PRACE NAUKOWE
Uniwersytetu Ekonomicznego we Wrocławiu

RESEARCH PAPERS
of Wrocław University of Economics

Nr 412

Zarządzanie finansami firm – teoria i praktyka

Redaktorzy naukowi

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Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu
Wrocław 2015

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Wrocław 2015

ISSN 1899-3192
e-ISSN 2392-0041

ISBN 978-83-7695-568-1

Wersja pierwotna: publikacja drukowana

Zamówienia na opublikowane prace należy składać na adres:
Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu
ul. Komandorska 118/120, 53-345 Wrocław
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www.ksiegarnia.ue.wroc.pl

Druk i oprawa: TOTEM

Spis treści

Wstęp

Działalność gospodarcza, w skali zarówno makroekonomicznej, jak i mikroekonomicznej, składa się z gospodarki realnej wytwarzającej dobra i świadczącej usługi, w której kluczową rolę odgrywa szeroko rozumiana sfera finansów, obejmująca trzy zasadnicze grupy zagadnień: racjonalnego wyboru celów jednostek (organizacji) gospodarczych w aspekcie finansowym, optymalnych źródeł ich finansowania, a także efektywnego wykorzystania zgromadzonych zasobów finansowych.

Procesy globalizacyjne, a także kryzysy polityczne i wojskowe, sytuacja gospodarcza w Unii Europejskiej spowodowana falą imigracji, załamanie w gospodarce chińskiej muszą być uwzględniane przy podejmowaniu bieżących i strategicznych decyzji finansowych. Ponadto okoliczności te przyczyniają się do powstawania niekorzystnych warunków gospodarowania przedsiębiorstw w sferze pozyskiwania kapitałów, a w skali makro mogą prowadzić do powiększania deficytu i długu publicznego. Warunki zewnętrzne i wewnętrzne wymuszają jeszcze większą koncentrację teorii i praktyki zarządzania finansami na problemach zarówno finansów publicznych, jak i finansów przedsiębiorstw. Chodzi mianowicie o takie zarządzanie finansami, które powoduje pomnażanie bogactwa właścicieli kapitału i jednocześnie prowadzi do wzrostu dobrobytu całych społeczności. Zagadnieniom tym poświęcone są artykuły opublikowane w niniejszym zeszycie Prac Naukowych. Problematyka poruszana w przedstawionych opracowaniach dotyczy między innymi następujących obszarów zarządzania finansami: pozyskiwania kapitałów przez inicjatywy partnerstwa publiczno-prywatnego, udziału *venture capital*, zarządzania finansami w jednostkach sektora publicznego, np. w służbie zdrowia, zarządzania ryzykiem w podmiotach gospodarczych, sterowania strukturą kapitału i płynnością finansową przedsiębiorstwa, finansowania działalności innowacyjnej przedsiębiorstw, oceny efektywności inwestycji w odnawialne źródła energii, finansowych aspektów zamówień publicznych, finansów sektora bankowego oraz efektywności rynku kapitałowego.

Artykuły wchodzące w skład niniejszej publikacji są związane z coroczną konferencją „Zarządzanie finansami – teoria i praktyka", organizowaną przez Katedrę Finansów Przedsiębiorstwa i Zarządzania Wartością oraz Katedrę Finansów Publicznych i Międzynarodowych Wydziału Zarządzania, Informatyki i Finansów Uniwersytetu Ekonomicznego we Wrocławiu z udziałem pracowników naukowych z najważniejszych ośrodków akademickich w Polsce, przedstawicieli praktyki gospodarczej i gości zagranicznych. Konferencja ewoluowała od wąskiego niegdyś ujęcia zarządzania finansami firm do ujęcia szerszego, którego istotą jest objęcie różnych sfer działalności gospodarczej, w których zarządzanie finansami ma duże

znaczenie. Dotyczy to finansów międzynarodowych, w tym finansów Unii Europejskiej, finansów centralnych (rządowych), finansów lokalnych (w tym jednostek samorządowych), finansów służb publicznych, jak również finansów wielu innych podmiotów gospodarczych.

Jako redaktorzy naukowi książki w imieniu autorów i własnym wyrażamy głęboką wdzięczność recenzentom – Paniom Profesor: Agacie Adamskiej, Aurelii Bielawskiej, Krystynie Brzozowskiej, Teresie Famulskiej, Małgorzacie M. Hybkiej, Wacławie Starzyńskiej, Paulinie Ucieklak-Jeż, oraz Panom Profesorom: Jerzemu Kitowskiemu, Jakubowi Marszałkowi i Jerzemu Różańskiemu – za wnikliwe recenzje i cenne uwagi, które przyczyniły się do powstania publikacji na odpowiednio wysokim poziomie naukowym.

Mamy nadzieję, że niniejsza lektura będzie inspiracją nie tylko do dalszych badań naukowych, ale również do wdrażania innowacyjnych rozwiązań w zakresie finansów zarówno w sektorze przedsiębiorstw, jak i w sektorze publicznym.

Adam Kopiński, Paweł Kowalik

PRACE NAUKOWE UNIWERSYTETU EKONOMICZNEGO WE WROCŁAWIU
RESEARCH PAPERS OF WROCŁAW UNIVERSITY OF ECONOMICS nr 412 • 2015
Zarządzanie finansami firm – teoria i praktyka
ISSN 1899-3192
e-ISSN 2392-0041

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THE IMPACT OF THE USE OF FUNDING SOURCES FOR TARGETED RESEARCH PROJECTS ON THE ACCOUNTING SYSTEM OF RESEARCH INSTITUTES IN POLAND – THE RESULTS AND ANALYSIS OF THE SURVEY

WPŁYW WYKORZYSTANIA ŹRÓDEŁ FINANSOWANIA CELOWYCH PROJEKTÓW BADAWCZYCH NA SYSTEM RACHUNKOWOŚCI W INSTYTUTACH BADAWCZYCH W POLSCE – WYNIKI I ANALIZA BADAŃ ANKIETOWYCH

DOI: 10.15611/pn.2015.412.10

Summary: Background: The complexity and efficiency of an accounting system should depend on the information needs of its customers (internal and external). A specific type of customers are the so-called funders granting funds for research projects, since they require detailed management information on the costs of projects, which typically is not provided by an accounting system built in the traditional manner, focused on the creation of information for financial reporting purposes. Objective: The aim of this article was to analyze the impact of the use of funding sources for targeted research projects on the accounting system of research institutes in Poland. The presented content indicates a relationship between the volume of funds raised for the implementation of targeted research projects and the degree of complexity and efficiency of the accounting system used. Methods: Two research methods were applied for the purpose of drafting this article: a statistical analysis of the survey results and an analysis of the available literature (literature review). The survey was conducted in January 2015 in a group of respondents representing almost 50% of all research institutes in Poland. The statistical analysis of the obtained results was based on the examination of the significance of the Cramér's V correlation coefficient. Conclusions: The conducted analyses confirmed a relationship between the level of funding for targeted research projects and the degree of development of the accounting system and its orientation on creating information for funders and project management. In case of the examined research institutes, the more funds came from such projects as NCN (National Science Centre), NCBiR (National Centre for Research and Development), and EU projects, etc., the greater the awareness and demand for financial information from the accounting system.

Keywords: source of funds, research institute, accounting system, survey research.

Streszczenie: Złożoność i efektywność systemu rachunkowości powinna zależeć od potrzeb informacyjnych jego odbiorców (wewnętrznych i zewnętrznych). Szczególnym typem odbiorcy są tzw. fundatorzy przyznający środki na realizację projektów badawczych. Wymagają oni bowiem szczegółowych informacji zarządczych o kosztach realizowanych projektów, których zazwyczaj nie dostarcza system rachunkowości zbudowany w sposób tradycyjny, ukierunkowany na tworzenie informacji dla celów sprawozdawczości finansowej. Celem artykułu jest analiza wpływu wykorzystania źródeł finansowania celowych projektów badawczych na system rachunkowości w instytutach badawczych w Polsce. W przedstawionych treściach wskazano na istnienie zależności pomiędzy wielkością środków finansowych pozyskiwanych na realizację celowych projektów badawczych a stopniem złożoności i efektywności stosowanego systemu rachunkowości. Dla realizacji celu artykułu zastosowano dwie metody badawcze: analizę statystyczną wyników badań ankietowych oraz analizę literatury przedmiotu. Badania ankietowe przeprowadzono w styczniu 2015 r. na grupie respondentów reprezentujących blisko 50% wszystkich instytutów badawczych w Polsce. Analiza statystyczna uzyskanych wyników oparta została na ocenie poziomu istotności współczynnika korelacji *V*-Cramera. Przeprowadzone analizy dowodzą istnienia zależności pomiędzy poziomem źródeł finansowania na celowe projekty badawcze a stopniem rozwoju systemu rachunkowości i zorientowaniem go na tworzenie informacji dla fundatorów oraz dla potrzeb zarządzania projektami. Im więcej środków finansowych w badanych instytutach pochodziło z projektów, np. NCN, NCBiR, projektów unijnych itd., tym większa była świadomość i zapotrzebowanie na informacje finansowe pochodzące ze stosowanego systemu rachunkowości.

Słowa kluczowe: źródła finansowania, instytut badawczy, system rachunkowości, badania ankietowe.

Be effective - this is the right job for the boss

Peter F. Drucker

1. Introduction

In Poland, for many years the financing of research has been based largely on the implementation of targeted research projects commissioned by public institutions designated for that purpose[1]. These institutions require the units that were granted the financial resources to provide some special reports, tailored to the individual requirements of each of the funders. This often results in the need for the preparation (on the part of the persons performing the research project) of entirely new reports based on the data collected outside the accounting system, due to the inability to obtain adequate information.

One of the most numerous groups of entities involved in scientific activity and using the aforementioned sources of funding are research institutes, established

[1] These are both Polish institutions such as the National Science Centre, the National Research and Development Centre, the Foundation for Polish Science and international institutions, such as the European Commission, the Polish-American Fulbright Commission, the Scientific and Technological Research Council of Turkey, etc.

under a separate Act of 30 April 2010. These are "state entities, separated in terms of legal, organizational, economic and financial matters, which conduct scientific research and development activities focused on their implementation and application in practice" [Act on Research Institutes, Article 1, Paragraph 1]. Currently, Poland has 116 such entities employing approx. 40 thousand employees[2]. Research institutes are funded from two main sources: statutory grants and funds allocated to targeted research projects. Some of the institutes also receive a significant portion of their revenues from commercial activities.

The aim of this article is to analyze the impact of the use of funding sources for targeted research projects on the accounting system in research institutes in Poland. The presented content has indicated a relationship between the amount of funds raised for the implementation of targeted research projects and the degree of complexity and efficiency of the accounting system used.

2. Review of the literature

The analysis of domestic and foreign literature on the effects of the use of the sources of financing of targeted research projects on the accounting system in research& development entities (including research institutes) pointed to a large research gap in this area. On the other hand, partial issues of this subject are well explained, such as the impact of the sources of financing of targeted research projects on scientific research, the impact of new information technologies on the importance and economic value of information, and the role of the accounting system in management information systems, in particular in the units carrying out long-term projects.

In English literature, case studies can be found of the impact of the sources of financing on scientific research. For instance, A. Jowkar et al. 2011 present an analysis of publications in Iran covering the years from 2000 to 2009 and the share of the publications made as part of research projects funded from external sources (during the period considered it equaled to 12.5%). The authors also indicate that in the last four years of the examined period there was a sharp increase in the share of this type of publications (up to nearly 45% in 2009 - Cf. Figure 1), which confirms the growing importance, also outside Europe, of the financing sources of targeted research projects.

In addition to this, H.E. Roosendaal et al. [2003] explain the economic consequences of the dynamic changes in Information and Communication Technologies (ICT), which include, among others, the Internet, wireless networks, Bluetooth networks, landline and mobile networks, communication of sound and image technologies, etc.

[2] The data is based on the information of the Central Council of Research Institutes, which represents the interests of the environment of research institutes before state authorities, local government, scientific, economic, and social organizations as well as opinion leaders and participates in economic and social politics, and particularly in science- and innovation-related politics. Source: [http://www.rgib.org.pl, access 09 April 2015].

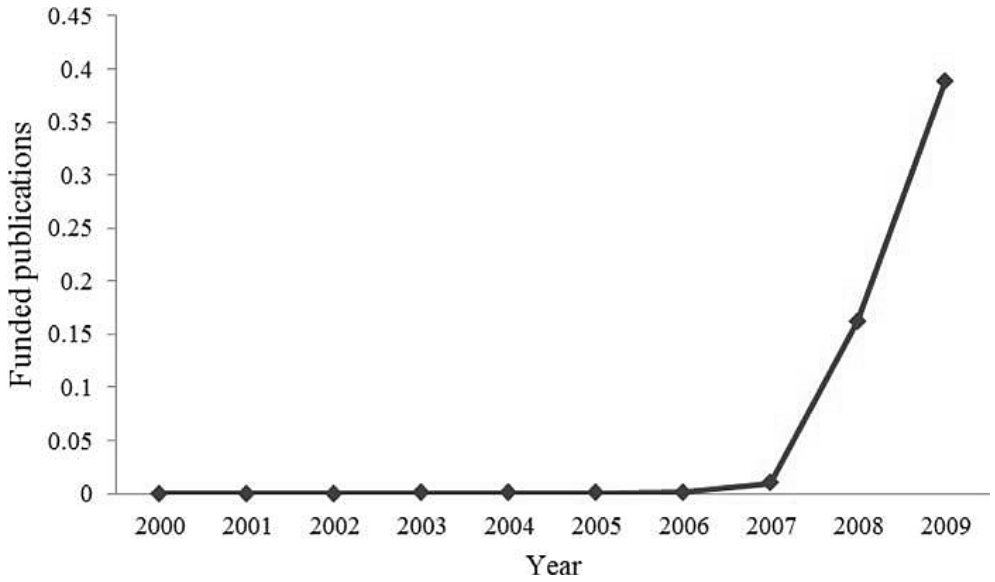

Figure 1. Percentage of the publications funded from targeted research projects in the total number of scientific publications in Iran between 2000-2009

Source: [Jowkar et al. 2011, p. 596]

The authors suggest that the development of the global information network increases the value of information, inter alia, by its universal and immediate availability. This article does not have a direct reference to the source of this information, but if we take into account that in the case of measures for the management, the main information system is the accounting system[3], the above-cited theses can be treated as evidence that currently the most valuable commodity in the market is credible, reliable and on-time-served useful information (both financial and non-financial). Similar findings are illustrated in the article by C. Brandas et al. [2015], clearly indicating that now the development and use of ICT are mainly influenced by the accounting information system – its quality and adjustment to the needs of the users. M.G. Shields [2001, p. 3], in turn, emphasizes that the provision of information to the information system by the accounting system is not a new idea, but a concept well-known and used in practice for many years.

R. Zhao [2003] describes in his article an example from China concerning the transformation of the system of control and management of research activity in

[3] The concept of an accounting system is defined by many authors Cf. for instance [Cooper 1988; Flamholtz et al. 1985; Sobańska 2010, p. 73]. For the purpose of this article, the definition of R.L. Hurt was adopted [2013, p. 4], which describes the Accounting Information System (AIS) as "a set of interrelated activities, documents, and technologies designed to collect data, process it, and report to decision makers."

a biotechnology research institute (the Shanghai Biotechnology Engineering Center – SBEC). He points out that such a system must be based on clearly defined measures for effective financial management of research projects. The author states that the management and control system is the link between the environment of the organization and the implementation of the strategy of operation. In addition, external sources of funding targeted research projects are the key to improving the efficiency of the system for control and management. The reasons for this are, on the one hand, the budgetary constraints of these projects, and on the other, the information requirements of the funders. In conclusion, the article stated that the analyzed institute (SBEC) despite a high academic level, advanced technology and excellent location was not able to achieve commercial success due to the lack of an effective control and management system. This conclusion is a direct confirmation of the main hypothesis formulated in the introduction.

As indicated by A. Karmańska [2006, p. 138], in order to maintain the proper quality of information created for the management, the following steps should be taken:

a) make the appropriate selection of the information obtained from external and internal sources of information from the point of view of the assessment of its decision-making suitability,

b) ensure proper procedures for its creation and processing,

c) synchronize the activities related to the flow of information.

I. Sobańska [2010, p. 74] stresses that "the increasing demand for information, useful (relevant) in the process of decision-making and the process of control is the cause of the development of the second area in the accounting system – i.e. management accounting." The role of the most important tool of management accounting – namely cost accounting – in improving the competitiveness of research institutes in the Lublin province (Poland) was in turn discussed by A. Nóżka [2010]. Based on her empirical research, she identified the weaknesses and the lack of adjustment of cost accounting in the examined institutes and proposed the basic requirements that they should meet. The author states inter alia that "meeting the new challenges faced by the R&D entities[4], requires a change in the management of these institutions, since it has become in many ways similar to the management of any other company in the market economy, and so it should be based on adequate and reliable information, including that on costs." In addition, the article indicates that the primary purpose of cost accounting of research institutes should be for instance meeting the reporting needs of the funders, supporting the decision-making processes (e.g. a reliable valuation of the cost of research projects), control of the expenditures and measurement of the performance and economy of operation. It is another confirmation of the main hypothesis formulated in the introduction.

[4] It is a term synonymous with research institutes. The article comes from 2010, when the new law on research institutes was just being passed. The Act replaced the previously used term of "research-development (R&D) entities" with research institutes and this term is used in this article.

In the analyzed literature, there were also articles in which the authors determined more precisely what an accounting system adapted to the needs of measurement of targeted research projects means. I. Sobańska and J. Kalinowski [2013] presented the results of the analysis of the process of change in the years 1990-2011 in cost management in European universities from 9 countries in which the process of change in cost accounting is significantly advanced and they formulated conclusions that should be used by the universities of the European Higher Education Area beginning the difficult process of introducing changes in cost accounting in the context of the application of strategic management. On the other hand, the previously cited A. Nóżka in another article [Nóżka 2013] explains the reasons encouraging the use of activity-based budgeting in research institutes, indicating the areas of management, where it could be utilized. In contrast, M. Koczuba-Sobieraj and P. Mielcarz [2011] presented a model of cost accounting of entities conducting scientific-educational activities. This model, however, contains a number of simplifications, particularly concerning the measurement of the main component of the cost of this type of entities – namely the cost of salaries. For this reason, according to the author, its use can lead to a significant distortion of information, which is a fault disqualifying the utility of any information system. Against this background, an interesting proposal of measurement of the cost of salaries is the payroll accounting model for scientific-research activity and teaching activity making a part of the Comprehensive Information System implemented in full in 2014 at the University of Łódź and described in detail in the article by I. Sobańska, A. Wencel, J. Kalinowski [2014].

Summing up the review of the literature concerning the aim of this article and the formulated hypotheses, it should be noted that the analysis showed, on the one hand, a large research gap in the area of the impact of the use of sources of financing for targeted research projects on the accounting system in research&development entities, and on the other, it confirmed indirectly, and in two cases directly, the main research hypothesis.

3. Hypotheses and research methods

In order to accomplish the aim of this paper, several hypotheses were adopted that were developed based on extensive literature studies and an analysis of the results of an empirical study carried out for the purposes of this article. In formulating the hypotheses, the practical experience of the author was also taken into account, gathered under the direct contact with the practice of financial management and accounting in research institutes in Poland.

Main hypothesis: A prerequisite for obtaining external funding sources by research institutes to implement targeted research projects is the use of an accounting system properly adapted to the particular needs of the funders and allowing for the creation of reliable, accurate and timely information about the project for them.

Auxiliary hypotheses:

1. There is a relationship between the size of the sources of financing from the institutions contracting targeted research projects and the management accounting tools used.

2. There is a relationship between the size of the sources of financing from the institutions contracting targeted research projects and the use of information from the accounting system for the purpose of reporting to the funding parties by the department dealing with the settlement of research projects.

3. There is a relationship between the size of the sources of financing from the institutions contracting targeted research projects and the role of the project manager in the development of information for the funders of research projects.

In order to verify the adopted hypotheses, two research methods were used: a statistical analysis of the survey results and an analysis of the literature. As many as 110 persons were selected employed in nearly a half of all research institutes in Poland and the survey was conducted in January 2015. The sampling used in the study was on-target selection. The author of the research received 52 properly completed forms from the management staff of the units analyzed. Specially trained interviewers gathered the source material in the form of 52 forms filled out with the "PAPI" method (Paper and Pencil Interview). The material was statistically analyzed using SPSS IBM Statistics.22. Next to the tables and charts there were determined structure indices, values of the V-Crammer (v) coefficient and the minimum probability (p) values for the sake of verification of statistical hypotheses about the significance of correlations between the more important variables[5].

4. Analysis of the survey results – characterization of the sample

4.1. Introductory information

As noted earlier, the article uses the results of the research carried out based on 52 surveys (out of the total 110 people representing nearly half of the research institutes in Poland). For the purpose of drafting the characterization, the sample was divided into two main categories:

1. Respondents who completed the questionnaire.

2. Research institutes in which the respondents who completed the questionnaire were employed.

Each of the groups was described by three parameters. In the first one, the elements taken into account were age, education, and the function performed in a research institute. The second group was characterized by the size of employment,

[5] More information on the statistical analysis and interpretation of the size of the V-Crammer (v) coefficient and the minimum probability (p) Cf. in: [Starzyńska 2005, pp. 328-330].

an organizational unit realizing the management accounting/controlling system and the share of external sources of funding for the implementation of targeted research projects in the total revenues of the examined institutes.

4.2. The structure of the respondents taking part in the survey

In the studied sample, the largest share of 42.31% was held by respondents aged 36-45 years, followed by those aged 56 years or more (25%), and those aged 25-35 years (19.23%). Young people under 25 years of age accounted for the smallest percentage of only 3.85%.

The analysis of the education of the respondents showed that 92.31% had higher education (including 59.62% with higher economics-related education) and only 7.69% had secondary education (including 50% with secondary economics-related education).

The respondents had both the financial and economics-related functions (48.08%) and other, non-financial functions (51.92%) in the examined institutions.

The financial and economics-related functions included the following positions: deputy director (head of unit) responsible for the financial/economic matters, chief accountant, specialist/manager in financial accounting and economics, specialist/manager in the field of management accounting/controlling, and the non-financial functions embracing the positions mentioned below: director (head of unit), deputy director (head of unit, other than the head of unit for financial/economic matters) and specialist/manager in the field of service and settlement of the scientific-research projects.

4.3. The structure of the analyzed research institutes

The studied sample was dominated by research institutes employing between 101 and 500 people (61.5%). The share of institutes employing over 500 people was 21.2%, and the percentage of institutions with employment rate of up to 100 people accounted for 17.3% of the whole sample.

As indicated by the results of the research, in 53.85% of the analyzed institutions, there was no separate organizational unit involved in the management accounting/controlling system. Only 21.15% of the examined institutes had a distinct section in the financial division, and 17.31% had a one-person position in the financial department dealing with the management accounting/controlling system.

In the examined institutions, there was observed a varied share of external sources of funding for the implementation of targeted research projects in the total revenues. For the purpose of further analysis, this perspective was used to identify three categories of institutions:

1) share amounting to 0%-40%,
2) share amounting to 40%-60%,
3) share amounting to 60%-100%.

On this basis, the percentage structure was determined of the surveyed institutes presented in Figure 2.

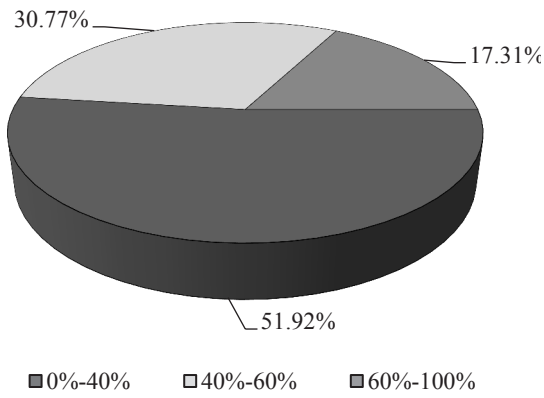

Figure 2. The share of external sources of financing for the implementation of targeted research projects in the total revenues in the studied institutes

Source: author's own research, 2015.

The largest group (51.92%) among the surveyed and 100% of such revenues. institutions are entities that receive 0% – 40% of their revenues from external sources of funding allocated to the implementation of targeted research projects. As many as 30.77% institutes obtain 40% – 60%, and only 17.31% receive between 60%

5. The analysis of the survey results – verification of the statistical hypotheses

5.1. The verification of the relationship between the size of the financing sources from the institutions contracting targeted research projects and the management accounting tools used

In order to verify the hypotheses formulated in the introduction, on the basis of the results of the survey, the indicators of structure and the values of V-Crammer (v) and the minimum probability (p) were determined. The analysis of the components of the accounting system in the examined institutes by the share of funds received for research projects in the total budget of revenues demonstrates the presence of a statistically significant relationship between the variables analyzed (Cramer's V = 0.38, p-value = 0.02), which supports auxiliary hypothesis 1. Entities with the share of funds received for the realization of research projects in the total budget of revenues within the range of 60%-100% had only a subsystem of financial accounting and cost accounting.

In the case of institutes in which the share of funds received for the realization of research projects in the total budget of revenues ranged from 40% to 60%, greater diversity is apparent of the accounting systems. As many as 43.8% of the surveyed entities had accounting systems composed of subsystems of financial accounting and cost accounting and advanced management accounting oriented on project management (controlling focused on project management).

Institutes with the smallest share of funds received for the realization of research projects in the total budget of revenues, namely within the range from 0% to 40%, had the most diversified accounting subsystems such as financial accounting and cost accounting (77.8%), advanced management accounting (controlling) (11.1%), and advanced management accounting oriented on project management (controlling focused on project management) (7.4%) (Cf. Figure 3).

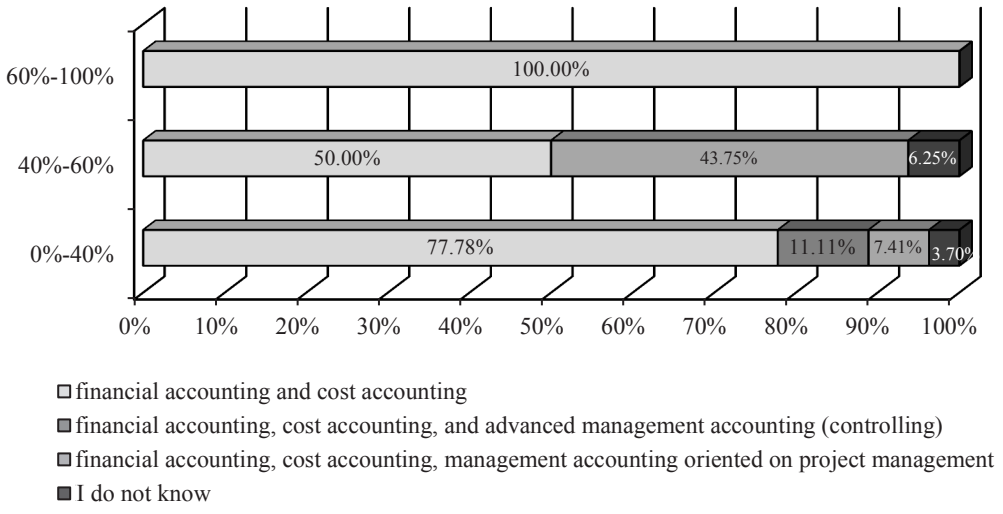

Figure 3. The accounting subsystem and the share of funds received for research projects realization in the total budget of revenues of the examined institute

Source: author's own research, 2015.

From the results obtained it can be concluded that institutes, in which the share of external funding is contained within the range of 40%-60% most clearly recognize the need for an accounting system tailored to the information needs of the funders (a subset of financial accounting, cost accounting and management accounting oriented on project management).

5.2. The verification of the relationship between the size of the sources of financing from the institutions contracting targeted research projects and using information from the accounting system for the purpose of reporting to the financing party by the department dealing with the settlement of research projects

The importance of the funds received for research projects in the total budget of the revenues of the investigated institute had an impact on the use of information from the accounting system by the department dealing with the settlement of projects. The analysis of correlation supported the existence of a substantial and statistically significant relationship between these variables (Cramer's V = 0.366, p-value = 0.033), confirming auxiliary hypothesis 2.

Entities with the share of funds at the level from 60% to 100% used the information from the accounting system, mainly from the book-keeping data, for settlements with the financing institutions (88.9%). In the case of entities with the share of funds within the range from 40% to 60% and from 0% to 40%, the utilized information from the accounting system was the basis for the final verification

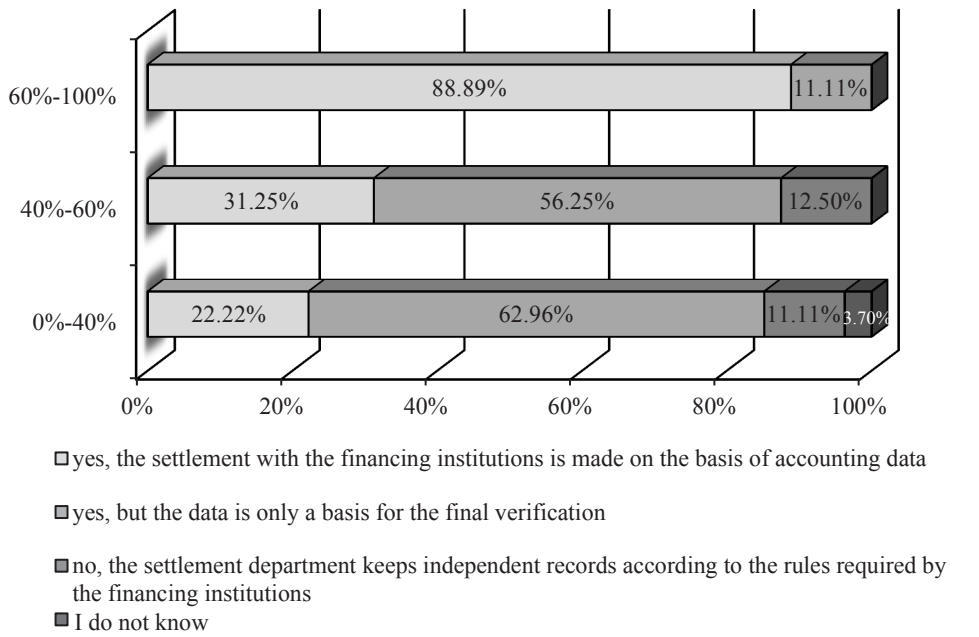

Figure 4. The use of information from the accounting system by the department dealing with the settlement of projects and the share of funds received for research projects in the total budget of revenues of the investigated institute

Source: author's own research, 2015.

(respectively 56.3% and 63%) and settlements with the financing institutions (respectively 31.3% and 22.2%). Only 12.5% and 11.1% of units with the share of funds within the range from 40% to 60% and from 0% to 40% in the total budget of revenues did not use the information from the accounting system, and the settlement department kept independent records according to the rules required by the funding institutions (Cf. Figure 4).

On the basis of these results, it can be concluded that the institutes where the share of external funding is the biggest (60%−100%), most frequently use (88.9%) information from the accounting system for the settlement with the financing institutions. In other entities, detailed information (analytical) is created outside the system, but prior to its publication, it is aggregated and verified at this level with the accounting data.

5.3. The verification of the relationship between the size of the sources of financing from the institutions contracting targeted research projects and the role of the project manager in the development of information for the funders of research projects

The percentage of the sources of financing received from the institutions contracting targeted research projects in the total budget of revenues of an institute has an impact on the importance of the project manager in the development of information for the funders. The analysis of correlation supported the existence of a substantial and statistically significant relationship between these variables (Cramer's V = 0.364, p-value = 0.087), confirming auxiliary hypothesis 3.

In the entities with the share of external financing at the level from 60% to 100%, a large or absolute impact of the project manager on the decisions concerning the way of creating the information for the funders was over 66%. It was a little lower for institutions with the share within the range of 40%-60%, and it amounted to 62.5%. In contrast, there was an inverse relationship in units with a small (0%-40%) share of external sources. The respondents indicated an answer of "no impact," "little impact," "medium impact" in 62.9% of the cases (Cf. Figure 5).

An interesting supplement to the previous analysis, which confirmed the big influence of the project manager in the institutes with the share of external financing amounting from 40% to 100% (48.1% of the surveyed institutions) is information on the responsibility for the projects unapproved as a result of incorrect settlement (cf. Figure 6).

In all the surveyed institutions, irrespective of the size of the share of external sources of financing, the responsibility of the project manager in this respect occurred in 33%-37.5% of the entities. In contrast, in the group of institutes with the largest share of funds for targeted research projects (60%-100%), the majority of answers suggested that no one was responsible for projects unapproved as a result of incorrect settlement (44.4%). Although formally it is not true (it is always the head of the unit

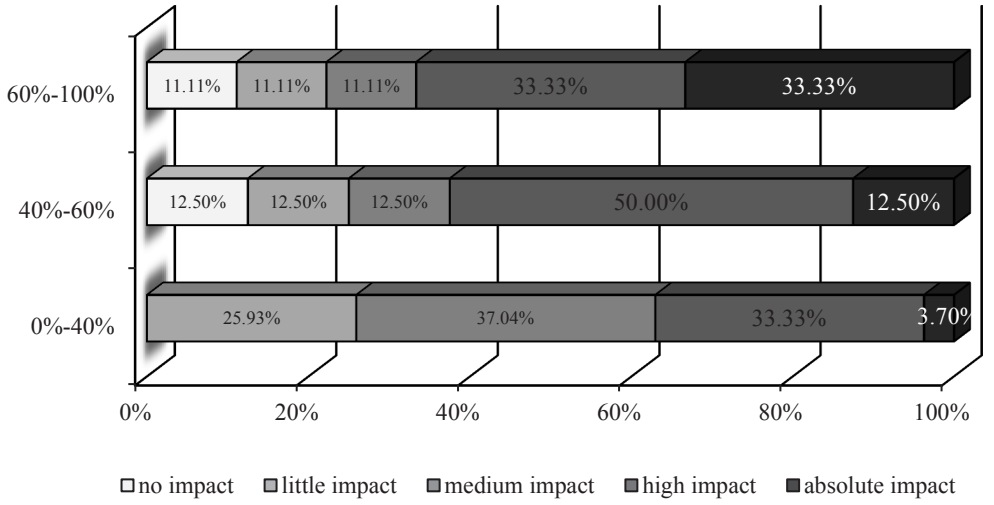

Figure 5. The method of creating information for the funders of research projects and the share of funds received for research projects in the total budget of revenues of the investigated institute

Source: author's own research, 2015.

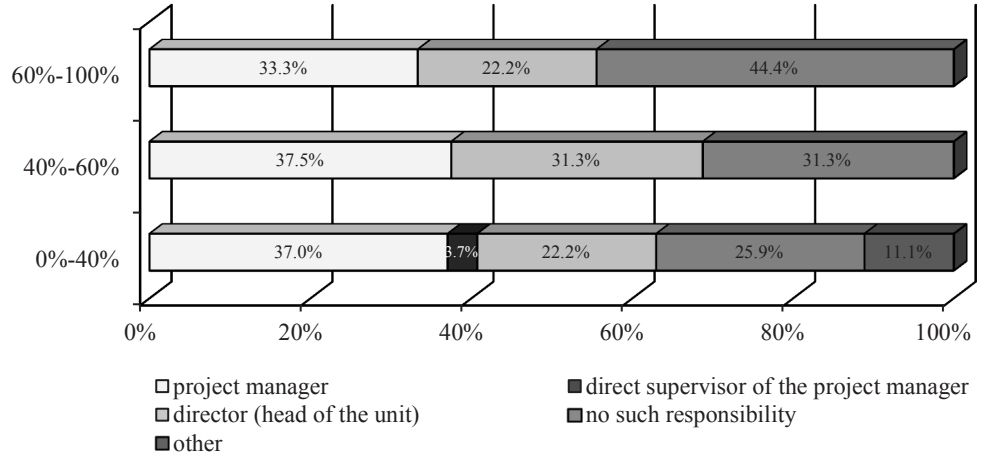

Figure 6. Responsibility for the research projects unapproved as a result of incorrect settlement and the share of funds received for research projects in the total budget of revenues of the investigated institute

Source: author's own research, 2015.

that is responsible "outside", in this case − the director of the institute), what is important is the level of awareness of the surveyed employees, who usually were the persons with higher economic education (89.6% - Cf. point 3.2).

6. Conclusions

The aim of the article was to analyze the impact of the use of funding sources for targeted research projects on the accounting system of research institutes in Poland. For this purpose, research hypotheses were formulated, namely the main hypothesis and three auxiliary hypotheses. The auxiliary hypotheses, which aimed to confirm the main hypothesis were positively verified by the statistical analysis of the results of the survey conducted in January 2015. On this basis, it was concluded that:

1. There is a relationship between the size of the sources of financing from the institutions contracting targeted research projects and the management accounting tools used.

2. There is a relationship between the size of the sources of financing from the institutions contracting targeted research projects and the use of information from the accounting system for the purpose of reporting to the funding party by the department dealing with the settlement of research project.

3. There is a relationship between the size of the sources of financing from the institutions contracting targeted research projects and the role of the project manager in the development of information for the funders of research projects.

The article was written based on a statistical analysis and a literature review, which additionally positively verified the main hypothesis: A prerequisite for obtaining external funding sources by research institutes to implement targeted research projects is the use of an accounting system properly adapted to the particular needs of the funders and allowing for the creation of reliable, accurate and timely information about the project for them.

The analyzes carried out proved the existence of the relationship between the level of the sources of financing for targeted research projects and the degree of development of the accounting system and its orientation on creating information for funders and project management. The more funds in the examined institutions came from such projects as NCN (National Science Centre), NCBiR (National Centre for Research and Development), the EU projects, etc., the greater the awareness and also the demand for financial information from the accounting system.

The summary of the article are the following conclusions:

1. Meeting the new challenges faced by research institutes requires a change in management, which in many ways has become similar to managing any other company in the market economy, and so it should be founded on adequate and reliable information, which is based on the accounting system consisting of two subsystems integrated with each other: financial accounting and management accounting.

2. In recent years, the main source of scientific-research activity are targeted research projects financed by funders with different reporting requirements for their realization. As shown by various examples from around the world, adjustment of the

information system to these requirements is a strategic challenge for research institutes, which may determine the potential to obtain these projects.

3. Dynamic changes in Information and Communication Technologies (ICT) cause an increase in the value of information by, among other things, its universal and immediate availability. Units that will have such information (timely, reliable, verifiable and useful), will gain a significant competitive advantage in the global research market.

4. Institutes, in which the share of external funding is contained within the range of 40%-60% most clearly recognize the need for an accounting system tailored to the information needs of the funders (a subset of financial accounting, cost accounting and management accounting oriented on project management).

5. Institutes in which the share of external funding is the biggest (60%-100%) are characterized by the greatest degree of using information from the accounting system for the settlement with the financing institutions. In other entities, detailed information (analytical) is created outside the system, but prior to its publication, it is aggregated and verified at this level with the accounting data.

6. Institutes in which the share of external financing is within the range of 40%-100% entrust most of the tasks related to creating information for the funders to the project manager. An inverse relationship occurred in units with low (0%-40%) share of external sources.

7. Customization of the accounting systems to the needs and requirements of the funders together with providing reliable information for management is a challenge, which in the near future will have to be faced by all research institutes that do not have such systems.

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