

A Comprehensive Review of Scientific Literature on Methods for Determining Discount Rates in Corporate Practices

KLÁRA SZÜCS MARKOVICS
ASSISTANT LECTURER

e-mail: vgtklara@uni-miskolc.hu

SUMMARY

On the basis of the findings of research conducted in eighteen countries and in the Central and Eastern European region, this study seeks to understand how the discount rate is set when capital budgeting practices are involved. According to the reviewed academic literature, the weighted average cost of capital is the most popular method of determining discount rates in a number of countries. Besides this, decision makers often apply the single method of corporate required rate of return regardless of the character of specific decision aspects and market risks.

Keywords: capital budgeting; discount rates; required rate of return; weighted average cost of capital.

Journal of Economic Literature (JEL) code: M21

INTRODUCTION

In order to apply dynamic capital budgeting practices such as the net present value or profitability index, it is required to determine discount rates quantifying the required rate of return. Since the amount of discount rate considerably affects both the final results and the evaluation of efficiency of capital budgeting practices, corporate experts should compute discount rates extremely accurately. In the Hungarian academic literature of the 1970s the required rate of return was called the discount rate. However, since the 1980s, following the trends in the English academic literature, Hungarian scholars have used several other terms to express this concept.

This study presents research findings published on this topic in English. In the course of evaluation and interpretation of findings, special attention is paid to the following issues:

- a) A representative approach often fails to give a clear picture about the topic of research, which results in a rather superficial knowledge of applied research methods.
- b) The evaluation of the empirical surveys on capital budgeting practices preferred by companies showed that the applied research methodology was extremely heterogeneous. Most surveys used questionnaires which were supplemented by oral interviews in some cases. Phone and e-mail surveys were also conducted.
- c) The circle of sampled firms involved in the surveys under analysis was quite wide. Companies differed along size dimensions. Most surveys were conducted on major companies and within them on companies listed on the Stock Exchange. Few surveys were conducted on small and medium-sized companies. There were even surveys in which the size of the sampled companies was irrelevant.
- d) As for the element number of the samples, there were surveys with hundreds of respondents and there were some with less than one hundred.
- e) As for the sectors of industry, the surveys did not show a single picture. There were surveys conducted in a wide range of companies belonging to different sectors, whereas some surveys excluded companies providing financial

services, while the others targeted only the manufacturing industry or limited their scope to a few branches.

- f) It was difficult to compare the survey results conducted overseas. This might have stemmed from the fact that there were some methods and factors (for example, cost of debt, cost of borrowing; weighted average cost of capital, weighted cost of sources of fund) that had the same or at least a very similar meaning, but they were used as different terms in several studies. In addition, there were some methods which were difficult to identify, thus the names of the applied methods were only guessed, which is likely to lead to misappropriate interpretation of findings.
- g) Since researchers often conducted research on the same topic from different angles, it was problematic or sometimes even impossible to compare their results.

A number of Hungarian academic articles discuss the definition of discount rate in differing degrees of detail. Despite the comparatively 'extensive' literature on this topic, very few studies provide information about the method of defining the required rate of return preferred by Hungarian decision makers. As for the literature outside of Hungary, this issue constitutes a part of the research agenda and studies attempt to provide an answer to the question of how the required rate of return is determined in corporate practice.

METHODS OF DETERMINING DISCOUNT RATES

Companies under analysis applied different methods in their surveys since there are several methods of determining the required rate of return in the academic literature. There were cases when decision makers relied on their previous personal experience and determined the discount rate without performing any calculations.

In the 1960s in the western literature on business management the most popular method was summarised by Schneider (1962), who stated that discount rates should be determined for the company's equity and debt capital separately. If a company has equity capital, the discount rate should be as high as in the investment projects with similar

risks. If debt capital is involved, the discount rate is calculated from credit interest rates increased by risk premium. A few decades ago, following the trends in the foreign literature, Hungarian researchers offered to compute interest rates by the required rate of return. However, Megyeri in his book published in 1970, expressed his concerns and claimed that discount rates applied in capital budgeting practices do not necessarily coincide with the interest rates of long-term credit and they cannot be lower than that value. When the amount of discount rate is computed, the values at risk, the profitability of other capital budgeting practices, the entrepreneurs' profit and some other issues are also taken into account (Megyeri, 1970, p.18.).

Bélyácz gives the following definition to the discount rate: The discount rate is an intangible time factor of capital budgeting, which developed as a result of several factors (Bélyácz, 1985, p.157.). Then he notes that the amount of the discount rate is a heavily debated issue in capital budgeting practices and it is important to take into account the factors affecting it. The applied factor of discount interests varies by the investment project and sets the minimum acceptable rate of return required from the capital budgeting practices (Bélyácz, 1985, p.157.). He warns against setting too high or too low a discount rate and favours discount rates ranging from 10% to 20%. According to Garrison (1985), corporate capital costs should be applied in case of capital budgeting practices. He also claims that corporate capital costs and interest rates paid on long-term debt are different concepts. Corporate capital cost is rather a comprehensive approach incorporating both equity capital costs and debt capital costs.

In the Study Volumes published in 2005 Csutora formulates the essence of the discount rate as follows: In corporate capital budgeting practices, the discount rate shows profit opportunity costs of capital, namely the costs of the best possible alternative. In the case of the nominal discount rate, this cost includes inflation and the interest rate that a company can generate by performing alternative investments. The higher the risk value of a project is, the higher the nominal discount rate is, because companies undertake higher risks in a project when they expect a higher return on their investment (Csutora, 2005, pp.13-14.). Kaplan and Atkinson's definition of the discount rate is consistent with Csutora's. According to them the discounted future cash-flow compensates the investor for losing the opportunity to invest his money in other directions while he is expecting some profit. Thus, the discount rate should reflect the lost profit of potential alternative investments, that is, the profit the investor would have gained in the event of investment with similar value of risk (Kaplan and Atkinson, 2003, p.554.).

The finance literature offers a definition based on capital yield differentiated in the proportion of capital holding as a criterion for dynamic capital budgeting practices, where the most frequently applied method is the Weighted Average Cost of Capital (WACC). According to Copeland et al., WACC is the discount rate used to convert expected future cash flow into present value for all investors (Copeland et al., 1999, p.272.). A Hungarian Internet Stock Exchange glossary defines WACC as follows: "Weighted Average Cost of Capital is the expected rate of return of corporate owners' equity and debt capital weighted by company's capital structure" (Tőzsdeszótár, p. 265).

Some authors mention the risk involved in applying Weighted Average Cost of Capital as the discount rate. Illés highlights the problems of the WACC indicator where the expected rate of return charged for equity capital and for credit consistently differ (Illés 2002, p.172.), which results in the fact that the higher the credit proportion is, the lower the rate of WACC is, because the required rate of return of the total risk premium is not charged for the credit. Thus, Illés suggests that

discount rate should be computed by applying required rate of return complying with the average level of opportunity cost. He also claims that equity capital should be charged both for the required rate of return and for debt capital and the charge should be the same, because the price of the product available on the market does not depend on the structure of the equity capital of the manufacturing company. (See references: Illés, 2002, pp.53-55 and 63-66). The discount rate can theoretically be quantified by the required rate of return of a safe investment in government bonds and it is made up of the price of capital consumption and the rate of entrepreneurial profit expectation on the invested capital. According to Illés, practices of companies involved in similar activities (with similar rate of risk) and the special risk correlation of an individual decision may provide a basis for formulating the definition of discount rate (Illés, 2002, p. 55).

Bélyácz highlights problems arising from applying WACC as the discount rate from another aspect. He thinks that applying WACC as the discount rate to future cash flow is possible only if the risk of the project being evaluated is similar to the risk of the current corporate activities. If the weighted risk of the project is taken into account and if the project risk considerably differs from the risk of overall company, the decision made on WACC will be faulty (Bélyácz, 2009, p. 224).

DETERMINING DISCOUNT RATE IN CORPORATE PRACTICE

Considerable research into methods of setting discount rate has been conducted in a number of countries all over the world in the past few decades. The studies in this comparative analysis deal with findings of the research conducted abroad. They focus on comprehensive analyses of corporate decisions on capital budgeting practices. The evaluation of the methods applied for quantifying the required rate of return constitutes only a part of the aforementioned studies.

The academic literature offers numerous methods for setting the required rate of return, which are more or less applicable for this purpose. It is very difficult to compare the results of the studies under analysis because the finance literature does not share a common approach to the required rate of return, studies apply different methodology when investigating this issue and researchers analyse different indicators in this field. The studies under this comparative analysis applied more than a dozen methods, and used several indicators and procedures. Several of them were described in almost every study, but there were some that were mentioned only in one study.

Since most studies applied the method of weighted average cost of capital in some form as an offered option, this comparative study will discuss the survey results by continent in a chronological order first and afterwards summarise the findings of research which do not contain the method of weighted average cost of capital as an offered option. This approach is justified by the fact that researchers applied a wide range of interviewing methods and it is difficult or simply impossible to compare the findings.

OVERVIEW OF RESEARCH RESULTS CONTAINING WEIGHTED AVERAGE COST OF CAPITAL

Research teams from Europe consisting of Liljebloom and Vaihekoski (Finland), Hermes et al. (the Netherlands) and Andor et al. (Central and East European region) conducted research on this topic. Liljebloom and Vaihekoski (2004)

interviewed chief financial officers of companies listed on the Finnish Stock Exchange about their capital budgeting practices made in 2002. The questionnaires were e-mailed to managers of 144 companies listed on the Stock Exchange in Helsinki in August 2002. The researchers were interested in the primary and secondary methods used by managers in setting the required rate of return. The responses are illustrated in Table 1.

Table 1
Primary and secondary methods of setting the required rate of return used by managers of companies listed on the Finnish Stock Exchange in 2002

Method of determining the required rate of return	Primary	Secondary	In some cases
Not set/no method used	9.1%	0.0%	9.5%
Same as for the whole company (WACC)	45.5%	5.8%	4.8%
WACC adjusted by project's risk	13.6%	19.2%	14.3%
WACC adjusted by division's risk	2.3%	5.8%	4.8%
WACC adjusted by country's risk	2.3%	7.7%	14.3%
Based totally on project's risk	9.1%	25.0%	4.8%
Using rule of thumb	4.5%	11.5%	28.6%
Based on the project manager's evaluation	2.3%	13.5%	14.3%
Based on the ratio of equity and debt used to finance the project	1.4%	11.5%	4.8%
Total	100.0%	100.0%	100.0%

Source: Liljebloom – Vaihekoski, 2004, p. 21.

The researchers offered the managers nine answers to chose from and five out of nine were related to capital budgeting practices based on differentiated rate of return. The range of the offered answers was reasonable compared to those in other surveys. According to the received responses illustrated in Table 1, three-fourths of the Finnish listed companies primarily applied differentiated methodology adjusted to capital structure when they quantified the required rate of return. The application of weighted average cost of capital was the most frequently used method. About one-fourth of respondents secondarily applied a methodology targeting overall project risks.

The Netherlands is another country where weighted average cost of capital is applied by many companies. Hermes et al. (2006) e-mailed questionnaires to sample firms in the Netherlands and China in the period between October 2003 and June 2004. Only 42 out of 250 e-mailed questionnaires were filled in and sent back. The research team asked questions related to the methods of setting the required rate of return. The chief financial officers were offered four answers and were asked to choose the most frequently used one. The responses showed that two-thirds of Finnish companies applied the weighted average cost of capital for setting the discount rate. Cost of debt was used by 14.3% and about 9.5% quantified the discount rate by cost of capital adjusted to risks involved in the project or by other methods. The surveys revealed that small companies and financial officers with lower qualifications use cost of debt capital more frequently than major companies and highly qualified decision makers.

A survey encompassing ten countries in Central and East Europe showed that the application of weighted average cost of capital as discount rate is not common. Andor et al. (2011) conducted an empirical study in ten countries (Bulgaria, the Czech Republic, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia). They interviewed as many as four hundred companies employing at least twenty-five people. In the phone interviews questions related to capital budgeting practices were asked. The research team was interested whether

the corporate decision makers applying capital budgeting practices charged discount rates for companies or for a particular project and which method was used for setting discount rate. Four methods were offered to respondents (for those who use discount rate at company level and at project level) on the questionnaire. The results are summarised in Table 2.

Table 2
Methods of determining discount rate in the Central and Eastern European region, 2010

Method of determining discount rate	Discount rate for firm	Discount rate for projects
We don't calculate it directly; we use general discount rate(s)	68.75%	47.52%
We use the Weighted Average Cost of Capital (WACC)	20.83%	33.67%
We use the Capital Asset Pricing Model (CAPM) to calculate the whole discount rate	6.25%	2.97%
Our practice is not consistent	4.17%	15.84%
Total	100.00%	100.00%

Source: The author's own construction on the basis of data taken from two tables in Andor et al. (2011, p. 40)

Central and Eastern European company managers applying discount rate both at company and at project levels tend to ignore setting the amount of the rate directly. They use the general discount rate in capital budgeting practices. It sounds a little strange at first. However, mention should be made that the majority of experienced managers are able to estimate the percentage profitability of capital budgeting practices with a similar rate of risk in other companies. Corporate practices reveal that managers set a certain discount rate after collecting sufficient information and performing thorough risk factor calculations, then forwarding the rate to decision makers without any explanations or remarks and is 'compulsorily' considered to be the required rate of return. The second most commonly used method in both circles of companies is the weighted average cost of capital. The application of the CAPM model is not widespread among companies in the region. The results of the surveys highlighted the fact that a higher proportion of Finnish and Dutch managers apply the WACC for setting discount rate than Central and Eastern European decision makers.

Considerable research on this topic has been conducted in the USA and Canada in the past few decades (Oblak and Helm, Petty and Scott, Jog and Srivastava, as well as Payne et al.). Oblak and Helm (1980) sampled multinational companies and found that 54% of respondents applied the weighted average cost of capital for setting the required rate of return. They also used cost of debt capital, past personal experience, expected growth rate and the CAPM model. The findings of surveys conducted within the circle of major companies by Petty and Scott (1981) show a bit different picture. As many as 44% of respondents claimed that they applied the weighted average cost of capital as the discount rate in capital budgeting practices. The rate of return was used by two-thirds of companies (66%). Jog and Srivastava (1995) surveyed companies in Canada where 47% favoured weighted average cost of capital to quantify the required rate of return, which is consistent with Petty and Scott's findings. Payne et al. (1999) compared capital budgeting practices used by Canadian and American company managers. The survey revealed that the weighted average cost of capital is a more commonly applied method in the USA than in Canada. In addition, Canadian decision makers rely on their personal judgment and experience more than their American counterparts.

Four studies in the analysis conducted in Asia (Kester et al., Leon et al., Isa and Kester, Hermes et al., Dangol et al.) also

contained a question regarding the application of weighted average cost of capital as a discount rate. Kester et al (1999) interviewed several CEOs and CFOs of listed companies about their capital budgeting practices in a number of Asian countries

and in the Pacific region in 1996 and in 1997. As for the sector of industry, the sample proportion in these countries showed a diverse picture. One question was related to the methods of setting the rate of return. The responses are given in Table 3.

Table 3
Methods of determining discount rate in five listed Asian countries in the late 1990s

Method of determining discount rate	Hong Kong	Indonesia	Malaysia	Philippines	Singapore
Single Discount Rate based on company's overall weighted average cost of capital used to evaluate all proposed capital investments	23.8%	28.6%	29.4%	16.1%	10.8%
Multiple Risk-Adjusted Discount Rates are used; the riskier the investment, the higher the rate	19.1%	28.6%	23.5%	51.6%	37.8%
The discount rate used for each project is the cost of the Specific Capital Used to Finance the Project (i.e., the discount rate for a project that will be financed entirely with debt is the cost of debt)	57.1%	42.8%	47.1%	32.3%	51.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Kester et al., 1999, p. 29

In the course of evaluation and interpretation of the findings summarised in Table 3, special attention was paid to the following issues:

- The offered three methods did not seem to be sufficient. In addition, the questionnaire failed to offer 'other' as an option answer. Despite the mentioned shortcomings the aggregated value amounted to 100%. Thus, the three methods offered in the surveys were more popular in the surveyed countries than the numerous other methods described in the academic literature. However, this assumption is hardly valid.
- The naming of methods was uncommon. The content of offered response categories was sometimes unclear. In economics the single corporate required rate of return based on the weighted average cost of capital which is computed from corporate data is never called a simple discount rate. The survey developers were not familiar with the real concept of discount rate multiply adjusted for risk. Thus, it is unclear whether the weighted average cost of capital was risk-adjusted or not.

In the questionnaire developed by Kester et al. the first and the third answers offered were related to the weighted average cost of capital. The first answer was based on corporate capital structure, the third one dealt with the project capital structure. It is unclear whether the second answer was based on the weighted average cost of capital. The responses suggest that a comparatively large proportion of listed companies applied WACC. The received percentage of 62-81% should be carefully interpreted. Firstly, because the offered answers were of limited and of specific character and could be easily misunderstood. Secondly, because of the low number of respondents. The discount rate based on cost of capital complying with individual project funding was more popular than the other differentiated methods based on the required rate of return. The wide popularity of the first method was very surprising because if the whole project were financed from credit, the discount rate would be as high as the credit interest. (It is obvious that the example on funding a project only from credit is an exaggeration which is far from reality, since equity capital is required for all projects in real life. The academic writer just makes an attempt to call attention to a huge shortcoming of the method. The related academic literature suggests if the project risk is considerably higher than the average, the discount rate needs adjusting.) According to Kester et al., the application of discount rate adjusted for risk – contrary to the proposition offered in the literature – was not considered to be a widespread method in the surveyed regions apart from two countries, which

were the Philippines and Singapore, where the decision makers of listed companies often used this method.

There was another research group (Leon et al., 2008) analysing practices of defining the discount rate in Indonesia in 2000. Both groups targeted companies listed on the Stock Exchange. However, there is a great difference in the number of their responses which can be evaluated. Kester et al. received 16 responses, whereas Leon et al. assessed 54 responses. In the course of evaluation the low number of responses should be taken into consideration. Both findings revealed that weighted average cost of capital was more often applied for determining discount rate in Indonesia than in other Asian countries. In the first study 71.4% of Indonesian managers applied WACC as a discount rate for capital budgeting practices (both at project and corporate levels). In the other survey 81.5% respondents used WACC or its project-matched risk version for setting discount rate. The comparison of these results with the findings of other studies under analysis revealed that using the weighted average cost of capital for setting discount rate was as popular in East-Asian countries as in Finland or the Netherlands.

The research team made up of Hermes, Smid and Yao (2006) that conducted research in the Netherlands and was mentioned above also conducted an e-mail survey in China. They interviewed employees of 300 companies regarding the most frequently applied method for setting the required rate of return. They received 45 responses. The responses reveal that more than a half (55.3%) of companies used WACC, 28.9% applied the cost of debt and 15.7% favoured the project-dependent cost of capital for setting the discount rate. Taking into account the size of the country, the survey involved a low number of companies. Thus, the results should be carefully interpreted. The study under analysis points out that Chinese financial officers with higher levels of education applied the cost of debt less frequently than their less educated colleagues or small companies. In addition, manufacturing firms used the cost of debt more often than other Chinese companies.

In Nepal forty manufacturing companies were interviewed about their capital budgeting practices (Dangol et al., 2011). The study also investigated how the companies in Nepal set the required rate of return. The responses revealed that the largest number of manufacturing companies (45%) used the target rate of return set by the management. It was followed by the weighted cost of sources of fund (32.5%). Only 10% of respondents indicated that they apply the company's historical rate of return and another 10% favoured the cost of specific source of fund for quantifying the rate of return.

Surveys on the application of WACC for setting discount rate were also conducted in Australia (Kester et al.) and in New

Zealand (Petty and Scott; Patterson; Vos and Vos). Kester et al (1999) interviewed companies in several Asian countries and expanded their survey work to Australia in 1996 and 1997. One of their questions investigated the use of methods for setting the minimum required rate of return in capital budgeting practices. The wording and the question structure of the survey developed by the research team should be taken into consideration when the results are assessed. The responses revealed that a relatively high proportion of the companies listed on the Stock Exchange in Australia applied WACC (62.5% used this method in case of corporate capital structure and project-specific capital structure). A Risk-adjusted discount rate was also frequently applied (37.5%).

In contrast, very few companies in New Zealand applied WACC for setting the discount rate. A study was conducted in New Zealand in 1999 to examine capital budgeting practices in small businesses (Vos and Vos, 1999). Questionnaires consisting of five pages were mailed to 3,446 randomly selected small businesses. Responses were received from 238 companies. Companies which responded that they applied

dynamic capital budgeting were asked how they computed the discount rate when calculation was required. The responses are illustrated in Table 4.

The judgement-based target return was the most popular method applied for computing discount rate by small businesses (42%) in New Zealand. The study did not indicate whose judgment (managers' or stakeholders') provided a basis for defining the expected rate of return. Historical accounting return on assets was the second most favoured method. Cost of debt capital was used by 13% and WACC was applied by only 10%. The researchers conducting this survey compared these findings with results of Patterson's (1989) as well as with Petty and Scott's (1981) surveys. Patterson surveyed companies listed on the Stock Exchange in New Zealand, whereas Petty and Scott interviewed American multinational companies. Both in 1981 and in 1989 the respondents may have ticked several answers in the questionnaires because after the figures were added, the percentage exceeded 100%. The results of the three surveys are shown in Table 4.

Table 4
Methods of determining discount rate by companies in New Zealand and USA in the 1980s and 1990s

Method of determining discount rate	Vos & Vos (1999) New Zealand Unlisted Companies	Patterson (1989) New Zealand Listed Companies	Petty & Scott (1981) American Multinational Companies
Judgment-Based target return	42%	57%	66%
Historical accounting ROA	15%	9%	15%
No method indicated	14%	5%	--
Cost of debt capital alone	13%	27%	11%
WACC	10%	30%	44%
Other	6%	5%	--

Source: Vos and Vos (1999, p. 8)

The results of the three surveys significantly differ. Three factors should be taken into account when the results are assessed. Firstly, almost two decades passed between the surveys. Secondly, only one answer was accepted in the survey of 1999, whereas in the other two surveys, the respondents were allowed to choose several answers. Finally, the circle of the surveyed companies also differed. Thus, the following statement can be made: judgement-based target return was applied for computing the discount rate in all three surveys. It was a popular method among businesses. About two-thirds of American companies, 57% of listed New Zealand companies and 42% of unlisted businesses applied this indicator when computing was required. The weighted average cost of capital was popular among major companies. This indicator was used by 44% of American major companies and 30% of New Zealand major companies, as opposed to 10% of New Zealand small businesses. Cost of debt capital alone was favoured by listed New Zealand companies. The other two types of companies applied historical accounting return on assets.

Relatively few research studies on corporate capital budgeting practices have been conducted in African countries and only one study was interested in methods used for quantifying the required rate of return. A study published in 2006 summarised the findings of a survey involving 94 companies listed on the Nigerian Stock Exchange (Elumilade et al., 2006). The study revealed that two-thirds of corporate managers relied on their previous personal experience when the discount rate was set. The second popular method was the weighted average cost of capital and one-fifths of managers used it for setting the discount rate. This method was followed by the cost of equity capital.

OVERVIEW OF RESEARCH RESULTS NOT CONTAINING WEIGHTED AVERAGE COST OF CAPITAL

There are very few studies that do not directly ask about the application of weighted average cost of capital for setting discount rate. In the studies under comparison there were only three: the study in the USA conducted by Graham and Harvey, another study carried out in four European countries by Brounen et al., and one more study performed in Australia by Truong et al. Mention should be made that although these researchers did not directly ask about the application of WACC for setting discount rate, they did not clarify how companies determined the commonly used discount rate at corporate level when individual investment projects were evaluated. It may have happened that some companies quantified the commonly used discount rate at corporate level from WACC adjusted to corporate capital structure. Thus, WACC was used to determine discount rate, however, in an indirect way, which the researchers failed to notice. Since the methods in the offered answers in these research studies completely differed from the ones offered in other analysed studies, the comparison of the findings is difficult.

Graham and Harvey (2001) conducted a comprehensive survey sampling a large number of companies in the USA at the turn of the century. Questionnaires were sent to 4,440 chief financial officers of American companies and in total, 392 of them responded to the survey. The companies ranged from very small to very large. Forty percent of the companies were manufacturers, 15% were financial firms and 13% were from the transportation and energy sectors. The researchers

investigated what methods from the offered answers the sampled companies used for quantifying the required rate of return in evaluating a project in an overseas market and how frequently they applied the preferred method. The respondents were asked to rate on a scale of 0 to 4. The results are summarised in Table 5. According to the study American decision makers always or almost always selected the discount rate for their entire company (58.79%) and risk-matched discount rate for a particular project (50.95%) for determining the required rate of return. Table 5 shows that the total sum of values in some countries considerably exceeds 100%; consequently, the respondents might have been allowed to choose several offered answers to one question.

Brounen et al. (2004) translated the questionnaire compiled by Graham and Harvey and conducted a survey in four European countries: the United Kingdom, the Netherlands, Germany and France in 2004. Both private and public companies employing 25 or more employees were selected. As a result 2000 companies from the U.K., Germany and France and 500 companies from the Netherlands made up the sample set. However, the number of responses received was very low, despite the fact that the American questionnaire was translated into the target language and the questions and the offered answers were the same as those in Graham and Harvey's study. The overall response rate amounted only to 5%. The results of the responses are shown in Table 5.

*Table 5
Methods of determining the required rate of return in the USA and four European countries in 2004
(the percentage illustrates the proportion of companies with 'always or almost always' responses)*

Method of determining the required rate of return	U.S.	U.K.	Netherlands	Germany	France
The discount rate for our entire company	58.79%	40.98%	64.58%	41.96%	24.14%
A risk-matched discount rate for this particular project (considering both country and industry)	50.95%	23.73%	27.08%	25.00%	27.27%
The discount rate for the overseas market (country discount rate)	34.52%	20.00%	14.89%	14.85%	16.36%
A divisional discount rate (if the project line of business matches a domestic division)	15.61%	17.24%	17.02%	12.00%	12.50%
A different discount rate for each component cash flow that has a different risk characteristic (e.g. depreciation compared to operating cash flows)	9.87%	10.53%	2.13%	7.14%	11.32%

Sources: Graham and Harvey 2001, p. 4 and Brounen et al., 2004, p. 97

Table 5 reveals that respondents from every country participating in this survey, with the exception of France, use the discount rate for their entire company when evaluating a new project in an overseas market. French respondents favour the method of a risk-matched discount rate for a particular project, which is quite popular among British, Dutch and German company managers, also.

In the same year Truong et al. (2004) conducted a survey on capital budgeting practices in Australia. The results were consistent with both American and European research. The survey based on 87 responses reveals that the most popular method is the discount rate for the entire company (57%), which is followed by the risk-matched discount rate for a particular project (22%). The number of Australian managers determining the discount rate based on their previous personal experience amounted to 17%.

CONCLUSIONS

Quantifying discount rate in corporate practices is extremely difficult. In addition, its evaluation is based on estimation. Consequently, there is a subjective factor involved. After conducting comparative analyses of several empirical research studies, it can be claimed that there are several methods of determining discount rate in corporate practice. The studies written in English and analysed here each show a different approach to this issue and ask quite different questions related to methods of determining discount rate. On the basis of

the methods used in the questionnaires, the research studies can be classified into two large groups: surveys that ask about the discount rate determined from weighted average cost of capital, and surveys that lack this method. Since these studies analysed different aspects, the findings of the two groups cannot be compared.

Since the general decision-making methodology is being given more and more attention in the financial literature, corporate decision makers use the weighted average cost of capital (WACC) for determining the discount rate in dynamic capital budgeting. The analysed studies reveal that there are countries such as Finland, the Netherlands, Hong Kong, Indonesia, Malaysia and Singapore where the rate of companies using WACC for determining the discount rate is surprisingly high.

The surveys which do not include WACC in their analyses reveal that managers in the USA, U.K., the Netherlands, Germany and Australia often do not determine the discount rate when they evaluate a new project. They rather use the discount rate for their entire company in capital budgeting. Unfortunately, very few researchers deal with exploring correlations and links hiding behind the obtained results.

It is typical that in some countries company managers determine the discount rate without performing any calculations. They completely rely on their previous personal experience, which does not seem to be a less acceptable method than WACC if decision makers are well-qualified, experienced and prudent enough.

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