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Investment Evaluation Methods and Required Rate of Return in Finnish Publicly Listed Companies

ABSTRACT

Financial literature advocates the use of the Net Present Value method for the evaluation of investments. Its key parameter is the required rate of return on equity, which is to be calculated using the Capital Asset Pricing Model or a similar model especially if the company is publicly listed. However, there is ample evidence on companies not necessarily utilizing the NPV method or the CAPM in their capital budgeting and investment evaluation processes. This paper presents results of a survey conducted among the companies listed on the Helsinki Stock Exchange. The results show that the Finnish companies still lag behind US and Swedish companies in their use of the NPV, and the IRR method, even though it has become more commonly used during the last ten years. CAPM is used in surprisingly few companies, and 27 percent of the companies have not even defined their required rate of return on equity.

Key words: investment, payback rule, IRR, NPV, WACC, CAPM, HEX

JEL Classification: G31

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1 BACKGROUND

Business schools have advocated the use of the net present value (NPV) criterion as the superior method for the companies' investment evaluation. Similarly, the Capital Asset Pricing Model (CAPM) has been advocated as the premier method for setting the required rate of return for the investment projects, especially in publicly listed companies. In Finland, the history of the CAPM and the NPV in business schools' curriculum is shorter, but they can be said to have been taught at least from the 1980's.

However, there are several studies indicating that companies do not necessarily follow these methods in practice, when they make their capital budgeting decisions. Graham and Harvey (2001) surveyed 392 US companies about the current practice of corporate finance. The results indicate that even though large companies for the most part rely on present value techniques and the Capital Asset Pricing Model, a result comparable to those by Moore and Reichert (1983)¹, smaller companies tend to use the payback criterion. Even though such results can be viewed as a significant improvement from the 1970's, when e.g. Gitman and Forrester (1977) found that only 9.8% of the 103 large firms in their sample used net present value as their primary method, Jagannathan and Meier (2002) discuss why the CAPM model is not used even more commonly in the companies.

In Finland, Honko and Virtanen (1975), Virtanen (1984), and most recently Keloharju and Puttonen (1995) have surveyed the investment evaluation criteria and planning horizon of Finnish publicly listed, and non-public companies. Keloharju and Puttonen (1995), who studied the methods used in 1994, found companies to favor the payback rule far beyond the NPV rule, a results contrary to that in Graham and Harvey (2001). However, the situation should have changed after their study due to increased efforts by the Finnish business schools to teach more advanced financial methods to their students. One contribution of our study is to provide recent evidence on the methods used in publicly listed companies in Finland. Our study also extends the Keloharju and Puttonen (1995) study by focusing in more detail into how the required rate of return is set by the company. Finally, we compare our results with recent results from Sweden and the USA to find out how the situation differs in these countries. One expects *a priori* the American CFOs, due to the long history of business schools and financial education, to use more advanced methods as, e.g., in Finland.

We have four specific aims in this paper. First, we provide empirical results of the popularity of investment evaluation methods in the Finnish companies together with some insights into how these methods are used in practice. Second, we analyze how the popularity of these

¹ Moore and Reichert (1983) found that 86% of the 298 Fortune 500 firms use some type of discounted cash flow analysis.

methods has developed during the last three decades, and how the current situation in Finland compares with other countries. Third, we analyze how the required rate of return is set and what is the cost of capital. Finally, we provide insights into the use of the CAPM or multibeta models in publicly listed Finnish companies. The results are based on a recent survey done among the financial managers of the companies listed on the Helsinki Stock Exchange.

The remainder of this paper proceeds as follows. The sample and survey method are discussed in section 2. In section 3 we present the results together with discussion of their implications. The final section offers conclusions and some suggestions for further research.

2 SAMPLE AND METHODOLOGY

To study the questions pointed out earlier, we conduct a survey among the publicly listed companies listed on the Finnish stock exchange, HEX Ltd. Publicly listed companies were selected purposely for this study, because they differ from other companies in a number of ways. First, they are more likely to employ specialized financial managers than smaller and private companies, because of their better financial resources and more advanced needs. Second, publicly listed companies are expected to be a relatively homogenous group in terms of financial management. In particular, these companies are expected to utilize the stock market information in their capital budgeting decisions.

The questionnaire was sent to the companies listed on the Main, I-, NM-, or Pre-List of HEX at the end of August 2002. The population consisted of 144 companies. The smallest company in the population in term of sales was Biotie Therapies Ltd. with turnover of less than one million euros and market capitalization value of approximately 10 million euros. The biggest by far was Nokia Corporation with a multibillion sales and market value.

The questionnaire was sent using the regular mail to companies' financial manager. If the financial manager could not be identified, the questionnaire was sent to the managing director. Respondents were promised a total anonymity. Due to the anonymity, we could not recollect the data. Since the Finnish market is rather small and includes many companies with easily recognizable features, we did not want to risk influencing the response rate in a negative way by asking questions concerning company specific characteristics such as industry and size. We received 46 responses in time for this study. They represent approximately 32 percent of the total sample, and the response rate can be considered to be fairly high for this kind of questionnaires.²

² Keloharju and Puttonen (1995) received answers from 104 companies representing 46 percent of the companies in their sample. Their sample was taken from the list of 500 largest companies in Finland. The list included public and non-public companies. Out of their 104 responses, however, only 23 were from publicly listed companies. Graham and Harvey (2001) had a much lower response rate of nine percent.

The questions in the questionnaire (see Appendix) focus on three areas: (1) which are the most commonly used investment evaluation methods, (2) how is the overall rate of return requirement for the company's equity set (and what are the inputs), (3) in what range is the current numerical estimate for the company's rate of return on equity, and (4) how are the project specific rates of return (and their inputs) set. Results on these four areas are analysed in subsections of the next section.

3 RESULTS

3.1 The investment evaluation method

The first question in the questionnaire asked the companies to indicate what kind of investment evaluation methods they use. We expected to see that the use of the NPV method has become more popular at the expense of the payback rule. Respondents were given a list of alternative methods to choose from with an option to add their own method if not included in the list. Contrary to Keloharju and Puttonen (1995), respondents were asked to select one of the methods in the list as their primary method as in Honko and Virtanen (1975) and Virtanen (1984). Moreover, respondents could select a number of secondary methods. Finally, they could indicate methods that are used only in some cases, but not necessarily in the evaluation of all investment projects.

Figure 1 indicates that the payback-method and the internal rate of return (IRR) method are the two most popular primary methods used to evaluate investment projects. If we sum up the users of both the discounted payback method and the ordinary payback-method, we can see that more than one third of the companies in our sample still use some payback-method as their primary evaluation method for investments. This is somewhat surprising considering the big problems associated with the use of payback-methods.³ One could have expected the payback method to serve only as a supporting method to the decision-making, if used at all.

The popularity of the payback method has been somewhat reduced from that in the Keloharju and Puttonen (1995) study. They found that 87 percent of the companies used the payback-method to evaluate their investments. They did not ask the companies to indicate whether or not the method is their primary method, but we can compare their number with the overall number of references to the payback method in our sample. Altogether, 75 percent of the companies in our sample indicated that they use the payback method, and 62.5 percent were using the payback as their primary or secondary method (see Table 1).

³ The NPV method has a strong theoretical foundation, since accepting all projects with a positive NPV can directly be linked to the optimal behavior of an investor maximizing his expected final wealth. The payback method, on the other hand, among other things, ignores the time value of money, and cash flows beyond the cutoff date, and can lead to inferior investment decisions.

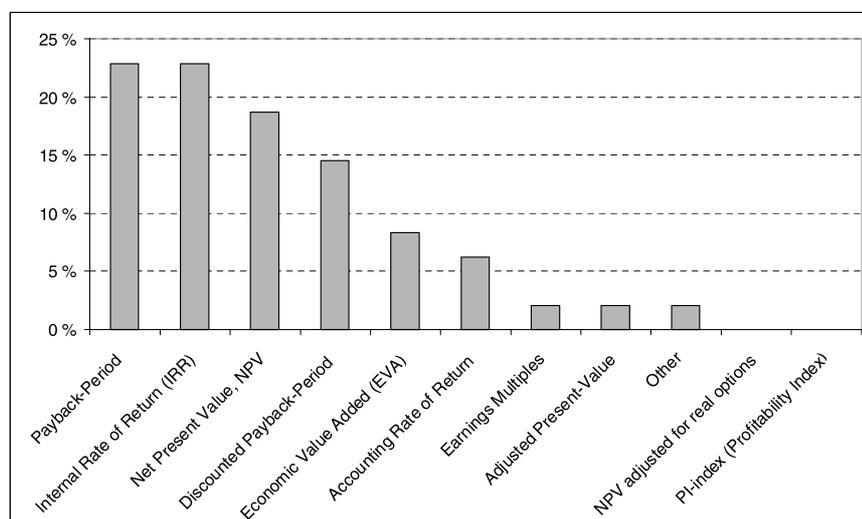


FIGURE 1. The popularity of different investment evaluation methods in publicly listed Finnish companies. The graph indicates the percentage of the respondents naming a given method as their primary method for evaluating their company's investment projects.

TABLE 1. The investment criteria.

The relative frequency of different investment criterion is given in the table. In the column "Primary", response frequencies (percentages) for the investment criterion used as the first choice for investment evaluation are given. The respondents were asked to provide only one criterion as their primary method. The next column "Secondary" gives the relative number of cases when the method is used as a secondary method. The column "In some cases" reports frequencies for methods that are utilized for certain cases. The respondents could cross several criteria as the "Secondary" and "In some cases" methods. The total number of companies (N) answering this question is 48. N is larger than the number of respondents as two companies indicated that they have two primary methods.

Criteria	Frequency		
	Primary	Secondary	In some cases
N	48 100.0 %	84 100.0 %	35 100.0 %
Payback-Period	11 22.9 %	19 39.6 %	6 12.5 %
Discounted Payback-Period	7 14.6 %	10 20.8 %	5 10.4 %
Accounting Rate of Return	3 6.3 %	6 12.5 %	1 2.1 %
Earnings Multiples	1 2.1 %	7 14.6 %	3 6.3 %
Net Present Value, NPV	9 18.8 %	15 31.3 %	3 6.3 %
Adjusted Present-Value	1 2.1 %	1 2.1 %	1 2.1 %
NPV adjusted with real option analysis	0 0.0 %	1 2.1 %	1 2.1 %
Internal Rate of Return (IRR)	11 22.9 %	15 31.3 %	5 10.4 %
Economic Value Added (EVA)	4 8.3 %	6 12.5 %	9 18.8 %
PI-index (Profitability Index)	0 0.0 %	3 6.3 %	1 2.1 %
Other	1 2.1 %	1 2.1 %	0 0.0 %

TABLE 2. A comparison of investment evaluations method studies.

The table summarizes, in Panel A, the number of Finnish large companies using a particular investment evaluation method according to four studies. In Panel B, results from two recent studies, one for the U.S. and one for Sweden, are reported. The percentage of firms using the payback method in Liljebloom and Vaihekoski (2004; this study) is the sum of payback and discounted payback method. The numbers in the first row for each study refer to the percentage of firms using a particular criterion as their primary investment evaluation criterion. When available, the sum of the primary and secondary users is also given in the next row (except for in the case of the Keloharju and Puttonen (1995) study, when results for the primary methods from two different samples are reported). N indicates the number of respondents, with the response rate in parenthesis.

Criteria	N (%)	Payback method	IRR	NPV
PANEL A: FINNISH STUDIES				
Honko and Virtanen (1975)	46 (92 %)			
– primary method		28.3 %	43.5 %	6.5 %
– usually applied		98.7 %	71.7 %	37.0 %
Virtanen (1984)	46 (92 %)		90.0 %	
– primary method		30.0 %	57.5 %	2.5 %
– usually applied		90.0 %	90.0 %	35.0 %
Keloharju and Puttonen (1995)				
– turnover >117 million euros	36 (59 %)	83.0 %	64.0 %	33.0 %
– all companies	104 (46 %)	87.0 %	48.0 %	25.0 %
Liljebloom and Vaihekoski (2004)	46 (32 %)			
– primary method		37.5 %	22.9 %	18.8 %
– primary or secondary method		97.0 %	44.1 %	52.1 %
PANEL B: FOREIGN STUDIES				
Graham and Harvey (2001) – U.S.	392 (9 %)	55.0 %	75.7 %	74.9 %
Sandahl and Sjögren (2003) – Sweden	129 (24 %)	78.1 %	22.7 %	52.3 %

Table 2 summarizes the overall development in Finland according to the results of past studies. The results show that there has not been any major changes as far as the popularity of the payback method goes. However, if we compare the popularity of the payback method with that in the U.S. and Sweden, we get somewhat different results. In the U.S., the payback rule is used always or almost always in 55 percent of the companies according to Graham and Harvey (2001). Sweden seems to fall in between Finland according to the older surveys, and the U.S., since Sandahl and Sjögren (2003) find that 78.1 percent of the largest Swedish companies use the payback method (also here, see Table 2).

An immediate difference between our results and those of Keloharju and Puttonen is in the popularity of the ROI as one of the methods. In 1994, more than 43 percent of the companies mentioned ROI as one of their evaluation methods. In our study, we did not have ROI as

one of the alternatives, but we expect most respondents to choose the accounting rate of return or earnings multiples had they utilized the ROI method. The results show that only 20.9 percent currently utilize accounting based methods and 23.0 percent use earnings multiples more or less frequently in their investment evaluation.

Biggest changes in the results can be seen in the utilization of the NPV method as the primary or secondary evaluation criteria. Table 2 shows that NPV has become much more popular as the primary method since the mid-1980's (compare Honko and Virtanen's 6.5 percent and Virtanen's 2.5 percent against our 18.8 percent for the NPV as the primary method). Furthermore, it is used more frequently (compare Keloharju and Puttonen's 33.0 percent for the overall use in large companies with our 52.1 percent for the NPV as the primary or secondary method in all listed companies). However, compared to the Graham and Harvey (2001) study, Finnish companies seem to be far behind their U.S. counterparts given that the NPV method was used in more than 74 percent of the U.S. companies. In Sweden the NPV method was applied in 52.3 of the firms, which is close to our number for the NPV as the primary or secondary method in Finland.

It seems that the NPV method has to some degree replaced the IRR method in popularity as we find the latter to be used less frequently than in the earlier studies. In the U.S., the IRR method was used even slightly more frequently than the NPV. Swedish companies seem to have adopted the NPV to an even larger extent, as the IRR method is only used in 22.7 percent of the companies.

Our questionnaire also included methods not given in Keloharju and Puttonen (1995). Interestingly, the Economic Value Added (EVA) method was used as the primary method in 8.3 percent of the companies, and more than 30 percent of the companies use it as secondary or on a case-by-case basis. Two companies (4.2 percent) indicated also that they use real options analysis either as a secondary method or in some cases. In the U.S., 25 percent of the companies use real option approaches always or almost always.

3.2 How is the required rate of return for equity determined?

Second, we asked the companies, how they determine the required rate of return on their equity. Table 3 shows the results, indicating one primary criterion per company as well as (possibly) several secondary criteria. 44 companies provided an answer to the primary criteria. More than one quarter of the companies (27.3%) admit that no required rate of return set is set for the equity and that it is not even calculated from other requirements. This is surprising as the cost of equity capital is one of the key parameters in the companies' cost of capital calculations.

Similarly, 12 companies answered that the requirement is stated otherwise, but the implicit required rate of return for the equity is calculated from the requirement. Ten companies

TABLE 3. The determinants of the equity's required rate of return.

The respondents were asked to provide a method for how the required rate of return is determined for the company's equity. The relative frequency for different criterion is given in the table. The column "Primary" reports the popularity of the criterion as the first choice. Only one primary determinant was allowed. The next column "Secondary" gives the relative number of cases where the criterion is used to provide additional information. The respondents were allowed to select several determinants. The sample size for each question is given in the table. The total number of companies answering this question (N) is 44.

Determinant	Frequency	
	Primary	Secondary
N	44 100.0 %	28 100.0 %
No required rate of return set for the equity	12 27.3 %	1 3.6 %
Target set otherwise, and the implied required rate calculated from that	12 27.3 %	4 14.3 %
Stock's historical return	2 4.5 %	6 21.4 %
Company's market risk (beta, CAPM)	5 11.4 %	6 21.4 %
Multibeta APM, APT	2 4.5 %	3 10.7 %
Determined from the literature	0 0.0 %	1 3.6 %
Set by the top management	10 22.7 %	5 17.9 %
Other	1 2.3 %	2 7.1 %

(22.7%) answered that their equity's required rate of return is set by the top management. Expectedly, the top management is also often quoted as the secondary source when the equity requirement is set. The stock's historical return has also some relevance in 21.4 percent of the companies.

Only seven companies (15.9%) said that they use the CAPM or a multibeta APM or APT to set the required rate of return for their equity. These methods were, however, used as secondary methods in nine companies. This result is surprising, as the CAPM has been advocated by the finance literature for more than thirty years as the best choice for publicly listed companies to calculate their equity's required rate of return. Graham and Harvey (2001) found out that the CAPM is used much more frequently by the U.S. companies; their study indicates that 73.5% of the respondents always or almost always use the CAPM.

If the company answered that they use the capital asset pricing model, we also asked them to specify what kind of market risk premium they use in the CAPM, and whether the risk premium and the company's beta change through time. Table 4 shows the results for the eight companies answering the risk premium question. The highest answer was six percent, the low-

TABLE 4. Risk factors in multibeta models.

Those respondents, who answered that they use several sources of risk in setting their required rate of return, were asked to list the risk factors. The frequency for each factor is given in the table. In addition, respondents answered several questions regarding the CAPM. The sample size (N) for each question is given in the table. The total number of companies participating in the survey was 46.

RISK FACTOR		N
Company's local beta		6
Company's global beta		2
Industry		3
Company size		0
Interest rate risk		1
FX-risk		1
Unexpected inflation		0
GDP-risk		0
Term structure		0
Other		0
QUESTIONS	%	N
Used market risk premium, average	4.83 %	8
Does the market risk premium change?		
Yes	12.5 %	1
No	87.5 %	7
Does company's beta change?		
Yes	33.3 %	3
No	66.6 %	6

est four percent, and the average risk premium was 4.83%. The average is close to what is often suggested in the literature, although being somewhat below those from the surveys among mainly finance professors by Welch (2000) and Welch (2001), who report 30-year risk premiums around 7%, and 5% to 5.5%, respectively.⁴ When comparing with other results for Finland, the number for the average risk premium in our study is in line with the longer term risk premiums from the PriceWaterhouseCoopers survey for Finland in 2002. They report averages of 5% for 10 years, and 4.6% for 30 years.⁵

Only one company said that the risk premium changes through time. Company beta was said to be time varying by three out of nine companies, which is also somewhat surprising as

⁴ Welch (2000) reports results from two surveys, in 1997 (114 responses) and in 1999 (112 responses). The survey reported in Welch (2001) was conducted in August 2001 (510 responses by finance or economics professors).

⁵ The PriceWaterhouseCoopers survey was conducted among 36 chief analysts of equity traders, investment funds, and insurance companies in Finland in 2002. There were 17 answers to the survey.

the beta can be argued to be stable only if the company's risk level (e.g., their amount of debt) stays the same from year to year.

Out of those companies that use the CAPM or a multibeta asset pricing model to set their required rate of return, six use the local market risk in their model. Two companies use a global market risk factor, three use an industry risk factor, and two companies use either interest rate risk or currency rate risk as a factor (see Table 4). The number of respondents is few, but the findings are similar to those of Graham and Harvey (2001) as they found most U.S. companies using multibeta models to use market, FX, business-cycle, inflation, and interest rate related sources of risk when estimating the required rate of return.

3.3 The level of the required rate of return

Table 5 investigates the required rate of return or weighted average cost of capital (WACC), as it is best known, for the whole company. 43 companies indicate with their answer that they do have the WACC set. If we compare the number of these responses with those in Table 3, we can see that there must be companies that have set a WACC, but who have not set the required rate of return for the equity. Cross-checking the responses reveals surprisingly, that we have twelve companies who have set their WACC without calculating their equity's cost of capital.

The companies show also wide discrepancy in their WACCs. Slightly more than 11 percent have a target between 5–10 percent. On the other hand, surprisingly many companies (more than 20 percent) have a requirement higher than 20 percent.⁶ Most companies (53.4%) had a target between 10 and 16 percent. The median answer falls into the category of 12–14 percent. We can also calculate a tabulated average using the category midpoint as the representative value for each category.⁷ The result gives an average WACC of 15.19 percent.⁸

These numbers can be perceived as rather high, given that the risk free rate at the time was around 3.1 % (the 1-year money market rate, EURIBOR, at the end of September 2002) to 3.9 % (the 5-year swap rate), and given the average risk premium estimate by the respondents, 4.8 %. Using the CAPM with the 5-year swap rate as a proxy for the risk free rate, and a risk premium of 4.8 %, a project beta of 1.7 to 2.1 would be required to motivate a rate of return requirement in the interval of 12–14 percent.

⁶ We analyzed whether this group differs from others with respect to how they set their required rate for equity. However, there seems not to exist a statistically significant difference.

⁷ For the open-ended >20 percent category, we use 22.5 percent as the category midpoint.

⁸ This indicates an average hurdle of 6.585 years for the payback rule given that firms' investments produce constant annual cash flows equaling the WACC of the original investment. This is naturally a simplification of the reality, but given a vast number of projects in a company, their pooled cash flows should be relatively constant.

TABLE 5. The company's required rate of return.

The respondents were asked a number of questions regarding the required rate of return for the whole company. The relative frequency of the answers as well as the number of answers (N) is given in the table. The total number of companies participating in the survey was 46.

QUESTION	%	N
What is your required rate of return for the whole company (WACC)		
< 0 %	0.0 %	0
0–5 %	0.0 %	0
5–10 %	11.6 %	5
10–12 %	23.3 %	10
12–14 %	2.3 %	1
14–16 %	27.9 %	12
16–18 %	4.7 %	2
18–20 %	9.3 %	4
>20 %	20.9 %	9
How often does it change?		
Never	15.0 %	6
Not every year	25.0 %	10
Once a year	60.0 %	24
More frequently	0.0 %	0
Is it the same for all projects, if project are equally long?		
Yes	22.2 %	10
In most cases	20.0 %	9
No, it can differ	57.8 %	26
Is it the same for investment projects of different lengths?		
Higher for longer projects	3.4 %	1
Lower for longer projects	17.2 %	5
Same (length does not matter)	79.3 %	23
How is inflation handled in the calculation?		
Cash flows are real	15.2 %	7
Cash flows are nominal	84.8 %	39
Required rate of return is real	12.5 %	5
Required rate of return is nominal	87.5 %	35

Keloharju and Puttonen (1995) asked the respondents to indicate the required rate of return after taxes used by the company's largest division. The respondents were given a chance to give the answer either in nominal or real terms. The average nominal rate of return was 17.0 percent in their study and the real rate of return 16.5 percent. These results are quite high, but we have to keep in mind that the risk-free rates were running around ten percent at that time.

We also study a hypothesis that firms using payback (or related) investment project evaluation methods also often have higher required rates of returns.⁹ We use a *t*-test to study the

⁹ Here we do not study whether there is a causal relationship between these two, though arguments could be made for the existence of such a relationship.

difference in the mean WACC between the two categories.¹⁰ The first category includes respondents who answered that they use the Paypack or the Discounted Paypack-rule. The second category includes those who answered that they use the NPV, IRR, Adjusted PV, or EVA. The results are in line with the hypothesized relationship. Companies using payback have a higher WACC, namely 15.9% (standard deviation 0.058) versus 14.6% (0.046) of the second category. However, the difference is not statistically significant (one-tailed *t*-test for lower WACC for the second category gives a *p*-value of 23.7%).

In addition, we asked the companies to give more detailed information about the overall project evaluation setting. First, we asked how often the required rate of return changes. Second, we asked whether the length of an investment project affects the required rate of return. Third, we asked how inflation is handled in the project calculations.

The results in Table 5 indicate that companies seem to update their targeted WACCs annually (60% of the respondents), but 15% do not update their required rate of return at all (at least, conditional on the past history known to the respondent). This seems surprising, as the risk-free rate of return alone has varied tremendously during the last ten years.

For most of the companies (57.8%), the required rate of return can differ across different projects even though they have an equally long time span. 79.3% of the respondents indicated that the time span or length of the investment does not affect the required rate of return. On the other hand, more than 17 percent use a lower required rate of return for longer projects. We find these results somewhat surprising, since many books seem to advocate higher required rates for longer investment projects in order to account for the higher risk involved with cash flows due long into the future. In addition, the most typical term structure is an upward sloping, indicating higher required rates of return for longer periods.

Expectedly, most companies (84.8% and 87.5%) seem to prefer using nominal cash flows and nominal required rates of return in their project evaluations. None of the companies used the nominal and real combination, which would be – naturally – simply wrong according to any textbook.

3.4 Risk and required rate of return for investment projects

We also asked the respondents how they set the required rate of return for individual investment projects. Once again, the respondents were given a chance to indicate one primary method, and several secondary and on a case-by-case basis used methods. Table 6 shows the results. Expectedly, almost half of the companies (45.5%) use the same required rate of return,

¹⁰ WACC values were calculated using the category mid-points. The test assumes unequal sample variances for the two categories. Sample sizes are 17 and 22.

TABLE 6. The investment projects' required rate of return.

The respondents were asked to provide a method used to determine the required rate of return for their investment projects. The frequency for each method is given in the table. The respondents were asked to provide only one primary method. They were allowed to provide a number of secondary measures as well as measures for some special cases. The sample size for each question is given in the table.

Criteria	Frequency					
	Primary		Secondary		In some cases	
N	44	100.0 %	52	100.0 %	21	100.0 %
Not set/no method used	4	9.1 %	0	0.0 %	2	9.5 %
Same as for the whole company (WACC)	20	45.5 %	3	5.8 %	1	4.8 %
WACC adjusted by project's risk	6	13.6 %	10	19.2 %	3	14.3 %
WACC adjusted by division's risk	1	2.3 %	3	5.8 %	1	4.8 %
WACC adjusted by country's risk	1	2.3 %	4	7.7 %	3	14.3 %
Based totally on project's risk	4	9.1 %	13	25.0 %	1	4.8 %
Using rule of thumb	2	4.5 %	6	11.5 %	6	28.6 %
Based on the project manager's evaluation	1	2.3 %	7	13.5 %	3	14.3 %
Based on the ratio of equity and debt used to finance the project	5	11.4 %	6	11.5 %	1	4.8 %

which they have for the whole company, as their primary approach. This is similar to the Graham and Harvey (2001) results. Almost 19 percent of the Finnish companies adjust the WACC by the project's, division's, or country's risk. Surprisingly many (11.4%) use the equity and debt used to finance the project as the basis for the investment's required rate of return. This, of course, is contrary to what is taught in finance classrooms, where one of the key lessons is that money cannot be "earmarked". Thus, the only reason for having a higher required rate of return for certain investment projects is its higher riskiness compared to the standard operations of the company.

Keloharju and Puttonen (1995) asked in their study, how the required rate of return for the investment is set. However, their list of alternatives differs slightly from ours, making direct comparisons a bit problematic. Some comparisons can still be made. First, they found that the required rate of return is in 46 percent of the cases based on the rule of thumb/experience/set by the top management. The cost of debt financing was the second most popular method (21%). The risk free rate of return plus a premium set according to the riskiness of the project was the third popular method. The equity cost of capital was used only by four percent of the respondents.

In our study, 20 respondents out of the 44 answering the question concerning the required return on individual investment projects, answered that they use the same return requirement as the one for the company as a whole (the WACC). The others (24 respondents)

TABLE 7. The project's risk measure.

The respondents were asked to provide a method for how they measure their projects' risk. The frequency for each measure is given in the table. The respondents were asked to provide only one primary measure. They were allowed to provide a number of secondary measures as well as measures for some special cases. The sample size for each question is given in the table.

Project's risk measure	Frequency		
	Primary	Secondary	In some cases
N	24 100.0 %	34 100.0 %	7 100.0 %
Using a rule of thumb	7 29.2 %	6 17.6 %	1 14.3 %
Based on the ratio of equity and debt used to finance the project/the division	2 8.3 %	3 8.8 %	0 0.0 %
Volatility of the project's or division's returns (profits)	4 16.7 %	6 17.6 %	0 0.0 %
Beta(s) of the project or division	1 4.2 %	2 5.9 %	1 14.3 %
Effect on the financial result	1 4.2 %	8 23.5 %	3 42.9 %
VaR-analysis	0 0.0 %	1 2.9 %	1 14.3 %
Sensitivity/simulation/scenario analysis	9 37.5 %	8 23.5 %	1 14.3 %

were asked to answer a follow-up question on how they measure project risk. Table 7 shows that the most common method (37.5% of the respondents) is to use some kind of sensitivity analysis (scenario, simulation) to find out the correct risk adjustment. Surprisingly many use some kind of rule of thumb or the volatility of the project's (the division's) returns (profits) to make the risk adjustment to the required rate of return.

5 CONCLUSIONS

In this study we have surveyed the practice of investment evaluation methods, their use, and the required rate of return in publicly listed Finnish companies. This study updates and to some extent extends earlier studies by Honko and Virtanen (1984), Virtanen (1984), and Keloharju and Puttonen (1995). The results show that even though the finance literature's favored method for evaluating investments, the Net Present Value, is gaining more popularity, the payback method is still used most often as the primary method of choice. Even though 52.1 percent of the companies indicate that they use the NPV either as their primary or secondary investment evaluation method, its use is still far below that in the U.S. according to a recent study (Graham and Harvey, 2001). Interestingly, the largest Swedish companies are also using the NPV as frequently (52.3 percent of respondents) as the Finnish ones.

We also find that the median required nominal rate of return for the capital is between 12–14 percent, but that more than 20 percent of the companies have a requirement above 20 percent. The tabulated mean WACC is 15.19 percent, indicating an average hurdle of 6.585 years for the payback rule given constant pooled cash flows from investments producing on average cash flows equaling the WACC rate on the original investment.

The capital asset pricing model or multibeta model is used only in some 40 percent of the companies as the primary or secondary method in setting the cost of equity capital. This is a surprisingly low number, given the fact that all respondents were publicly listed companies. Even more surprising was to find that a quarter of the companies have not calculated the cost of their equity capital even though it is one of the key parameters in setting the WACC.

This study did not ask the companies to provide any reasons for not using the NPV technique or other more advanced methods. Similarly, it would be interesting to study, what hurdles are preventing companies from using the CAPM (or a similar model) to set the required rate of return for their equity. Therefore, it would be interesting to study in more detail what is exactly the standard of tools used in Finnish companies and what can be done to promote more advanced methods leading to best outcomes in the long run and advocated by the finance profession. These questions are left for further research. ■

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APPENDIX The Questionnaire



Vastauksia käsitellään luottamuksellisesti



YHTIÖSTEN TUOTTOTAVOITE JA INVESTOINNIT SUOMESSA 2002 -kysymys

1. Mikä ovat ne investointikriteerit, joiden perusteella yrityksenne investointien arvointi tehdään?

	Ensimmäinen [vain yksi rasti]	Toinen [vasta rasteja enintään kaksi]	Joskin tapauksissa [vasta rasteja enintään kaksi]
Takaisinmaksuaika (Payback-Period)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diskontattu takaisinmaksuaika (Discounted Payback-Period)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kirjanpidon tuottoaste (Accounting Rate of Return)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuottokerroin (Earnings Multiples)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investoinnin nettokäyvä (Net Present Value, NPV, NNA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investoinnin mukautettu nettokäyvä (Adjusted Present Value)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investoinnin nettokäyvä käännettynä reaaliarvoasteikolla	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investoinnin sisäinen korkokanta (eli IRR)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investoinnin taloudellinen lipänie (eli EVA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riindeksi (Profitability Index)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Muu mikä? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Miten määräytyy yrityksen tuottotavoite omalla pääomalla?

	Käsiteltävä tapa [vain yksi rasti]	Käytetään myös lisäinformaatiota [vasta rasteja enintään kaksi]
Ei asetettu prosentuaalista tuottotavoitetta omalle pääomalle	<input type="checkbox"/>	<input type="checkbox"/>
Tavoite kirjattu muuten ja sitä on laskettu tuottotavoite omalle pääomalle	<input type="checkbox"/>	<input type="checkbox"/>
Yhtiön osakkeen historiallinen tuotto	<input type="checkbox"/>	<input type="checkbox"/>
Yhtiön osakkeen markkinariski (betari) kautta (CAPM)	<input type="checkbox"/>	<input type="checkbox"/>
Multibeta CAPM eli markkinariskin lisäksi mallissa on muita riskitekijöitä (APT)	<input type="checkbox"/>	<input type="checkbox"/>
Opetta kirjallisuudesta	<input type="checkbox"/>	<input type="checkbox"/>
Omat ja/yh. johto asettanut (peruste ei välttämättä tiedossa)	<input type="checkbox"/>	<input type="checkbox"/>
Muuta, mistä _____	<input type="checkbox"/>	<input type="checkbox"/>

3. Jos vastatse edelliseen kysymykseen multibeta CAPM (käsiteltävä tai lisäinformaatio), mitä riskitekijöitä käytätte?

Yhtiön Suomen markkinabeta	<input type="checkbox"/>	Yhtiön koko	<input type="checkbox"/>	Odotamaton inflaatio	<input type="checkbox"/>
Yhtiön globaali markkinabeta	<input type="checkbox"/>	Korkotiski	<input type="checkbox"/>	BKT-riski	<input type="checkbox"/>
Yhtiön teollisuudenala	<input type="checkbox"/>	Vaihtuvuus	<input type="checkbox"/>	Korkojen tuottoero	<input type="checkbox"/>
Muuta _____	<input type="checkbox"/>	Muu	<input type="checkbox"/>	Muu	<input type="checkbox"/>
Markkinapreemiona käytämme: _____ %					
Vaihtoeiko käyttämme markkinapreemion määrää vuodesta toiseen?	<input type="checkbox"/>	Ei vaihtele	<input type="checkbox"/>	Vaihtelee	<input type="checkbox"/>
Vaihtoeiko käyttämme käytössä markkinabeta vuodesta toiseen?	<input type="checkbox"/>	Ei vaihtele	<input type="checkbox"/>	Vaihtelee	<input type="checkbox"/>

4. Millä oli yrityksen nimellinen kate pääoman tuottotavoite vuoden 2002 alussa?

< 0 %	<input type="checkbox"/>	10 - 12 %	<input type="checkbox"/>	16 - 18 %	<input type="checkbox"/>
0 - 5 %	<input type="checkbox"/>	12 - 14 %	<input type="checkbox"/>	18 - 20 %	<input type="checkbox"/>
5 - 10 %	<input type="checkbox"/>	14 - 16 %	<input type="checkbox"/>	> 20 %	<input type="checkbox"/>

5. Kuinka usein yrityksen kate pääoman tuottotavoitetta muutetaan?

Ei koskaan	<input type="checkbox"/>	Muutamman vuoden välein	<input type="checkbox"/>
Kerran vuodessa	<input type="checkbox"/>	Useammin	<input type="checkbox"/>

6. Onko tuottotavoite sama kaikille investointiprojekteille?

Yhtiö kaikille projekteille	<input type="checkbox"/>	Erilille investointiprojekteille	<input type="checkbox"/>
Sama	<input type="checkbox"/>	Korkeampi kuin yhtiöllä	<input type="checkbox"/>
Pääosin	<input type="checkbox"/>	Matalampi kuin yhtiöllä	<input type="checkbox"/>
Voi vaihdella	<input type="checkbox"/>	Sama (pitäydellä ei vaihduta)	<input type="checkbox"/>

7. Miten inflaatio huomioidaan investointilaskelmissa?

Säännöllisesti reaalisella (inflaatiokorjattu) nimellä	<input type="checkbox"/>
Tuottotavoite reaalisella (inflaatiokorjattu) markkinariskin pohjalta eli nimellä	<input type="checkbox"/>

8. Miten menetelmä käyttää investointiprojektien tuottoarvojen laskennassa?

	Ensimmäinen [vain yksi rasti]	Toinen [vasta rasteja enintään kaksi]	Joskin tapauksissa [vasta rasteja enintään kaksi]
a. Ei asetettu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Sama kuin yrityksen tuottotavoite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Yhtiön tuottotavoite projektin riskillä korjattuna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Yhtiön tuottotavoite divisioiden riskillä korjattuna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Yhtiön tuottotavoite investoinnin kohdemaan riskillä korjattuna	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Projektin riskin perusteella	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Tapauskohtaisesti määriteltävällä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Investoinnin vetäjän kanssa käyty keskustelun perusteella	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Investoinnin rahoitukseen käytetty vieraan ja oman pääoman suhteen perusteella	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Jos vastatse edelliseen kysymykseen c) - f), miten mitaatte projektin riskit

	Ensimmäinen [vain yksi rasti]	Toinen [vasta rasteja enintään kaksi]	Joskin tapauksissa [vasta rasteja enintään kaksi]
Näppurimallilla	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Projektin/divisioonan rahoitukseen käytetty vieraan ja oman pääoman suhteella	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Projektin/divisioonan tuottajien vakauteella	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Projektin/divisioonan tuottajien betalla/betoilla	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vaihtuvuudella tilinpitokseen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VaRanalyyysillä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Henkyyssimulaatio- tai skenaarioanalyysillä	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>