return on a bond that is held until its lifetime ends and is usually a long-term yield of a bond (Investopedia, n.d.).

calculated as weighted average of the expected market risk premiums of the different investors. Since estimated market risk premiums can be very volatile and estimated only on a short-term basis, this above mentioned method is very uncommon in practice (Damodaran 2006, p. 38). β is a measure for the risk of the volatility of securities or a portfolio compared to the general movements in the overall market. The market portfolio of all assets that can be invested has a β of 1. If β equals 1, then the stock has the same level of risk as the market. When the β is higher than 1 then it indicates an investment with higher volatility than the overall market, but if β is between 0 and 1 then the volatility is lower than the market (Vaidya, n.d.). A portfolio that has $\beta = 0$ gives an expected rate of return as the risk-free rate (Lo & Wang, 2008). The β can show a volatile investment with non-correlated price movements with the market. The fluctuation around the price around the mean is a volatility measurement for the standard deviation. The formula for the CAPM is written as:

$$r_E = r_f + \beta_E * (r_m - r_f)$$

Where:

- r_E is return on equity,
- r_f is risk free interest rate,
- β_E is for Beta which means the risk, where E = equity, and
- $(r_m - r_f)$ is market premium.

(Brealey et al., 2016, p. 198-202)

The CAPM method is most commonly used to calculate the cost of common stock. The three components needed for the calculation are risk-free rate, equity risk premium and Beta (Clayman et al., 2002).

The CAPM is built on four assumptions. Firstly, the investors are risk averse and therefore they evaluate every investment portfolio for expected return and standard deviation of return, measured over the same period. Secondly, capital markets are perfect in several senses, including these four following factors:

- All the assets are immeasurably divisible,
- There is no transaction cost, no short selling restrictions or any taxes,
- Information is without any cost and is available to everyone, and
- Every investor can have borrowed and lend at the risk-free rate.

Thirdly, investors do all have the same access to the information of possible investments and therefore have the same opportunities of investing. Fourthly, investors all make the same estimations of expected returns for each individual asset, standard deviation of return and the correlation of asset returns (Perold, 2004, p. 15-16).

When these two methods are used together, by calculating the CAPM one receives an estimated required return on equity (r_e) to use in the WACC calculations. There are examples of the CAPM and the WACC in paragraphs 1.2.2 and 1.2.3.

1.2.1.1 Valuation validity websites

There are websites where valuation validity is updated daily for each sector of business. These websites are databases with figures for the CAPM and the WACC equations. One of these websites is Damodaran Online. Damodaran Online is the homepage of Aswath Damodaran, who is a teacher in the Stern School of Business at New York University. On Damodaran homepage there are tools that are updated every day where you can see the Beta (β), the rate of return on debt (r_D), and the rate of return on equity (r_E) and a lot more useful figures for financial calculations. This database is vital for financial managers to find information to be able to calculate the CAPM and the WACC in more simple way, without calculating the necessary factors themselves (Damodaran, n.a.). There are other websites with valuation validity, like Bloomberg, but this website is the most cited website by universities and companies. In this thesis, the focus is on Damodaran's website.

1.2.2 The CAPM calculations

Damodaran's website can be very useful tool when presumptions are needed for the CAPM calculations. By using the figures from Damodaran for the missing data, in this example using Chemical (Diversified) industry, it gives the following assumptions for the cost of equity (Damodaran, n.d.):

$$8\% + 1.52 * (12.8\% - 8\%) = 15.3\%$$

Where:

- the risk-free rate (r_F) is 8%,
- Beta (β) is 1.52 for the industry, and
- the market risk (r_M) is 12.8%.

This gives the outcome that the market premium ($r_M - r_F$) is 4.8%, which is the difference between the assumed cost of equity and risk-free rate. The difference is multiplied by 1.52, which is 7.3%. Add the risk-free rate to that number. Then the cost of equity (r_E) is found to be 15.3%.

Per the CAPM calculations, if a company can invest in another investment opportunity and can earn a return on the cost of debt then the rate of return is the company's cost of funds. So, if companies expected return (r_E) does not meet or pass the required return then the decision should be not to invest. This applies, if a company can repay the origin of capital and save a cost of debt, then the cost of debt is the company's cost of funds. If the company cannot earn more than its opportunity cost of funds on an investment it should not undertake that investment, or else the investor will lose from the investment (Clayman et al., 2002). To be clear, according to the above example of the CAPM calculations for the cost of equity, if the required return would be 16% but the cost of equity (r_E) found is only 15% then the decision for investment should not be undertaken. If the required return on the investment would be 14% (less than the CAPM), then the decision or investment should be undertaken.

1.2.3 The WACC calculations

Now the cost of equity is known, from the calculations of the CAPM, and the cost of debt is needed. Cost of debt is the interest rate that a company needs to pay for that kind of debt. Interest expenses are tax deductible and can then be calculated as:

$$r_D = \text{Yield to maturity of debt} * (1 - T)$$

Where:

- T is the company's Tax rate.

Then the WACC can be calculated, by using either calculated assumptions or by using the data from databases, like Damodaran. The weights in the WACC are the relative market values of the company's debt and equity. The weights on Debt to Value (D/V) and Equity to Value (E/V) can either be target weights or real weights from the company's statement. Cost of debt is always less than cost of equity (Koller, Goedhart & Wessels, 2015). The formula for the WACC is written as:

$$WACC = r_D * (1 - T_C) * \left(\frac{D}{V}\right) + r_E * \left(\frac{E}{V}\right)$$

Where:

- r_D is the required return on debt financing,
- $(1-T_C)$ means the tax adjustment for the interest expense,
- r_E is the cost of equity,
- D/V is the ratio debt to total value, and
- E/V is the ratio equity to total value.

(Brealey et al., 2016, p. 221).

Here below is an example of how the WACC calculations are made when a company is financed with both equity and loans from financial institutions (or bond issuance). In this example, the company needs to pay 10% interest of the loan but owners demand 15% yield on equity, the same as in the calculations for cost of equity in the CAPM calculations above. Total liabilities of the company are 1.000.000.000 ISK but market value of equity is 2.000.000.000 ISK. The company's total value is 3.000.000.000 ISK, where 1/3 of it is financed with loans (D/V) and 2/3 are financed with equity (E/V). The WACC is then weighted average of 10% and 15% where the weight of 10% is 1/3 and the weight of 15% is 2/3. Then the WACC is found by using the formula above, as follows:

$$10\% * \frac{1}{3} + 15\% * \frac{2}{3} = 13.33\%$$

If interest cost is valued as the company's cost and are deductible from taxes, then the equation changes. Then the cost of having a loan is $10\% * (1 - \text{tax})$ instead of 10% interest rate. If we estimate 20% corporate taxes, then the equation would be as follows and gives us a lower WACC:

$$10\% * (1 - 0.2) * \frac{1}{3} + 15\% * \frac{2}{3} = 12.67\%$$

Where:

- r_D is 10%,
- Tax rate is 20%, so $(1-T_c)$ is 80%,
- r_E is 15%,
- D/V is $1/3$ or 33.33%,
- E/V is $2/3$, or 66.66%.

The Weighted Average Cost of Capital is one of the metric that managers consider when they need to make financial decisions. Investments need to be accountable for the cost so it can be useful to compare expected profitability and the WACC. In most cases, before making any decisions, it is important to consider other factors as well, like the Net Present Value of the investment or a project, which should be positive (Gylfi Magnússon, 2002).

A company's Cost of capital is defined as "expected return on a portfolio of all the company's existing securities" (Brealey et al., 2016, p. 219). Company's cost of capital can be used to discount cash flows on projects that have similar risk as the company as a whole. For riskier projects, the Cost of capital is more than the company's Cost of capital, but for less risky projects it is less than the company's Cost of capital. The general rule for the company's Cost of capital is that any projects offering higher return than the company's cost of capital should be accepted, regardless of its risk. If the company's Cost of capital is rather low figure, then there is a possibility that high-risk projects are being accepted, because they are higher than the company's Cost of capital, or rejecting many good low-risk investment projects. The company's Cost of capital is usually estimated as a WACC, as the average rate of return expected in debt and equity, for the investors who demand it. When a company has no outstanding debt then the company's Cost of capital is the expected rate of return from the company's stock. There are two guidelines that show when it is important to find the company's Cost of capital and they are:

- Projects can be treated as average risky compared to other assets of the company, and
- It can be useful to set the starting point of discount rates, for projects which are either risky or safe.

So, the company's Cost of capital is often used as a benchmark for making decision on a new project and it is also used as a discount rate for every available project (Brealey et al., 2016).

An analyst should use the WACC in valuation because the WACC gives a fuller picture of how the operation or a project is evaluated. Then, it is very important, for the calculations of the WACC, to update the assumptions for each factor in the formula, for example if the cost of debt increases in one year, like from 6% to 7%, then in the new calculations the cost of debt should be 7%. The WACC is being used along with other valuation methods, like when using the NPV method, to value a project. The NPV is Present value of inflows subtracted with Present value of outflows. When the NPV is positive, the investors should invest. Then the project or the investment has positive earnings, which is exactly what investors want (Koller et al., 2015).

The Return on Invested Capital (ROIC) is another method that is related to the WACC. The ROIC is used for valuation and decision making for investment. When the spread between ROIC and the WACC is positive (ROIC>WACC), then new growth is creating value for the company. It is then recommended to invest or focus on product innovation in companies. (Koller et al., 2015).

1.2.4 The WACC unlevered and relevered

The formula for the WACC can be dangerous to use in a too simple way, where people make logical errors. The WACC formula does only work with projects that are carbon copies of the company. So, when a company can borrow 90% of a new project the debt to value ratio (D/V) would be 90%. The company is not 90% debt-financed. In these cases, the WACC needs to be adjusted when debt ratio and business risk are different. Then the WACC needs to be unlevered and then relevered again by three steps (Brealey et al., 2016).

Step 1 is to unlever the WACC by calculating the WACC and the cost of equity at zero debt. Then the opportunity cost of capital is found as r , if the real debt ratio (D/V) is 40%, when using the WACC formula:

$$r = r_D * \frac{D}{V} + r_E * \frac{E}{V}$$

Where:

- r is the opportunity cost of capital,
- r_D is the required return on debt financing,
- r_E is the cost of equity,
- D/V is the ratio debt to total value and
- E/V is the ratio equity to total value

When using the figures from the previous example the calculations are as follows, by using the WACC formula above:

$$r = 10\% * 33.33\% + 15\% * 66.66\% = 13.33\%$$

Where:

- r_D is 10%,
- r_E is 15%,
- D/V is 33.33% and
- E/V is 66.66%

Then, in step 2, the cost of debt (r_D) is estimated at the new debt ratio, using the CAPM formula:

$$r_E = r + (r - r_D) * \frac{D}{E}$$

Where:

- r_E is the cost of equity,
- r is the calculated r from step 1,
- r_D is the cost of debt,
- D/E is the Debt to Equity ratio

When using opportunity cost of capital (13.33%) from step 1 and the same cost of debt (10%) with the new debt ratio 20% (assumed here), then the result for cost of equity (r_E) is:

$$r_E = 13.33\% + (13.33\% - 10\%) * \frac{20\%}{80\%} = 14.16\%$$

Where:

- r is 13.33%, which is opportunity cost of capital,
- r_D is 10%, and
- D is 20%, which gives that E is then 80%, so D/E is 0.25.

In step 3 the WACC is calculated again with these new figures from step 2:

$$WACC = r_D * (1 - Tax) * \frac{D}{V} + r_E * \frac{E}{V}$$

Which gives the relevered WACC to be:

$$WACC_{new} = 10\% * (1 - 0.2) * 0.2 + 14.16\% * 0.8 = 12.93\%$$

These calculations can also be done by unlevering and relevering the Beta. Unlevering the Beta is done for companies and investors to review the WACC for evaluation on the returns that is needed to meet the capital obligations. Amongst others, creditors and stockholders need this information for their decision making. Beta (β) is important for the WACC because of the weight of cost of equity to take the risk into the calculations. The debt is not involved in all capital obligations. The Beta calculations that do not include the impact of debt are required for comparisons. The process of this calculations is unlevering the Beta (Corporate Finance Institute, n.d.).

1.2.5 The WACC used for decision making

Even though executives estimate value using different approaches, in the past 25 years there has been a clear trend toward methods that are more formal, direct, and institutionalized. In the 70's, the Discounted Cash Flow analysis (DCF) came up to be the best practice for valuing corporate assets. There was one version of DCF that became the standard version. The standard version assumed the value of a business to equal its expected future cash flows, discounted to present value using the WACC. In the late 90's this version of the WACC was based upon standard procedure that was outdated. With today's improved computers and data the use of the WACC works better than ever. One effect of that collapse in cost is that managers put more emphasis on analysis. Nowadays there is greater possibility to use valuation methodologies that are better designed for the big decisions that managers face. The resource allocation process presents three basic methods of valuation problem. Managers must value operations, ownership claims and opportunities (Luehrman, 1997). It is the managers' job to

maximize the stockholders' asset as much as possible. To be able to do so and make the right decisions, the managers have many valuation tools and methods. One vital technique is the WACC method but other evaluation methods are being reviewed in paragraph 1.3.

Managers need to have the opportunity of valuing their operations and investment opportunities. They also need to be consistent in valuing the ownership of their claims or the loans they are providing. It has become a common practice to use the same tool for all kind of problems for valuation, even though the valuation is a function of cash, risk and timing. All problems have structural features that present clear analytical challenges and set them apart from others. The most basic problem is how to value operations and which method is the best one to use. It can be difficult for managers to find the best estimations to put in the formulas because the new investment could affect change in suppliers because of a better or worse valuation. It could be a brand-new investment with unknown factors, that would have been important to show regard for, or it could be an acquisition, if the valuation seems low but is not in practice, and other companies might then show interest in buying the company. It can be difficult to find the correct assumptions for the calculations. Some features are very simple to find while others must be calculated in a difficult manner. Then the calculations may also be too overwhelming for managers to execute. Computers nowadays offer different methods of calculations so each company has its own method. The main question is whether the expected cash flow in the future is worth the investment (Luehrman, 1997).

1.3 Other valuation methods

1.3.1 The Internal Rate of Return (IRR)

The Internal Rate of Return is one method that can be used for capital budgeting to measure, compare and evaluate new investments and capital projects. That is, to calculate the Internal Rate of Return (IRR). The IRR can also be used in personal life, for evaluating own investments. The IRR is known as the discount rate that is used with the NPV of all cash flows of a project, the NPV is made equal to zero with the IRR discount rate. The IRR is also used for corporations to evaluate repurchase programs, which are programs to buy the company's outstanding shares, which decreases the number of shares that are in the open market. The disadvantages of the IRR calculations are its level of difficulty. The formula can be very complex. Therefore, Excel or financial calculator is vital for the execution. Other disadvantages are that all cash flows

are assumed to be using the same discount rate when reinvesting, though in the real world the discount rates fluctuate and are always changing. The advantage is that when one has adapted to the calculations and uses the same method of executing, it gets simpler to use it (Investopedia, n.d.).

The IRR formula is the following:

$$NPV = \sum \left(\frac{\text{Period Cash Flow}}{(1 + r)^t} \right) - \text{Initial Investment}$$

Where:

- r is the interest rate and
- t is the number of time periods.

The NPV formula is used for the IRR calculations, by solving for the r when the NPV is equal to 0. The IRR is used on monthly basis so the annually IRR is divided with 12 to have the monthly Internal Rate of Return. The IRR calculations relate very much to the WACC calculations. When a project begins only satisfying its required return then it is providing a NPV of zero (Koller et al., 2015).

1.3.2 The Net Present Value (NPV)

In capital budgeting there are many different approaches that can be used to evaluate a project or a company. The Net Present Value (NPV) is one of them, along with the IRR, but these two methods are related. If all assumptions are the same then these two methods often give the same result. There is difference in when each method is effective. The IRR has the same single discount rate for evaluation for every investment so the method is not valid for longer-term projects. The NPV is the difference between the present value of cash flow coming in and the cash outflow. This method is being used to analyse profitability of new investments, in capital budgeting (Investopedia, n.d.).

When calculating the NPV it is good to use the Free Cash Flow (FCF) approach. The formula for FCF is the following:

$$\begin{aligned} FCF &= \text{Profit after tax} \\ &+ \text{depreciation} \\ &- \text{investment in fixed assets} \\ &- \text{investment in working capital} \end{aligned}$$

(Brealey et al., 2016, p. 485)

When the FCF has been found the Present Value of the Free Cash flow is found for year 1. The NPV is then PV–Investment. In Table 1 there is an example of the calculations for the NPV, made in Excel. All figures in the table are fabrication but it is to show what features are needed for these calculations (Author’s example).

Year	0	1	2	3
Sales		8.100	8.505	8.930
Cost of goods sold		3.807	3.997	4.197
Promotion expense		891	936	982
General and Administrative expense		760	770	780
EBITDA		2.642	2.802	2.971
Depreciation		0	288	288
Profit before tax (EBITD)		2.642	2.514	2.683
Tax		713	679	724
Profit after tax		1.928	1.835	1.958
Investment in equipment	1.440			
Accounts receivable		1.664	83	87
Inventory		1.185	59	62
Accounts payable		389	19	20
Investment in net working capital		2.460	123	129
Investment in net working capital released				
Free cash flow	-1.440	-531	2.000	2.117
Discount factor		0,9346	0,8734	0,8163
PV		-496	1.747	1.728
PV horizontal value				32.084
WACC	7%			
PV	35.064			
I	1.440			
NPV	33.624			

Table 1: Calculation of the NPV.

First, it is important to find out the Free Cash Flow (FCF) which is roughly the same as the annual net income each year assuming constant investments and depreciation³ discounted with the WACC. Then the discount factor is calculated to be able to find out the PV for each year. All PVs and the PV horizontal value are added up and the PV for the total investment is here 35.064. Then the Investment is subtracted and the NPV is then 33.624. Where the NPV is positive in this example, it is recommended to invest in this project.

1.3.3 The Payback period

The Payback period is a method that is calculated by counting the years it will take to get back the invested cash in a project. It shows expected initial cash outflow of a new investment and the expected time-period for the investment to be recovered with

³ A difference occurs when new investments are much higher in the future than in the past.

cash inflow. The usual assumption for the Payback period is the longer payback period, the more risk. This method is very simple and is used by many CFOs, because it is so easy to use (Accounting Coach, n.d.). The formula for the calculation of the Payback period is the following:

$$\text{Payback period} = \frac{\text{Cost of the initial investment}}{\text{Cash inflow per period}}$$

(Irfanullah, 2013)

This formula gives the Payback period in years. There can be different cash flows over the payback period; even cash flows or uneven cash flows. They both have different calculation methods, which has to be used to find out the best choice for the company. When cash flows are even, then the investment is expected to bring the same constant income for every year of the period. For even cash flows the formula above is being used. There can be different amounts of cash flow each year of the time-period. Then the amount of the cash flow for each year is not the same, as it is in the even cash flows. When the cash flows are uneven, like this, the formula needs to be calculated with different amounts each year of the period (Ardalan, 2012).

The above formula does not count if the cash flows are uneven. Then the Payback rule says that if the Payback period is less than the cut-off period that is specified in the contract, then the project, or investment, should be accepted. The more explicit formula is the one that Brealey et al. (2016) shows for initial investment:

$$NPV(A) = -\text{Cash outflow} + \frac{\text{Cash Inflow}_1}{(1+r)^1} + \frac{\text{Cash Inflow}_2}{(1+r)^2} + \dots + \frac{\text{Cash Inflow}_n}{(1+r)^n}$$

This formula is for calculating the Net Present Value (NPV) of an investment. The difference from the Payback rule, the NPV-rules that all investments with a positive NPV should be accepted, without deciding any cut-off periods. The Payback rule can give misleading results. It ignores all cash flows after the cut-off period. So according to the Payback rule, a project is rejected if the cut-off date is shorter than the Payback period, even though it has a positive NPV. The Payback rule also gives equal weight to all cash flows before the cut-off period. So, of two projects where one has a positive NPV and one has a negative NPV, with the same cut-off period and are equally

attractive to the Payback rule, the positive NPV is more attractive if chosen only one alternative (Brealey et al., 2016).

The basic idea of Miller & Modigliani's proposition, about that changes in the capital structure, is that they do not have effect on a value of a company. Investors can diversify by buying shares in a mutual fund that has diversified portfolio. Companies cannot diversify as easily as investors. A diversification cannot add to company's value or subtract from it, so the total value of a company is the sum of the parts. This is value additivity. When it works to add up cash flows, it must work the same when you subtract them (Brealey et al., 2016):

$$\text{Company's value} = PV(A) + PV(B) = PV(AB)$$

Where:

- PV(A) is the Present Value of cash flow of project A,
- PV(B) is the Present Value of cash flow of project B, and
- PV(AB) is the sum of the two Present Values.

This shows the sum of separate values of asset. Each project should be evaluated by its own cost of capital and the value-additivity principle is a clear implication of that. This means that if you have two cash flows which have been calculated for two projects, or more, then it doesn't affect the PV for the two projects added together. So, when the assets of a company are three, then the PVs of the assets are also added, just like when there is a two-asset company. This shows that financial decision taken by dividing up the operating cash flows do not increase companies value. This shows that changes in capital structure do not have effect on a value of a company (Brealey et al., 2016).

1.3.4 Discounted Cash Flow (DCF)

The Discounted Cash Flow (DCF) analysis usually show that companies are passively holding their assets. One disadvantage of the DCF analysis is that the analysis ignores opportunities of expanding successful projects or bailing out from the ones that are not successful. Managers can overlook that and make it an advantage to modify them by making the calculations more often, if they find it necessary. This DCF method is a rather simple method to use and it implies that the company will passively hold the assets. Another disadvantage of DCF is that the method does not work for options. That is, the company is ignoring the real options in the project and is using different options

that are not comparable to the project. That gives wrong picture of the project's options. Then, the managers should be able to see the opportunities or mitigate the loss, because the decision of using an opportunity with unclear result can add value. The following chart shows the appropriate discount rates for each cash flow and the different cash flows created, just to improve understanding of what are the basic cash flows to be considered in a company's valuation (Fernández, 2013):

CASH FLOWS	APPROPRIATE DISCOUNT RATE
Free Cash Flow (FCF)	Weighted Average Cost of Capital (WACC)
Equity Cash Flow (ECF)	Required return to equity (K_e)
Debt Cash Flow (CF_d)	Required return to debt (K_d)

Table 2: Basic cash flow for company's valuation.

As seen in Table 2, there are three basic cash flows; FCF, ECF and CF_d . The Free cash flow (FCF) enables the total value of a company to be obtained. The Equity cash flow (ECF) allows to get the equity value which will also allow the company's total value to be determined, combined to the value of the debt. Debt cash flow (CF_d) is the easiest to understand, but it is the sum of the paid interest on the debt added to principal repayments. The Debt cash flow must be discounted at the required rate of return to debt, meaning that one must be able to determine the present market value of the real debt. Often, the debt market value should be equivalent to its book value. That is why the book value is very often used as sufficient approach to the market value (Fernández, 2007). When bonds are issued on an active market, then the rate of return is being used. If the bonds are not on active market, then another approach is being used if the valuation of the company has changed since the bonds were issued (Koller et al., 2015).

To use cash flow for the Discounted Cash flow valuation there are two main ways. It is either Free Cash Flow to the Firm (FCFF) which is cash flow available to debt and stock holders, or Free Cash Flow to Equity (FCFE). FCFE is the cash flow available to only the equity holders of the company, after interest rate costs have been paid. The FCFF method is more relevant than the FCFE approach when focusing on the WACC calculations. There are more than one method that can be used to calculate

FCFF which all have the same result. One of these methods is using the following formula for FCFF:

$$FCFF = NOPAT + D\&A - Capex - Increase\ in\ NWC$$

(Steiger, 2008)

Where:

- NOPAT is Net Operating Profit After Tax⁴,
- D&A is Depreciation and Amortization,
- Capex is Capital expenditure⁵.

The DCF is a valuation method used to examine investment opportunities. The future cash flows, at the same discount rate as investors expect to earn from the investment, are discounted to have the Present Value to have the Value today.

$$Earnings - investment = Cash\ Flow$$

Then the Cash Flow is discounted with the years and that is the Present Value today (Koller et al., 2015).

If the value through DCF is higher than the current cost of the project it might be a good investment opportunity. There are well documented disadvantages of the DCF method, at textbook levels as well as in other information form. The problem to account for the value, which is created by management decision, and the failure of using constant discount rate of a projects life time, are common disadvantages. In sectors where the value of research and development are significant, there should be expected an increase in companies using real options techniques. This would be in sectors like information technology or biotechnology. In the natural resource sectors it could be valuable to provide the flexibility (Truong et al., 2008).

1.4 Miller and Modigliani

Miller and Modigliani (MM) are two professors who studied profoundly capital-structure theory. Ozyasar (n.d.) says that the MM theorem is a key pillar in modern finance. They developed the capital-structure irrelevance proposition from their analysis. They said that in perfect markets changes in the capital structure do not influence value. The market value of a company is determined by the risk of underlying

⁴ NOPAT = Operating Income * (1-Tax) (Investopedia, n.d.)

⁵ Funds being used to acquire a physical assets, like real estate property.

assets as well as the earning power. Its value is independent of the choice of financing the companies' investments or dividends distributed. Value is independent of capital structure if the total cash flow is unchanged. The value of the pie depends on the size of the pie, not the way the pie is sliced (Brealey et al., 2016).

The capital-structure irrelevance proposition assumes no bankruptcy cost and no taxes. This means that the valuation of a company is not relevant to its capital structure (Borad, 2015). This proposition simplifies the Weighted Average Cost of Capital. Therefore, there are no changes in the WACC even though there are changes in the company's borrowing agreements. According to that approach, the WACC should remain constant despite changes in the capital structure of the company. In addition, the capital structure of a company does not affect a company's stock price. Miller and Modigliani's proposition is based on a few key assumptions that do affect the evaluation on business. Even though companies do pay taxes in practice, thus there is a tax shield for stockholders, Miller and Modigliani put the assumption that having no taxes, no transaction cost, no bankruptcy cost, symmetric market information of both companies and investors, it would have no effect on debt before interest and taxes. It is also a key assumption to have equivalent borrowing costs, for both companies and the investors. Nevertheless, this key assumption is not parallel to the real world where there are taxes, transaction costs, etc. The method of Miller and Modigliani is used when the debt policy is framed in the terms of using fixed market-value debt ratio (Investopedia, n.d.).

The fact that Miller's and Modigliani's approach assumes there are no taxes involved shows that this is not in the real world, where companies do have taxes. Miller and Modigliani have been criticized for ignoring the corporate taxes, and the personal taxes, in their approach because it has no connection to the real world (UK Essays, 2015). The approach for corporate taxes acknowledges tax savings. This means that it concludes that when debt to equity ratio changes it affects the WACC. The WACC is lower if the debt is higher (Borad, 2015).

In chapter 1, the main dimensions of the cost of capital techniques have been reviewed and explained. Other researches that have been performed on the usage of the WACC and other valuation methods will be reviewed in chapter 2. These researches show how these methods are being used in practice.

2 Surveys of valuation methods

2.1 Relevant surveys

There are several researches that have been made on the utility of the various methods of cost of capital, and which ones are more popular than other methods. In a survey made by Arnold and Hatzopoulos (2000) in the UK 96% of the respondents used either the Internal Rate of Return (IRR) or the Net Present Value (NPV) methods, as an estimation for the cost of capital, but the Discounted Cash Flow (DCF) method was also dominant. The Payback period method still gained support, not sacrificing the DCF method which was being used in more cases. All large companies in the UK were using either the IRR or the NPV and over 90% of medium sized and small companies were using these methods. The WACC is frequently used to calculate the hurdle rate for investment appraisal. In a survey made in 1976 (Westwick & Shoheit), less than 10% of companies in the UK were using the WACC at that time. In the survey in Arnold & Hatzopoulos' survey, made 24 years later, there were almost 50% of the respondents that were using the WACC. In that survey, small companies were still using interest rate payable on debt. Even though the WACC was used in so many companies at that time they were not using the method as it was prescribed in textbooks. Many companies were calculating the WACC and adding inflation to it. In the WACC calculations there is neither inflation added nor inflation calculated in any factor of the formula. So, the calculation methods were not according to the definition of the WACC in textbooks, and therefore the results of these companies were not showing the correct WACC. From the study in 1976, by Westwick & Shoheit, there was a significant increase in using the CAPM, especially in the equity component of the WACC. It is mentioned that the precision of the WACC is less important than having reliable data (Arnold & Hatzopoulos, 2000).

Another research found about the usage of the WACC is from Sri Lanka. There was a research by Nurullah & Kengatharan (2015) who studied which capital budgeting methods are being used in 32 sampled manufacturing and trading companies in Sri Lanka. The results of the research were that the NPV was the most common capital budgeting method used, and the Payback period and the IRR were the next widely used methods. The results also revealed that the WACC was the most widely method used for calculating cost of capital. In addition, the results showed that the size of the capital budget does affect the usage of the capital budgeting methods, which are the NPV, the

IRR and the Payback. CFOs who were higher educated preferred to use more complicated capital budgeting methods, mainly the NPV, the IRR and sensitivity analysis. CFOs with more experience preferred to use the IRR and sensitivity analysis (Nurullah & Kengatharan, 2015).

In this same research, CFOs were asked to rank the method of the cost of capital calculation on a Likert scale, from *Always* (5) to *Never* (1). The most prevalent method was the WACC which was in 25% cases calculated *Always* and in 59.4% cases it was calculated *Often*. The methods which were next widely used were Cost of debt (r_D), *Always* 12.5% and *Often* 53.1%, and the Capital Asset Pricing Model (CAPM), *Always* in 6.3% cases and *Often* 18.8% (Nurullah & Kengatharan, 2015).

According to a research by Graham & Harvey (2001), highly levered companies were more likely to use sensitivity and simulation analysis, where they were more sensitive to loss. It might be because of regulatory requirements that the approaches that were more likely used were the IRR and the NPV and then sensitivity and simulation analysis were performed. More interesting, CFOs with MBA degree were more likely, than non-MBA CEOs, to be using the NPV method. The Payback period method was the one most frequently used of the capital budgeting methods, other than the NPV and the IRR. Financial textbooks usually tell the importance of disadvantages of the Payback period method (Graham & Harvey, 2001). One of the disadvantages of this method is that the Payback period does not consider the time value of money, risk, financing, and the value of additional cash flows in the future periods. As described in chapter 2, alternative measures for return preferred by economists are the NPV and the IRR (Boundless, 2016).

In this same above mentioned survey, by Graham and Harvey (2001), CFOs in U.S. companies were asked which methods their companies are using. The most common method to be used for estimation of cost of equity was the CAPM. Publicly traded companies were more likely to use the CAPM, than private companies. When evaluating projects, majority of companies used single company's cost of capital and some applied risk adjustment for new individual projects (Graham & Harvey, 2001).

The cost of capital's result has various approaches but the WACC is the dominant approach, is consistent with corporate finance theory. Tax does matter in the calculations for the WACC because companies adjust for tax in the cost of capital, when finding the after-tax cost of debt. The most common method for calculating equity cost

of capital is the CAPM. Next to follow are dividend yield⁶ and earnings yield⁷ methods, but these methods are not used in Iceland and are not being reviewed here. It is equally common to use book value or market value in the measures of cost of debt but when computing cost of equity, it is open to wide variation in companies' approaches. Companies with higher cost of capital combine the CAPM rather than dividend yield, with or without a growth factor (McLaney, Pointon, Thomas & Tucker, 2010).

There was a study where the ability of generating business value in the agribusiness sector in Brazil was analysed during the period 2008-2011. In this study the WACC was used as a determinant of a value creation of the businesses, so the capital structure of companies was analysed as well, thus demonstrating the usage levels of debt and equity. The results showed, regardless of that the cost of equity had proved more costly in most cases, that there was a superiority of capital structure. In view of that, the subject about the influence of the cost of capital, on Brazilian agribusiness companies, it is the result that companies with debt are financed simultaneously with capital and equity from third party. The study showed that the companies, of the sector of Brazilian agribusiness, using the WACC generated value for its stakeholders. All the companies, that were in the sample, during the analysis period were able to create value and the users of the WACC ranged from 8.08% to 19.73% (Rodrigues, 2012).

In the recent years, there has been a development in high rated change of business and economy practices all over the world. The development of academic literature has led to the requirement of re-examination on the proportions of whether the newer theoretical developments have had effect on capital budgeting. Literature about Indian corporate capital budgeting shows that in the Indian corporate sector has witnessed a growing inclination to use multiple capital budgeting methods to evaluate investments. The Net Present Value (NPV) is being used as an addition to DCF methods. The high popularity of the NPV method is attributed to its increasing emphasis on risk, liquidity and how simple the method is in process. All other investment methods have been less frequently used in India (Roopali, 2017).

Over the years, cost of capital methods have also demonstrated a growing trend of sophistication in the calculations. While earlier researches reported in 1966 (Christy)

⁶ Dividend yield = A financial ratio that says how much dividends a company should payout each year, relative to its share price (Investopedia, n.d.).

⁷ Earnings yield = The earnings per share for the recent 12 months divided by the current market price per share (Investopedia, n.d.).

and 1970 (Williams) that the WACC calculations were used by less than 30% of companies as a discount rate, a more recent survey by Gitman and Mercurio (1982) where there was established an important increase in the usage of the WACC, by more than 80% of companies. In surveys by Gitman & Mercurio (1982) and Ryan & Ryan (2002) there was shown a significant increase in the usage of the WACC calculations. The CAPM estimations were found to be the most popular to use to calculate cost of equity (Roopali, 2017). Nowadays, it is much simpler to use the WACC because of the computers on the market.

Three surveys conveyed in the years 1981, 1984 and 1991 showed an increased reliance on the WACC as the discount rate and that popularity of DCF method was growing. The Payback period method, the ARR or the discounted payback were methods that were used by substantial number of companies in Australia by that time. In the survey from 1991 (Freeman & Hobbes) the respondent companies that used the WACC, to calculate hurdle rate in capital budgeting, were 62%.

Relevant surveys	Mostly used method	The second most	Was WACC used?
1966/1970			WACC in less than 30%, as discount rate
1976	CAPM		WACC in 10% cases
1982			WACC in more than 80%, established increase
2000	Payback	IRR and NPV	WACC in 50% cases, for hurdle rates
2001	Payback	NPV and IRR	
2002	CAPM, for r_E		Significant increase of WACC
2015	NPV	Payback and IRR	WACC most widely used, for cost of capital

Table 3: The development of the usage of the WACC, 1966-2015.

In the Table 3 is information from the above mentioned researches on the capital budgeting methods used. The table shows the development of the usage of the WACC but the most difference is from 1966, when the WACC was used in less than 30% cases. Then 10 years later the usage of the WACC had decreased to being used in only 10% cases. After an established increase of using the WACC in 1982 there were more than 80% of companies that were using the WACC. Around the millennium the WACC was widely used but then along with other methods, for example the NPV, the Payback period and the IRR (Christy, 1966; Williams, 1970; Westwick & Shohet, 1976; Gitman and Mercurio, 1982; Arnold & Hatzopoulos, 2000; Graham & Harvey, 2001; Roopali, 2015). With the existence of computers softwares are available that can be helpful when

using the cost of capital methods. Since 1990, Excel is a spreadsheet that is one of the most useful tools on the computers.

2.2 Surveys of the CAPM

There is a European survey, by Brounen, De Jong & Koedijk (2004), where the practice of corporate finance was examined in four European countries; the U.K., the Netherlands, Germany and France. In this survey the results were compared to practices in another research by Graham and Harvey (2001) for U.S. companies. In these four European countries, The CAPM method was the most popular one used to estimate cost of equity. Even though the CAPM was the most commonly used method, it was only used in 34% cases in Germany but most often in Netherlands, or in 56% cases. In the U.S., companies were comparable and were using the CAPM in the same calculation method. The use of the CAPM tended to rise the larger the companies were, in Europe, but the education of the CFOs appeared to be irrelevant to the usage of the CAPM. Large companies were also more likely to use the CAPM and the NPV to find appropriate discount rate. It was also found that European usage of capital budgeting techniques differed from the practice reported in other researches. The Payback period was more popular method to use than the NPV and the IRR methods. The companies' size did positively matter when computing the usage of DCF method, as well as the CAPM. Smaller companies were more likely to be using the Payback period and were setting the cost of capital on what their investors told them to do (Brounen et al., 2004). The results showed that the CAPM is a less used method, which contrasts with the research of McLaney et al. (2010), where the CAPM was the most popular method to be used for the cost of capital estimation.

In the U.S. research by Graham and Harvey (2001), the CAPM method was widely used and was the most popular method for estimation of cost of equity. There were 73.5% of the respondents who responded that they use the CAPM *always* or *almost always* in the survey. Even though the CAPM was very popular in this research it was not clear whether the model was properly applied. Large companies were more likely to use the CAPM method than smaller companies (Graham & Harvey, 2001).

2.3 Survey in Australia

One sample survey was made to analyse the capital-budgeting practices of listed companies in Australia, which was published in 2008. The results for this research were that the most popular techniques used for valuation of a business were the Net Present

Value (NPV), the Internal Rate of Return (IRR) and the Payback period. The Weighted Average Cost of Capital (WACC) was most often used for discounting, with the assumption that the life of the project would be constant with same discount rate across departments. Most companies used many methods in their evaluation rather than relying on only one capital budgeting method (Truong et al., 2008).

The WACC was usually based on targeted weights, for debt and equity, rather than current weights. In this research the Capital Asset Pricing Model (CAPM) was widely used rather than other pricing models, which were not mentioned. The discount rate was reviewed on regular basis and it was updated as conditions changed. In most companies in Australia project analysis did not consider the value of adding tax credits to the calculation but the Australian price regulators took account of it when computing the cost of capital (Truong et al., 2008).

When valuing new projects, the value of tax credits was not considered. The credits were ignored when computing the market risk premium and Beta, when estimating cash flows and calculating the WACC. Only a few companies considered the value of imputation credits to be zero, despite that many companies were making no adjustments for valuing imputation credits (Truong et al., 2008).

There was a survey conveyed in 1999 (Kester, Change, Echanis, Haikal, Md.Isa, Skully, Tsui and Wang) that confirmed that DCF methods were most popular in Australia, where Cash Flow was discounted with the WACC. The CAPM method was also very popular, which was used in 73% cases of the surveyed companies. Another survey, by Graham and Harvey (2001), gave the same results of using the CAPM. The CAPM was the most popular method of estimation of cost of equity, with 73.5% respondents who relied on the CAPM calculations.

In the research by Truong et al. (2008) on Australian companies, there were results from the survey showed a resemblance that large firms were more likely to participate in the research. The respondents that use cost of capital methods for the evaluation in their company were 88%. Most respondents in this research estimated the WACC, or 84% of them. Of the respondents who did estimate the WACC, 60% of them were using target weights but 40% were using current weights. In the responds in regard of the choice between market value or book value weights there was a substantial dropout. The companies that responded were nearly even between the ones using market value (51%) and book value (49%). There were 69% of respondents in

estimating the WACC who adjusted the cost of debt for the interest tax shield but 31% did not (Truong et al., 2008).

In this Australian survey, by Truong et al. (2008) there were listed eight capital budgeting methods to find out the importance and the usage of evaluation techniques. The respondents were asked to tick all relevant methods used in their company. They were also asked to rank the methods in five Likert scale; Very important, Important, Moderately important, Not important and Not applicable. The results, from 77 responses on this question, were that the NPV method is being used in 94% of the respondents' companies, the Payback period is used by 91%, the IRR in 80% cases and Hurdle rate in 72% cases. The WACC was not an option in this question. Other methods were used more rarely. The most important method was the NPV (57%), then the IRR (30%) and the third was the Payback period (27%) (Truong et al., 2008).

The respondents in the Australian research were asked how often they used the cost of capital estimates. There were 32% participants that made the calculations annually and 30% when a new project was being evaluated. There were only 20% who made the calculations every six months and 18% when there was a significant change in the business environment (Truong et. el, 2008). This question was asked in this research's survey and the results to that question, sub-question 1), will be reviewed in chapter 5.1.2.

In this Australian research, done in 2008, the respondents were asked about time spent with their companies and how long they had held their job positions. The ones that had worked more than 10 years were only 8% and the ones working for 8 to 10 years were 11%. The highest rate was 32% but they had been working in the same position for 1-3 years, and 26% for 4 to 7 years. The most common business sectors of the participants in this research were Materials (29%) and Industrials (25%). The third most common was only 12% in the Consumers Discretionary sector. Others were much fewer (Truong et al.).

The Australian research by Truong et al. (2008) is the one that is the prefiguration for this project because of the similarity of the subject researched. The research was studying the same topic with the most relevant emphasis as aimed for in this research. The questions in Study I are based on this research, on companies in Iceland, and the conclusion is being compared to the results of the Australian research.

2.4 Relevant domestic literature

Of 10 of the largest companies in Iceland there are six companies operating in financial services but only three of them are financial institutions. When going through the annual reports of the 15 largest companies in Iceland (see Table 4), researching whether the WACC is being calculated for them, there seemed to be only three companies using the WACC, and that was Icelandair Group, Marel and Össur.

Rank number	Company's name	Business	Year	Revenues (million ISK)
1	Icelandair Group hf.	Financial services, not insurances and pension funds	2016	145.038
2	Marel hf.	Production on uncounted machines and equipment	2016	116.126
3	Arion banki hf.	Financial services, not insurances and pension funds	2015	91.393
4	Íslandsbanki hf.	Financial services, not insurances and pension funds	2016	89.512
5	Alcoa Fjarðarálf sf.	Production of metal	2015	88.516
6	Samherji hf.	Financial services, not insurances and pension funds	2015	81.061
7	Landsbankinn hf.	Financial services, not insurances and pension funds	2016	80.978
8	Icelandic Group hf.	Wholesale, excluding motorised machines	2015	75.871
9	Össur hf.	Production	2015	62.537
10	Eimskipafélag Íslands hf.	Financial services, not insurances and pension funds	2016	61.532
11	Rio Tinto á Íslandi hf.	Production of metal	2015	59.008
12	Norðurál Grundartangi ehf.	Production of metal	2016	58.989
13	Landsvirkjun	Electricity, gas and heating utility;	2015	48.732
14	Primera Travel Group hf.	Financial services, not insurances and pension funds	2015	46.414
15	Skeljungur hf.	Wholesale, excluding motorised machines	2016	46.055

Table 4: The largest companies in Iceland, according to Keldan (n.d.)

Icelandair Group hf. is the largest company in Iceland, according to Keldan (n.d.) and Össur hf. is the 9th largest company in Iceland (Keldan, n.a.) which is a pioneer of innovation and technological advancements. The company is a global leader in non-invasive orthopaedics. In the company's human resources, there are designers, doctors and technically educated employees who all work on helping more people to live their life without limitations. In the annual report of Össur for 2016 the company used the WACC in its calculations for the carrying amount of goodwill according to cash-generating units, which was the WACC (Össur, 2017).

In the annual report for Icelandair Group hf. the WACC was found. The WACC is calculated under the notes for Impairment test. The values that were assigned for are the key assumptions for future trends in the airline, the transportation and the tourism industry. The assumptions are based on historical data (Icelandair Group, 2017).

Marel hf. is the 2nd largest company in Iceland. Marel is a leading global provider of advanced processing systems and services to the meat, poultry and fish industries. In the Annual report of Marel for 2016 there are were information found

about the WACC as impairment of goodwill. The uncertainty in price and time value of money are calculated as the WACC, based on information from the external market on the following three factors; the market risk, the interest rates and specific elements, for example a country risk (Marel, 2017).

2.4.1 Other Icelandic companies

The WACC is a useful tool to calculate whether new projects will be profitable for a company. Reitir is a real estate company that invests in buildings and rents out to companies, usually as office space. Therefore, Reitir should be able to use the WACC to decide whether the company should invest in new projects or not. In the company's annual report the WACC can be found in notes to the financial statement. The WACC was calculated from value of each investment asset by finding Present Value (PV) of Free Cash Flow with discount factor that reflects the expected WACC and time value of the Cash Flow. Reitir uses information from the market along with the CAPM when deciding real rate of return on equity. In its annual report, it is stated that:

“The required rate of return is based on the rate of return on state-guaranteed treasury bonds on the market at accounting date, risk premium for the real estate market, and special risk premium for each real estate property. The managers' expectations regarding market rates on singular properties are being relied on. The equity ratio is assumed to be 35% (2014: 35%) and tax savings are not being considered in the Weighted average cost of capital calculations.”⁸

(Reitir fasteignafélag ehf., 2016).

It can be inferred that the WACC is at least calculated once a year by these two institutions but it is not known whether it is calculated once a year, more often or less often. It would be interesting to have information whether it is calculated in companies in Iceland and to know how often the WACC is calculated, or assumptions changed and the WACC is re-examined. The purpose of this project is to analyse whether companies in Iceland are calculating the WACC, and if not then which other methods are they using and why they are being used instead of the WACC.

⁸ Original text in Icelandic, translated by author.

3 Method

Necessary data to solve the issue of the Cost of capital was collected with qualitative and quantitative researches, obtained independently. The approach for the research was divided into two studies. Study I was a quantitative questionnaire which included demographic and probing questions, assertions, specifics and one open-ended question. In total, there were 18 questions. In Study II there were qualitative semi-structured interviews to CFOs of companies in Iceland.

The aim for Study I was to answer the main research question along with the research sub questions 1), 2) and 3) when Study II was used to provide answer to research sub question 4). The research questions are mentioned in the chapter *Procedure of the research*.

The theory applied to Study II is the Grounded Theory (GT). GT is a methodology which is in general used in social science. The methodology is being used for the construction of a theory by using the analysis of data gathered from a research (Strauss & Corbin, 1994). When using both quantitative and qualitative methods, like is done in Study I and II, it is valuable to give more comprehensive view on the subject than relying only on one method. When data is collected asynchronously with two methods the understanding of the subject should be increased (Venkatesh, Brown & Bala, 2013). The procedure of using GT has been used for social justice to develop innovative analysis but has also been used for examining established concepts (Denzin & Lincoln, 2011). Although the methodology is usually linked to sociology, health and nursing it has been used in variety of fields (Goulding, 2005). The reason for using this theory, working on the results from the research, is to have better results and fuller understanding on the topic.

4 Research

4.1 Research question

The research question is:

Are companies in Iceland using Cost of capital calculations to evaluate their operation?

The following four research sub questions are to provide a fuller picture of the subject:

- How many companies are using these calculations on regular basis?
- How often are these calculations executed?
- Who performs the calculations?
- What other calculation methods are companies in Iceland using along with or instead of the WACC calculations?

4.2 Study I

The main purpose for this research project was to gather data about the usage of the WACC calculation methods in companies in Iceland, operating in different sectors; by having both quantitative and qualitative research. A quantitative survey was sent to a random sample of 200 companies in Iceland. The e-mail address list was received from CreditInfo. In Iceland were 68.893 companies registered in 2015, per information from Statistics Iceland (2016 and 2017), but in November 2016 were only 16.498 wage payers, which are the companies that are in operation. So, e-mail lists for the sample was obtained and was randomly chosen by CreditInfo.

4.2.1 Participants

The sample for Study I was a random sample of 200 companies in Iceland. There was not a possibility of having e-mail addresses of only CFOs so the survey was sent to main e-mail addresses of the 200 companies, asking the receiver of the e-mail to forward it to the CFO of the company or the person accountable for the financial decisions. The sample of companies to participate in the survey were randomly selected by CreditInfo. Each company had equal chance of being selected and their answers were not able to be traced to them or their company. In the end, there were only 178 valid e-mail addresses so the sample ended in that number. There were 10 e-mail addresses in companies that are no longer in operation and 12 were sent to former employees of the company. In those cases, main e-mail addresses of those companies were found and the survey was forwarded to those addresses, even though it is not

known that they were received. The response rate was only 14.4% of the 178 random sample companies that are still in operation. There were no incentives for the participation in the survey.

4.2.2 Research design

Exploratory research is used to seek insights in general nature of a problem, and relevant variables that should be taken into place. In all researches, there is prior knowledge of the researcher to be built on but the research methods can be unstructured and qualitative so the researcher starts with only ideas of what will be found in the research. The hypothesis of Exploratory researches are either vague and badly defined or they have never existed (Aaker, Kumar, Leone, & Day, 2013). This approach was designed to collect responses from CFOs. The questionnaire was sent in Icelandic to the random sample and it can be seen in Icelandic in Appendix B.

4.2.3 Materials

The questionnaire was set up in Google Forms and was sent by e-mail to the random sample of 200 in companies in Iceland. Enclosed was a letter, addressed to a CFO, with a short introduction of the purpose of the survey (see Appendix A). It was also important that answers were anonymous so there would not be a possibility of tracking answers to a certain participator or a company. The questions in the survey were six demographic questions, five probing questions, three assertions, three specifics and one open-ended question. The questionnaire had the options of usually five points Likert scale; but answering options were different between questions. Only three of them had the Likert scale from “Totally agree” to “Totally disagree”, where there were three assertions, while others had different four options but the fifth option was “not being calculated”. The results from the questionnaire are in Appendix C. Both, the questionnaire and the results from the survey, are in Icelandic because the survey was sent in Icelandic.

4.2.4 Procedure

The survey was set up through Google Forms. It was open for answering for 12 days. The answers were transported to Excel and were then processed of acquiring analysis with Excel tables and figures. The Australian survey (Truong, 2008), which is the prefiguration of this research, does not have any statistical results so it was decided not to acquire statistical analysis in this research. Furthermore, the sample of this survey

is very small, or only 200 companies, of which only 27 answered, so statistical analysis would not show the correct picture of the results with such few responses.

4.3 Study II

4.3.1 Method

The quantitative research was followed up with qualitative research. Like previously mentioned, in Study II the Exploratory method was adopted. This method is used when one is seeking for insights into general nature of possible decision alternatives and relevant variables that are necessary to be taken into consideration (Aaker et al., 2013).

The theory applied to the process of Study II is the Grounded Theory (GT). GT is a general methodology to be used for the construction of theory, by using the analysis of systematically gathered data from a research (Strauss & Corbin, 1994). GT is an inductive reasoning where sampling and analysis on data has different steps to be repeated until the data describes and explains the topic. In GT the participants are chosen by theoretical sampling. The data for the analysis is then collected from users that are aware of the researched subject, like here the WACC. GT has different steps that are repeated until the data describes and explains the subject, as theoretical saturation (Corbin & Strauss, 2008). The interviews to the sample of Study II were at first only three with the same results. The fourth interview had different answers so there were two other interviews performed, to be able to have the theoretical saturation in answers of the subject.

There are three benefits of using GT and they are Ecological validity, Novelty and Parsimony. Ecological validity shows how close to the generated data the theory is. The layout of Ecological validity is abstract, very explicit, specific in perspective and very closely connected to the analysed data. The second benefit is Novelty. That means that there is no theory that already exists of this new and fresh theory and it holds potential to new discoveries. Parsimony is the third benefit and it involves the simplest description of defining the complexity in the subject. Grounded theories do often aim on providing practical and simple explanations about complex phenomena. There is one disadvantage of GT that is how easy it is to have possible errors in similar ways as other qualitative research approaches. There is a possibility of an error if the researcher misreads the data, which jeopardize the precision of the theory (Glaser, 1978; Glaser, 1998). Grounded theory connects to the subject because the project's subject might be a

novelty, where this topic has not been examined before in Iceland. The participants are chosen from users who are familiar to the subject, the calculations of the WACC, which is the reason for the selection of this theory for this project.

4.3.2 Participants

The sample for Study II were Chief Financial Officers (CFOs) in Icelandic companies, like in Study I. In Study II there were interviews with five CFOs and one managing director who makes all evaluation calculations for his company. They were asked more thoroughly about the calculations they are using for evaluating their operation, why they are using that method rather than any other, etc.

4.3.3 Materials

Examples of questions for the qualitative research are following:

- Core phenomenon: Do you use Cost of capital calculations?
- Causal conditions: Why do you use this method, rather than any other?
- Strategies: How often do you make these calculations; on regular basis or every now and then?
- Consequences: Do you change your method of calculations (e.g. assumption for risk free rate)?

4.3.4 Procedure

The interviews to the six financial managers took place at their own offices in the facility of their companies. There was no probability that taking the interview in their surroundings would affect their answers.

5 Conclusion

5.1 Study I

5.1.1 The research question

Question 7 in the questionnaire was designed to answer the main research question:

Are companies in Iceland using Cost of capital calculations to evaluate their operation?

In that question the participants were asked which method is being used to evaluate the operation and they could answer more than one method. There are 11 respondents who answered positive to using the WACC, or 41% of all respondents. They are almost half of the respondents, or 48%, that are using the NPV as valuation technique for their company. They are only 5 who are using the Payback period method, or 19%, and the same respond was about using the IRR method. The results for the main research question can be seen in Table 5, where the cost of capital methods used for evaluation can be seen.

Methods	Number of companies using each method	Responses %
WACC	11	41%
NPV	13	48%
Payback	5	19%
IRR	5	19%
Hurdle rate	1	4%
APV	1	4%
Value at risk	3	11%
ROE - Return on Equity	1	4%
Profit	2	7%
Margin	1	4%
ROIC	1	4%
DCF	1	4%
None	2	7%

Table 5: Number of companies using each method.

In the Australian research (Truong et al., 2008) the respondents used the NPV in 94% cases, the Payback Period in 91% cases and the IRR in 80% cases. So, even though it can be confirmed that the results for companies in Iceland is that the NPV and the WACC are the most popular techniques, the response rate is much less than in the Australian report, or 65% less response rate.

The results from the Australian research showed the Net Present Value (NPV), the Internal Rate of Return (IRR) and the Payback period were the most popular techniques used for valuation of companies in Australia (Truong et al., 2008). In this research, for companies in Iceland, the results show that the two most popular techniques were the NPV (48%) and then the WACC (41%). The Payback period and the IRR shared the third place (19% each), as can also be seen in Table 5. In comparison to the Australian research, in that research there were 84% of the respondents who are using the WACC.

The conclusion is that the second most popular technique for companies in Iceland is the WACC. It is being calculated in 11 companies of 27 companies that answered the survey, or 40.7%. There were only three of these companies, that participated, that only use the WACC to evaluate their business, without using any other valuation method. All other respondents are using other evaluation methods, either along the WACC or not using that method (see Figure 1). There are 15 companies that are using other method than the WACC.

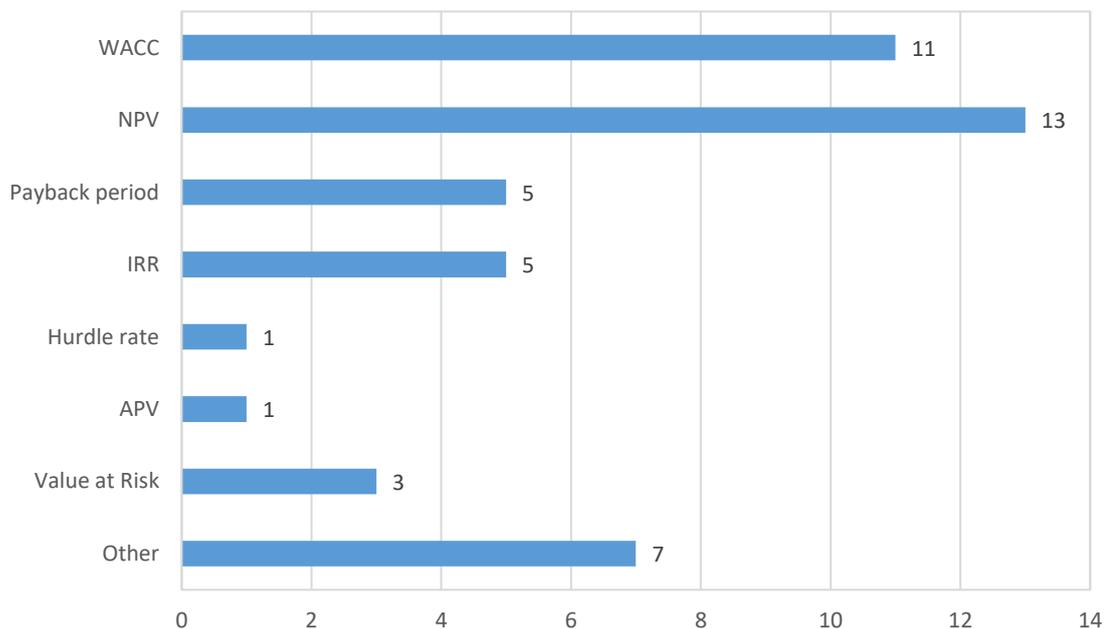


Figure 1: Which method is being used to evaluate your business?

It is interesting how many companies were using more than one single capital budgeting technique in their evaluation process. In Table 6 all the answers to question 7 in the survey, *which method is being used to evaluate the business?*

Methods	Companies' answers																								
WACC		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								
NPV	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								
Payback			1	1			1		1					1											
IRR			1	1	1								1			1									
Hurdle rate														1											
APV							1																		
Value at risk					1					1	1														
ROE - Return on Equity	1																								
Profit		1					1																		
Margin						1																			
ROIC							1																		
DCF							1																		
None											1					1									
Number of methods used	1	1	1	1	1	4	3	5	1	5	1	3	1	1	1	1	1	3	1	3	1	2	1	1	1

Table 6: Number of evaluation techniques being used in the companies.

Table 7 shows the number of companies, and the percentage, which are using unequal number of evaluation methods.

Number of techniques	Iceland		Australia	
	No of companies	%	No of companies	%
1	19	70%	2	3%
2	1	4%	7	9%
3	4	15%	12	16%
4	1	4%	20	26%
5	2	7%	36	46%*
Total responses	27	100%	77	100%

* 5 methods or more

Table 7: Number of companies and % using unequal number of evaluation methods.

There were two companies (7% of respondents) that are using five evaluation techniques in their companies, one (4%) that is using four techniques and four companies (15%) that are using three techniques. In the Australian research there were 16% are using three methods, 26% of respondent companies that were using four methods, and 46% were using five methods or more. The difference between the results in this research and the Australian research can be seen in Table 7.

5.1.2 Sub questions 1 and 2

The following sub questions were setup to provide better picture of the main research question. These sub questions are the following:

- 1) How many companies are using these calculations on regular basis?
- 2) How often are these calculations executed?

In question 10 in the survey, the respondents are asked how often they calculate the WACC for their operation. These two above mentioned sub questions are answered with this question and the answers can be seen in Figure 2.

Of the 11 respondents who do calculate the WACC they are calculating it in different periods. There were only three respondents who calculate the WACC annually and only one makes it every six months. There were two respondents who calculate the WACC for every new project, which is very interesting result how few use that approach. Five respondents calculate it when it is needed to recalculate the WACC, which cannot be foreseen how often that is.

Compared to the Australian survey, they were 32% who calculated annually and 30% for every new project’s evaluation. Only 20% made the calculations every six months and 18% when there was a significant change in the environment of business (Truong et al., 2008). Here below, in Figure 2, are the results from this Icelandic survey.

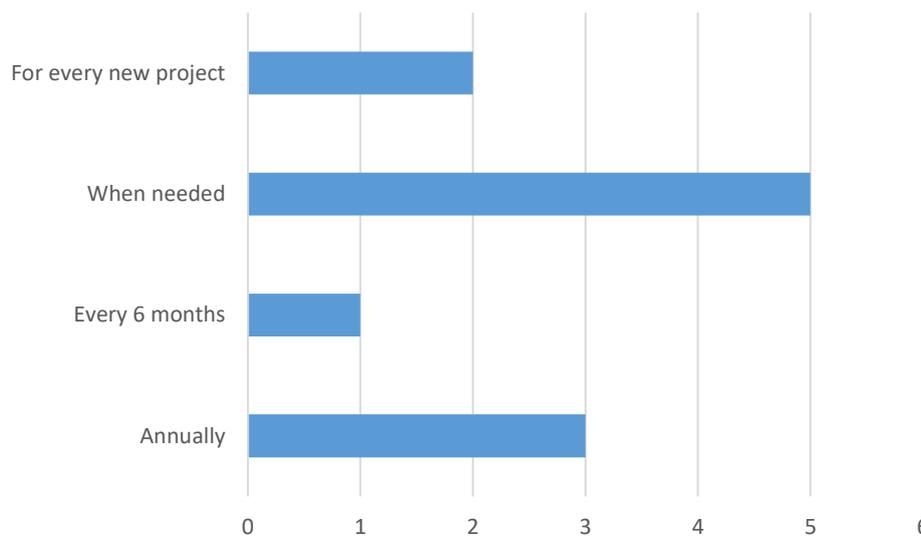


Figure 2: Is the WACC calculated on regular basis?

The results of this research, compared to the Australian research, are in Table 8.

	Iceland		Australia	
	Number of responses	% of responses	Number of responses	% of responses
Annually	3	27%	25	32%
Every 6 months	1	9%	16	21%
Quarterly		0%	7	9%
For every new project	2	18%	23	30%

Table 8: Results of how often cost of capital estimates are performed.

5.1.3 Sub question 3

The third sub question, which is also answered by Study I, is:

3) *Who performs the calculations?*

The answer to that question is that in 13 companies, of the 27 that participated in the survey, or 48% of the respondents, the CFO is the one who performs the evaluation calculations. There were only two cases where a subordinate of the CFO is performing them but in three cases an auditor performs the calculations. In four cases the answer was *Other* than CFO, subordinate or an auditor is performing the calculations, but who that might be is unknown because it was not an option to answer as open-ended question. It could be an employee of the company, for example the CEO, or this person could be working outside of the company. The answers are in Figure 3: Who performs the evaluation calculations in the company?

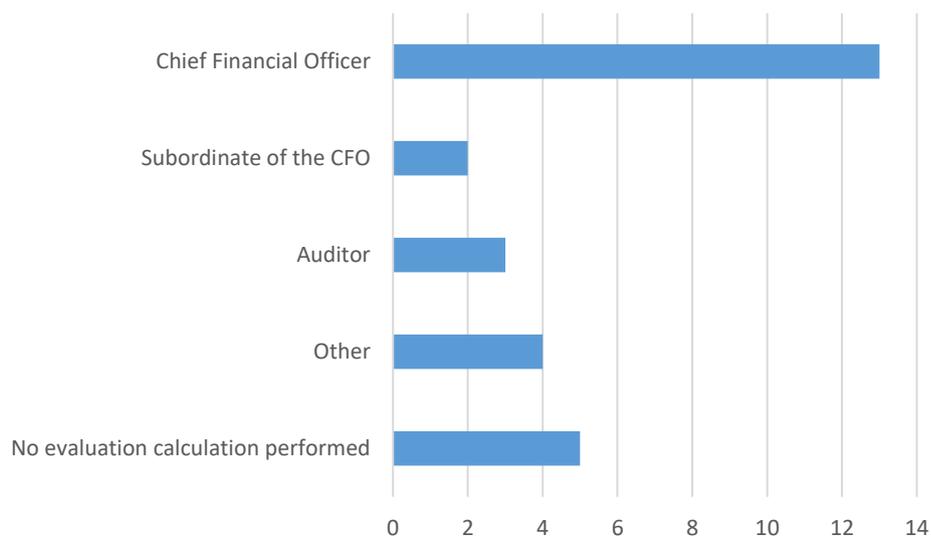


Figure 3: *Who performs the evaluation calculations in the company?*

In the companies where the WACC is calculated they were 11. Seven of them were CFOs of the companies, one subordinate and one auditor. There are two persons who are calculating the evaluation methods for the two companies that are either having another job title than was an option in the multiple question in the survey or are working outside of the company. Of them who performs the calculations there were seven CFOs but only two of them are only using the WACC method.

	WACC and other methods	
		Only WACC
CFO	7	2
Subordinate Auditor	1	0
Other	1	1
	2	1
	11	4

Table 9: Who is calculating the WACC?

5.1.4 Sector vs evaluation techniques

In the following table, there are results for evaluation technique used compared with sectors of business.

Sector	WACC	NPV	Payback	IRR	Other
Tourism			1		
Telecommunications					
Health care					
Industry	3	2	2	3	2
Agriculture					
Energy	1				1
Fishing industry	1				1
Information technology (IT)		1	1		1
Retail	3	6	1		4
Service	2	2	1	1	1
Other	1	1		1	1
Total	11	13	5	5	11

Table 10: Sector vs evaluation technique.

The WACC is mostly calculated in the Retail and the Industry sectors. The most frequently used method is the NPV in the Retail sector (see Table 10).

5.1.5 Education vs evaluation techniques

When comparing whether education affects the usage of different analysis techniques there is much difference between highly educated CFOs and the less educated ones. Of the ones who use the Payback period as analysis technique, there are 60% of them postgraduates and they also use the NPV, the WACC and the IRR. The undergraduates are 15 who use any technique but mostly use the NPV and the WACC calculations. One postgraduate uses Hurdle Rate. This question had the option of answering open-ended too, and one respondent is using the Adjusted Present Value⁹ (APV), which was not an option in the multiples and will not be gone through here. Those are the only ones using these methods. There were only two respondents with a

⁹ The APV is the NPV (if financed solely by equity) + PV of financing benefits. Then, APV includes tax shields as provided by deductible interest.

Ph.D. degree and one of them uses Value at Risk to evaluate his/her company but the other one uses the WACC, the NPV, the Payback period, the IRR and Value at Risk. The respondents who have a College degree were each using only one method for the evaluation. So, the more education the respondents have, the more evaluation methods they are using. In Table 11 are the comparable of education and analysis technique used.

Education	WACC	NPV	Payback	IRR	Hurdle Rate	APV	VaR	Other	Distribution across education
Primary school	0%	0%	0%	0%	0%	0%	0%	0%	0%
College	9%	0%	20%	20%	0%	0%	33%	13%	11%
Undergraduate from University (B.Sc.)	36%	38%	0%	20%	0%	0%	0%	63%	32%
Postgraduate from University (M.Sc.)	45%	54%	60%	40%	100%	100%	33%	25%	47%
Ph.D. from University	9%	8%	20%	20%	0%	0%	33%	0%	11%
Total	100%	100%	100%	100%	100%	100%	100%	100%	

Education	WACC	NPV	Payback	IRR	Hurdle Rate	APV	VaR	Other	Distribution across education
Primary school	0	0	0	0	0	0	0	0	0
College	1	0	1	1	0	0	1	1	5
Undergraduate from University (B.Sc.)	4	5	0	1	0	0	0	5	15
Postgraduate from University (M.Sc.)	5	7	3	2	1	1	1	2	22
Ph.D. from University	1	1	1	1	0	0	1	0	5
Total	11	13	5	5	1	1	3	8	47

Table 11: Comparable of education and analysis technique used.

5.1.6 Private or public company vs evaluation techniques

The difference between the private companies and the public companies and the evaluation methods chosen to use is rather much. The private companies are much more willing to use many different methods while the public companies use a few methods. There were only three public companies that responded to the survey and only one of them is using the WACC and the NPV methods but the other two companies are using one method each – the WACC and APV (see Table 12). There were only 27 respondents but the answers in the private companies are 42, so most of the respondents were answering more than 1 method.

Methods	Private	Public
	Number of companies	Number of companies
WACC	9	2
NPV	12	1
Payback	5	
IRR	5	
Hurdle rate	1	
APV		1
Value at risk	3	
ROE - Return on Equity	1	
Profit	1	
Margin	1	
ROIC	1	
DCF	1	
None	2	
Total	42	4

Table 12: Comparing the private and the public companies and the method chosen.

5.1.7 Size of a company vs evaluation techniques

In Table 13 there is comparison to the size of a company and the evaluation technique used to evaluate the business. It could have been assumed that larger companies would rather be using the WACC calculations than the smaller companies, which the table below shows. According to Table 13, the WACC is being used in 55% of large companies and 27% of small companies. The NPV is being used 38% in small companies and 31% in both medium and large companies. Hurdle rates are being used in only one small company, which gives 100% in the table below.

Size	WACC	NPV	Payback	IRR	Hurdle Rate	APV	VaR	Other	Distribution across size
Small	27%	38%	60%	60%	100%	0%	33%	25%	38%
Medium	18%	31%	0%	20%	0%	0%	0%	50%	23%
Large	55%	31%	40%	20%	0%	100%	67%	25%	38%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 13: Analysis technique usage by company's size.

The response due to the size of a company was the same for large and small companies or 11 respondents each, or 40.7%, but 18.5% of the respondents were from medium sized companies.

From the Australian research the analysis techniques used are very similar between sizes of the companies, athwart the table 3 in that research (Truong et al., 2008). There are 27-33% of large companies using all the above-mentioned analysis techniques and 18-24% of small companies are also using all these methods. So, the medium sized companies are also using these methods in 45-50% cases. Most

companies were relying on more than a single budgeting technique (Truong et al., 2008). That was not the case in this Icelandic research, per Table 6 in chapter 5.1.1, where the results show that most of the companies that participated in the survey were using only a single technique, or 70.4% of the respondents.

5.1.8 Period of employment vs changed presumptions

In the table below there are results when comparing how often the presumptions in the calculations of evaluation are being changed. The options for answers were: For every new project, every six months, annually, when needed or Occasionally and Not executed. The expected result, comparing to the Australian research, was that most of the respondents would never adjust the presumptions (59% in Australia), and that about 16% would answer Occasionally (Truong et al., 2008). The result from this research are that 56% of the respondents do not execute the WACC calculations which should be assumed that the presumptions are never changed. There was higher rate of respondents, in this research than the Australian, that change the presumptions when needed, or 33%. So, it can be assumed that these results can be comparable and are similar (see Table 14).

Changed presumptions	Number of companies	% of respondents
For new project	1	4%
Every 6 months	1	4%
Annually	1	4%
When needed	9	33%
Not executed	15	56%
Total	27	100%

Table 14: How often are the presumptions in the evaluation calculations changed?

5.1.9 Size and Business sector

The Australian report compared the sectors of the respondent companies, the size of them, the period of employment in the same job position, etc. When comparing the results of this research to the Australian research there are different results (Truong et al., 2008).

In the Australian research, there were most respondents in the Material sector and Industry, but in this research the Material sector was not an option. Table 15 represents the distribution of the respondents of this survey comparing with sectors and size of the companies.

Respondent companies		
Sector	Number of companies	%
Tourism	1	4%
Telecommunications	0	0%
Health care	0	0%
Industry	8	30%
Agriculture	0	0%
Energy	2	7%
Fishing industry	2	7%
Information technology (IT)	1	4%
Retail	9	33%
Service	2	7%
Other	2	7%
Total	27	100%

Size	Number of companies	%
Big (50 employees or more)	11	41%
Medium (20-49 employees)	5	19%
Small (19 employees or less)	11	41%
Total	27	100%

Table 15: Respondent companies by Sector and Size.

It is interesting that the respondents in the survey were just as many from big companies, with 50 employees or more, and from small companies, with 19 employees or less, or 41% from each company's size. There were only 5 respondents from Medium sized company which gives 19% of the respondent companies. In the Australian research the size of the companies was measured in revenues of the companies, not in the number of employees like was done in this research (Truong et al., 2008).

5.1.10 Position held

In the Australian research, there were only 8% of the respondents who had spent 10 years or more at the companies and most of them, or 26%, had worked in their positions for only 4-7 years (Truong et al, 2008). Table 16 shows the respondents' years of experience as CFO, for the companies analysed in Iceland. It is interesting how many respondents have been in their job positions for more than 10 years, or 52% of the respondents.

Sector	Iceland		Australia	
	Number of companies	% of respondents	Number of companies	% of respondents
More than 10 years	14	52%	7	8%
8-10 years	3	11%	9	11%
4-7 years	5	19%	22	26%
1-3 years	3	11%	27	32%
Up to 1 year	2	7%	19	23%
Total	27	100%	84	100%

Table 16: Respondents' time spent in job position.

5.1.11 Target weights vs current weights

There are different assumptions for the WACC calculations. Target weights and real weights are one of these assumptions that can be different between CFOs, when using the WACC. From the Australian research (Truong et al., 2008) 60% of the companies used target weights and 40% were using current weights. In this research there were only 11 respondents using the WACC and therefore answered the question about whether they are using target weights or real weights. And the responses were six, or 22%, who are using target weights and five answered real weights, or 19% of the responses (see Figure 4).

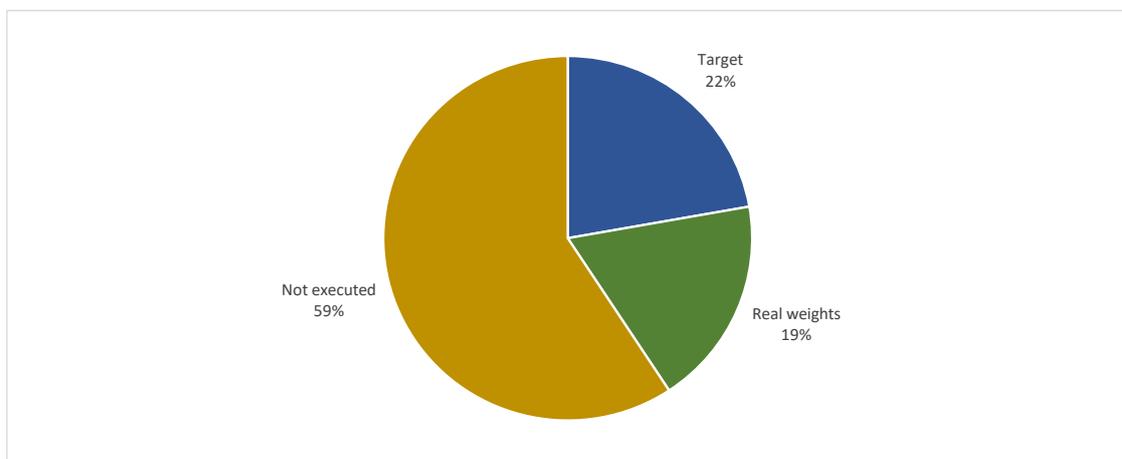


Figure 4: The weights used for the WACC calculations.

5.1.12 Three assertions about the WACC

There were three assertions in the survey about the WACC. The one assertion, where the WACC method is asserted to show properly how the operation is going, shows the answers in Figure 5.

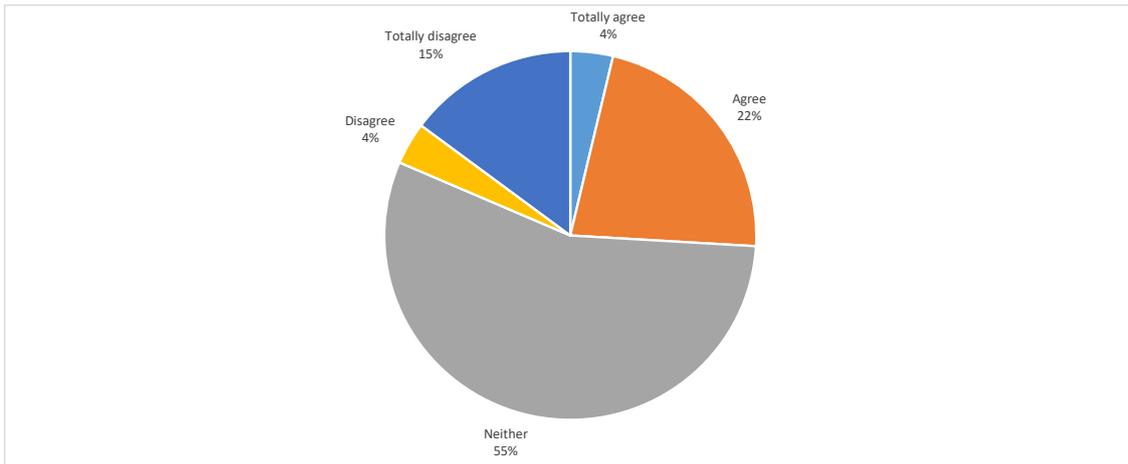


Figure 5: The WACC method shows well how the operation is going.

There was another assertion, regarding the usage of the WACC is good. There were only two respondents that totally agreed on that assertion and eight agreed. Nevertheless, only one disagreed and two totally disagreed, so most of the respondents seem to have good feeling about the usage of the WACC (see Figure 6).

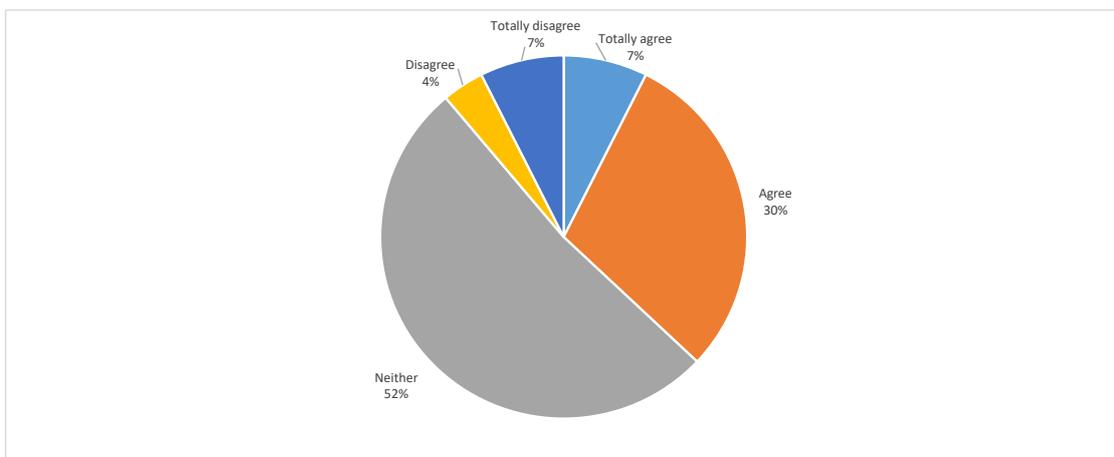


Figure 6: The usage of the WACC is good.

The last assertion was about the WACC being easy to execute. Four respondents answered totally agree (15%) but nine agreed (33%). Most of the responses were marked to “Neither” or 13 respondents (48%). Only one totally disagreed on this assertion, of the WACC being easy to execute. This is showed in Figure 7, here below.

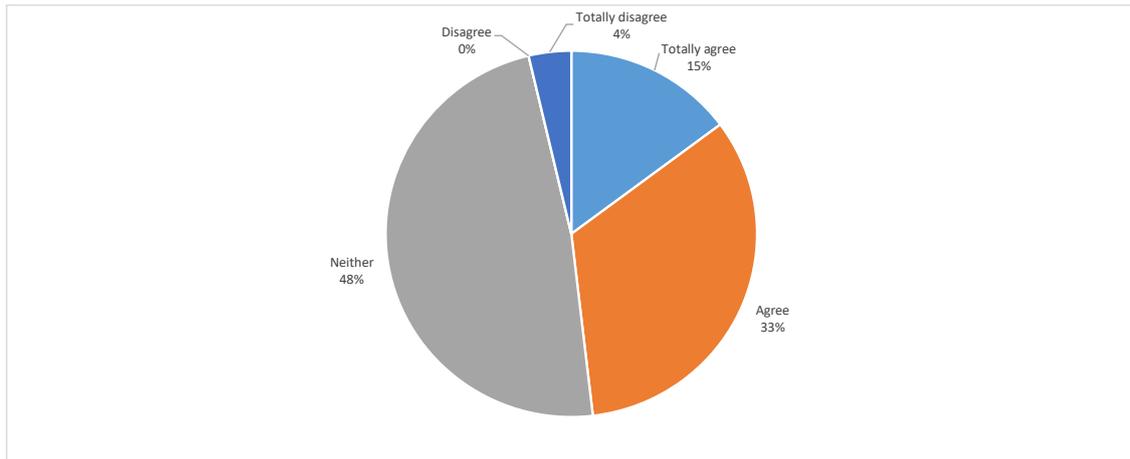


Figure 7: The WACC is easy to execute.

5.2 Study II

The fourth, and last, sub question is being answered by Study II. That question is as follows:

4) Which other calculation methods are companies in Iceland using along with or instead of the WACC calculations?

There were six individuals who were interviewed for Study II.

5.2.1 First interviewee

One of my interviewee in Study II was a managing director of a retailing company for the construction business. He is one of two founders of the company and is not the CFO at the company but he performs evaluation calculations for the company. The company is small, with only 18 employees. He admitted that he never calculates the WACC. His reason for that is that his operation is still recovering after the crisis in Iceland. He said:

“We have not been able to save profits, to increase the equity to pay dividend to the stockholders, because we must use the profit to finance new projects.”

Their target is to have 35-40% weight of equity. He mentioned that they might need to use the WACC calculations for new projects in the future but they haven't done that, ever. Then they will probably use the target weight on equity, rather than the real weight, he said. He said that when he will start calculating the WACC he will need to find his old textbooks to recollect his memory about the method and calculations.

“But I use Payback period. That method is simple and shows me exactly when the investment will pay-off. I use the same Excel-sheet and update it with new numbers and save it then for the project I am calculating it for.”

Core phenomenon	Causal conditions	Strategies	Consequenses
<ul style="list-style-type: none"> •NOT using WACC: •Because of low equity •Not circumstances at this time •Wants to use WACC in the future •Use target weights •Using Payback period 	<ul style="list-style-type: none"> •Payback period: •Clear vision •Simple •Takes short time 	<ul style="list-style-type: none"> •Calculates for new investment projects •Only once for each •In Excel 	<ul style="list-style-type: none"> •Risk-free rate the same •Familiar with NPV and IRR •Does not remember WACC method

Figure 8: Horizontal result for the first interviewee.

5.2.2 Second interviewee

The second interviewee has finished B.Sc. degree in business. She has held her job position as a CFO, in the same company in the printing sector, for five years and has never used the WACC. She uses the Payback period method in all calculations because it gives clear vision and simple to use. She mentioned that the CEO has provided her with the WACC for some new investments but only in a very few cases. She mentioned that there have been very little investments in the recent years and therefore she thinks there has not been a reason for using the WACC or any valuation calculations.

“Recently, we had to buy a new machine and then I used the Payback period. It is very simple and takes short time in process, and I have used it for a long time with good results.”

The Payback period gives her good information before deciding on making an investment.

“Soon, there will be renovation on our real estate and we also need to buy a new delivery truck, so to evaluate that I use an Excel-sheet that I fill in and calculate the Payback time for the project.”

She is considering to decide to finance these factors, of the renovation and the car purchase, and calculate the Payback period to see how long the assets will be depreciated. She does evaluate investments and ongoing projects every year, just to be updated on whether the investment pays off. And she uses Excel for it, as she does for many other projects. The risk-free rates are assumed to be the same over the period of the project. She knows the NPV and says she actually uses that method and the IRR is calculated by the auditors, for the annual report. Hurdle rate, APV and Value at Risk are unknown methods to her, or at least she does not use them.

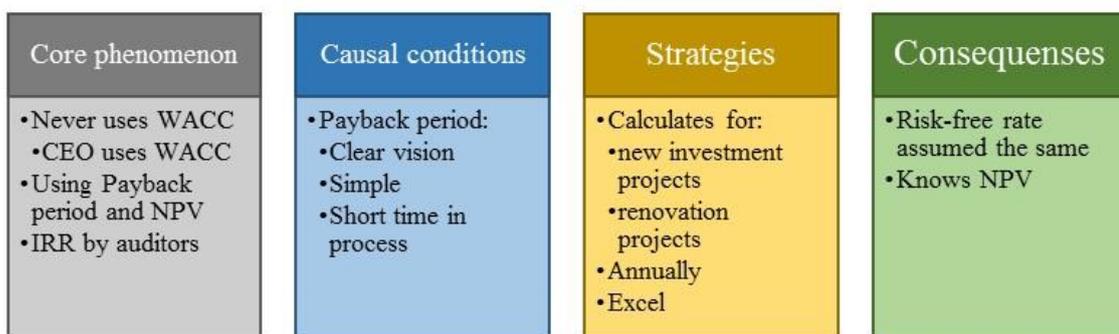


Figure 9: Horizontal results for the second interviewee.

5.2.3 Third interviewee

The third interviewee has a Master degree in Political Economy from a University in the UK. He says, “I am using the WACC method indirectly, without using the formula”. He does not use any website databases for the presumptions and does not know Damodaran’s website. He uses the real weights on debt to value and equity to value. He says he uses the WACC method because, “it is logical and gives clear picture, especially in our sector of business”, which is the construction sector. The company has little equity but a lot of loans, so this is the main reason, if they can, for trying to sell the assets on the construction period, so the WACC will be lower than the margin of the projects. He calculates the WACC for each project but only in the beginning. He checks the status on all project on regular basis. He does not think it is necessary to change the assumptions; he only wants to see if the project is paying off. He says:

“The WACC is extremely important in Iceland, especially in the construction business. We are paying high interest rates. The WACC gives clear picture and is a good valuation method for companies. I am checking if the project has return on equity.”

Small investments, like buying a car or an apartment that is not supposed to be sold, are not considered calculated with the WACC but, he said:

“When you know the calculations of the WACC then the calculation method is in your sub-consciousness and you calculate it without realizing you are using the WACC method.”

Then he uses the Payback Period to check out the revenues and the interest rates and calculates whether it pays off or not. He does not change the presumptions, like risk-free rates. When being asked whether he changes the assumptions for risk-free rates, he answers:

“I use the same risk-free over the lifetime of a project.”

He is familiar to the NPV, the hurdle rates and Value at Risk and used these calculations in previous job in the banking sector, but not for the construction business.

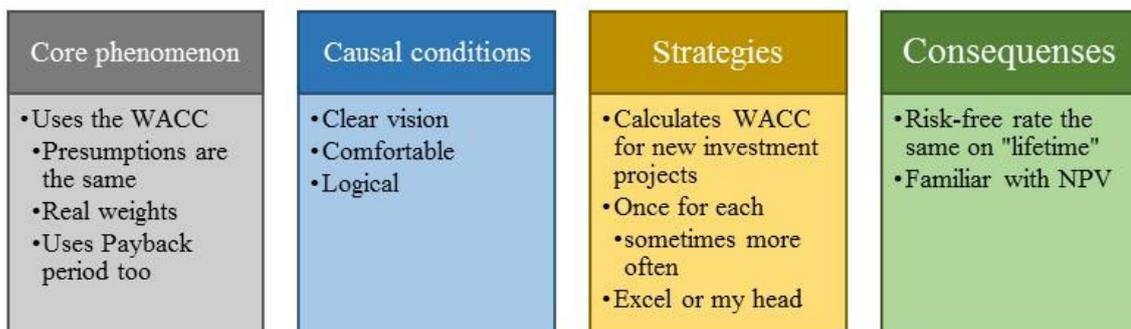


Figure 10: Horizontal results for interviewee three.

5.2.4 Interviewees four and six

Two interviewees, the fourth and the sixth, answered so similar so here is a summary of the results for these two interviews. One has a Master's degree in Management and strategic planning but the other has a B.Sc. degree in Economics. Both

interviewees were in the retail business and neither of them is using the WACC. Both are using the NPV and the Payback period to evaluate new projects or new investments for their companies. These calculations are made in Excel, in a form that is used repeatedly with updated presumptions. They agree on that they do not recalculate the valuation of a project after it has begun or was invested in it. They are using the same risk-free rate for each project.

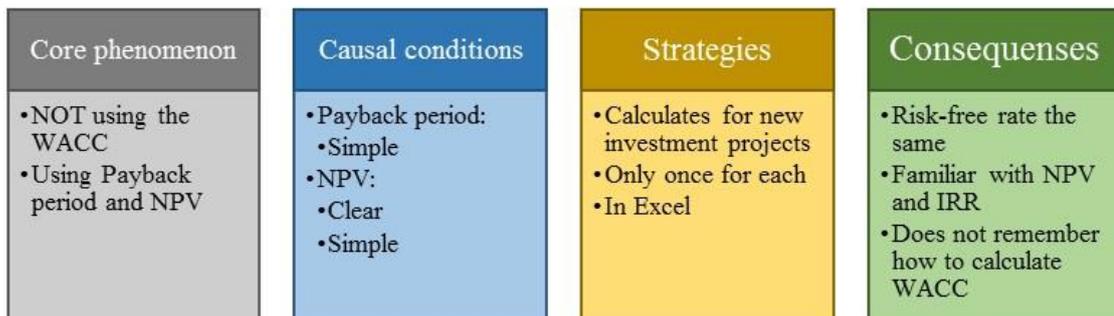


Figure 11: Horizontal results for interviewees four and six.

5.2.5 Fifth interviewee

The fifth interviewee is in a physical activity business in the health sector. She has B.Sc. degree in Business. She is mostly booking deposits from customers and paying salary and is in control over all accounting and statements in the company. So, the answers were mainly negative towards the WACC or any other valuation method. When there are new investments she uses the NPV method by calculating the Free Cash Flow, then the Present Value for the Cash flow and subtracts the Investment and gets the NPV of the investment. She says:

“I use the rule of thumb for the Net Present Value; if the NPV is positive I have faith in the project and accept it. I have accepted a project with a positive NPV that was not paying off so I learned from it. But usually this rule is effective.”

She does not re-predict the presumptions again, even though she admitted that she should have done that in the above-mentioned instance. She is familiar with Damodaran from previous work place. She knows the Payback period method and would like to commit to that method, and then use it along with the NPV.

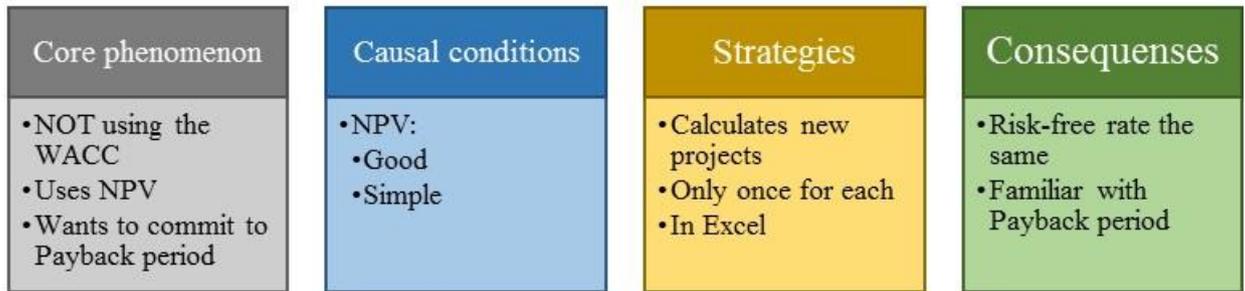


Figure 12: Horizontal results for the fifth interviewee.

5.2.6 Sub question 4

The fourth sub question, is the only one of the research questions that is answered in Study II. The question is following:

- 4) *What other calculation methods are companies in Iceland using along with or instead of the WACC calculations?*

The answer to that question in the interviews were very simple. Most of them are using the NPV and the Payback period and neither of them is using the WACC along with them. There was only one CFO who is using the WACC on regular basis. In this research the results are that the NPV and the Payback period are the most popular evaluation methods among CFOs in companies in Iceland. All the interviewees who use the NPV method are using the WACC for discounting. In all cases except one, they get the information about the WACC from databases, for example from Bloomberg and Damodaran.

Compared to the Australian research (Truong, 2008) there are more methods that are being used there than in this Icelandic research. The same results are in the Australian research; the most popular techniques are the Net Present Value (NPV), the Internal Rate of Return (IRR) and the Payback period. The Weighted Average Cost of Capital (WACC) was most often used but then for discounting.

6 Discussion

At first, when the idea of this project started, more than a year ago, then it was expected that in most companies the most common valuation method would be the WACC. Then, after some consideration with Icelandic CFOs and after trying to find the WACC in annual reports of companies in Iceland the expected valuation method to be the most common would be anything else but the WACC. The reason for that assumption is that the WACC was not being found in so many annual reports. Corporate Finance courses generally stress the importance of the method for evaluating either a company or a new project considered to invest in. So, what should be done? The results of the research are interesting in many ways. It is surprising that the answer to the research question is that so few companies do calculate the WACC, or only 41% of the respondents.

By Truong et al. (2008), the results from the Australian research were that the Net Present Value (NPV), the Internal Rate of Return (IRR) and the Payback period were the most popular techniques used for evaluation of companies in Australia (2008). The WACC was most often used for discounting and along with other evaluation methods. In this research, the study of evaluation methods used in companies in Iceland, the results show that the two most popular techniques were the NPV and then the WACC, which is very good. That shows that the WACC is still important and relevant in companies in Iceland even though the method is in most cases used along with other evaluation methods, either one or more. That is also very surprising how many companies are using more than one technique to evaluate their businesses. How few respondents from the interviews are really using the WACC is a little bit disappointing because the expectations were that more CFOs were using the WACC for evaluation. There were five of six interviewees, from Study II, that are not using the WACC and not even along with other methods. The only one who is using the WACC uses that method as his dominant method, even though he also uses the Payback period and is familiar with other methods. The results indicate that CFOs in companies in Iceland do have different opinions on which method is the best and gives the best results. It was assumed that CFOs that lack an education would rather be using simple methods. The result from Study I showed that the less education the respondents have, the fewer evaluation methods they are using. There were only two respondents who calculate the WACC for every new project, which is very special result, how few they are. But five respondents calculate it when the WACC needs to be recalculated, which cannot be

foreseen how often that is. From Study II, it is quite interesting how the same evaluation techniques are being used in companies in Iceland. Is it the famous Icelandic herd behaviour, where everyone must own the same design and as nice cars and houses as the friend or the neighbour? Most the respondents are using the Payback period and the NPV. This supports the findings of that CFOs of companies in Iceland are not using one valuation method for evaluation of their business but two or three, and sometimes four or five. The WACC is valued as an important and a relevant method and is used in companies in Iceland.

Managers must value operations, ownership claims and opportunities. They have their own approach but the results to this research should attract CFOs to execute the WACC. They could execute it for one or two new projects, as a test for themselves, and see whether the result is suitable or not. They should then compare the results for the WACC and their present valuation method and see the difference, if there is one. CFOs in companies in Iceland have not been committed to the WACC calculations but as soon as they would adapt to the method they would see how important and relevant the method is, in all sectors of business. To make the presumptions quick and efficient the website of Damodaran is recommended to use to find the cost of debt, the cost of equity and the Beta, or either presumptions needed in the calculations of the WACC.

There is a lack of statistically significant results in the results of this research because the random sample was very small, or only 200 companies, and the respondents were only 27, or 13.5% of the total sample. Because the sample is so small, there would not be significant results for the measure of the statistics between the respondents' answers. More implications of this research project are addressed in Appendix D.

From the paragraph 2.2., the CAPM method was widely used and was the most popular method for estimation of cost of equity in 1976 (Westwick et al.), 2001 (Graham and Harvey), 2004 (Brounen et al.) and 2010 (McLaney et al.). In the results from Graham and Harvey (2001) there were 73.5% of the participants who responded that they use the CAPM *always* or *almost always* in the survey. This result could be reason for continuation of this research, or applying similar research in the form of studying the usage of the CAPM in companies in Iceland instead of the WACC in this research.

The Payback period is a simple method to explain to others. The method is risky in that way that it can show a profit from the operation or the project that is being

evaluated but a new project could form a loss of the project later, when the decision of investing has been made.

Hopefully, this research will increase an awakening to CFOs to use the WACC on a regular basis for their companies. The calculation methods for the WACC can be difficult but once they have been learnt they will be in the sub-consciousness and can be calculated without thinking, just like the third interviewee mentioned. The data shows an increase in the use of the WACC, according to Table 3 in chapter 2.1, where there is significant increase in use of the WACC in the year 2002 and in 2015 the WACC was most widely used for the Cost of capital budgeting. That might be the computer software, also mentioned in chapter 2.1, that attracts managers to use more difficult methods for more explicit information. The WACC should be used more often, on regular basis, in companies in Iceland for more explicit details of a valuation on a new project or for the business.

References

- Aaker, D., Kumar, V., Leone, R. & Day, G. (2013). *Marketing research* (11th Ed.). United States: John Wiley & Sons, Inc.
- Accounting Coach. (n.d.). *How do you calculate the payback period?* Retrieved April 25th, 2017 from <https://www.accountingcoach.com/blog/calculate-payback-period>
- Ardalan, Kavous. (2012). Payback Period and NPV: Their Different Cash Flows. *Journal of Economics and Finance Education*, vol. 11(2). Retrieved May 9th, 2017 from <http://www.economics-finance.org/jefe/volume11-2/01.Payback%20Period%20and%20NPV%20Their%20Different%20Cash%20Flows.pdf>
- Arnold G.C. and Hatzopoulos, P.D. (2000). The Theory-Practice Gap in Capital Budgeting: Evidence from the United Kingdom. *Journal of Business Finance and Accounting*, vol. 27(5) and vol. 27(6), 603-626. Retrieved March 30th, 2017 from <http://hrproxy.hir.is:2146/doi/10.1111/1468-5957.00327/epdf>
- Block, S. (2011, April 1st). Does the Weighted Average Cost of Capital Describe the Real-World Approach to the Discount Rate? *The Engineering Economist*, 56, 170–180. Retrieved March 30th, 2017 from DOI: 10.1080/0013791X.2011.573618
- Borad, Sanjay Bulaki. (2015). Capital Structure Theory – Modigliani and Miller (MM) Approach. *eFinanceManagement*. Retrieved May 10th, 2017 from <https://efinancemanagement.com/financial-leverage/capital-structure-theory-modigliani-and-miller-mm-approach>
- Boundless. (2016, May 27th). Disadvantages of the Payback Method. *Boundless Finance Boundless*. Retrieved May 9th, 2017 from <https://www.boundless.com/finance/textbooks/boundless-finance-textbook/capital-budgeting-11/the-payback-method-92/disadvantages-of-the-payback-method-400-4251/>
- Brealey, R., Myers, S. and Allen, F. (2016). *Principles of Corporate Finance* (12th Ed.). Berkshire: McGraw-Hill Education.

- Brounen, D., De Jong, A. and Koedijk, K. (2004). Corporate finance in Europe: Confronting theory with practice. *Financial Management*. Vol. 33, 71-101.
- Clayman, M.R., Fridson, M.S. and Throughton, G.H. (2012). *Corporate Finance: A Practical Approach* (2nd Ed.). New Jersey: John Wiley & Sons, Inc.
- Christy, G.A. (1966). *Capital budgeting: Current practices and their efficiency*. Eugene: Bureau of Business and Economic Research. University of Oregon.
- Corbin, J., and Strauss, A. (2008). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (3rd ed.). Thousand Oaks, CA: Sage.
- Corporate Finance Institute. (n.d.) *What is unlevered Beta?* Retrieved May 4th, 2017 from <http://www.corporatefinanceinstitute.com/unlevered-beta-asset-beta>
- Damodaran, Aswath. (n.d.). Damodaran homepage. Retrieved January 17th, 2017 from <http://pages.stern.nyu.edu/~adamodar/>
- Damodaran, Aswath. (2006). *Damodaran on Valuation*. New York: Wiley.
- Denzin, N.K. and Lincoln, Y.S. (2011). *The SAGE Handbook of Qualitative Research* (4th Ed.). California: Sage Publications Inc.
- Fernández, P. (2007, November 1st). *A More Realistic Valuation: APV and WACC with Constant Book Leverage Ratio*. IESE Business School Working Paper No. 715. <http://dx.doi.org/10.2139/ssrn.946090>
- Fernández, P. (2013, November 23rd). *Company valuation methods – The most common errors in valuation*. Retrieved March 4th, 2017 from http://is.vsfs.cz/el/6410/leto2014/N_OP/um/Fernandez_2013_Company_Valuation_Methods_SSRN-id274973.pdf
- Freeman, M. & Hobbes, G. (1991). Capital budgeting: Theory versus practice. *Australian Accountant*, vol 61, 36-41.
- Gallo, A. (2015, April 30th). A Refresher on Cost of Capital. *Harvard Business Review*. Retrieved April 30th 2017 from <https://hbr.org/2015/04/a-refresher-on-cost-of-capital>

- Gitman, L.J. and Mercurio, V.A. (1982). Cost of capital techniques used by major US firms: Survey and analysis of Fortune's 1000. *Financial Management*, pages 21-29.
- Glaser, B. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory*. Mill Valley, CA: Sociology Press.
- Glaser, B. (1998). *Doing grounded theory: Issues and discussions*. Mill Valley, CA: Sociology Press.
- Graham, J.R. and Harvey, C.R. (2001). The theory of practice of corporate finance: evidence from the field. *Journal of Financial Economics*, 60. 187-243. Retrieved March 29th, 2017 from https://faculty.fuqua.duke.edu/~charvey/Research/Published_Papers/P67_The_theory_and.pdf
- Goulding, C. (2005). Grounded theory, ethnography and phenomenology: A comparative analysis of three qualitative strategies for marketing research. *European journal of Marketing*, 39(3/4), 294-308.
- Gylfi Magnússon. (2002, February 13th). Hvað er vegið meðaltal fjármagnskostnaðar? *Vísindavefurinn*. Retrieved March 16th, 2017 from <https://www.visindavefur.is/svar.php?id=2112>
- Icelandair Group hf. (2017). Annual report 2016. Retrieved May 3rd, 2017 from <http://www.icelandairgroup.is/servlet/file/store653/item982449/version4/Annual%20Report%202016.pdf>
- Investopedia (n.d.). Bond Rating. Retrieved May 10th, 2017 from <http://www.investopedia.com/terms/b/bondrating.asp>
- Investopedia (n.d.). Capital Asset Pricing Model (CAPM). Retrieved January 15th, 2017 from <http://www.investopedia.com/terms/c/capm.asp>
- Investopedia. (n.d.). Cost Of Capital. Retrieved March 4th, 2017 from <http://www.investopedia.com/terms/c/costofcapital.asp>
- Investopedia. (n.d.). Discounted Cash Flow (DCF). Retrieved March 28th, 2017 from <http://www.investopedia.com/terms/d/dcf.asp>

- Investopedia. (n.d.) Dividend Yield. Retrieved May 10th, 2017 from <http://www.investopedia.com/terms/d/dividendyield.asp>
- Investopedia. (n.d.) Earnings Yield. Retrieved May 10th, 2017 from <http://www.investopedia.com/terms/e/earningsyield.asp>
- Investopedia. (n.d.). Internal Rate of Return (IRR). Retrieved April 24th, 2017 from <http://www.investopedia.com/terms/i/irr.asp>
- Investopedia. (n.d.). Modigliani and Miller's Capital Structure Theories. Retrieved January 19th, 2017 from <http://www.investopedia.com/walkthrough/corporate-finance/5/capital-structure/modigliani-miller.aspx>
- Investopedia. (n.d.) Net Operating Profit After Tax – NOPAT. Retrieved May 2nd, 2017 from <http://www.investopedia.com/terms/n/nopat.asp>
- Investopedia. (n.d.). Net Present Value (NPV). Retrieved April 24th, 2017 from <http://www.investopedia.com/terms/n/npv.asp>
- Investopedia. (n.d.). Yield To Maturity (YTM). Retrieved May 10th, 2017 from <http://www.investopedia.com/terms/y/yieldtomaturity.asp>
- Irfanullah, Jan. (2013). Payback Period. *Accounting Explained*. Retrieved May 9th, 2017 from <http://accountingexplained.com/managerial/capital-budgeting/payback-period>
- Keldan. (n.d.). Listi Keldunnar yfir stærstu fyrirtæki landsins. Retrieved May 7th, 2017 from <https://www.keldan.is/market/keldan300>
- Kester, G., Change, R.P., Echanis, E.S., Haikal, S., Md.Isa, M., Skully, M.T., Tsui, K.C. and Wang, C.J. (1999). Capital budgeting practices in the Asia-Pacific region: Australia, Hong Kong, Indonesia, Malaysia, Philippines and Singapore. *Financial Practice and Education*, 9(1), 25-33.
- Koller, T., Goedhart, M. and Wessels, D. (2015). *Valuation: Measuring and Managing the Value of Companies* (6th Ed.). New Jersey: John Wiley & Sons, Inc.
- Lo, A.W. and Wang, J. (2008). MIT Sloan Finance Problems and Solution Collection Finance Theory I, Part 2. Retrieved May 14th, 2017 from http://alo.mit.edu/wp-content/uploads/2015/06/PS_Part2.pdf

- Luehrman, Timothy A. (1997, May-June). What's It Worth?: A General Manager's Guide to Valuation. *Harvard Business Review*. Volume issue May-June 1997. Retrieved January 15th, 2017 from <https://hbr.org/1997/05/whats-it-worth-a-general-managers-guide-to-valuation>
- Marel hf. (2017). Consolidated Financial Statements Annual Report, 31 December 2016. Retrieved April 13th, 2017 from <http://marel.com/Files/ir/2016/Marel-Q4-2016-statements.pdf?source=ar2016-downloadcenter>
- McLaney, E., Pointon, J., Thomas, M. and Tucker, J. (2010, May 17th). Practitioners' perspectives on the UK cost of capital. *European Journal of Finance*, vol 10. 123-138. <http://dx.doi.org/10.1080/1351847032000137401>
- Nurullah, M., & Kengatharan, L. (2015). Capital budgeting practices: Evidence from Sri Lanka. *Journal of Advances in Management Research*, 12(1), 55-82. Retrieved March 29th, 2017 from <https://search.proquest.com/docview/1679029970?accountid=28419>
- Ozyasar, Hunkar. (n.d.) Assumptions of the Modigliani-Miller Theorem. *Chron*. Retrieved 10th, 2017 from <http://smallbusiness.chron.com/assumptions-modiglianimiller-theorem-55674.html>
- Perold, André F. (2004). The Capital Asset Pricing Model. *The Journal of Economic Perspectives*, 18(3), 3-24. Retrieved April 29th, 2017 from DOI: 10.1257/0895330042162340
- Reitir fasteignafélag ehf. (2016). Ársreikningur samstæðunnar 2015. Retrieved January 16th, 2017 from http://www.reitir.is/static/files/REITIR_fjarhagsuppl./2015-12/reitir-fasteignafelag-hf-arsreikn-ifrs-2015-undirritadur-lr.pdf
- Rodrigues, Luiz Fernando. (2012, November). Cost of capital and value creation: a study among companies from the agribusiness sector listed on Bovespa. *Custos E Agronegocio*, 8, 22-41, SI. Retrieved March 15th, 2017 from <http://www.custoseagronegocioonline.com.br/especialv8/Capital%20cost.pdf>
- Roopali Batra. (2017, March). Capital budgeting practices in Indian companies. *IIMB Management Review*. 29(1), 29-44. <http://doi.org/10.1016/j.iimb.2017.02.001>
- Ryan, P.A. and Ryan, G.P. (2002). Capital budgeting practices of the Fortune 1000: How have things changed. *Journal of Business and Management*, 8(4), 355-364.

- Schmidt, M. (2017, April 26th). Cost of Capital, Cost of Borrowing, and Similar “Cost of” Terms explained. Retrieved April 27th, 2017 from <https://www.business-case-analysis.com/cost-of-capital.html>
- Statistics Iceland (2016, January 2nd). Fjöldi skráðra fyrirtækja og félaga eftir atvinnugreinum 2008-2015. Retrieved January 18th, 2017 from http://px.hagstofa.is/pxis/pxweb/is/Atvinnuvegir/Atvinnuvegir__fyrirtaeki__fjoldi__fyrirtaeki/FYR01001.px/table/tableViewLayout1/?rxid=aec56aae-66a5-4e44-9c94-f0a657accbaa
- Statistics Iceland (2017, January). Fjöldi launagreiðenda 2008-. Retrieved January 18th, 2017 from http://px.hagstofa.is/pxis/pxweb/is/Atvinnuvegir/Atvinnuvegir__fyrirtaeki__fjoldi__launagreidendur/FYR01201.px/table/tableViewLayout1/?rxid=321985bc-9a60-48a0-95f1-34727f0f966b
- Strauss, A. & Corbin, J. (1994). Handbook of qualitative research. Retrieved January 19th, 2017 from http://www.depts.ttu.edu/education/our-people/Faculty/additional_pages/duemer/epsy_5382_class_materials/Grounded-theory-methodology.pdf
- Steiger, F. (2008). The Validity of Company Valuation Using Discounted Cash Flow Methods. *European Business School*. Retrieved March 14th, 2017 from <https://arxiv.org/ftp/arxiv/papers/1003/1003.4881.pdf>
- Truong, G., Partington, G. and Peat, M. (June, 2008). Cost-of-Capital estimation and capital-budgeting practice in Australia. *Australian Journal of Management*, 31(1), 95-121. Retrieved March 15th, 2017 from <http://journals.sagepub.com/doi/pdf/10.1177/031289620803300106>
- UK Essays. (2015, March 23rd). The Criticism of the Modigliani and Miller Hypothesis Finance Essay. Retrieved May 14th, 2017 from <https://www.ukessays.com/essays/finance/the-criticism-of-the-modigliani-and-miller-hypothesis-finance-essay.php>
- Vaidya, Dheeraj. (n.d.). CAPM Beta – Definition, Formula, Calculate Beta in Excel. *Wall Street Mojo*. Retrieved May 4th, 2017 from <http://www.wallstreetmojo.com/capm-beta-definition-formula-calculate-beta-in-excel/>

- Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the qualitative-quantitative divide: Guidelines for conducting mixed methods research in information systems. *MIS quarterly*, 37(1), 21-54.
- Westwick, C.A. and Shohet, P.S.D. (1976). Investment Appraisal and Inflation. *ICAEW Research Committee, Occasional Paper*, vol 7.
- Williams, R.B. jr. (1970). Industry practice in allocating capital resources. *Managerial Planning*, 18(6), 15-22.
- WSO, Master Your Finance Career. (n.d.). Weighted Average Cost of Capital (WACC) Definition. Retrieved April 25th, 2017 from <https://www.wallstreetoasis.com/finance-dictionary/what-is-weighted-average-cost-of-capital-WACC>
- Össur hf. (2017). Annual report 2016. Retrieved February 23rd, 2017 from http://annual-report.ossur.com/download/files/2016_Q4_Ossur_Company_Announcement.pdf

Appendix A

Letter sent to the random sample of participants in Study I, with request for their participation.

Berist til fjármálastjóra eða staðgengils

Kæri fjármálastjóri.

Ég er nemandi við Háskólann í Reykjavík og er að vinna að rannsóknarverkefni mínu í meistaranámi í fjármálum fyrirtækja (M.Sc. in Corporate Finance). Leiðbeinandi minn er Már Wolfgang Mixa.

Tilgangur verkefnisins er að fá upplýsingar frá fjármálastjórum um það hvort reikningsaðferð vegins fjármagnskostnaðar (Weighted Average Cost of Capital - WACC) sé notuð reglulega í fyrirtækjum á Íslandi, til að meta rekstur þeirra.

Þú hefur verið valin/n í úrtak fyrir lokaverkefnið. Úrtakið var fengið úr gögnum í vörslu Creditinfo. Upplýsingar úr rannsókninni munu ekki verða notaðar frekar að rannsókn lokinni og svör eru ekki rekjanleg.

Mér þætti mjög vænt um það að þú gæfir þér 2-3 mínútur af tíma þínum til að svara þessum 18 spurningum. Rannsóknin er opin í aðeins eina viku og því nauðsynlegt að fá skjót viðbrögð.

Ef spurningar vakna eða athugasemdir eru varðandi könnunina þá er netfangið mitt: liljabjorg05@ru.is.

Með fyrirfram þökk og vinsemd,

Lilja Björg Guðmundsdóttir.

Appendix B

The questionnaire in Study I

Er WACC reiknað í þínu fyrirtæki?

Rannsóknarverkefni í M.Sc. í fjármálum fyrirtækja við Háskólann í Reykjavík

1. Hvert er menntunarstig þitt? (*merktu við hæstu gráðuna sem þú hefur lokið*)
 - a. Grunnskólapróf
 - b. Framhaldsskólapróf
 - c. Grunnám í háskóla (t.d. B.Sc.)
 - d. Meistaránám í háskóla (t.d. M.Sc.)
 - e. Doktorsnám í háskóla
2. Ef þú hefur lokið háskólaprófi, frá hvaða háskóla?
 - a. Háskóli Íslands
 - b. Háskólinn á Akureyri
 - c. Háskólinn á Bifröst
 - d. Háskólinn í Reykjavík
 - e. Hólaskóli
 - f. Landbúnaðarháskóli Íslands
 - g. Listaháskóli Íslands
 - h. Önnur menntastofun
 - i. Hef ekki lokið háskólaprófi
3. Í hvaða atvinnugrein starfar fyrirtækið sem þú starfar hjá?
 - a. Ferðaþjónusta
 - b. Fjarskipti
 - c. Heilbrigðismál
 - d. Iðnaður
 - e. Landbúnaður
 - f. Orka
 - g. Sjávarútvegur
 - h. Upplýsingatækni

- i. Verslun
 - j. Þjónusta
 - k. Annað
4. Fyrirtækið er:
- a. Einkafyrirtæki
 - b. Opinbert fyrirtæki
5. Hve stórt telst fyrirtækið vera sem þú starfar hjá?
- a. Stórt (50 starfsmenn eða fleiri)
 - b. Meðalstórt (20-49 starfsmenn)
 - c. Lítið (19 starfsmenn eða færri)
6. Hver er starfsaldur þinn í núverandi stöðu?
- a. Allt að 1 ári
 - b. 1-3 ár
 - c. 4-7 ár
 - d. 8-10 ár
 - e. Meira en 10 ár
7. Hvaða aðferð/ir notarðu helst til að meta reksturinn í fyrirtæki þínu? (*má merkja við fleiri en einn valmöguleika*)
- a. Veginn fjármagnskostnaður – Weighted Average Cost of Capital (WACC)
 - b. Núvirði - Net Present Value (NPV)
 - c. Reikna tímabilið sem tekur að greiða upp - Payback period
 - d. Innri ávöxtun - Internal Rate of Return (IRR)
 - e. Hurdle Rate
 - f. Leiðrétt núvirði - Adjusted Net Present Value (APV)
 - g. Virði í hættu - Value at Risk
 - h. Annað: _____
8. Hvar lærðirðu/varðstu fyrir áhrifum af þessari aðferð?
- a. Frá kennara
 - b. Frá fyrrverandi starfsmanni
 - c. Frá núverandi yfirmanni/stjórnarmanni
 - d. Úr grein/blaði/verkefni/bók
 - e. Annað

$$WACC = \text{debt rate} * (1 - \text{Tax}) * \left(\frac{\text{Debt}}{\text{Value}}\right) + \text{equity rate} * \left(\frac{\text{Equity}}{\text{Value}}\right)$$

9. Ef WACC er reiknað, hvaða vigtir/hlutfall eru notað á skuldum (Debt/Value) og eigið fé (Equity/Value)?
- "Target weight" (Markmiðsvigt/-hlutfall verkefnis/fyrirtækisins) fyrir bæði skuldir og eigið fé
 - "Real weight" (Raunvigt/-hlutfall verkefnis/fyrirtækisins) fyrir bæði skuldir og eigið fé
 - "Target weight" fyrir skuldir en "real weight" fyrir eigið fé
 - "Target weight" fyrir eigið fé en "real weight" fyrir skuldir
 - WACC útreikningar eru ekki framkvæmdir
10. Ef WACC er reiknað, hve oft er WACC reiknað fyrir reksturinn á fyrirtækinu?
- Fyrir nýtt verkefni
 - Á 6 mánaða fresti
 - Árlega
 - Eftir þörfum
 - WACC útreikningar eru ekki framkvæmdir
11. Er forsendum (t.d. áhættulausum vöxtum (*risk free rate*)) breytt í útreikningunum?
- Fyrir nýtt verkefni
 - Á 6 mánaða fresti
 - Árlega
 - Eftir þörfum
 - Aldrei / WACC útreikningar eru ekki framkvæmdir
12. WACC-aðferðin sýnir vel hvernig reksturinn gengur í fyrirtæki þínu.
- Mjög sammála
 - Sammála
 - Hvorki né
 - Ósammála
 - Mjög ósammála
13. Nytsemi á Cost of capital aðferðinni (WACC) er góð.
- Mjög sammála
 - Sammála
 - Hvorki né

- d. Ósammála
 - e. Mjög ósammála
14. Cost of capital aðferðin er auðveld í útreikningi.
- a. Mjög sammála
 - b. Sammála
 - c. Hvorki né
 - d. Ósammála
 - e. Mjög ósammála
15. Hver framkvæmir útreikningana á þeirri aðferð sem notuð er í þínu fyrirtæki?
- a. Fjármálastjóri
 - b. Undirmaður fjármálastjóra
 - c. Endurskoðandi
 - d. Annar
 - e. Eru ekki framkvæmdir
16. Hvernig eru útreikningarnir framkvæmdir?
- a. Í Excel eða sambærilegu töflureikni
 - b. Upplýsinga-/bókhaldskerfið gefur kost á að reikna úr kerfinu
 - c. Annað
 - d. Eru ekki framkvæmdir
17. Af hverju notarðu aðferðina frekar en aðra?
- a. Auðveld í framkvæmd
 - b. Gefur skýrar upplýsingar
 - c. Annað: _____

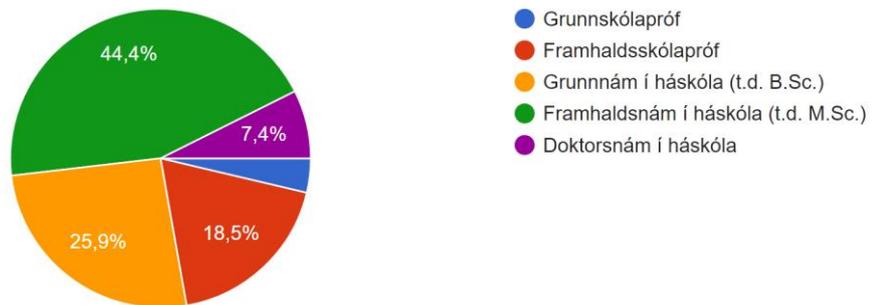
Specifics og Open ended

18. Gætir þú hugsað þér að nota frekar aðra aðferð en þá sem er notuð? Ef já, þá hvaða?
- _____

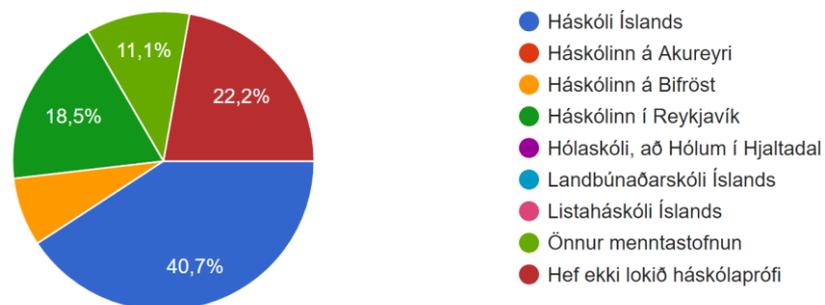
Appendix C

Results from the questionnaire in Study I, from Google Forms.

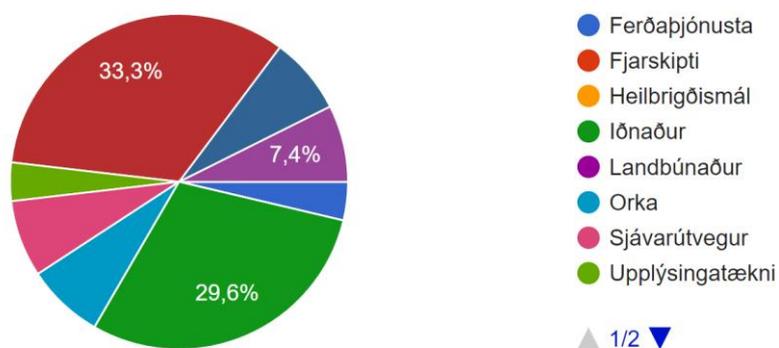
1. Hvert er menntunarstig þitt? (Merktu við hæstu gráðu sem þú hefur lokið)
(27 svör)



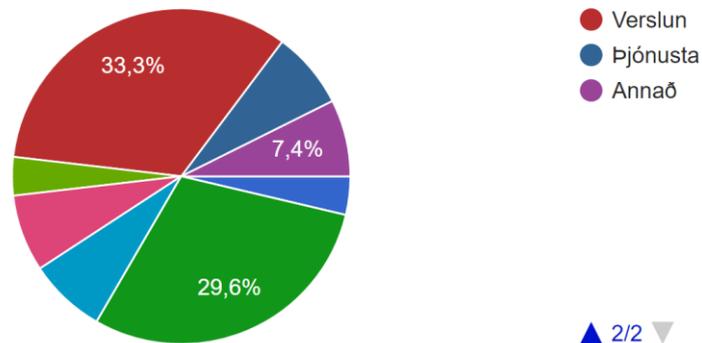
2. Ef þú hefur lokið háskólaprófi, frá hvaða háskóla? (27 svör)



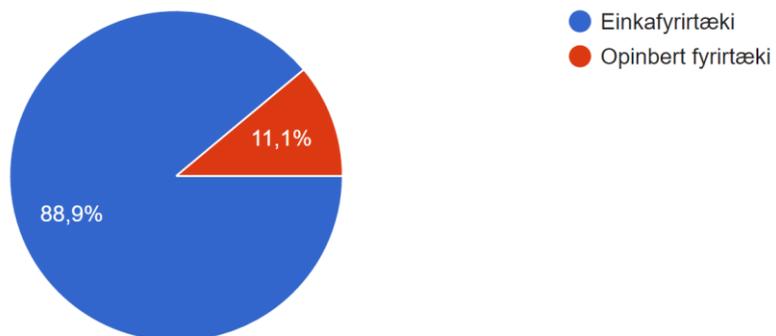
3. Í hvaða atvinnugrein starfar fyrirtækið sem þú starfar hjá? (27 svör)



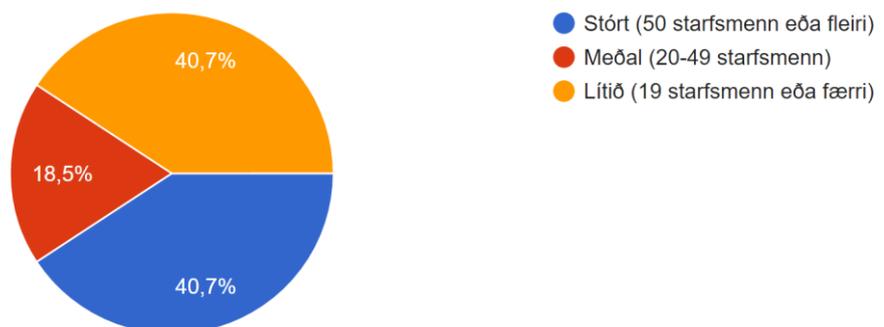
3. Í hvaða atvinnugrein starfar fyrirtækið sem þú starfar hjá? (27 svör)



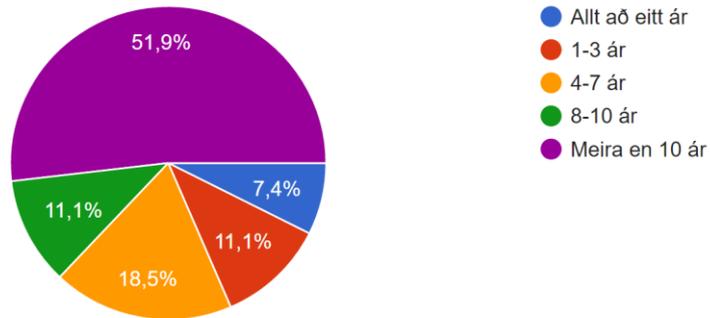
4. Fyrirtækið er: (27 svör)



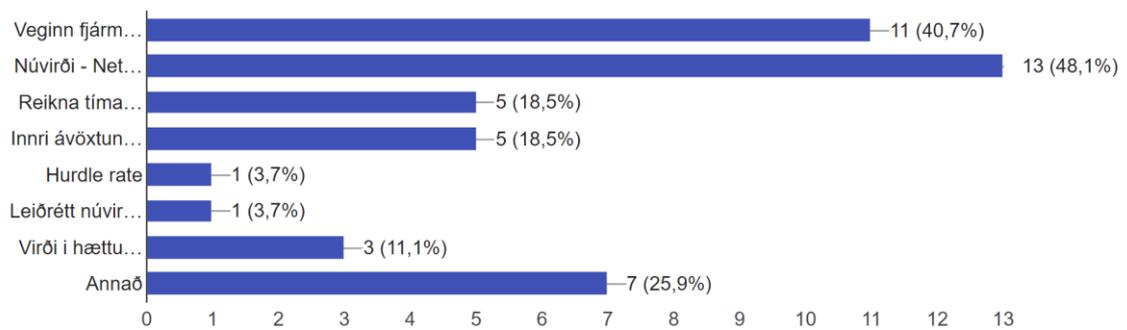
5. Hve stórt er fyrirtækið sem þú starfar hjá? (27 svör)



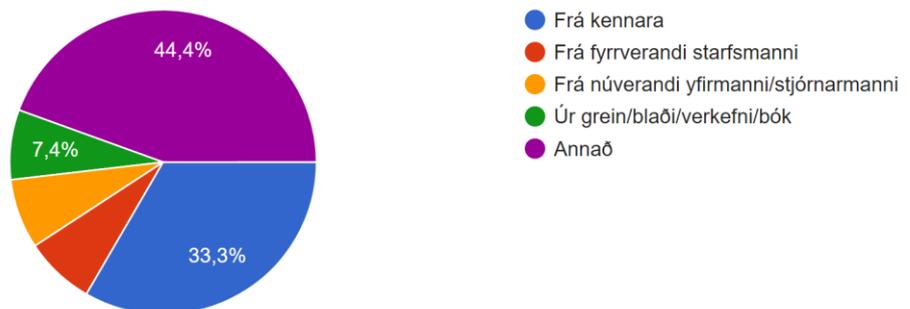
6. Hver er starfsaldur þinn í núverandi stöðu? (27 svör)



7. Hvaða aðferð/ir notarðu helst til að meta reksturinn í fyrirtæki þínu? (Má merkja við fleiri en einn valmöguleika) (27 svör)

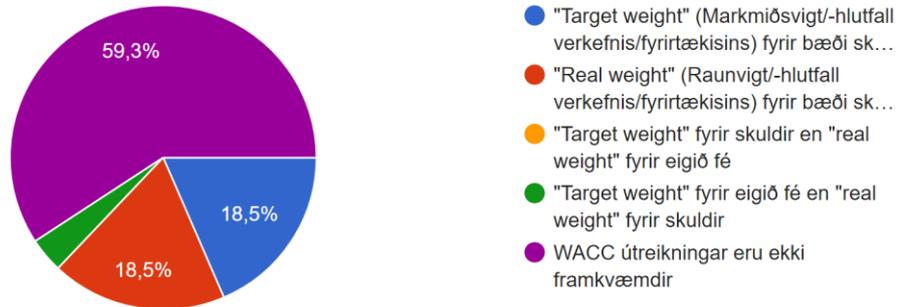


8. Hvar lærðirðu/varðstu fyrir áhrifum af þeirri aðferð sem þú notar? (27 svör)

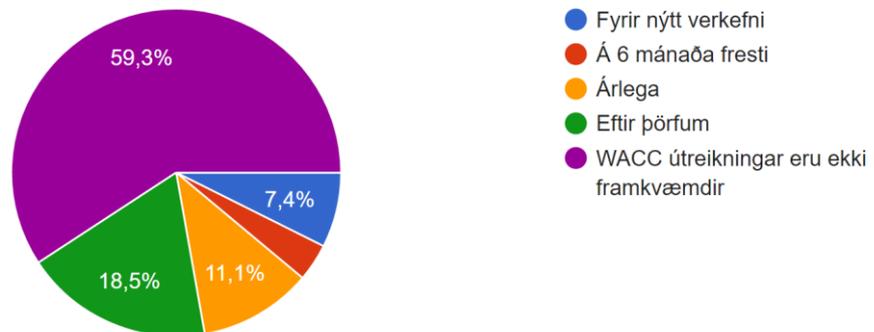


9. Ef WACC er reiknað, hvaða vigtir/hlutfall er notað í skuldum (Debt/Value) og eigið fé (Equity/Value)?

(27 svör)

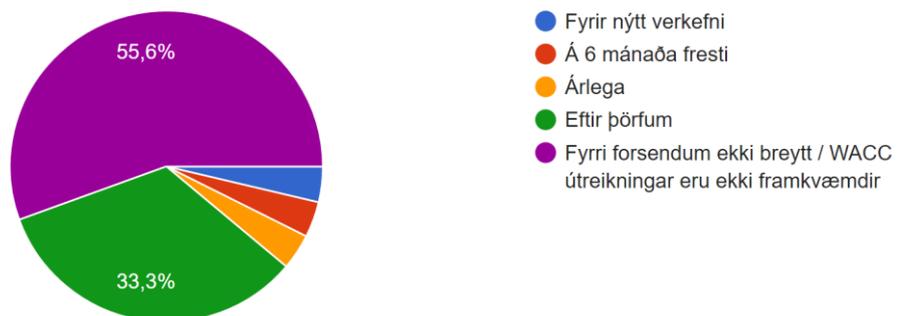


10. Hve oft er WACC reiknað fyrir reksturinn á fyrirtækinu? (27 svör)

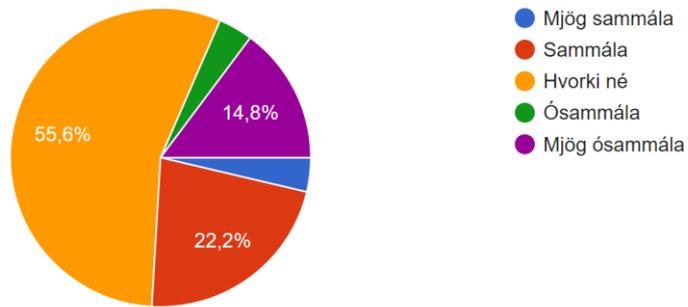


11. Er forsendum, t.d. áhættalausum vöxtum (risk free rate), breytt í útreikningunum?

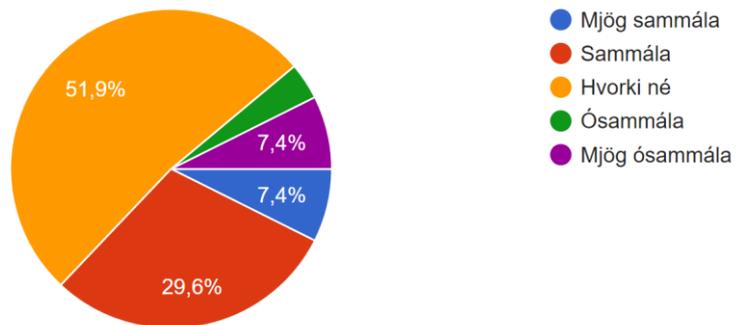
(27 svör)



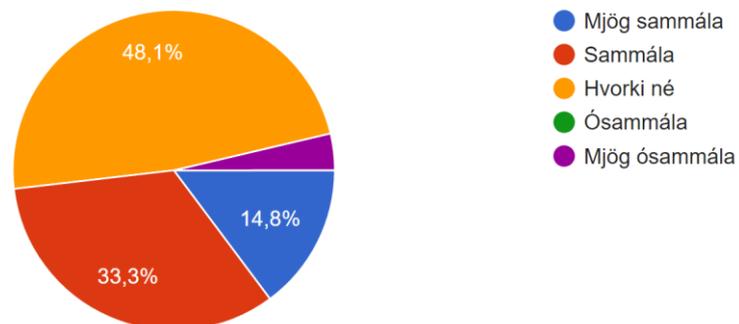
12. WACC-aðferðin sýnir vel hvernig reksturinn gengur í fyrirtæki þínu. (27 svör)



13. Nytsemi á Cost of Capital-aðferðinni (WACC) er góð. (27 svör)

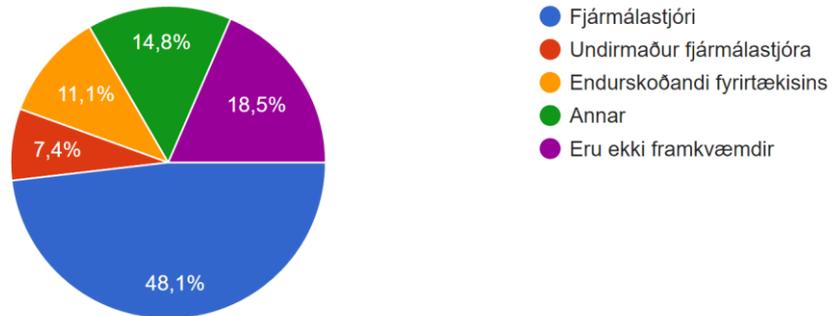


14. Cost of Capital aðferðin (WACC) er auðveld í útreikningi. (27 svör)



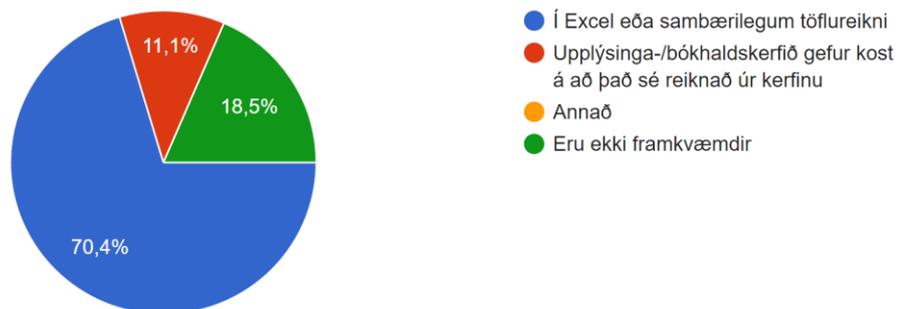
15. Hver framkvæmir útreikningana, á þeirri aðferð sem notuð er í þínu fyrirtæki, til að meta reksturinn?

(27 svör)



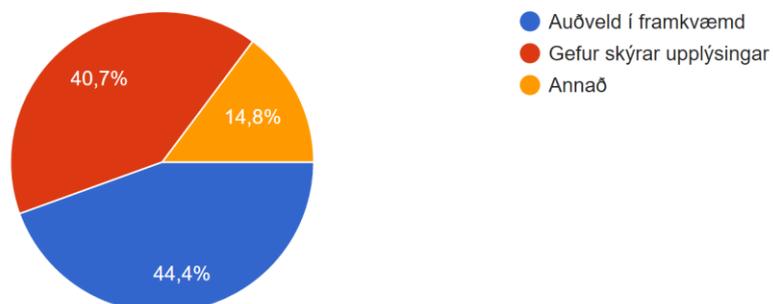
16. Hvernig eru útreikningarnir, á þeirri aðferð sem notuð er í þínu fyrirtæki, framkvæmdir?

(27 svör)



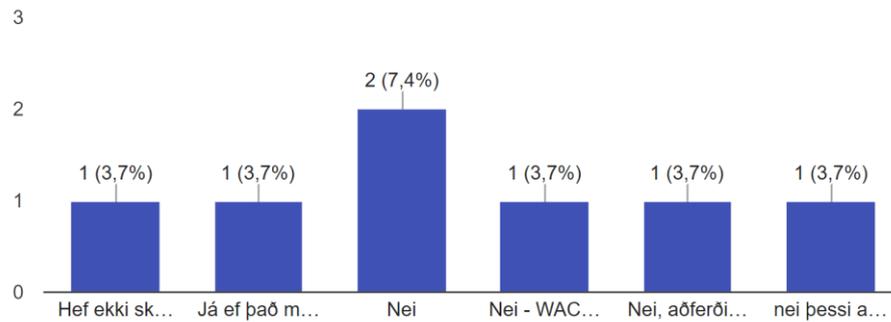
17. Af hverju notarðu aðferðina sem notuð er, í þínu fyrirtæki, frekar en aðra aðferð?

(27 svör)



18. Gætir þú hugsað þér að nota frekar aðra aðferð en þá sem er notuð? Ef já, hvaða?

(7 svör)



Answers to open ended question 18:

- ✓ Nei - WACC er of teygjanleg mælieining, full af spádómum um framtíð sem enginn þekkir. Raun arðsemi er það eina sem skiptir máli þegar allt er lagt saman.
- ✓ Já, ef það myndi bæta afkomuna.
- ✓ Nei.
- ✓ Nei.
- ✓ Nei, þessi aðferð hefur reynst ágætlega.
- ✓ Nei, aðferðin sem við notum virkar mjög fínt. Þar sem ég þekki ekki til WACC þá get ég ekkert sagt um þá aðferð.
- ✓ Hef ekki skoðað það.

Appendix D

Implications of the research

E-mail addresses

At first the intension was to send the survey in Study I only to CFOs of companies in Iceland. It appeared that no institution in Iceland could provide e-mail addresses only for financial managers but only main e-mail addresses of the companies. So, the survey had to be sent to the main e-mail address with the request of forwarding the survey to a financial manager or the person accountable for the financial decisions in the financial department.

Since it was not possible to collect e-mail addresses of only CFOs the survey was sent to main e-mail addresses of the 200 companies. That could have affected the small number of respondents because the survey might not have been forwarded to the right person and might, therefore, not have been received by the CFOs or a person accountable for the financial decisions.

In the end, there was no institution in Iceland that could provide e-mail addresses of all CFOs in companies in Iceland but there was one, CreditInfo, that had main addresses, which they had collected through survey sent annually to companies in Iceland.

Response rate

The survey was sent to 200 e-mail addresses. There were 22 e-mail addresses were not in use anymore, 10 of them because of employees that have quit their jobs and 12 of them were companies that are not in operation anymore. So, the sample was only 178 useable e-mail addresses. The survey was approachable for only 12 days and the responses were only 27, or 14.36% response rate. CFOs are often very busy working on their assignments at work and might also have postponed the participation in the Study I. Therefore, it might be taken into consideration as an implication that the participation was only 15.2%.

Continuation of the research

In the survey in Study I, there was not an option to have open-ended multiple regarding who other than CFO, subordinate or an auditor performs the evaluation calculations. This could be an option, if there will be any continuation of this research, to have more open-ended multiple options in the questionnaire, for the participants to answer with their own words.

If the author of this research thesis could think of a continuation of this research it could be interesting to study a research of the use of the CAPM model in companies in Iceland.