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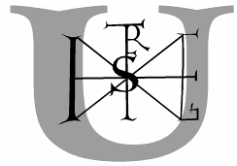

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DEVELOPMENT OF MANAGEMENT ACCOUNTING APPLICATION AT HUNGARIAN AGRICULTURAL ENTERPRISES

THESES OF THE DOCTORAL (PH. D.) DISSERTATION

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1. ANTECEDENTS OF THE WORK, TARGETS SET

1.1 The significance and relevance of the topic

One of the most important points about this issue is that in Hungary nowadays the activities that support managerial decisions and corporate management tasks are not as widespread, developed, stressed and focused as they should be. One of the main reasons for this can be found if you consider the past of the country. This phenomenon is the so called 'lack of past', which has its roots in the socialist system. Even today most people interpret management accounting as financial accounting, which is meant to inform non-company users about the company's current conditions concerning assets, income and finances based on past figures [Laáb, 1998]. However, the primary goal of management accounting is to support the executive layer in the area of short and long term decision making, that is, it provides information for in company use. Rather than giving information about the past, management accounting focuses on future activities of the company using not only past figures but also estimates and forecasts. A future-oriented managerial attitude and the ability to make well-prepared quick decisions are essential factors to build up and maintain a successful operation and competitiveness in the long term as far as Western European and Hungarian companies are concerned. Management accounting plays an absolutely essential, proactive role on the way to company success. Its application 'forces' the enterprise to become profitable [Kittredge, 2004]. The application of management accounting also supports other basic corporate goals like the efficient use of resources or proper stock management, the maintenance of liquidity or in general the profitable running of the business.

In the present paper a special focus is put on the agricultural sector, in which the application of management accounting is highly significant. Nowadays it is getting more and more evident that the operation of agricultural enterprises requires the application of management information systems – among others controlling and management accounting, which it includes - to solve a large proportion of management problems. Agriculture as a sector of the national economy has a number of characteristics that are also significant for management accounting. Production takes place outside in open areas, that is, it is affected by the forces of nature. A large proportion of investment is through arable soil, that is, with the insertion of living organisms. The activity necessitates a large amount of capital and it usually takes a long time for the investment to have its return. Due to the time period required by the production process the information related to the volume of production as well as to sales prices is quite uncertain at the time of decision making. All these factors show the peculiarly risky nature of the sector and highlight the need for a more careful planning.

The topic discussed in the present paper is an up-to-date issue partly due to the fact that Hungary has recently joined the European Union. A significant part of my paper and research results is made up of analyses of the European Union Farm Accountancy Data Network (hereinafter FADN) as well as of the conclusions drawn based on them. In Hungary the basis of data supply to the FADN system is provided by the Hungarian FADN System, whose operation is coordinated by the Research Institute of Agricultural Economics (RIAE). Enterprises that are members of the system provide their data voluntarily. All the information provided is handled as confidential by both RIAE and the Commission. The enterprises can use the collected and systematised data for their own analyses, evaluations as well as for the preparation of their decisions. As a result of this, the production of the input information (or at least a large part of it) required for the application of management accounting does not mean extra expenses. In addition to this, the information already processed, analysed and returned by the FADN system (for example, information that contains processed combined data coming from similar companies, that is, not unique information) may also serve as a valuable basis for the preparation of further managerial analyses. There seems to be a

clear connection between data to be supplied to and obtainable from FADN and data used by management accounting information systems.

1.2 Objectives and hypotheses

In my research my basic objective is to examine the development opportunities of Hungarian enterprises through management information systems with a special emphasis on management accounting and the agricultural sector. In my research my goal is to confirm that my hypotheses are right.

In my paper I discuss the available literature on this issue to evaluate – with a management oriented attitude - the role management accounting has supporting the management of companies with a special focus on the agricultural sector and corporate development opportunities.

In my research I examine the popularity, level of development and quality of the application of management accounting in the daily practice as well as the attitude and theoretical opinion of Hungarian agricultural executives on the issue. This way I have the opportunity to examine, describe and evaluate the general situation of management accounting in Hungary and to point out the insufficiency of application and further areas for development as well as highlight and prove the necessity of application.

Furthermore, I consider it very important to study and analyse the connection, the common information database as well as the needs of management accounting and the Hungarian FADN System – established for the European Union FADN system in order to explore how the two systems support each other and the outside economic environment, the advantages of using both systems at the same time and the future potentials and areas to be developed.

Based on my researches, empirical experience and secondary examinations I have four hypotheses. These assumptions contain my conclusions, on the one hand, about the possible and probable obstacles of the widespread application and development of management accounting and on the other hand, my assumptions and ideas related to the economic advantages and the necessity of application.

Hypothesis 1: The widespread application of management accounting is hindered by the social and economic characteristics of the Hungarian attitude especially in the sector of agricultural enterprises.
The way of thinking and attitudes of corporate executives related to economic issues are still heavily influenced by factors that were characteristic during the forty years of socialism. One of the main features of this particular attitude is that executives have not yet understood the importance and necessity of the application of information systems that support company management – for example, the management accounting system. Neither have they realised that their application has advantages concerning the future of their enterprises, that is, the return of the investment. It also has an effect on the company level harmonisation of the criteria of business management and management accounting approach.

Hypothesis 2: The corporate integration or lack of integration of information tools and systems is a real hindering factor of the application of management accounting.
In addition of what has been discussed so far the application of management information systems also requires the establishment of a physical basis. A management information system in today's

world cannot operate without software, information networks, hardware equipment and other IT investments, which means that some financial expenses cannot be avoided. Generally, agricultural enterprises at the moment do not always possess the Information Technology equipment that is indispensable for management information systems and development or integration is often lacking. This is due to the lack of own resources earmarked for development, the low level of investment plans – which often has to do with the size problem of enterprises as mentioned above – as well as to the quite low level of creditability of agricultural companies as it is well known.

Hypothesis 3: Enterprises that use management accounting or similar information in management are more efficient than others. What is more, the system also supports decision-making and management. Once applied, the enterprises can become more competitive in the agricultural sector.

There seems to be a connection between the proactive decision-making support that is built up with the use of management accounting information and the long-term profitability and positive economic development of enterprises. Under the current economic conditions the achievement and retainment of competitiveness means more and more pressure for company executives to have a better cost management, more accurate plans and the most proper financing of investments in order to increase company efficiency and to come up with the most appropriate long-term strategy [Garg et al., 2004]. All these factors make it necessary to turn the data into valuable information, to have a high level of accountability within the company, to have a higher transparency of costs and to have more grounding for future plans and decisions. Management accounting provides information, systems, methods and techniques that make the executives able to make plans for the future and that help them maximise the profit.

Hypothesis 4: There is a link between management accounting and the information basis and area of utilisation of the FADN system. Moreover, examinations show that the two systems support each other.

European Union FADN and the Hungarian FADN System have a significant role as far as the agricultural application of management accounting is concerned. One of the most important bases of management accounting is the data and information it uses, which, in many respects, show similar characteristics to those of the input and output data of the FADN system. The widespread use of the European Union FADN system at Hungarian companies might also promote the increasing use and development of management accounting and vice versa. The development of the two systems may have a positive effect on each other and on the outside environment economically, statistically and as far as the attitudes are concerned.

2. MATERIALS AND METHODS

The applied background of my research was strengthened by the fact that during my professional career, I spent three years working for the Hungarian subsidiary of the international accounting company PricewaterhouseCoopers. During this period, I got into contact with a number of high level executives responsible for Hungarian companies. At the same time, I also got an insight into the information produced and methods applied in the financial, accounting and management activities of the enterprises.

During *my research of professional literature,* I studied the financial, accounting, controlling and general managerial articles of Hungarian and international professional books, newspapers and journals that have been published in the past few decades with a special emphasis on articles about the agricultural sector. I have also read relevant Hungarian and European Union laws, rules and regulations as well as statistical analyses published by the Hungarian Central Statistical Office and the Research Institute of Agricultural Economics and sources with internet addresses found among references. I also took part in some conferences and professional events which did not only provide a general theoretical background but also useful practical experience and up-to-date news all of which I could make use of while I was writing my paper. During the examination of the professional literature with a system-based approach I compared them and – based on my own theoretical and practical experience – I formulated my own opinion, interpretation and standpoint. When I studied the professional literature I focused on the features of the modern management approach and of agricultural enterprises. I believe that when the issues of the Hungarian economy are discussed – as a consequence of fast changing economic events of the past few decades – the up-to-date and practical professional approach is absolutely essential.

When the *questionnaire was created* and I considered the aspects to be focused on, I relied on the professional knowledge and experience gained from the consultations with the experts, researchers and colleagues of the Research Institute of Agricultural Economics. They provided me with statistics, analyses, professional publications, databases and other sources that turned out to be valuable materials I could use when the questionnaire was put together. As a result, I could create a questionnaire that suited best my research goals. To carry out the questionnaire based survey, the General Manager of Trendcoop Ltd provided me with access to the company's database. Trendcoop Ltd, which is the largest company of its kind in Hungary and has clients coming from the largest geographical area, deals with FADN data. The data gained this way was the basis for the questionnaire survey discussed in my paper. The questionnaires were completed, on the one hand, based on the economic data of the database of Trendcoop Ltd, on the other hand, based on general management, approach, finances and accounting data provided by the executives of enterprises taking part in the survey.

My research was carried out with the participation of agricultural enterprises that are members of the Hungarian FADN System that enables them to supply data to the European Union FADN system. This selection of Hungarian agricultural enterprises was necessary since in my research, among others, I studied the positive effects management accounting and the FADN system have on each other. To draw conclusions as accurate as possible and to make the survey as representative as possible, two basic aspects had to be considered when samples were taken. On one hand, the grouping and categorisation of enterprises so that they support best the research results, and, on the other hand, geographical coverage. To achieve this goal I used the method of *stratified sampling* based on the size categorisation and geographical position of the companies.

I started my research with secondary type data collection and qualitative research in order to be able to outline more exactly the research problem and the research activities to be carried out. During my *secondary data collection*, I had several conversations with experts and researchers mainly working in the Research Institute of Agricultural Economics, in my workplace, in the Agricultural and Rural Development Agency and in the Directorate-General for Agriculture and Rural Development furthermore, with the executives of different sized companies. Besides, by means of reading several sectoral assessments and analyses of economic trends that are available via the internet or EU databases, I broadened and updated the topic related information I had acquired before. Secondary type information serves as a proper basis at the beginning of research. Apart from the secondary type data collection, *qualitative research* also proved to be useful for defining the research problem more accurately and for perfecting the questionnaire. I conducted *long interviews* in order to uncover relations of cause and effect and different opinions in connection with the topic under investigation, furthermore, to understand motivation in depth. The interviews lasted 1.5-2 hours on average, in the course of which we assessed together the management accounting related areas of the interviewees' management and their general theoretical points of view related to the topic. During the interviews with the executives of businesses, I utilised the advantages of personal contacts.

In the primary data collection phase i.e. at the *application of primary research methods*, out of the generally well-known methods I opted for the *questionnaire survey* because this served achieving the research purpose better. The target group included medium-sized businesses (collective and private agricultural holdings) that are members of the Hungarian FADN system. Out of these approximately 800 businesses at present [Keszthelyi, 2007] a total of 60 was selected. The interviews were carried out by an interviewer, due to which the willingness to reply was 100 per cent and the whole of the research became much more efficient, productive and professional.

The *questionnaire* contains 34 questions belonging to four structural groups. The *General features of the companies* deals with the size category of the business, number of employees, average annual income, and the category of the business activities etc. The second group contains the *general questions related to the application of management accounting.* For example whether any management accounting tools have been used at all, if yes, how long, what the experience and the attitude of the management and employees have been like and what inhibiting or positive factors the management can see in relation to the application of management accounting, etc. The third group of questions contains more detailed *questions related to the application of management accounting.* Among others, this group of questions deals with planning costs and general business activities, budgeting processes, authorising, calculation and accounting of costs, methods for calculating prime costs, the use and analysis of indices and other methods for planning and controlling. The last group contains *questions examining the relation between management accounting and the Farm Accountancy Data Network.*

The questionnaire contains both open and closed questions. The *open questions* are needed mainly for surveying the knowledge, the professional grounding, the opinion, the way of thinking, the ideas and the needs of the interviewees. Furthermore, such questions were also used for checking purposes. On the basis of the questions inviting reasoning, it is possible to decide whether the interviewee has given valid data when answering the question being checked. Nevertheless, the major part of the questionnaire is based on *closed questions* in which case the interviewees can give pre-determined answers. A considerable advantage of the latter question type is that it is simple to answer, it does not discourage answering. During the assessment, we can work with more unambiguous answers than in the case of open questions. The questionnaire includes classical *yes-no questions* and it also contains *ordering questions* which provide opportunities for giving more than one answers, and putting them in a hierarchical order. It was an important aspect for me to

ensure the good quality of the assessment, the measurability and quantification of the answers by the adequate formulation of the questionnaire.

The information recorded in the questionnaire survey was analysed and interpreted by using *statistical analysis based on scientific methods* in order to support the conclusions of the dissertation on the desired level. The electronic data processing was made by using the SPSS (Statistical Package for the Social Sciences) statistical program package and I used several statistical analysis methods. The results were presented by using a number of tables and graphs to promote understanding and receptibility for readers. For the analysis, I used several statistical methods, the most frequent of which were the following.

- The *monovariante analysis* is one of the first steps of every database analysis. From these I used the most common measures of central tendency such as the *mean, median* and *modus calculations*; furthermore, I used *measures* such as *kurtosis* and *skewness,* which describe distribution horizontally and vertically.
- For analysing attitude questions, I used the *Likert-type measuring method*. I measured the effects of certain factors by using a five-grade Likert-scale where only the smallest and the biggest values were defined with text (most true, not true at all). In this way, I was able to measure the strength of the particular opinion by the average score of the answers given to certain factors.
- For analysing *the relations between two or more variables* I often used *cross table analysis,* when I was interested to find out whether the two nominal or ordinal factors were related, and if yes, how strong the particular connection was. I used this type of analysis when I needed to know the answers to another or several other questions given by respondents who gave identical answers to a certain question. From the statistical indices available, I mostly used the *Phi* and *Cramer's V coefficients* to analyse the strength of the possible correlations.

3. RESEARCH RESULTS

Partly on the basis of my literature review, partly as a result of the fact that the Hungarian management accounting related literary sources focus on cost management, I generally expected that the practice would be in accordance with the available Hungarian professional theory namely that management accounting mainly deals with costs or rather their planning and analysis. My questionnaire survey has not justified that expressly. It shows the recent changes and development in the management accounting culture or in the whole financial-economic culture in Hungarian enterprises. Unfortunately, several executives did not have clear ideas about the theoretical and practical background of management accounting and it was not uncommon that the executives – even from given possible answers – were not able to tell what type of profit and loss account, cost accounting or prime cost accounting methods their company uses. On the other hand, the executives of agricultural holdings where management accounting has been introduced in any way are relatively conversant with the practice and field of use. Furthermore, they have favourable experiences regarding the results of use, they have positive attitude towards modern methods for enterprise development and they are open to further development into new areas.

3.1 The features of the investigated companies

In my research I concentrated on middle-sized companies exclusively (40 ESU/ 12 000 thousand HUF > SGM value of farm holding > 8 ESU/ 2 400 thousand HUF). Regarding the number of employees, the large majority of respondents (78.3 per cent) employs only 1 or 2 people, a further nine companies employ three people, two companies had four, while one company employs five, and one had nine. Concerning annual net income, the calculated average value is 14 122 thousand HUF. In the sample divided into categories with an equal number of companies the dispersion of the distribution towards higher values can be recognised as the size of the category intervals is constantly increasing. The income per employee shows normal distribution. Results are presented in Figure 1.

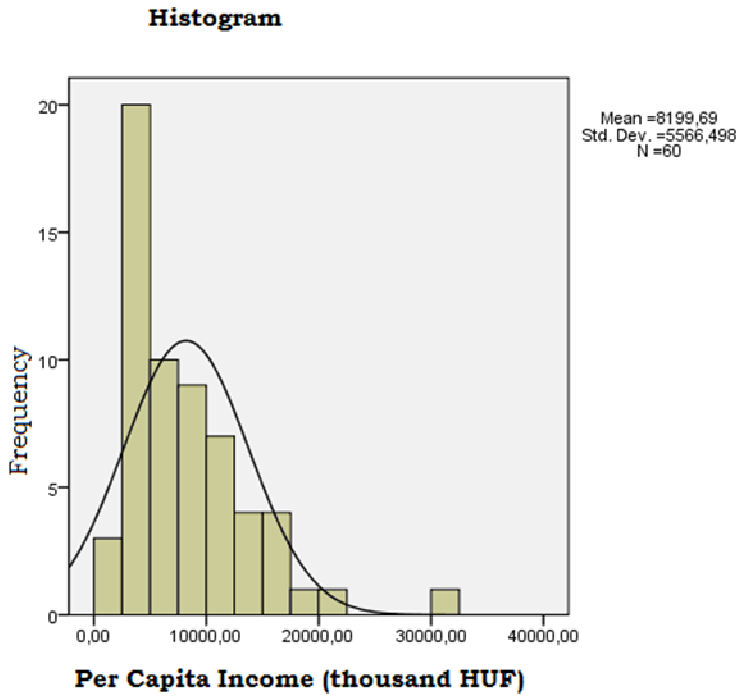

Figure 1 Distribution of income per capita at the investigated businesses

Source: drawn by the author based on SPSS

Looking at the activities of farm holdings, it can be stated that the majority of them deal with cultivation. The proportion of farm holdings dealing with cultivation exclusively was 55per cent, the proportion of farm holdings pursuing solely animal husbandry was only 8.4per cent, and one-third of the respondents constituted of mixed farm holdings (dealing with both cultivation and animal husbandry). Regarding the geographical areas of activities, the farm holdings were roughly evenly distributed among the western, eastern and central regions of Hungary.

3.2 The results of general investigations concerning management accounting and its application

First, I requested an answer from the agricultural holdings to what they mean by the concept of management accounting. With the help of this open question it was possible to assess how much knowledge they have of the subject and of how this tool can aid their work at all. In spite of the fact that among the respondents there were many small-sized companies, a lot of them marked criteria that are really true of management accounting (Table 1).

Table 1 The description of the concept of management accounting by the investigated agricultural holdings

Criteria marked	Frequency of incidence (times)
Aids decision making	13
Aids the operation of the agricultural holding	5
Provides information	2
Tool for cost reduction – income enhancement	7
Balance sheet, Profit and loss account, ledger statement, other accounting document	14
Does not know/no answer	19

Source: compiled by the author

Those who mentioned the first criteria can be said to be apprehending one of the most element factor of management accounting category. Actually, though it can be said to be a wider interpretation, and some of the descriptions might be generalisations, the second, the third and the fourth answer cannot be termed incorrect either. 14 companies considered management accounting identical with solely the elements of the annual report or a ledger statement, and only 19 companies were not able to provide any definition or characteristic. On the whole, it can be established that 45 per cent of the respondents (first 4 factors) are closer to the area of management accounting, 55 per cent are further. It is possible to state in advance that the development work based on this research seems to be necessary, as it would be beneficial to improve this ration.

Next, I attempted to find out what positive results management accounting could yield. The respondents evaluated outstandingly high points to two criteria, the reduction of costs (3.84 on average), and the enhancement of profit (3.88). In other words, agricultural holdings think that management accounting fundamentally increases profitability. Apart from these two criteria, high points were awarded to aiding planning and making the managers more well-informed. They did not see much correlation with areas far from accounting in the classical sense for example motivation or appropriate forming of areas of responsibility. The executives mainly see the benefits of management accounting related to the concepts of profit and income-costs, which are traditionally linked to accounting. At the same time, the functions related to decision support, better information flow, planning and controlling carry a special emphasis, which supports the development of this area. I was also interested to find out opinions on the positive side of management accounting with regard to whether the given agricultural holding applies management accounting as well; and this way I found close correlation based on the evaluation of the SPSS software. In Figure 2 the blue column presents how positive the given effect of management accounting is according to the opinion of companies not using management accounting; while the red one shows how holdings that started the application of management accounting earlier evaluate the system.

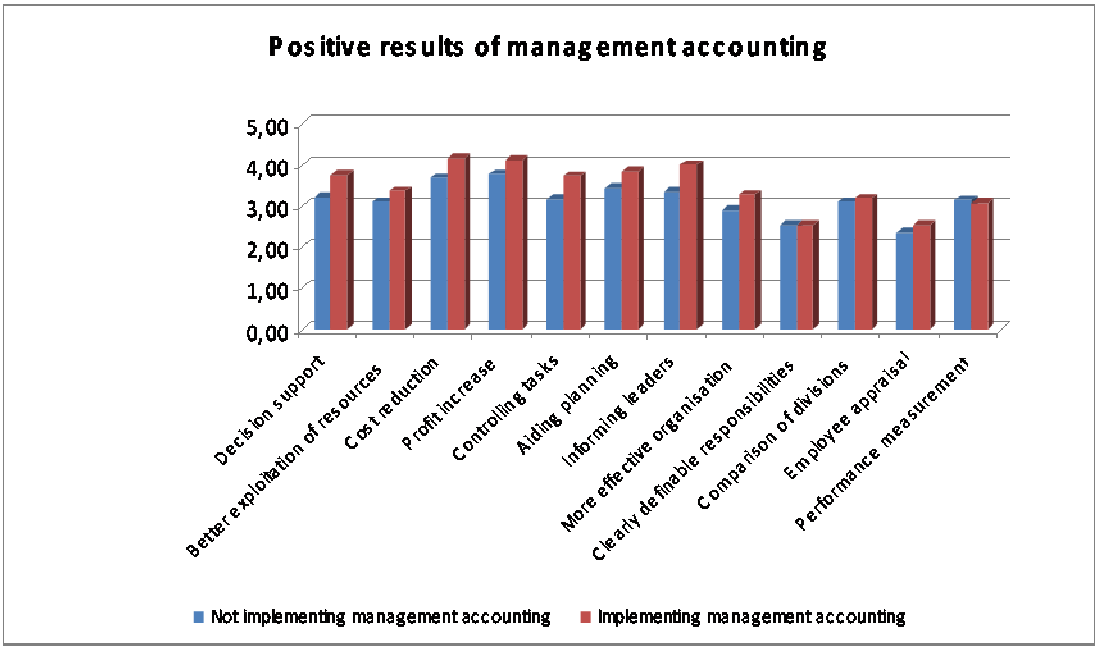

Figure 2 Opinions of agricultural holdings implementing and not implementing management accounting about its positive aspects

Source: drawn by the author based on SPSS

This can be interpreted as an evaluation of expectations (blue column) and of experiences (red column) in connection with management accounting. In other words, if the latter is higher, it means that experience shows that the results of management accounting are better than what was expected. This is realised in full as it can be overtly seen that the evaluation of those who already implement the system is almost always the same as or better than of those who do not implement the system. This clearly reinforces the successfulness of the system since all of those who implement it gave a favourable opinion of it. The largest positive differences between the two groups can be found in the fields of informing leaders (0.66), controlling (0.56), decision support (0.53) and cost reduction (0.47). On the basis of the above, it can be stated that the mentioned fields are the ones where management accounting is the most effective according to practical experiences, and that *management accounting actively supports directing and decision-making activities* in the life of businesses. Based on the opinions, the method was evaluated the lowest in the fields of performance measurement (-0.07) and clearly definable responsibilities (0.00); which shows that it is in the field of human resource management where the holdings can exploit the possibilities of management accounting the least. One of the possible reasons for this could be that in more than three fourth of the surveyed farm holdings the number of employees was 2 or lower. With such low numbers of employees, subjects of human resources are not attached as high significance as at larger companies employing more people.

After that, I intended to find out what inhibiting or limiting factors could play a role in applying or introducing management accounting at the respondent agricultural holdings. I investigated the relationship with the implementation of management accounting at this question, too. It is useful to examine the question from this point of view because the practical experience of the companies can be analysed on this basis such as in which areas they met larger or smaller obstacles than expected. Furthermore, it is possible to assess whether the hypotheses I have made so far are really justified in practice.

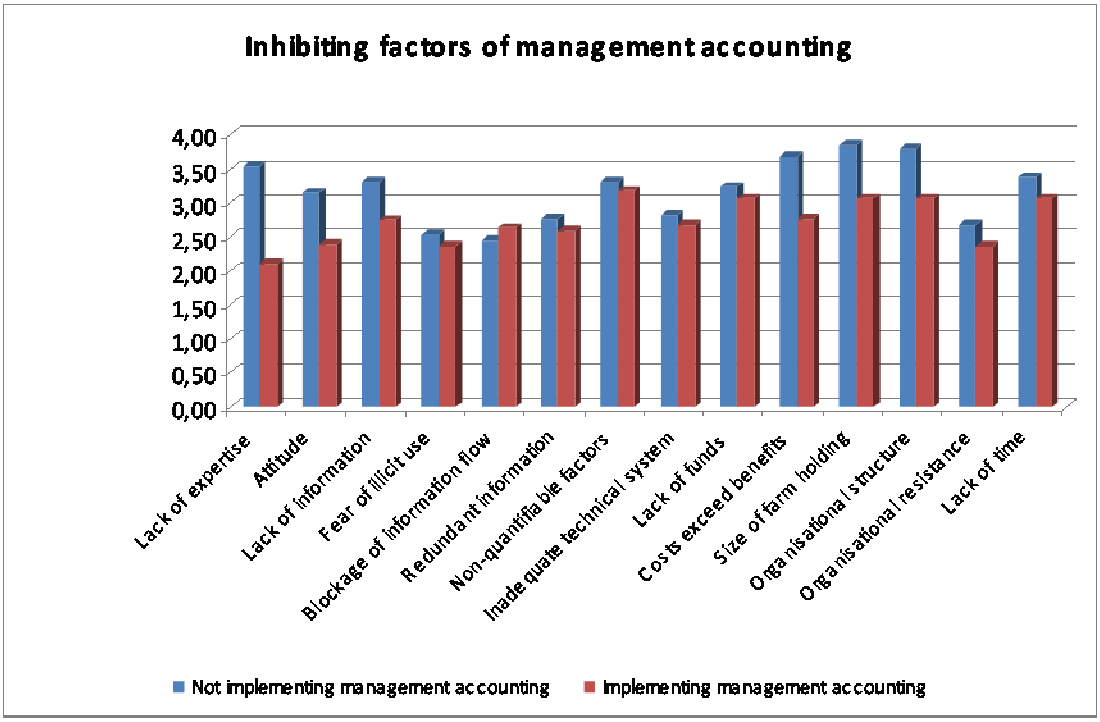

Figure 3 Opinions of agricultural holdings implementing and not implementing management accounting about the inhibiting factors of application

Source: drawn by the author based on SPSS

Results indicated in Figure 3 show that there is only one factor which is considered as a more serious obstacle by the ones who have already implemented the system than by those who have not. Opinions on the method have improved considerably in several fields, moreover, the most important differences between the opinions of users and non-users of management accounting lie exactly where the "resistance" seemed the biggest during the previous analysis. Businesses introducing the system recognised it is a feasible and profitable method for even their size. One of the most important differences – and the second biggest – is the -0.91 figure for "costs exceed the advantages". Based on this fact, those who introduced the management accounting system realised that the positive effects are more considerable than the costs (professional, physical, time etc. investments) involved, in other words, it proved to be a profitable and successful investment. It is also important because the basic driving force behind the decisions of an enterprise is always the concern whether the resulting benefits outweigh the costs and only in that case is it worth introducing.

The result of the observation supports the hypothesis namely that *the introduction of management accounting does not have real physical obstacles*, *the main impediments lie in the heads of the executives, in their thinking and in their attitude*. This fact is definitely advantageous as it can be changed. Thus, mainly the approach, the attitude and the orientation of the executives need to be altered for the development of enterprises by management information systems.

3.3 Results of detailed examinations concerning the methods and tools of the implementation of management accounting

In the third group of questions I intended to assess the existing accounting culture of the companies. I examined how developed the planning and forecasting systems of the businesses were, whether they prepared short or long term plans and if yes with what regularity. The majority of the companies (68.3 per cent) answered that they prepared plans at least once a year while 15 per cent do not prepare plans at all. This fact can be considered favourable as they were mostly micro businesses. Almost 75 per cent of the companies prepare some kind of plans for costs which is not much smaller than the total number of the companies who plan. The conclusion can be drawn: costs have a significant role during planning. It is not surprising as the area of costs is the most manageable and controllable for a company. Furthermore, it is a basic task for every business to plan the income with the costs as these factors of activity have the most important role in defining its profitability. Formalised budgeting processes are implemented by a small minority of the companies; it is possibly a result of their relatively small size. In case of those ten businesses that implemented some kind of method, 80 per cent used mostly activity based budgets. Regarding the non-formalised cost planning the survey shows a much more positive picture as more modern methods were implemented more frequently. 32 per cent implemented flexible budgeting and rolling budgeting was implemented by 49 per cent. In this respect businesses can adapt to the changes in the internal or external environment relatively well and quickly.

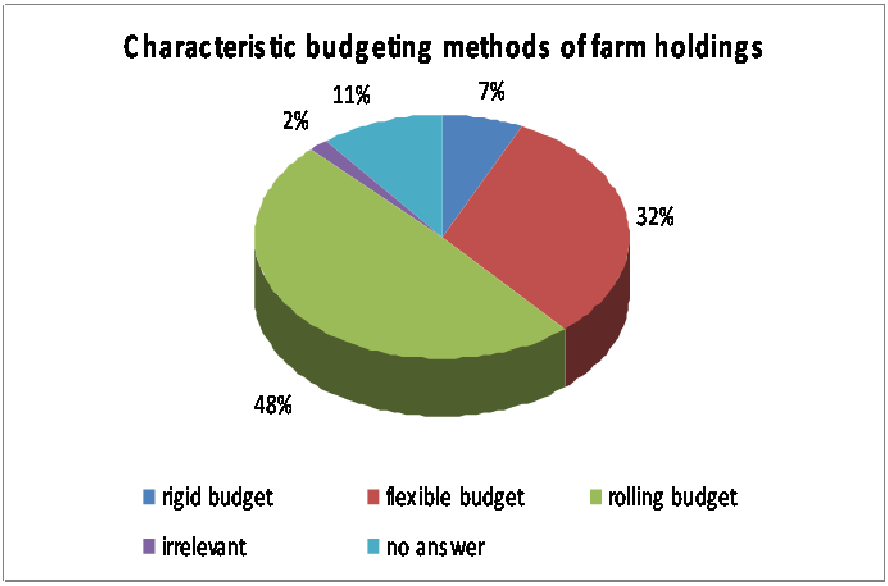

Figure 4 Distribution of budgeting methods in businesses taking part in the survey

Source: drawn by the author based on SPSS

Subsequently I examined the cost related controlling, remittance, clearing and cost accounting methods. Unfortunately, my findings show that in these areas the company leaders know very little about these questions in their company, although these are essential for the introduction and existence of management accounting. Therefore, there are significant shortcomings in these areas. 78 per cent of the companies do not have formalised methods for remittance or authorization of costs. It is relatively understandable in case of businesses employing fewer than two people but from the 13 companies employing more than two people only 6 has such order of process, moreover

they do not apply it in practice. This fact undoubtedly limits the precise cost tracking and the possibility for cost control. In connection with entering costs in the ledger 41.7 per cent of the respondents did not know whether they primarily used invoice classification code 5, or 6-7. The respondents were divided nearly evenly, 15 used settlement methods based on the type of the costs while 20 used settlement based on the cost centre or the cost bearer. The situation was similar in case of the profit and loss account. 40 per cent could not indicate what type of profit and loss account they used, the others – except the person who did not answer – marked the total cost method. The percentage of those who did not know what costing method they used was also very high (55 per cent). From those who indicated what method they used very few (altogether 3 companies) were able to give any reasons for the selection. For the question enquiring about who implements the abovementioned costing methods in the company and for what purpose, more than two thirds of the companies (68.3 per cent) replied that the accounting department used it solely for preparing the annual report. This fact justifies validity of the conclusion drown based on the answers for the initial questions. Not more than 20 per cent indicated the possibility that they used the results of these calculations for other calculations than the preparation of the annual report. This considerable uncertainty explicitly shows that the majority of executives do not use the statements containing mostly accounting data for acquiring information or management purposes. These statements are prepared mostly because they are compulsory.

This situation is much more favourable in monitoring costs and comparing them to target figures and norms, which is possibly due to their more direct effect on profitability and the fact that they are more tangible. Most businesses check costs once a year while 8.3 per cent regularly check them several times a year (Figure 5). Interestingly enough, no connection can be found between the size of the business and the frequency of checking; several small agricultural holdings have controls regularly while numerous big companies rarely execute checks.

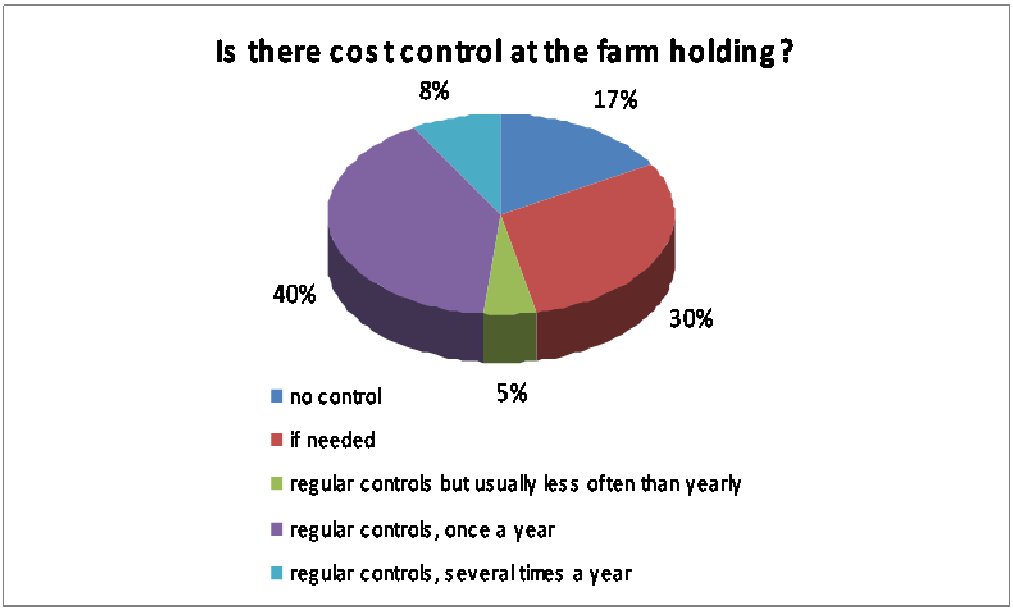

Figure 5 Practice of cost control in agricultural holdings

Source: drawn by the author based on SPSS

I found relatively good results in connection with the use, checking and analysis of indices (Figure 6). Indices are used by several of the respondents. The most frequently used indices are the ones related to the profitability of production such as the average produce (98.3 per cent), average yield (86.7 per cent) closely followed by preparing calculation to analyse profitability (80 per cent).

The analyses of the financial situation, liquidity, efficiency indices or financial standing are performed a little less frequently while cash-flow statements are prepared by only 8.3 per cent of the businesses. On the whole, the results can be regarded ideal since by the use of these indices businesses can make their activity more efficient, they can select those areas more easily where higher profit can be reached.

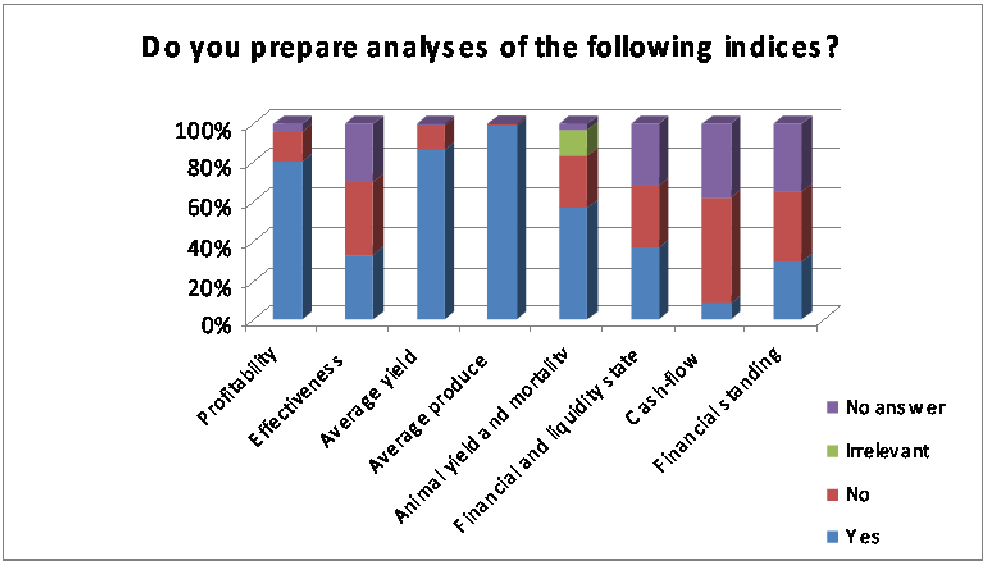

Figure 6 Practice of index analysis in the examined businesses

Source: drawn by the author based on SPSS

Unfortunately, the proportion of those who regularly analyse the indices calculated above is rather low. In most cases, these figures are not compared to the sectoral average, target figures or the results of the previous years. In fact, 75 per cent prepare such analyses only when they are really needed, whereas 15 per cent never do them. This definitely darkens the overall picture as the indices can only provide valid information when used in comparison. In order to obtain truly useful results, it is always advisable to use some kind of benchmark.

3.4 Results of examination of the connection between management accounting and the FADN System

I examined with the help of the questionnaire the relationship between management accounting and the FADN System, the attitudes of the leaders of businesses towards the FADN System and the correlations between the information-base of the two systems in question. Concerning the results of the observation, some efficient future solutions based on the simultaneous application of the two systems can be drawn up for the Hungarian agricultural sector.

First I investigated whether the respondents opined that the FADN system could be used as a data source of management accounting; whether they saw any connections between management accounting and the information in the FADN system. More than twice as many respondents stated that they could see the connection between the two data sets which indicates the benefits and the unexploited possibilities of the FADN system. I also examined whether it correlates with their answers for other questions. On the basis of this we can see that those who use the majority of the accountancy data not only for the preparation of the compulsory annual report but also for other

economic and financial calculations, can more probably see the connection between the FADN and the data of management accounting. It means that those who have actual practical experience in implementing management accounting and know and use its methods, they obviously see a connection between the data sets of the two systems. Furthermore, even more respondents stated they could utilise the data from the FADN system which is a really positive result.

Subsequently, I conducted my research into areas which can provide basis for developing the FADN system and motivating businesses to take a more and more important part. First I enquired about which data and indices from the FADN system they used mostly for their own financial-economic analyses. Businesses can most effectively use the comparative data that refer to different regions about production, yield and profitability. Average prices and production costs calculations can be used the least effectively. It can possibly be explained by the fact that the majority of the executives do not even use the production costs calculations of their own companies for any purpose at all.

Then, I examined that from planning, decision making, organisation of work and controlling (the classical functions of management accounting) which activity is supported most effectively by the use of FADN data. Results are shown in Figure 7. Controlling (65 per cent) and planning (55 per cent) turned out to be far the most important fields of use.

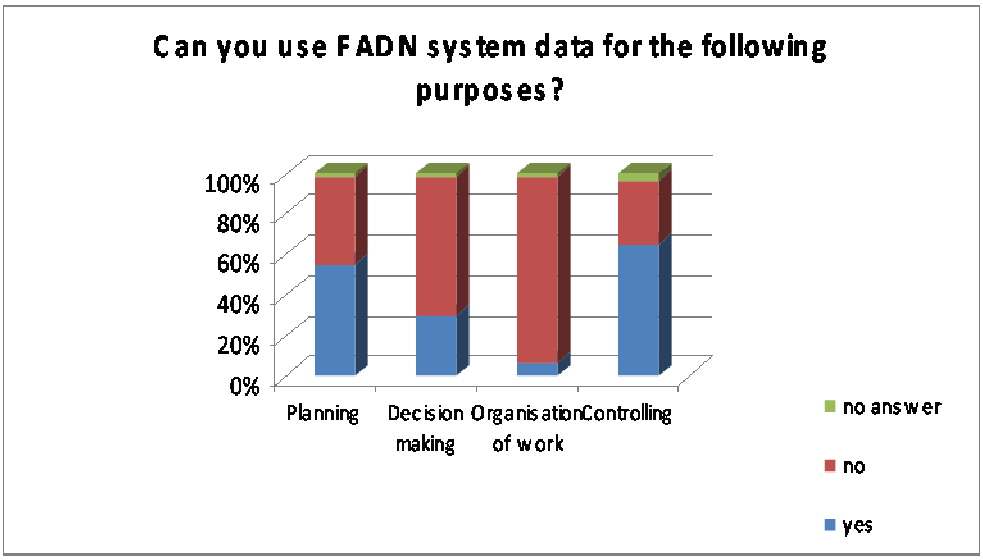

Figure 7 How FADN system data supports management accounting functions

Source: drawn by the author based on SPSS

To sum up, on the basis of the answers of the agricultural holdings, we can conclude that the *information obtained by using the Hungarian FADN System has definitely beneficial effects on the functions of management accounting in the classical sense exercising especially positive influence in the fields of controlling and planning.*

3.5 Examination results of the impact of management accounting application on business efficiency

I examined the relation between the implication of management accounting and its efficiency (which was measured by per capita income). Initially, I decided on the application of management accounting based on the answers of the companies: I considered them as implementing companies if they stated they implemented such methods. In this examination the SPSS did not find a significant connection between efficiency and implication. This fact could possibly be considered as a result of the small number of elements and the large dispersion as there is an overt connection between these two factors based on the following data. 43 per cent of the companies performing about average stated that they use management accounting tools, whereas this figure was only 26 per cent in the case of companies performing below average. Moreover, the average of per capita income of companies not using management accounting tools was 7.6 million HUF. In case of the companies implementing management accounting the same efficiency index was 9.2 million HUF. Based on these results it can obviously be seen that *we can find much higher efficiency index at agricultural holdings using methods of management accounting*.

Subsequently, I examined the same question from another point of view. I categorised the implementation of management accounting by the fact whether the company checked the development of its costs or compared it to certain target figures or norms, because it can be an objective measure of whether or not the business is applying management accounting tools or not. The SPSS showed a significant correlation in this examination. The significance level of the mixed connection is 1.5 per cent while the eta showing the strength of the connection is 0.445, thus the connection is of medium level. Accordingly it can be established that enterprises which use the tools of management accounting for managing their businesses are more productive and more effective, for instance they control their costs, follow cost changes by comparing them to standard figures and target figures, and they calculate indices to measure their profitability and performance in order to increase their general profit. The efficiency in no wise is independent from how closely the financial-accounting system of the given agricultural holding and its management system are related and to what extent the company officers use the data generated by the financial-accounting department during the day-to-day operation and management tasks.

As a summary, we can assess that the businesses using the tools of management accounting for managing the business are more efficient and profitable, than those not utilizing such methods.

3.6 New scientific results

1. I pointed out in my dissertation that in order to promote the introduction of management accounting in more and more agricultural holdings, *first of all, the attitude, the approach and the orientation of the executives need to be altered*. One of the major inhibiting factors of the introduction of management accounting does not lie in the financial obstacles but in the heads of the executives.

2. *It cannot be proved that the lack of Information Technology equipment or their organisational integration* is a real inhibiting factor of the spread and development of management accounting. Lack of IT equipment and their organisational integration can play in some cases a limiting role in the conformation of overall business information systems – such as in the development of the management accounting system –, however their disponibility is not proved to aid the setting up of similar systems.

3. I proved that *enterprises which use the tools of management accounting for managing their businesses are more productive and more effective,* for instance they control their costs, follow cost changes by comparing them to standard figures and target figures, and they calculate indices to measure their profitability and performance in order to increase their general profit. The efficiency is not independent from how closely the financial-accounting system of the given agricultural holding and its management system are related and to what extent the company officers use the data generated by the financial-accounting department during the day-to-day operation and management tasks.

4. The *development of management accounting and the FADN system as well as the system of contacts originating in the development result in a synergy in the management of the enterprises.* In my dissertation I disclosed the relationship between management accounting system and the FADN system, that their information base show an important similarity, and that the systems have positive impact on each other. Classical management accounting functions – especially planning and controlling – are actively supported by the application of FADN system. The joint application of the two systems promotes the development of the husbandry management approach and its changes into desirable direction.

5. I found in my research those *management accounting areas* which can be characterised by their considerable neglect, have been defined and *the development of which deserves priority* to improve the management accounting and general management support activities of the enterprises. These areas include remittance of costs within the company, costs control, application of decision oriented cost forecasting methods, the use of formalised accounting methods and prime cost calculating techniques for management purposes; furthermore, not only the calculation of indices but also their analysis and the use of accounting reports – especially the use of the profit and loss account – for management activities.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The fundamental aim of my research was to promote the development possibilities of Hungarian businesses by applying management information systems with special regard to the tools of management accounting and the simultaneous use of the information base of the agricultural FADN system.

Three out of my hypotheses – the 1st, the 3rd and the 4th – have been proved by the results of my research.

Hypothesis 1: The widespread application of management accounting is hindered by the social and economic characteristics of the Hungarian attitude especially in the sector of agricultural enterprises.
According to the agricultural holdings already applying management accounting, the factors inhibiting the introduction and success of the system are much weaker than the ones that have not introduced the system think. The results of the investigation clearly presented the real characteristics of the inhibiting factors: the majority of the agricultural holdings that do not apply the method do so deliberately as they are not convinced that these methods would have a positive effect on their holdings to the expected extent. In other words, they think that raising the intellectual, financial and other sources necessary for the introduction exceeds the rate of the accumulated yields of application. The findings of the observation support the hypothesis that there are no real obstacles to applying management accounting in the physical sense; the main obstacle is in the heads of the executives i.e. in their thinking and attitude. This fact is definitely positive considering that it can be changed.

Hypothesis 2: The corporate integration or lack of integration of information tools and systems is a real hindering factor of the application of management accounting.
This hypothesis has not been proved by the results of my questionnaire survey justifiably. The analysis of the results of investigation into several questions has shown that the introduction of applying management accounting is more aided if the technical background necessary for operating the system is already available at the enterprise though; and the same requirement is also true of raising financial resources. However, we must definitely see it clearly that the main obstacle to introducing management accounting methods and other management support procedures is not the above, but the attitude of the executives of Hungarian agricultural enterprises. Nevertheless, this does not point to the deficiencies of Hungarian farmers; it could rather be interpreted as a consequence of the economic characteristics of the past decades.

Hypothesis 3: Enterprises that use management accounting or similar information in management are more efficient than others. What is more, the system also supports decision-making and management. Once applied, the enterprises can become more competitive in the agricultural sector.
Enterprises are manifested to be more productive and more effective when the financial-accounting system of the business is closely related to its management system, when costs are controlled and analysed, in other words when the tools of management accounting are used for directing the business. Furthermore, the enterprises that had effective practical experience regarding the application of management accounting and its impact after the increase in profitability immediately marked decision support and the fact that the executives became better informed as positive results of introducing the system, which reinforces the other supposition raised in the hypothesis. Besides

these, the research results have proved the supportive role of the Farm Accountancy Data Network system – connected to planning and controlling – which also aids executives both in making their decisions and in performing other managerial duties.

Hypothesis 4: There is a link between management accounting and the information basis and area of utilisation of the FADN system. Moreover, examinations show that the two systems support each other.

In the survey at the examination of the relationship between management accounting and the FADN system, I have pointed out that farmers who have effective practical experience regarding the application of management accounting, know the methods of management accounting and actually use them obviously see a connection between the databases and information sets of the two systems. Furthermore, the supposition has also been proved that those who use the majority of the accountancy data not only for the preparation of the compulsory annual report but also for other economic and financial calculations, can more probably see the connection between the FADN and the data of management accounting, acknowledge the positive impacts of the two systems on each other i.e. they have a positive attitude to the usefulness of the information obtainable from both systems.

Awareness raising regarding the necessity and the usefulness of the application is therefore of fundamental importance, but certainly it is not always easy. Accounting staff often must convince owners and executives themselves that they also have to monitor and evaluate the balance sheet and the profit and loss account. They must call attention to the fact that the figures reflect not only the results of the past and the current situation but also the future. Management accounting actually sheds light precisely on the future, the viability of the enterprise and how far it can be stretched. Therefore, it is worth the effort and the costs to establish its system and to use it even for farmers if they plan and shape the future of their enterprises this way. In the case of simple enterprises, detailed planning might seem needless, and a waste of time and money at first sight. However, simplicity does not justify neglecting planning; just the tools of planning must be adjusted to the characteristics of the company. For example in such a case, it is not necessarily reasonable to invest in expensive computing devices, but a pen, a notebook and a calculator might suffice. Expertise and belief in the usefulness of the method cannot be neglected in such cases either.

Finally, the positive consequences feasible through the further development of using management accounting and the FADN system simultaneously are not to be neglected. Positive interaction of the joint application of the two systems on the one hand contributes to making simpler the introduction of the system to be introduced. On the other hand, thanks to the common information base of the two systems, the opportunity for the companies to use a common database and database handling system could result in long term cost saving. Furthermore the common reliable database makes it possible to establish an economic performance evaluation system based on unified principles that could be utilized by other entities of the economy apart from the farmers for example in allocating subsidies or granting bank loans.

Competitiveness also arises with respect to the fact that in order to build up and continuously preserve competitiveness, enterprises are compelled to introduce, establish and apply management accounting in the long run. The reason is that this will help them find the possibilities for eliminating their disadvantages, for example due to their size and for applying in practice the most suitable and most proper economic turnover, cost distribution, rate of fixed assets, capital distribution, gross margin, etc. for their individual enterprises.

4.2 Recommendations concerning the development of management accounting

Based on my research it can be summed up that for promoting the introduction of the management accounting system at as many agricultural holdings as possible it would be the most necessary to change the attitude of company leaders. The necessity, the usefulness and the role of management accounting application should be made clear in the minds of farm leaders in order to influence the management approach. This could be achieved the most successfully by carrying out the tasks – proposed by the author – as follows.

- Asserting the advantages of the system at as many forums as possible, as extensively and in as many ways as possible.
- Demonstrating the positive experiences achieved so far at farms.
- Making the system freely available for trial in practice.

Opportunities for getting acquainted with management accounting principles must be created for agricultural holding leaders. In my opinion the methods of practical experience are the most efficient for this. Farmers would welcome such sort of initiatives as it was confirmed by the results of my questionnaire too. I highlight six of such free services.

- Information leaflets and publications.
- Model farms established to create the possibilities to try the applications in practice.
- Synoptic management information booklets, which contain aggregate data of Hungarian holdings.
- Exchange programs with foreign farms.
- Series of presentations.
- Internet based query of aggregate average data about Hungarian agricultural holdings with filtered opportunities.

My research results indicate that the majority of respondents preferred leaflets containing information and other publications. These publications would provide general information about management accounting and would describe simple methods and techniques applicable in agriculture with benefit. Though these would not expressly strengthen the practical side of learning, they could still play an important role in the task of conveying basic information due to its simple implementation, low costs and the minimal time requirement of reading.

The second most popular means turned out to be “visiting model farms with the possibility of trying certain practical applications”, which, in my opinion, could be the most significant method due to its relatively low costs and its effectiveness originating in its practical nature.

Apart from the above, a feasible method could be compiling and publishing synoptic management information leaflets which would be delivered to the enterprises at regular intervals. On the one hand, the information leaflet would contain average data of all the FADN farms, which would enable comparison with average indices of Hungarian agricultural holdings regarding, for example profitability, production cost, capacity utilization, or manpower utilization indices. On the other hand, it would contain guidelines concerning the proper and effective utilization of average indices in management accounting with the description of purposefully selected benchmark techniques. Comparison with average indices would have a motivating effect on modernising husbandry management and increasing efficiency. Also, the publications could present a new, up-to-date management accounting technique in each issue in order that farmers could familiarize with the details of management information tools better and better and at a higher and higher level by

this means as well, and in order to indicate solutions to dealing with currently arising problems in agriculture as a branch of industry.

Query average data from Hungarian FADN holdings by applying discretionary filter conditions could fulfil a similar function. The advantage of this method is that it offers a tailor-made function. Furthermore, exploiting the feats of modern technology information could be delivered fast, relatively free of charge and to everyone.

Additionally, I find the possibility of participating in exchange programs with foreign farm holdings and lecture series on applying management accounting useful.

When introducing management accounting in practice, special focus needs to be put on areas whose development enjoys the highest priority. Such areas have been identified as follows.

- Using formal procedures for cost control.
- Applying decision oriented cost planning processes.
- Utilizing formal budgetary techniques.
- Applying cost accounting methods for management purposes.
- Increasing the role of accounting information appreciated by the management - especially the profit and loss statement.
- Planning, calculating and accounting costs suited for the given business and its needs as effectively as possible.

Creating these field guarantees the integration of management accounting systems in the organization too. Thanks to the development project businesses could manage their businesses as much in pursuance of their own purposes and as efficient as possible.

Farm Accountancy Data Network is assigned a special role in the process of introducing management accounting. After enterprises realized the advantages and necessity of using management accounting, the connection needs to be established between management accounting and financial accounting, which is well-known to everybody, mostly as it is obligatory or more well-known. The FADN System in this respect could function as a connecting link. Primarily, the data from financial accounting serve as the main source of data for the FADN System as well. Secondly, the process of making the right data available, the analyses and statements obtainable from these data as well as the aggregated average data available for the holdings in relation to the System as ‘convenience goods’ so to say facilitate the application of the management accounting system. Apart from that, only one task remains for the enterprise namely to transform the already existing information into tailor-made, unique information; in other words to generate new management accounting output information from the ‘semi-manufactured’ data pursuant to its own needs and wants. The merged system that can be established due to the common database of the two systems also enables long-term cost savings. As the input data of the two systems are comprised of principally the same basic data, both systems can be properly operated by using the same database management program.

I conceive the practical implementation of all the above through FADN accounting offices. The reason is that for a small or middle-sized enterprise on its own it would not probably be worth developing their own database management software handling such specialised tasks or just buying software having been developed by someone else earlier due to the problems of time rate of return and economies of scale. However, at FADN accounting offices, where the data of dozens of similar enterprises are collected, it might be worth implementing such an investment with the prospect of marketing the extra service (or simply to gain competitive advantage or aiming at acquiring customers). This way enterprises operating as members of the FADN System would have a possibility to access management accounting output information tailored to their own enterprises, or even to their analyses and evaluation.

5. PUBLICATIONS OF THE AUTHOR RELATING TO THE TOPIC

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