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Capital Budgeting Practices in Non-manufacturing Companies in Poland

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Abstract

This paper aims at analyzing the diffusion of investment appraisal methods in non-manufacturing companies Poland. In particular, it deals with the relationships between the methods used and the selected characteristics of companies. The questionnaire was completed in 2012 by representatives of non-manufacturing companies operating in Poland and focused on three areas: (a) general firm characteristics, (b) organization of investment process, (c) investment evaluation methods used.

The questionnaire research has shown that service companies in Poland use the same investment appraisal methods as companies in more developed countries; however, the diffusion of these methods is less. What is more, a foreign origin of equity capital, the magnitude of the capital expenditures budget, and a company size have significant and statistically positive influence on the investment appraisal methods in use, especially on: (a) formalization of the investment appraisal process, (b) the use of discounted cash flows – DCF methods, (c) employment of risk assessment methods, and (d) audit after closing the investment process.

The author believes that the study bridges the gap in management accounting literature and researchers will use the results of this study to question current ideas and develop new theories. The results of the conducted study may also help practitioners identify the areas in their companies where academic recommendations have not been implemented and their use could be beneficiary for the company due to the fact that they facilitate activities which create value of the company.

Keywords: **management accounting, capital budgeting, non-manufacturing firms.**

Introduction

Capital budgeting decisions are one of the most important areas of company finance management. Using inappropriate methods of investment appraisal may lead to engaging limited resources into projects generating lesser return than the cost of capital, which, in turn, could contribute to destruction of value (Rappaport, 1986; Stewart, 1991; Copeland, Koller and Murrin, 1996). Improper system of investment appraisal may also lead to a situation in which a company refuses to engage into projects offering a return higher than the cost of capital and the competitiveness of the firms worsens (Porter, 1985).

An investment appraisal process involves numerous methods; however, their use should not be arbitrary – according to theory, which has been taught at universities for decades, methods based on cash flows, especially net present value – NPV (which incorporates time value of money concept and is based on all cash flows that the investment generates) maximize the value of the company (Copeland, Koller and Murrin, 1996). Other methods, such as internal rate of return – IRR, payback – PB, or discounted payback – DPB, are frequently criticized. The main objection to IRR is that it can be misleading when choosing between mutually exclusive projects and it also causes a problem of multiple rates of return (Copeland, Koller and Murrin, 1996). Even though IRR is widely criticized, it is extensively used (Graham and Harvey, 2001; Sandahl and Sjögren, 2003; Brounen, De Jong and Koedijk, 2004; Andor, Mohanty and Toth, 2011). Payback is also under criticism because it ignores time value of money and cash flows after the payback time; however, it is relatively frequently used in practice (Graham and Harvey, 2001; Sandahl and Sjögren, 2003; Brounen et al., 2004; Andor et al., 2011). A modified version of payback criterion, discounted payback, does not ignore time value of the money concept but still does not take into account cash flows after payback point. It should be also stressed that payback and discounted payback measure time when inflows from the investment are equal to its outflows and not the profitability of investment; these criteria do not measure too if the investment maximizes company value. Other capital budgeting criterion which is also extensively used (Graham and Harvey, 2001; Sandahl and Sjögren, 2003; Brounen et al., 2004; Andor et al., 2011) is accounting rate of return – ARR. This method is criticized because it does not take into consideration time value of money and is based on accounting earnings, and not cash flows (Copeland, Koller and Murrin, 1996). The problem with the use of accounting numbers in ARR is that these numbers can be affected by management (e.g., management can cause accounting earnings to increase even though actions taken may have a negative influence on company's value in the long run).

Apart from the methods of investment appraisal, such as NPV, IRR, PB or ARR, companies use risk assessment methods including sensitivity analysis or scenario analysis. These methods are in principle free from any defects and

should be used in capital budgeting decisions whenever it is important to see whether a project maximizes company's value if one or more variables change (sensitivity analysis), or in different situations (scenario analysis).

In the light of the above observations, questions emerge in terms of investment appraisal. Do non-manufacturing companies in Poland use methods advised by theory? Is there a gap between theoretical recommendations and practice? Are there any differences between companies of different characteristics (e.g. size, origin of capital) in using those methods? Do non-manufacturing companies in Poland use similar methods of investment appraisal as their counterparts in other countries?

Table 1

Diffusion of investment appraisal methods

Country	Usable responses	DCF	NPV	IRR	PB	AAR
Australia (Blayney and Yokoyama, 1991)	N/A	N/A	45%	37%	61%	24%
Australia (Kester et al., 1999)	57	100%	79%	79%	51%	27%
Australia (Truong, Partington and Peat, 2008)	77	92%	86%	64%	59%	19%
Bulgaria (Andor et al., 2011)	20	35%	N/A	N/A	40%	30%
Canada (Jog and Srivastava, 1994)	133	N/A	41%	62%	50%	17%
Canada (Baker, Dutta and Saadi, 2011)	214	N/A	75%	68%	67%	40%
China (Firth, 1996)	361	N/A	46%	41%	47%	42%
China (Chan, Haddad and Sterk, 2001)	54	N/A	90%	41%	13%	67%
China (Hermes, Smid and Yao, 2007)	45	92%	49%	89%	84%	N/A
Croatia (Dedi and Orsag, 2007)	50	N/A	66%	71%	75%	20%
Croatia (Andor et al., 2011)	16	56%	N/A	N/A	69%	63%
Czech Republic (Andor et al., 2011)	57	37%	N/A	N/A	53%	40%
Cyprus (Lazaridis, 2004)	56	N/A	11%	9%	37%	18%
Finland (Liljeblom and Vaihekoski, 2004)	144	N/A	52%	44%	97%	21%
France (Brounen et al,. 2004)	61	55%	35%	44%	51%	16%
Germany (Brounen et al., 2004)	132	60%	48%	42%	50%	32%
Hong Kong (Kester et al., 1999)	29	68%	49%	58%	80%	40%
Hong Kong (Lam, Wang and Lam, 2007)	46	N/A	72%	65%	85%	83%
Hungary (Andor et al., 2011)	46	43%	N/A	N/A	63%	76%
India (Anand, 2002)	81	N/A	66%	85%	68%	35%
India (Soni, 2006)	87	N/A	16%	80%	80%	9%
India (Verma, Gupta and Batra, 2009)	30	N/A	63%	77%	80%	27%
Indonesia (Kester et al., 1999)	16	100%	83%	77%	48%	17%
Indonesia (Leon, Isa and Kester, 2008)	108	N/A	64%	64%	86%	41%
Ireland (Clarke and O'Dea, 1993)	N/A	N/A	N/A	84%*	84%	24%
Japan (Blayney and Yokoyama, 1991)	N/A	N/A	6%	4%	52%	36%
Korea (Kim and Song, 1990)	N/A	N/A	60%	75%	75%	68%
Latvia (Andor et al., 2011)	9	44%	N/A	N/A	33%	67%
Lithuania (Andor et al., 2011)	14	43%	N/A	N/A	57%	50%
Malaysia (Kester et al., 1999)	35	89%	71%	68%	70%	35%
Netherlands (Brounen et al., 2004)	52	78%	70%	56%	65%	35%
Netherlands (Hermes et al., 2007)	42	100%	89%	74%	79%	2%
Philippines (Kester et al., 1999)	35	98%	66%	87%	71%	39%
Poland (Szychta, 2001)	60	N/A	30%	25%	40%	35%
Poland (Wnuk-Pel, 2011)	100	N/A	53%	47%	35%	15%
Poland (Andor et al., 2011)	143	58%	N/A	N/A	81%	59%
Romania (Andor et al., 2011)	57	58%	N/A	N/A	61%	68%
Scotland (Sangster, 1993)	94	73%	48%	58%	78%	31%
Singapore (Kester et al., 1999)	54	82%	59%	70%	70%	44%
Slovakia (Andor et al., 2011)	25	56%	N/A	N/A	64%	72%
Slovenia (Andor et al., 2011)	13	46%	N/A	N/A	62%	77%
Sweden (Sandahl and Sjögren, 2003)	129	69%	52%	23%	78%	21%
Sweden (Daunfeldt and Hartwig, 2011)	88	N/A	61%	30%	54%	24%
UK (Pike, 1975)	100	58%	32%	44%	73%	51%
UK (Pike, 1981)	100	68%	39%	57%	81%	49%
UK (McIntyre and Coulthurst, 1985)	141	45%	36%	28%	82%	33%
UK (Pike, 1986)	100	84%	68%	75%	92%	56%
UK (Pike, 1992)	100	88%	74%	81%	94%	50%
UK (Block, 1998)	302	N/A	38%	39%	76%	28%
UK (Arnold and Hatzopoulos, 2000)	96	82%	62%	68%	46%	41%
UK (Brounen et al., 2004)	68	68%	47%	53%	69%	38%
USA (Smith and Sullivan, 1990)	N/A	N/A	28%	52%	59%	13%
USA (Ryan and Ryan, 2002)	205	N/A	85%	77%	53%	15%
USA and Canada (Graham and Harvey, 2001)	392	97%	75%	76%	57%	20%

** total internal rate of return and net present value*

In the context of the above research questions, the aim of the study has been formulated: the study aims at analyzing the diffusion of investment appraisal and control methods in non-manufacturing companies in Poland. In particular, it aims at analyzing the relationship between the methods used and the selected characteristics of the researched companies (foreign origin of equity capital, company size, and the magnitude of capital expenditures budget). The aims of the study are fundamentally concurrent with aims of similar studies conducted in the world; however, some of their aspects were slightly different. Firstly, the present study, unlike most of the former studies, concentrates on non-manufacturing companies. Secondly, the study has been carried out on a sample of companies operating in Poland, a country which is different in terms of culture, institutions, or significance of capital market for the economy. Thirdly, the study not only aims at presenting the methods used in capital budgeting, but it also analyzes the procedures and organization of the investment appraisal process. One of the most important objectives underlying the present study has been an attempt to fill in the research gap between the theory, which provides tools for investment appraisal, and the practice of using these methods in Poland's non-manufacturing companies (in other words, it aims at measuring the scope of use of theoretical concepts by practitioners in Poland). In author's opinion, this study may also be useful for practitioners (managing finances in companies and investors) who are given the chance to broaden their knowledge about capital budgeting methods used in practice.

Literature review

Investment appraisal methods, such as discounted cash flows – DCF, risk assessment by means of sensitivity and scenario analyses or post-implementation audit have been widespread in the practice of highly-developed countries since 1960's. The use of investment appraisal methods in companies in those countries grew systematically especially in large and very large companies and in the nineties of the twentieth century the methods were commonly used. The situation was slightly different in smaller firms. Investment appraisal methods normally used in large companies were less often used in small companies.

As previous studies show (Table 1), DCF methods are most commonly used by companies in North America, Asia, and Pacific countries. DCF methods are less common among companies from Western Europe and they are least commonly used in the countries of Central and Eastern Europe – CEE.

As Table 1 shows, vast majority of research dedicated to the problem of capital budgeting was conducted in highly-developed countries of North America, Australia, and Western Europe: Australia (Truong et al., 2008), Canada (Graham and Harvey, 2001), France (Brounen et al., 2004), Germany (Brounen et al., 2004), the Netherlands (Hermes et al., 2007), Sweden (Sandahl and Sjögren, 2003), the UK (Brounen et al., 2004), and the USA (Graham and Harvey, 2001). The results of these studies are widely known, especially in academic circles, and they had undoubtedly influenced on the development of theory and its teaching as well as its practical use in companies.

Studies investigating capital budgeting in countries, characterized by a lesser degree of development, most of all Asian countries but also countries from CEE, are definitely less common. However, one should mention two cross-section works: Kester et al. (1999) which is more than a dozen years old and embraces such countries as Hong Kong, Indonesia, Malaysia, the Philippines, and Singapore as well as a work by Andor et al. (2011) revealing the practices of ten CEE countries: Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Even with more of such studies (see selected studies presented in Table 1), a practical use of investment appraisal methods is not researched enough, especially when compared to research carried out in more developed countries.

Moreover, studies of capital budgeting practices in companies based in CEE seem interesting due to historical reasons. These countries have been undergoing political transformation which started at the end of the 1980's and resulted in profound changes in economies of these countries, which over these years have come a long way from communism to capitalism, and since 1999 have been integrating with European Union structures. Economies of these countries have opened to foreign capital which they have to compete with locally and, more often, globally. The competition manifests itself inter alia in investments undertaken by these companies and which, for the sake of efficient competitiveness with other firms, must be effective – it requires both good business ideas and proper use of evaluation of these ideas (investments) – methods which are widespread and commonly used in companies based in more developed countries.

Research methodology

The research into diffusion and ways of use of investment appraisal methods in non-manufacturing companies operating in Poland was preceded by extensive literature review. The review has embraced literature on investment appraisal methods and organization of investment process; especially it has covered research into the diffusion of investment appraisal methods and the ways these methods were used in practice (e.g., Klammer, Koch and Wilner, 1991; Graham and Harvey, 2001). The results of literature review have enabled the formulation of this work's aim (see introduction), research questions, and they have also helped determine variables which have been tested. In order to develop and specify in more detail the aim of this study, the following hypotheses have been formulated:

1. Non-manufacturing companies operating in Poland, in terms of investment appraisal methods use the same methods as companies in more developed countries; however, the diffusion of these methods is less.
2. Equity capital origin, company size, and the magnitude of annual capital budget influence the

investment appraisal methods in use in non-manufacturing companies in Poland.

A survey research method has been selected to realize and verify the adopted hypotheses. Despite many shortcomings of this research, the author is convinced that it will facilitate unique analysis of non-manufacturing companies' practice in Poland in terms of capital budgeting and it will contribute to modification of existing beliefs and development of new theories. Another argument which made the author to use survey research was the desire to compare his own study results with the results of research conducted earlier both in Poland and other countries (e.g., Kester et al., 1999; Arnold and Hatzopoulos, 2000; Graham and Harvey, 2001; Sandahl and Sjögren, 2003; Bruonen et al., 2004; Hermes et al., 2007; Truong et al., 2008 or Andor et al., 2011); such a comparison would not be possible using a case study method.

The survey research, of course, could not constitute a complete source of knowledge about the methods supporting capital budgeting decisions in non-manufacturing companies operating in Poland. There are three main reasons for it. Firstly, the chosen sample is not representative and therefore generalizations of the obtained results should be done with caution. Secondly, there is a possible non-response bias in the results – the response rates are low, and the results may reflect the responses of people working in companies which are more familiar with capital budgeting techniques. Thirdly, a survey research itself bears some limitations which unfortunately do not allow in-depth and detailed analysis of investment process selection, evaluation, and control in the researched companies.

In order to analyze investment appraisal methods in non-manufacturing companies operating in Poland three basic groups of variables have been used: (a) variables characterizing companies, (b) variables characterizing the organization of investment process, (c) variables characterizing investment appraisal methods used by the researched companies. The questionnaire used contained multiple-choice questions, but respondents were asked to provide more expansive answers and comments (the survey instrument was pre-tested for clarity and accuracy). The choice of groups and individual variables was made taking into account study aims, so that the methods of investment appraisal used are analyzed in a credible manner.

The questionnaire survey was conducted in 2012 among practitioners participating in MBA and other postgraduate studies, participants of trainings for certified auditors and participants of different courses in the field of management accounting, in which the issue of investment appraisal had been brought up. In general, 396 questionnaires were distributed. 60 of them, filled in correctly, were returned but 3 were rejected because they had been filled by respondents from repeating companies. The survey was based on 57 questionnaires and all calculations were made using SPSS statistical software (the response rate was quite low because persons which filled out the questionnaire had to have knowledge about investment appraisal in their companies, which, to a great extent, limited the number of responses – questionnaires were filled out only by people who had such experience).

Research results

The analyzed companies realized both cost strategy and strategy of product differentiation and provided services to a different number of customers. Less than a half of the analyzed companies (38%) realized cost strategy providing mass products to their customers, whereas most of the companies (62%) realized differentiation strategy and provided specialist products to their clients. Majority of the surveyed companies provided specialist products to numerous customers (36%), companies which provided mass products to a small number of clients constituted the smallest group (4%). Almost half of the respondents (46%) assessed competition within the core business as intense, the rest of the respondents rated it as average (37%) or little (17%). Within the tested sample of companies, there were firms whose equity capital had different origin: 25 companies (47%) had solely domestic capital, 11 companies (21%) had mixed capital, and 17 companies (32%) had entirely foreign capital.

Two thirds of the researched companies (64%) sold their products only in the domestic market, and the rest of the firms (36%) sold it both inside and outside Poland. It needs to be stressed that only in the case of 6% of companies export sales constituted more than a half of all sales. The number of employees in the present research was a determinant of the size of the analyzed companies. It needs to be emphasized that small and medium-sized companies were dominant – they constituted 65% of the sample whereas large and very large companies constituted 35% of the sample. In particular, there were: (a) 33% of small companies (1-100 employees), (b) 32% of medium-sized companies (101-500 employees), (c) 12% of large companies (501-1000 employees) and (d) 23% of very large companies (more than 1000 employees) in the sample.

In a significant majority of companies (61%), capital expenditure has risen over the last five years. Only 13 respondents (23%) declared that capital budget in their company was reduced in that time, and in 9 companies (16%) it did not change. What seemed interesting, were the results stemming from the analysis of investment plans of the surveyed companies in the years to come. Despite the fact that the research was carried out at the time of the worldwide economic crisis, more than a half of respondents (54%) declared that in the next few years the capital expenditure was about to rise (it seems interesting due to the fact that during the crisis capital expenditure tends to be limited at most). It can be explained in two ways – on the one hand, companies operating in Poland were not affected by the crisis as badly as companies in other countries (despite the crisis, Poland maintained economic growth) and, on the other hand, consequences of the crisis may affect Polish companies with a certain delay.

Table 2

Organizational level at which final decisions about investment are made depending on the size of investment

Specification	Minor investments	Midium-size investments	Major investements	Very large investements
Manager of a department which realizes the investment	32			
Director of a division which realizes the investment	13	25	2	
The Board	10	11	20	9
Headquarters (e.g., parent company)	3	1	9	19
All together	58	37	31	28

Only 20% of companies declared the reduction of capital expenditures in the next few years, whereas 26% of firms expect that it should stay at the same level.

The research carried out has revealed that the key aims of investment undertaken by Polish non-manufacturing companies are as follows: (a) increase of company potential in the case of existing products (65%), (b) improvement of customer service quality (51%), (c) extending the range of products on offer (42%), (d) reduction of costs (39%), (e) modernization of company's potential (32%), (f) improvement of product quality (23%), and (g) other (7%).

In the majority of the analyzed companies, investment process involves entire teams of managers representing different functions realized within the company (e.g. basic business, sales and marketing, logistics, and accounting/finance). In 71% of companies investment projects are evaluated by teams, whereas in the rest of firms projects are evaluated by one person or by top managers (usually a chairman of the Board).

The survey has helped notice that decisions about investments, in most of the analyzed companies, are made on the level of the Board – out of all the companies which provided answer to this question, 50 of them (88%) have given such an answer. In 40 companies (70%) the capital budget was shaped by directors of divisions responsible for investment (they were usually small and medium-sized investments), in 32 (56%) companies - by managers of departments, which realized investments (only small investments) and 32 (56%) - by the headquarters (e.g. by the parent company) (they were mostly very big and big investments). For better analysis of the way capital budget was shaped, the level at which decisions about investments were made was set together with the magnitude of investment projects. The results are presented in Table 2.

The analysis of data presented in Table 2 has led to a conclusion that when the size of investment project grows, the level at which the project is finally accepted changes; generally, the bigger the investment, the higher the level at which the investment decision is accepted (with probability of error 0,01 it may be assumed that the relationship is statistically significant and fairly strong (Cramer's V = 0,565)).

The research shows that in the majority of analyzed companies (81%) formal capital budgeting is present and that proves the importance of the investment process (only 19% of companies do not have formal investment appraisal). The research carried out by Andor et al. (2011) on a sample of ten countries from CEE provides similar results – 83% of responding companies showed that formal capital budgeting was used by their firms (61% of companies in which formal investment appraisal was done, used DCF methods).

For a better understanding of the investment appraisal formalization process in the researched companies, this has been set together with selected characteristics of the companies. Further and detailed analysis has led to a conclusion that the influence of such variables as equity capital origin, company size, or the magnitude of annual capital budget on the formalization of investment process is not statistically significant. The research into capital budgeting conducted by Andor et al. (2001) in ten countries of Central and Eastern Europe has revealed that respondents are convinced about the dominant influence of foreign organizational culture (expressed by foreign equity capital) on the practice of financial management, especially on the capital budgeting methods (59% of respondents were convinced about such influence). The study has also revealed that the process of investment appraisal is slightly more formal in large companies (86%) than in small and medium-sized companies (75%).

The conducted research has shown that companies use methods based on accounting profit, discounted cash flows and also those based on un-discounted cash flows. Some of the responding companies have shown that their firms in terms of investment appraisal use other methods, not listed in the questionnaire, e.g., return on equity – ROE or economic value added – EVA.

Table 3

Investment appraisal methods in use

Specification	Never	Rarely	Occasionally	Often	Always
Accounting rate of return (ARR)	35%	22%	28%	15%	0%
Payback (PB)	21%	19%	26%	23%	11%
Discounted payback (DPB)	30%	22%	22%	19%	7%
Net present value (NPV)	27%	2%	14%	34%	23%
Internal rate of return (IRR)	22%	11%	9%	28%	30%

The use of individual methods of investment appraisal in the researched companies and their frequency of use are presented in Table 3.

The results of the conducted study show that the NPV method is used as often as IRR method in Polish companies. Within the surveyed population of companies 57%-58% of them often or always apply NPV and IRR methods. The results are concurrent with the results presented by Andor et al. (2011) which proves that the use of investment appraisal methods based on cash flows in those countries is significantly lesser than in other countries, where similar research has been carried out (Graham and Harvey, 2001; Brounen et al., 2004).

The study shows that in terms of use of investment appraisal methods based on discounted cash flows in Polish companies some progress is evident. In comparison to the study carried out by Szychta (2001), the percentage of companies using NPV has grown from 30% to 57% and the percentage of firms employing IRR has also grown from 25% to 58%. Therefore, it could be concluded that the theory-practice gap has narrowed and that the acceptance of the knowledge from university courses and textbooks has increased. The obtained results may stem from the effectiveness of teaching these methods at the university and professional courses for practitioners (such teaching has become a standard over the last 20 years) and it may also be due to a diffusion of their use by foreign companies investing in Poland (these methods are more popular among companies with foreign equity capital). Despite the fact that the use of DCF methods has increased, 40% of researched companies do not apply NPV or IRR. The percentage is quite high, but does it mean that so many companies make wrong investment decisions? Not necessarily. Some companies which do not use DCF methods may base their decision-making process on copying behavior of the most successful firms in their business (it is possible that these companies use value maximizing methods of capital budgeting). Many companies could make appropriate decisions about investments even without the application of methods suggested by theory.

The payback method is less popular than DCF methods. The analysis of investment appraisal methods in non-manufacturing companies operating in Poland has revealed that 34% of companies often or always use payback and 26% use discounted payback. Such a percentage is significantly lower, in comparison with highly-developed countries. The research by Andor et al. (2011) conducted in the countries of CEE has shown a more often payback used (68%). In the light of previous studies, the results concerning frequent or constant use of payback (34%) are quite surprising – in the research carried out in other countries, the percentage of companies using payback is much higher. The difference may be explained by the fact that Polish companies do use payback but they tend to apply it rarely or occasionally (50%) rather than often or always (the differences may also stem from a specific choice of the sample group – non-manufacturing companies).

As the study has shown, accounting rate of return in non-manufacturing companies in Poland is not frequently used – only 15% of the analyzed companies use this method often or always. The results of this study in terms of ARR use differ significantly when compared with the research by Andor et al. (2011) (81%) and they are closer to results of research obtained in such countries as Indonesia (17%) or the USA and Canada (20%) (Graham and Harvey, 2001).

Out of all methods of investment appraisal, the methods based on discounted cash flows are considered the best, as employment of such methods leads to maximization of the value of company (as it has been already mentioned, these methods are used by nearly half of the analyzed companies). For a proper use of these methods, apart from appropriate estimation of forecasted cash flows it is important to apply adequate cost of capital for the process of discounting (see McMahon, 1981; Bruner et al., 1998). It is commonly believed that such cost should be determined as weighted average cost of capital – WACC[1]. Among the researched companies that use discounted methods it was WACC which was applied most frequently (39%). The second most commonly used cost of capital employed for discounting process was cost of debt used to finance the investment. This approach has been applied by 26% of the researched companies. Respondents indicated that arbitrarily chosen discount rates were used less often (22%) and marginal cost of capital was least common (13%). Summarizing the results of the study it can be concluded that despite 20 years of academic expounding on the virtues of WACC, the majority of companies in Poland do not use this concept for capital investment appraisal.

The research has revealed that almost all companies (89%) prepare risk analysis of realized investment projects by means of such methods as sensitivity or scenario analysis. 51% of the surveyed companies use sensitivity analysis to see how investment profitability changes when, e.g. there are modifications of cost of capital used for the purpose of investment appraisal, or there are changes of price or costs generated by these investments or changes of investment expenditure. Scenario analysis is slightly more popular. 67% of the researched companies prepare risk analysis of investment appraisal for pessimistic, realistic, and optimistic variants. As it turned out, the researched companies not often (28%) use both sensitivity and scenario analyses for the purpose of risk assessment. None of the respondents pointed out the use of more complex methods, e.g., Monte Carlo simulation. The results of the study are supported by the results of previous research, e.g., Graham and Harvey (2001) who proved that 51% of companies in the USA and Canada for the purpose of investment appraisal use sensitivity analysis (the percentage for the UK reached 43%, the Netherlands 37%, Germany 28%, and France 10% – see Brounen et al., 2004).

[1] It does not apply to a situation in which a company undertakes very large projects whose financing is different from the capital structure of the company (in that case the use of marginal cost of capital – MCC seems appropriate for DCF methods).

It is obvious that the investment process does not end at the evaluation and choice of investment project, it should also include implementation and the time right after the investment has been completed. In the majority of the surveyed companies (73%), profitability and risk related to the investment are monitored during implementation (only 27% of companies do not monitor investments during implementation – once the decision about the investment is made the company implements it and does not monitor whether the profitability or risk related to the investment changes).

Monitoring investment in the post-implementation period is as important as monitoring the investment process during implementation itself. Post-implementation investment appraisal is an important element in terms of the entire investment process as it helps find and eliminate defects within the procedures employed by the company (Azzone and Maccarrone, 2001). Most companies appreciate the importance of this process. Post-implementation audit is carried out in 58% of the analyzed companies (42% of companies do not use it). The results are supported by the results obtained by Arnold and Hatzopoulos (2000) who claim that 87% of companies always or occasionally conduct post-audit (in cases of bigger projects) and only 13% of companies do it rarely or never.

The study has revealed that most companies (64%) perceive the procedures and methods of investment appraisal used in their firms as appropriate and their changes are not planned in the near future. More than a quarter (28%) of the respondents think that current methods are inappropriate and should be replaced. Despite that, changes are not planned. Only 4 (8%) responding companies claim that current methods of investment appraisal should be replaced and that such replacement is planned for the near future. The changes aim at, e.g.: (a) adapting to the requirements of the corporate group (energy distribution company), (b) introducing a unified model of investment appraisal (retail sales company), (c) introducing appraisal in general and assent of investment appraisal by the financial department before it is approved by the management or before it is introduced for approval to the Board (big trading company).

A more in-depth study of the relationships between the methods used for investment appraisal and selected characteristics of the analyzed companies has been carried out by means of a chi-square test. In particular, it has been tested how the origin of equity capital, size of company and magnitude of annual capital budget influence:

1. methods used for investment appraisal,
2. cost of capital used in discounted methods,
3. methods of risk analysis,
4. monitoring of investment during implementation,
5. post-implementation audit.

Further and detailed analysis has led to a conclusion that companies with a share of foreign capital less frequently than companies with domestic capital tend to base their investment appraisal on intuition (14% in comparison to 40%). With a probability of error of 0,05 it can be assumed that the relationship is statistically significant however its strength is moderate (Cramer's V = 0,291).

The study has also shown that the influence of such variables as company size or the magnitude of annual capital budget on the use of DCF methods for investment appraisal is statistically insignificant. The results seem surprising and are not compatible with most of the previous research, proving that large companies usually use more advanced methods of investment appraisal (DCF) due to accessibility of resources (mainly qualified analysts who are able to use DCF methods: Graham and Harvey, 2001; Sandahl and Sjögren, 2003; Brounen et al., 2004; Daunfeldt and Hartwig, 2011). The discrepancies of the results may be explained by a small number of companies within the sample group of this study and their specific business type (non-manufacturing companies).

Different results (compatible with previous research) were obtained after a more detailed analysis was carried out (separately on the level of NPV and IRR, instead of general reference to DCF). This in-depth analysis helped notice that, out of basic methods of investment appraisal, the use of NPV and IRR depends on the value of annual capital budget. Companies whose annual capital budget is bigger tend to use NPV and IRR more frequently than companies with a smaller capital budget. With the probability of error of 0,1 it can be assumed that the relationship is statistically significant yet its strength is moderate (Cramer's V = 0,379). The results of this study are supported by the results obtained by Hermes et al. (2007) and Daunfeldt and Hartwig (2011) and provide evidence that the use of more sophisticated methods by companies with bigger capital budgets is cheaper (or, companies with bigger capital budgets are generally large companies which have suitable and qualified staff).

For the purpose of a more detailed analysis of the relationship between the use of discount rate (marginal cost of capital, weighted average cost of capital, cost of debt, and arbitrarily chosen discount rate) and the selected characteristics of analyzed companies, both categories have been set together. Detailed analysis has lead to the conclusion that weighted average cost of capital is more frequently used by companies which: (a) have a share of foreign capital, (b) are bigger and (c) have a bigger capital budget. However further analysis has revealed that these relationships are statistically insignificant. The study results are partially supported by the study conducted by Andor et al. (2011). Additionally, Arnold and Hatzopoulos (2000) claim that WACC is more often used by large companies (61%) than by small companies (41%). Small companies as a discount rate frequently use interest payable on debt (23%) or arbitrarily chosen figure (12%); among large companies such technique of defining discount rate practically does not exist.

The analysis of investment appraisal methods in terms of selected characteristics of the surveyed companies has allowed investigating the influence of equity capital origin, the size of a company, and the magnitude of annual capital budget on the methods of risk analysis, monitoring investment implementation, and post-implementation

audit. The following relationships which are statistically significant have been observed:

1. Methods of risk assessment such as sensitivity or scenario analyses are more often used the higher the annual capital budget of the company is (with probability of error at 0,05 it may be assumed that the relationship is statistically significant, however, its strength is moderate (Cramer's V=0,448)). Moreover, foreign origin of equity capital positively influences the frequency of use of sensitivity analysis. The influence of such variables as the origin of equity capital (excluding sensitivity analysis) or the size of company on the frequency of use of risk assessment methods (sensitivity and scenario analyses) in the investment appraisal methods is statistically insignificant. The results are partially supported by previous research. In terms of risk assessment of investment projects Andor *at al.* (2011) claim that big companies and those with foreign capital more frequently employ sensitivity analysis in comparison to small companies without foreign capital share.
2. Monitoring of investment during its implementation is more frequent in the case of large companies (with probability of error at 0,1 it may be assumed that the relationship is statistically significant, however, its strength is moderate (Cramer's V = 0,258)). Influence of such variables as the origin of equity capital, size of company, or the magnitude of annual capital budget on the frequency of monitoring the investment during its implementation is statistically insignificant.
3. Post-implementation audit is carried out more often in companies with foreign capital and in companies which have higher annual capital budget. In the case of the first variable (origin of equity capital) the relationship is statistically significant at 0,05 and its strength is moderate (Cramer's V = 0,481). Similarly, in case of the second variable (the magnitude of annual capital budget), the relationship is statistically significant at 0,05 and its strength is moderate (Cramer's V = 0,435). The influence of the size of a company on the frequency of post-investment audit is statistically insignificant.

The results of the research carried out on a sample of non-manufacturing companies in Poland are largely consistent with the results of studies conducted in CEE (e.g. Andor et al., 2011) as well as, but to a lesser extent, with the results of studies in more developed countries in North America, Asia and Pacific, and Western Europe. The reasons for these differences may be varied. Firstly, the differences may stem from discrepancies in institutional systems in these countries and the level of economic and human development. Secondly, these differences may be due to relatively minor importance of capital market for Polish economy in comparison to countries in North America, Asia and Pacific, and Western Europe (especially the UK). Thirdly, the differences may stem from the fact that, unlike the majority of previous studies which concentrated on manufacturing and non-manufacturing companies, this research embraced only non-manufacturing companies.

Discussion and concluding remarks

Companies operating in Poland more frequently employ tools of management and financial accounting used by companies in more developed countries – this refers to, e.g., methods of investment appraisal and control. Survey research which has been carried out and concerned the problem of investment appraisal in companies operating in Poland enables the formulation of the following specific conclusions which facilitated the verification of hypotheses put forward at the beginning of this work:

1. In-depth analysis of the researched companies enables positive verification of the first hypothesis, stating that companies operating in Poland, in terms of investment appraisal methods, use the same methods as companies in more developed countries. However, the diffusion of these methods is lesser; it should be stressed that there is a significant gap between the diffusion of recommended methods of capital budgeting in the USA, Canada, Australia, or the UK and Poland; it means that a lot should be done by academics in the field of publications and teaching of current and future managers.
2. On the basis of conducted research, the second hypothesis has been verified partially positive, in particular:
   a) the research has revealed that equity capital origin has a significant influence on the investment appraisal methods. Foreign origin of equity capital has a significant and statistically positive influence on: (a) formalization of the investment appraisal process, (b) frequency of use of sensitivity analysis, and (c) audit after closing the investment process. Significant and statistically relevant relationship between the origin of equity capital and remaining variables has not been identified;
   b) the second factor which has a significant influence on the investment appraisal method is the amount of company's annual capital budget. Increase of the budget has a significant and statistically positive influence on: (a) the use of NPV and IRR, (b) employment of risk assessment methods (sensitivity and scenario analyses), and (c) audit after closing the investment process. The research has enabled stating that there is no significant and statistically relevant relationship between the amount of company's capital budget and remaining variables;
   c) carried out research revealed that the company size does not have significant and statistically relevant influence on the investment appraisal methods used.

Apart from verification of the two hypotheses set out at the beginning of this study, the present research has revealed that there is a relationship between the size of investment and the level of management at which the decision about implementation or rejection of the investment project is made: the bigger the investment, the

higher the level at which the decision is made (probability of error at 0,01 thus it may be assumed that the relationship is statistically significant and relatively strong).

The comparison of practices employed by non-manufacturing companies to the methods used by manufacturing companies (Wnuk-Pel, 2011) has shown that there is no significant relationship between the type of business (manufacturing or non-manufacturing) and: (a) formalization of the investment appraisal process, (b) use of discounted cash flow methods, (c) way of cost of capital definition in discounted cash flow methods, (d) risk analysis or investment monitoring during the process, and (e) audit after closing the investment process.

Conclusions stemming from the research have both theoretical and practical significance. From the theoretical point of view, the research points out that Poland's non-manufacturing companies employ the same methods of investment appraisal as companies in more developed countries, yet their use in Poland, in comparison to more developed countries is more limited. The study has also revealed that there are differences in the use of investment appraisal methods in Polish companies and other countries; it may be due to different institutional systems of these countries, the level of economic or human development, and also differences in the role of capital market in economy. The author believes that the study will bridge the gap in the management accounting literature and researchers will use the results of this study to question current ideas and develop new theories.

From the practical point of view, companies considering modification or implementation of new methods of investment appraisal should be aware of the fact that these methods are commonly employed by companies which are their competitors in the global markets. A wider diffusion of better investment appraisal methods in Poland's non-manufacturing companies could improve the effectiveness of investment decisions and, generally, increase company competitiveness. The results of the conducted studies may help practitioners identify the areas in their companies where academic recommendations have not been implemented and their use could be beneficiary for the company due to the fact that they facilitate activities which create value of the company.

The study allows to identify a few opportunities for further research:

1. The survey research which has been carried out and presented here may be continued. It would seem interesting from the scientific point of view to conduct the presented questionnaire in a few-years' time. On the one hand, it would probably improve representativeness of the sample; on the other hand, it would help notice if or how the practical use of investment appraisal and control methods change in Polish companies.
2. Due to the fact that the conducted research was in a form of a survey, a detailed analysis of individual companies was impossible. Conducting research in a form of a case study would enable a more detailed analysis of capital budgeting in Polish companies, especially, e.g., post-investment audit, which constitutes an important research area, and its influence on the future investment process and the organization as a whole. The analysis of investment appraisal and control by means of case studies, despite its numerous limitations, would enable better investigation of the above problems.
3. What seems interesting in terms of further research are the studies of capital budgeting which would take into consideration different characteristics of the researched companies. Apart from the characteristics used in the present research, different variables may be employed, such as: leverage, growth, target debt level, management ownership, CEO age, CEO education, CEO tenure. It is also possible to analyze if capital budgeting practices are different for public/non-public companies, for companies with foreign sales, companies paying/non-paying dividends, and also for manufacturing/non-manufacturing companies.

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Investavimo įvertinimo metodų paplitimas negamybinėse Lenkijos įmonėse

Santrauka

Mokslinėje literatūroje ir verslo praktikoje visame pasaulyje jau penkerius metus diskutuojama dėl diskontuojamų įplaukų metodų (NPV, IRR) panaudojimo pirmumo vertinant įmonių investicijas (Rappaport, 1986; Stewart, 1991; Copeland et al., 1996). Vidutiniai kapitalo kaštai (angl. *weighted average cost of capital or WACC*) ar rizikos įvertinimo metodai (jautrumo ar scenarijaus analizė) yra taip pat įvardinami kaip prioritetiniai įmonėms, siekiančioms maksimizuoti vertę ilgajame laikotarpyje (Copeland et al., 1996). Šie metodai yra plačiai naudojami išsivysčiusių šalių praktikoje, nors kai kurios studijos rodo, jog įmonės ne visuomet naudojasi šiais metodais ir kad jų naudojimas priklauso nuo tokių įmonių charakteristikų - užsienio paprastųjų akcijų kapitalo kilmė, įmonės dydis ar investuojamų finansų dydis (pvz., Graham, Harvey, 2001; Ryan, Ryan, 2002; Brounen et al., 2004; Baker et al., 2011; Chen, 2012).

Lenkijoje metodai, pagrįsti diskontuojamais grynaisias srautais, mokslinėje literatūroje plačiai diskutuojami nuo 1990-ųjų metų pradžios, tačiau tyrimai, vykdomi iki dabar (Szychta, 2001; Wnuk-Pel, 2011), parodė investavimo vertinimo metodų atsilikimą palyginti su labiau išsivysčiusių šalių praktika. Dėl anksčiau minėtų priežasčių, spragų

ankstesniuose tyrimuose Lenkijoje, itin svarbu atlikti visapusiškus investavimo metodų, naudojamų Lenkijoje, tyrimus negamybinių įmonių atvejų studijų pavyzdžiu.

Straipsnio tikslas – išanalizuoti investavimo metodų Lenkijos negamybinėse įmonėse paplitimą, ypatingą dėmesį skiriant ryšiui tarp naudojamų metodų ir parinktų tiriamų įmonių charakteristikų. Siekiant detalizuoti tyrimo tikslą, buvo suformuluotos dvi hipotezės: (1) negamybinės įmonės, veikiančios Lenkijoje, investavimo įvertinimui taiko tuos pačius metodus, kaip ir įmonės, veikiančios labiau išsivysčiusiose valstybėse, tačiau šių metodų paplitimas yra mažesnis; (2) akcinio kapitalo kilmė, kompanijos dydis ir investuojamo kapitalo dydis lemia investavimo įvertinimo metodų panaudojimą.

Apklausa raštu buvo vykdoma apklausiant MBA bei kitų magistro studijų dalyvius, sertifikuotų auditorių mokymų ir skirtingų vadybos apskaitos kursų dalyvius, kurie studijavo investavimo vertinimo aspektus. Iš viso buvo išdalintos 396 anketos, iš kurių 57 grįžo teisingai užpildytos, tai sudarė 14% grįžtamumą. Klausimai anketoje buvo sufokusuoti į tris klausimų blokus: (a) bendros įmonės charakteristikos; (b) investavimo proceso organizavimas; (c) investavimo įvertinimo metodai, naudojami įmonėje.

Įmonės, veikiančios Lenkijoje, rečiau naudoja sprendimus, kurie taikomi labiau išsivysčiusiose šalyse (pvz., JAV, Kanadoje, Australijoje, Didžiojoje Britanijoje, Prancūzijoje, Vokietijoje) – ypač vertinant investavimo metodus. Tyrimai leido patikrinti hipotezes, suformuluotas tyrimo pradžioje:

1. Atlikta analizė leidžia patvirtinti pirmąją hipotezę, kuri teigia, jog negamybinės įmonės, veikiančios Lenkijoje, vertindamos investavimą naudoja tuos pačius metodus, kaip ir įmonės labiau išsivysčiusiose šalyse, tačiau metodų paplitimas yra mažesnis (dažnai arba retai NPV yra naudojamas 57% visų įmonių, IRR naudojamas 58% visų įmonių, diskontuojamas skolos grąžinimas 26%, skolos grąžinimas 34% ir ARR 15% visų įmonių);
2. Antroji hipotezė pasiteisino iš dalies, ypač:
   a) tyrimas parodė, jog akcinio kapitalo kilmė turi reikšmingos įtakos investavimo vertinimo metodams. Užsienio akcinis kapitalas turi reikšmingos ir statistiškai patikimos teigiamos įtakos: (a) investavimo įvertinimo procesui formalizuoti; (b) jautrumo analizės panaudojimo dažniui ir (c) auditui, užbaigus investavimo procesą. Reikšmingi ir statistiškai patikimi santykiai tarp akcinio kapitalo ir likusių kintamųjų identifikuoti nebuvo;
   b) antrasis veiksnys, kuris turi reikšmingos įtakos investavimo įvertinimo metodui, yra įmonės metinis biudžetas. Biudžeto didėjimas turi reikšmingos ir statistiškai patikimos teigiamos įtakos: (a) NPV ir IRR metodų panaudojimui; (b) rizikos įvertinimo metodų panaudojimui (jautrumo ir scenarijaus analizės) ir (c) auditui, užbaigus investavimo procesą. Tyrimo rezultatai leidžia teigti, kad nėra reikšmingos ir statistiškai patikimos priklausomybės tarp įmonės kapitalo dydžio ir likusiųjų kintamųjų;
   c) tyrimo rezultatai parodė, jog įmonės dydis neturi reikšmingos arba statistiškai patikimos įtakos naudojamiems investavimo vertinimo metodams.

Negamybinių ir gamybinių įmonių praktikos palyginimas (Wnuk-Pel, 2011) rodo, jog nėra reikšmingo ryšio tarp veiklos srities pobūdžio (gamybinė įmonė ar ne gamybinė) ir - (a) investavimo įvertinimo proceso formalizavimo; (b) diskontuojamų piniginių srautų metodų panaudojimo; (c) kapitalo kaštų apibrėžimo būdo diskontuojamų kaštų srautuose; (d) rizikos analizės ar investavimo monitoringo proceso metu ir (e) audito, užbaigus investavimo procesą.

Tyrimo metu suformuluotos išvados turi tiek teorinės, tiek praktinės reikšmės. Teoriniu požiūriu tyrimo rezultatai leidžia teigti, kad Lenkijos negamybinės įmonės naudoja tuos pačius investavimo įvertinimo metodus kaip ir labiau išsivysčiusios šalys, nors jų panaudojimo sklaida ir mažesnė. Praktiniu požiūriu įmonės, svarstančios naujų investavimo įvertinimo metodų panaudojimo ar modifikavimo galimybes, turi būti įsitikinusios, kad faktiškai šie metodai yra naudojami ir įmonių, kurie yra jų konkurentai globaliose rinkose. Platesnė geresnių investavimo įvertinimo metodų sklaida Lenkijos negamybinėse įmonėse gali padidinti investavimo sprendimų efektyvumą ir iš esmės – įmonių konkurencingumą.

Tyrimas neatskleidė jokių priežasčių, kodėl investavimo įvertinimas nėra atliekamas panaudojant metodus, grįstus diskontuojamų grynųjų pinigų srautais (NPV ar IRR), įvertintais vidutiniais kapitalo kaštais ar rizikos įvertinimo metodais (jautrumo ar scenarijaus analize); neatskleidė realių opcijų panaudojimo. Ateityje svarbu ištirti, kas trukdo Lenkijos negamybinėms įmonėms naudotis šiuos metodus apskritai ir detaliau ištirti naudojamus kapitalo biudžeto įrankius.

Reikšminiai žodžiai: investavimo įvertinimo metodai, valdymo apskaita, kapitalo finansavimas, negamybinė įmonė.

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