

University doctoral (PhD) dissertation abstract

**EFFICIENCY AND PROFITABILITY STUDIES AND
THEIR ACCOUNTING INTERRELATIONS IN FOOD
INDUSTRY**

Siklósi Ágnes

Supervisor:

Kondorosi Ferencné Dr.

egyetemi docens (associate professor; university docent), Ph.D. habil



**UNIVERSITY OF DEBRECEN
Karoly Ihrig Doctoral School of Management
and Business Administration**

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1. THE AIMS OF MY STUDY

In Hungary, food industry is of overriding importance, both in supplying and employing the inhabitants and in foreign currency production. Competitiveness of enterprises depends a great deal on their information and decision-making system. Because of this, establishing an accounting system that can fulfil the Hungarian Accounting Law's requirements and help the decisions of executives with extra information is increasingly important. Applying controlling procedures is vital, since in today's economic environment no one can skip the steps of harmonizing planning, controlling and information-supplying. While, at the same time, practice shows that it is mainly small enterprises, which do not take the opportunity to take advantage of prospects provided by controlling systems.

For substantial decision-making it is inevitable to have a system of ways and means that creates an adequate information base for analysis, the results of which can be used to make the enterprise more efficient. The source of information is accounting that needs to be established in a way that it helps coordinate planning, supervising and monitoring. These requirements are fulfilled by managerial accounting. In order to be able to create comparative analyses, integrated and harmonised accounting regulations are required, which are guaranteed by the International Accounting Standards.

The best interest of food industry is to apply changes in food production that help to adjust to consumers' continuously changing needs and strict food safety regulations in a competitive way, both in national and international markets. To make this happen, such a controlling system is required that monitors through the whole production process from planning, producing and controlling, ensuring that executives can interfere at any stage if they feel it is needed.

Recent changes at food industrial enterprises and in the economic environment make it necessary that enterprises make more and more efforts to analyse their economic management.

In order to measure efficiency fixed and consumed resources need to be defined for operations. While measuring resources it is equally important to pay attention to yield calculation and the examination of resource efficiency.

Nowadays there is a tendentious demand for data processing in a way that it results in a standardised evaluation, performed according to standardised rules and regulations, consequently results can be compared to each other by economic actors.

In my study I

- **explore** and organise the topic's domestic and foreign bibliography,
- **analyse** Hungarian food industry's development, highlighting important factors, elements and problems (in bakeries in food industry) from my dissertation's point of view,
- **review** the methods of yield calculation and expenditure measurement (approached from an accounting point of view)
- **systematize** indices of efficiency and profitability,
- **study** the accounting system, which is the information base of the analysis and I highlight the advantaged and disadvantages of these systems

The main aim of my study was to examine how it is possible to measure the efficiency of the operation of an enterprise. I did research on micro-level mainly, during which I examined the accounting system (and its parts), which is the information base of the analysis more thoroughly, as it plays an important role in measuring and reporting the enterprise's real property and financial status and processes; as well as in reflecting correlations between revenues, incomes and costs. It can provide several concrete information to enterprises, investors, creditors and others inquiring, which can contribute to increasing profitability of food industrial products.

Hypothesises in my research topic are the following:

- If enterprises own and use an adequate information and decision support system, they can monitor their efficiency and profitability continuously and they can increase them as they have the required information at all times. Small and medium enterprises in food industry do not take the opportunity to use controlling systems, so they cannot continuously monitor factor elements influencing efficiency.
- In order to be able to compare results, comparable data is required, which is provided by standardised accounting regulations.
- Among food industrial enterprises, medium enterprises are the most efficient.

- It is possible to increase efficiency by using resources more effectively and by cutting back on expenses. Possibilities to increase incomes are limited. The main impediment of food industry's efficiency is the lack of innovation and qualified workforce.

The structure of my dissertation:

In the **first chapter** I review the bibliography of efficiency and profitability. I examine the theoretical methodics of several scientific fields, I study their research results in efficiency-analysis.

In the **second chapter** I introduce the place and role of food industry in the Hungarian economy. I provide a landscape of food industry's international situation, exploring its role in world economy – based on actual data. After presenting the macro-economic situation I examine the coherences of efficiency-measurement.

In the **third chapter** I expound the material requirements and methodology of my study. I present the aims of my surveys and deep interviews and the methods used by processing and analysing. I analyse the results of my surveys and deep interviews searching for possibilities to improve efficiency and profitability. I study and analyse efficiency- and profitability-indices calculated from bakery enterprises' annual financial reports.

In the **fourth chapter** I present my index-system recommendations through a model-enterprise and I analyse its financial reports for the last five years.

In the **last chapter** I present the results of my study, my conclusions, my establishments and my new research results. According to my original aims I also give a recommendation for increasing enterprises' profitability and resource-efficiency.

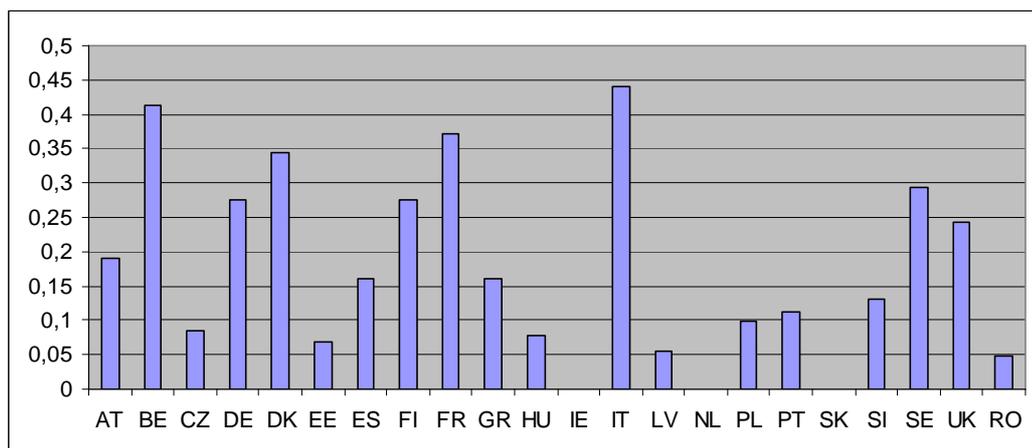
2. PRECEDENTS AND APPLIED METHODS

2.1. Food Industry's place and role in Hungarian economy

Before performing the micro-level research I did international and macro-level analysis taking related bibliography into consideration.

Data prove unambiguously that the situation of food industry has gotten worse in the last few years. In international comparison the efficiency index of Hungary is poor, it is in the bottom third of EU-25. Typically, on the market of food industry there is an overproduction, consequently products can only be sold on low prices. Looking at real values it is obvious that prices have been decreasing recently and there is not any sign of changes in the tendency. One of the reasons is that developing countries (China, South American countries, etc.) produce huge amounts of food products on very low costs and sell them on European markets.

There are a number of reasons for food industry's declining performance in the last few years: low capital supply, frequently changing ownership, low productivity, high rate of over capacity and weak market presence due to lack of concentration. Apart from the above mentioned factors I believe that the connection between agriculture and processing industry is loose, they are not coordinated enough and they are not in accord with each other.



Source: own editing based on CIAA data

1. figure: **Gross Output per employee in EU member states in 2007 (million €)**

2.2. The subject of my study, the applied methods and the examined enterprises

The aim of my study was to perform an adequate amount of surveys and deep interviews that enables us to study and judge Hungarian food industrial enterprises' efficiency and profitability and factor elements influencing them.

During my research I carried out both qualitative and quantitative data gathering. Qualitative data that was gathered during the interviews helped me identify problems and state my hypotheses. The interviews also enabled a complex review of the problems and an audit of quantitative data. The data base creates from the survey-data and the indices calculated from it represent objective, numerical results of the studied field. Apart from surveys, I also **calculated efficiency-indices from financial reports of several business years** and the results of these also support my hypotheses. I performed examinations based on statistical methods as well. I adopted **variance analysis, t-test, trend analysis** to analyse periods and **regression analysis**. For data processing I used the **SPSS** (Statistical Package for Social Sciences) software and Microsoft Excel. In order to **measure efficiency in practice** I assembled a questionnaire that consisted of 48 questions. Managers and executives of 400 food industrial enterprises were asked to fill in the questionnaire. There were 332 questionnaires returned and 276 of them were appreciable. This means that **83% of the enterprises were willing to co-operate**, which is considered a quite high percentage and is most likely thanks to the interviewers and questioners hard and excellent work.

Taking number of employees into consideration by the enterprises, which filled in the questionnaire, 34% are micro, 42% are small, 16% are medium and 8% are large enterprises (the number of employees are 250 or more). This division adequately represents the current situation in Hungary considering enterprise size.

Examining **ownership-structure** we find that 28 out of 276 enterprises operate partially on foreign capital and 90% of them operate only on domestic.

75% of the enterprises distribute their products only in Hungary and 25% sell them on international markets as well.

3. THE MAIN CONCLUSIONS OF MY DISSERTATION

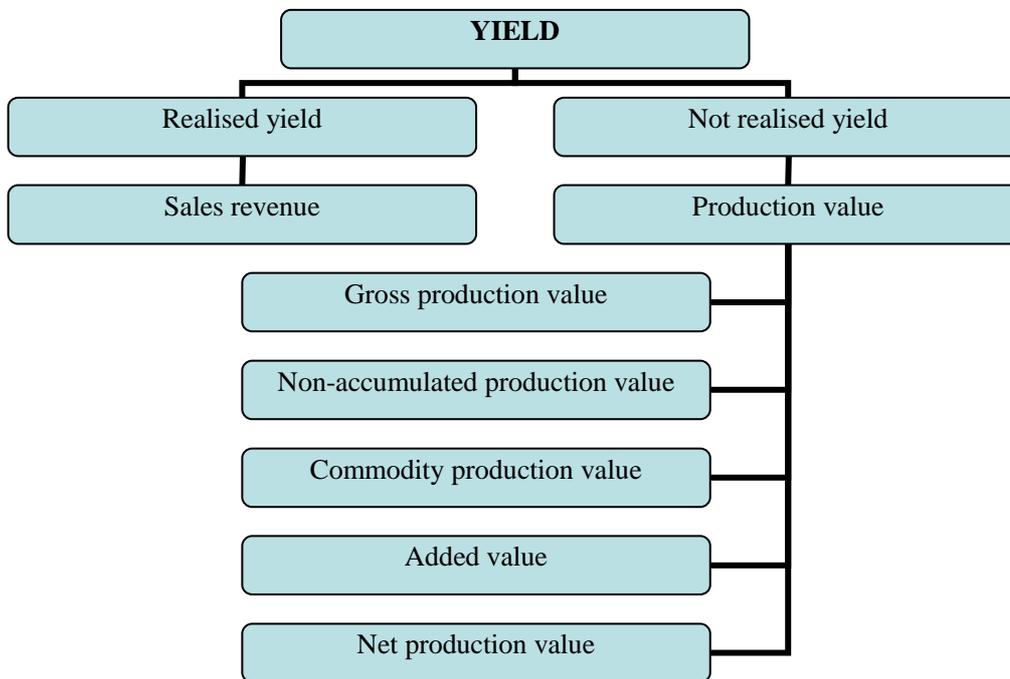
3.1. The results of my study

It is vital that economic actors possess the required **information** for their decision making, so that market economy can work properly..

Market actors make their decisions according to interior (incomes and revenues, profits, short-and long-term financial situation, liquidity) and exterior information (market situation, economic indexes, trends and the financial situation of market actors). Availability of exterior information is ensured by the 2000. C. Accounting Law (of Hungary). The tool of information is the financial report, the authenticity and availability of which is ensured by accounting principles, depositing and publishing.

Following business year's financial reports should be comparable, which is ensured by using the same type of balance sheet and income statement and the same evaluation methods.

Different yield-indexes can be used for efficiency studies.



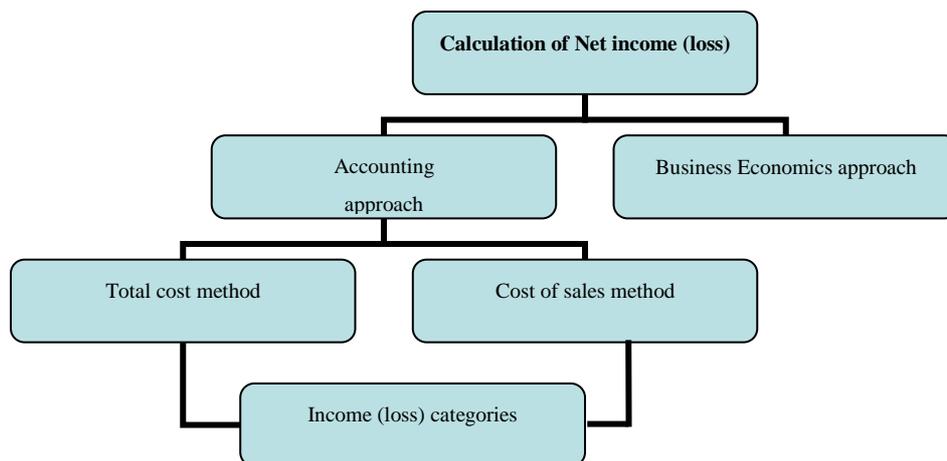
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2. figure: **System of yields**

Sales revenue is an important data for analysis; it helps define the enterprise's market share and its expectable growth. While studying sales turnover, sales revenue should be measured by branches of business and geographical regions as well. Both price- and

quantity changes need to be taken into consideration the same time. Without factor analysis no correct conclusions can be drawn.

Net income/profit of the enterprise is the most complex indicator. It is the result of all the operation and manufacturing processes performed at the enterprise.



Source: own editing

3. figure: **The system of net income (loss) calculation**

Analysing net income/profit is a truly complex and important task, since so many factor elements influence it. In order to be able to analyse and study the data of a financial report it is not enough to examine financial-economic processes alone, one-by-one.

By many food industry enterprises the whole range (verticum) is present. Accounting Law assumes returns when measuring net income/profit, but the **business economic view** does not. It is obvious that measuring realised net income/profit is vital, but by some economic branches vertical connections cause lots of important **not realised incomes** as well. In efficiency studies, both accounting and business economic incomes/profits should be taken into consideration.

There are several enterprises that do not fully operate in food industry and have other branches of business as well. By companies that operate in the full range (verticum), in the agricultural branch produced revenue should be measured apart from realised income/profit.

Produced revenue is the difference of production value and operating expenses.

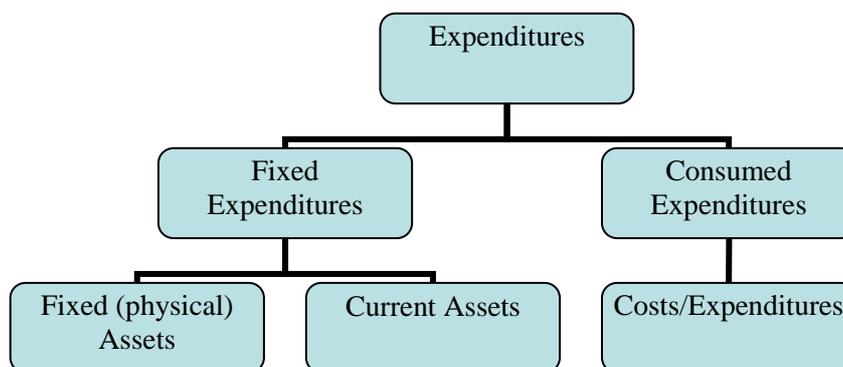
When measuring produced revenue (or loss) we assume that all products were sold, so we take the branches' whole production into consideration. The results we get this way

are more suitable for measuring the real economic situation of the branches than net income/profit counted from actual sales revenue. Realised income depends on sale volume and rate. The main difference between produced revenue and realised income is that produced revenue is counted from the whole number of manufactured products and realised income only takes sold products into consideration.

In theory, income statement can contain both realised and not realised incomes - depending on revenues and expenses taken into account. The types of incomes taken into consideration in the statement depend on who the financial report is prepared for and why. If the income statement contains a defined period's revenues and expenses, then the income statement can only show the realised income according to the executive Hungarian Accounting Law.

General costs of an enterprise should be deducted from the business year's revenues. This means that general costs are considered fixed costs that depend on the volume of production. These general costs count as negative revenues as they decrease the profit of the current business year.

While measuring efficiency, studying expenses plays an important role. The system of expenditures is shown on the figure below:



Source: own editing

4. figure: System of expenditures

Costs are utilisations that are needed because of production technology, while utilisations that are not required are deducted from operating income. The concept of expenses is wider than the concept of costs, as it contains utilisations that cannot be booked as costs.

Expenditures have different elements,

- that were booked as costs before and only become expenses according to output (direct cost of production of sold private produced goods)
- costs that may only become expenditures according to output (indirect costs, e.g. operation costs of the head office)
- elements that are never booked as costs, when they occur they are booked as expenditures, deducted from operating income (other expenses and losses, interest expenses, irregular items)

Defining costs clearly is vital, because costs have a role in evaluation (evaluating private produced goods on their original, direct cost of production); this means that by deciding which elements can be booked as costs can greatly influence balance sheet items' values, the financial situation of the enterprise and the tax base.

Enterprises basically operate with resources not costs. By assigning supplies, assets and human resources costs are produced, but these costs cannot be modified by the time they occur. With this approach all costs can be influenced and supervised (even depreciation) at the time of making investment decisions.

Accounting and controlling systems form the information base for resource-efficiency and enterprise-profitability studies. Within accounting systems, **executive information systems** are the ones that can provide adequately structured information for efficiency-analysis. Adopting and applying managerial accounting is not obligatory for enterprises. Managerial accounting is a special field of accounting, which provides information for executives that **can contribute to a decrease in costs and/or an increase in profit, which both lead to improved efficiency.** Accounting Law regulates financial accounting; managerial accounting is adopted and developed by the enterprises and entrepreneurs.

For **substantial and established managerial decision making** it is vital to own accurate information on time. Information can be gained from the results of financial and economic analysis. Conclusions drawn can help to define the orientations and efficient ways of economic management.

Analysing **financial reports' data** periodically is inevitable. Examining economic phenomena in coherences and defining connections can help to establish a more efficient economic management. Organising indices calculated from financial reports into time series creates a base for **medium- and long-term planning and strategy.**

Calculations need to be performed yearly, but some basic-indices should be calculated more **frequently and regularly**, preferably on a monthly basis. Monthly analysis is ideal, as accounting data is available for the managers and executives at the end of each month for the current period. I recommend the calculation of the following indices. During the examination the target period's actual figures **should be compared to** expected figures or base period's figures. Base period can be the last examined period or the former year's same period. Production's seasonal character requires the latter. The next step is **grading the differences** between actual and expected/base data. If the changes are positive there is no need for operational interference, economic management is satisfactory. If the changes are negative, further investigation is required to clarify the details, reasons and deeper coherences of the phenomenon. Only when the leadership is aware of the reasons and connections should they take action and interfere with the economic management.

1. table **Indices recommended to support managerial decisions**

Name of the index	Expected figure	Base figure	Target period's figure	Managerial decision in case of negative changes in target period's figures compared to expected figures or base period's figures
Percentage of waste: $\frac{\text{Total amount of waste}}{\text{Total amount of production}}$				<ul style="list-style-type: none"> – discovering reasons behind increased amounts of waste – interfering with the production process
Analysing sales turnover: $\frac{\text{Target period's sales turnover}}{\text{Former period's sales turnover}}$				<ul style="list-style-type: none"> – discovering reasons behind decreased amounts of sales – interfering with the sales process

Name of the index	Expected figure	Base figure	Target period's figure	Managerial decision in case of negative changes in target period's figures compared to expected figures or base period's figures
Gross production value per person (employee): $\frac{\text{Gross production value}}{\text{Headcount}}$				<ul style="list-style-type: none"> - discovering reasons behind decreasing gross production value per person - interfering with the production process
Wage efficiency: $\frac{\text{Net production value}}{\text{Wage - costs}}$				<ul style="list-style-type: none"> - discovering reasons behind decreasing wage efficiency - interfering with the production process - revising wage-policy and incentive-system
Fixed assets efficiency: $\frac{\text{Net production value}}{\text{Average net value of fixed assets}}$				<ul style="list-style-type: none"> - discovering reasons behind decreasing fixed assets efficiency - revising investment-policy - selling spare fixed assets
Production cost-level: $\frac{\text{Production costs}}{\text{Gross production value}}$				<ul style="list-style-type: none"> - discovering reasons behind increased production cost-level - revising cost-management - checking raw material purchase
Velocity of circulation of inventories (Inventory velocity): $\frac{\text{Net sales}}{\text{Inventories}}$				<ul style="list-style-type: none"> - discovering reasons behind slowing velocity of circulation - checking sales processes
Gross profitability: $\frac{\text{Gross earnings}}{\text{Net sales}}$				<ul style="list-style-type: none"> - discovering reasons behind decreasing gross profitability - interfering with the processes
Ratio of customers and suppliers: $\frac{\text{Accounts Receivable}}{\text{Accounts Payable}} \times 100$				<ul style="list-style-type: none"> - discovering reasons behind unwanted changes - re-thinking financing options - taking action in order to realise money from debtors
Quick ratio of liquidity: $\frac{\text{Current assets - Inventories}}{\text{Current liabilities}}$				<ul style="list-style-type: none"> - discovering reasons behind decreasing liquidity - taking action in order to maintain liquidity
Liquidity of cash and cash equivalents: $\frac{\text{Cash and cash equivalents}}{\text{Current liabilities}}$				<ul style="list-style-type: none"> - discovering reasons behind decreasing liquidity of cash and cash equivalents - taking action in order to maintain liquidity

From the results of my survey, deep interviews and figures gained from financial reports of several years, I would like highlight the following few data that support my hypotheses.

2. table The partaking enterprises' usage of Executive Information System or Controlling System plotted against the number of employees in 2008

Denomination		Uses Executive Information System or Controlling System		Total
		No	Yes	
Number of employees	10 or less	65	28	93
	between 11 and 50	47	69	116
	between 51 and 250	8	37	45
	251 or more	0	22	22
Total		120	156	276

Source: edited from own survey

43% of the enterprises do not have any Executive Information System. It is clearly visible from the table above that these are micro-, small- and medium-enterprises. Most of these enterprises usually get their book-keeping done by an independent accounting office that processes accounting vouchers once a month, so it is not possible that the enterprises' executives get feedback about their everyday operation sooner than at the end of each month. Executives do not always get the required data in due depth and structure.

3. table Expectations of efficiency in 2008 by the partaking enterprises

Denomination		Expectations of changes in efficiency next year compared to the current year			Total
		Worse	Same	Better	
Number of employees	10 or less	18	46	29	93
	between 11 and 50	20	47	49	116
	between 51 and 250	6	12	27	45
	251 or more	0	11	11	22
Total		44	116	116	276

Source: edited from own survey

42% of the partaking enterprises are optimistic, they said that their situation would improve; other 42% said that there would be no changes and 16% are pessimistic and

expect a fall in efficiency. 17% of small enterprises (between 11 and 50 employees) are pessimistic and only 42% are optimistic about the future. 19% of micro enterprises (less than 10 employees) expect a decrease and only 31% expect an increase in efficiency. The data shows unambiguously that the situation of smaller enterprises is more elusive, they are the most exposed and their chances are the smallest to react to changes in time.

4. table Partaking enterprises' work force utilisation level plotted against domestic portfolio of orders and demand for the products in 2008

Denomination		Work force utilisation level (%)						Total
		0-50 %	51-60%	61-70%	71-80%	81-90%	91-100%	
Domestic portfolio of orders and demand for the products in 2008	Very low	0	0	0	0	0	1	1
	Low	2	2	3	5	2	3	17
	Medium	4	20	28	63	37	43	195
	High	0	1	3	18	13	28	63
Total		6	23	34	86	52	75	276

Source: edited from own survey

Work force utilisation level by 2% of the partaking enterprises is below 50%, by 8% it is between 51 and 60%, by 12% it is between 61 and 70%, by 31% it is between 71 and 80%, by 19% it is between 81 and 90% and only by 27% is it between 91 and 100%. 23% of the enterprises have a high domestic portfolio of orders and demand for products. 71% of the partaking enterprises said that the domestic portfolio of orders and demand for products is medium and 6% said that it is low or very low.

5. table **Partaking enterprises' machine utilisation level plotted against domestic portfolio of orders and demand for the products in 2008**

Denomination		Machine utilisation level (%)						Total
		0-50 %	51-60%	61-70%	71-80%	81-90%	91-100%	
Domestic portfolio of orders and demand for the products in 2008	Very low	0	0	0	0	0	1	1
	Low	3	3	4	3	1	3	17
	Medium	10	33	36	56	38	22	195
	High	3	2	4	17	24	13	63
Total		16	38	44	76	63	39	276

Source: edited from own survey

Machine utilisation level is lower than 50% by 6% of the partaking enterprises, by 14% of them it is between 51 and 60%, by 16% it is between 61 and 70%, by 28% it is between 71 and 80%, by 23% it is between 81 and 90% and by only 14% is it between 91 and 100%. The proportions are even more disadvantageous than at work force utilisation levels. Naturally, the fact that it is easier to mobilise work force than machine capacity contributes to this. Whenever production falls, the first reaction of management is to dismiss employees. Work force and machine utilisation level is higher by enterprises where domestic portfolio of orders and demand for the products is higher. The most important resources' utilisation level by the partaking enterprises is relatively low. Capacities barely grow due to investments; consequently, decreasing capacity utilisation causes a decrease in production as a reaction to lower demand. Different structure of ownership or different proportions of export does not induce considerable changes in capacity utilisation. Taking size into consideration, medium enterprises' capacity utilisation were the highest and micro enterprises' capacity utilisation were the lowest.

6. table Changes in operating costs plotted against changes in sell-prices by the partaking enterprises in 2008

Denomination		Changes in operating costs in the last few years							Total	
		Increase by more than 10%	Increase by 8-10%	Increase by 6-8%	Increase by 4-6%	Increase by 2-4%	Increase by 0-2%	No change		Decrease
Changes in domestic sell-prices in the last few years	Decrease	7	6	5	2	1	0	1	1	23
	No change	18	13	7	6	4	7	3	2	60
	Increase by 0-2%	6	1	2	5	6	4	1	0	25
	Increase by 2-4%	5	6	4	6	9	9	1	0	40
	Increase by 4-6%	7	9	5	8	4	0	0	1	34
	Increase by 6-8%	13	5	7	5	1	1	1	0	33
	Increase by 8-10%	22	14	2	2	0	0	0	0	40
	Increase by more than 10%	17	1	1	0	0	0	0	1	20
Total		95	55	33	34	25	21	7	5	275

Source: edited from own survey

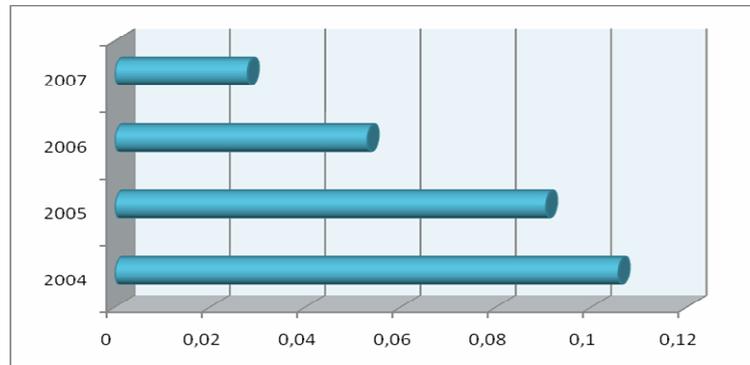
Operating costs decreased by 2% of the partaking enterprises and did not change by 2.5% of them compared to last year. By all the other enterprises the operating costs increased. The cost increase was above 10% by 34% of the partaking enterprises, it was between 8 and 10% by 20%, by 12% it was between 6 and 8%, by 12% it was between 4 and 6%, by 9% it was between 2 and 4% and by 8% of them it was less than 2%.

Sell-prices decreased by 8% of the partaking enterprises and by 22% they did not change. Only 7% of the enterprises increased their sell-prices by more than 10%, all the others increased their prices by less than 10%.

Most of the time the enterprises could not fully include their operating cost increase in their sell-prices, as their sell-price increase was usually lower than the operating cost increase. This means that their profit margin has been decreasing, which lowers their efficiency. Since the market position of these enterprises is not dominant and they cannot determine prices, their only opportunity to increase efficiency is to rationally decrease operating costs as much as possible. Although, in my opinion, decreasing operating costs below a certain level is not possible without decreasing the level of quality as well.

When studying efficiency of bakeries I analysed data from 128 bakery enterprises' financial reports for the past 4 years.

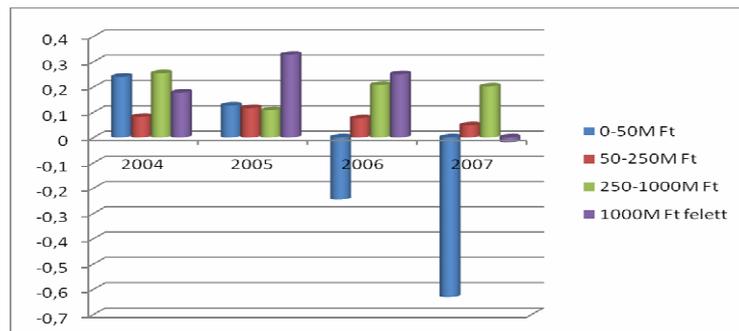
The results of the calculations are shown in the following diagrams:



Source: edited from own survey

5. figure Variation of average ROA in the examined sample

A tendency of gradual decrease can be observed from the year 2004, which can be explained by the low utilisation of capacities according to the conducted surveys as well. The equipment in bakery are obsolete, only low-efficiency production is possible with them. However, the disadvantageous situation of the whole sector does not make it possible to implement investments that could bring modernized technology. Also the figures of the survey have clearly shown that the willingness to invest is relatively low in the bakery sector. This attitude is only strengthened by the existing financial problems.

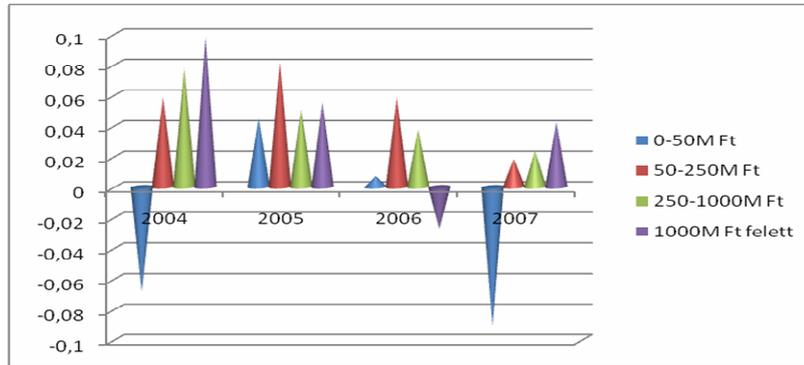


Source: edited from own survey

6. figure Variation of ROE in the examined sample with enterprises sorted by their annual revenues

Enterprises with less than 50 million forints of annual revenue are in the most disadvantageous situation in the aspect of ROE. Enterprises in the second and third category did the most balanced performance. The ROE index of enterprises with more

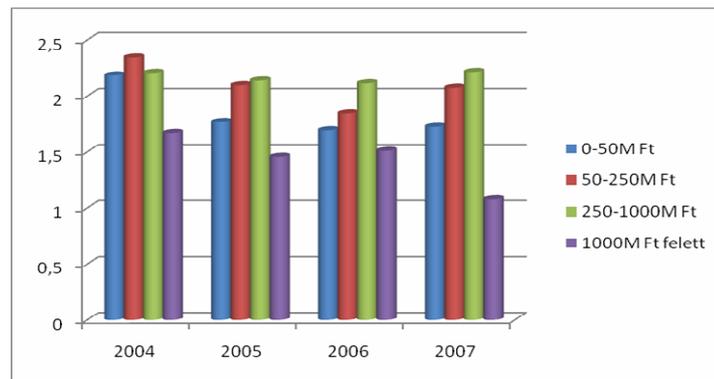
than 1000 million forints of annual revenue shows a decrease. These enterprises are the least effective in utilising their capacities.



Source: edited from own survey

7. figure Variation of ROA in the examined sample with enterprises sorted by their annual revenues

The smallest enterprises are in the most disadvantageous situation in the aspect of ROA, but all the enterprises exhibit a tendency of decreasing ROA as well. The equipment of bakeries are out-of-date, their capacity-utilisation is relatively low.



Source: edited from own survey

8. figure Variation of average asset turnover in the examined sample with enterprises sorted by their annual revenues

It is clear that the performance of enterprises with their revenues between 250 and 1000 million forints is the steadiest. The smallest and the largest enterprises are in the most disadvantageous situation. A gradual decrease in the past few years can be observed in this field as well.

The analysis of ROS has strengthened the fact that the position of medium-sized enterprises is the most advantageous while the smallest enterprises are in the worst position. The latter can barely react to the smallest changes in their economic

environment, their operation is based on survival strategy. The sector they operate in requires a lot of equipment, so they have no opportunities for development since for a production of adequate efficiency and quality well-trained workforce is required as well.

The concentration and strengthening of positions in food trade is a general tendency, not only the feature of the bakery sector. These changes cause a conflict between small-scale producers and large-scale trade and result in price cutting, which has a great impact on the efficiency of producers.

3.2. Conclusions, recommendations

Based on the presented findings I'd like to present my major conclusions according to my original aims:

- In the case of small and medium enterprises **the obstacle in the way of increased efficiency is the lack or improper use of an information and decision-support system**. Even with the presence of such a system, the utilisation of the opportunities provided is inadequate. The findings of my study show the same results.
- **Small and medium enterprises don't have an Executive Information System**, the flow of information towards the management isn't adequate. Pieces of information are not utilized appropriately. Not enough emphasis is put on planning or evaluation of expected and actual figures to uncover the reasons for deviation.
- The greatest economic disadvantage of food industry enterprises is that **they can only sell their sell their products at low prices with a low margin of profit**. According to the results of the survey, price increase is only a partially implementable factor in order to increase efficiency. The **reasons** why sell prices have become low are the following:
 - The **high proportion of low quality out-of-date products** on the market that do not meet the requirements of a healthy lifestyle press down the prices of good quality products.
 - The **presence of too many small and disorganized producers** make the market chaotic and undeterminable, so decision making about the prices isn't adequately supported by market information.
 - **Food industrial manufacturers are at a low level of organisation**, so they are not in a good position when negotiating with multinational commercial chains.
- **Increasing operating prices** can result in a critical situation in food industrial production's efficiency. According to the survey and deep interviews, food industrial enterprises are especially sensitive to cost-prices of raw materials. Food industrial production requires lots of raw materials and a lot of labour power as well, especially at small and medium enterprises, where mechanisation is relatively low. If expenditures on wages grow it also influences their situation disadvantageously.

Government regulations, such as minimum wage, contribution on wages, etc. can greatly influence the conditions of employment. It is not likely that operating costs will rise on long term, so these negative changes may result in the loss or decrease of present competitive edges.

- **Funding difficulties** can cause an equally problematic situation. They are also among the most common arising problems according to my study. Small and medium enterprises can hardly support investments, without own liabilities assets might become more and more obsolete. **Investment sources** and state subsidies will most likely **decrease** in the future.
- Food industrial production is **strongly influenced by the situation of agriculture** as well, considering that agriculture produces the raw material base of food industry. Weather conditions can result in huge differences in the volumes of produced raw material and that can also affect food industry.
- The **lack of trained workers** is also a serious problem, as the results of the survey show. The main condition of quality production is the presence of well trained, qualified workers. However, this difficulty can only be solved on macro-level.
- According to my study, **machine utilisation level** is also low, which contributes to lower efficiency.

I would like to summarise my **recommendations** based on the findings of my research and my conclusions here.

- Increasing efficiency is not possible without possessing information that can be used to support decisions. Small and medium enterprises should take actions to decrease or abolish defectiveness on this field. The coordination of planning, monitoring, information supplying and taking maximal advantage of the opportunities provided by controlling is vital.
- Establishing a managerial accounting information system that provides the base figures for analysis is an available option for small and medium enterprises as well. (Taking enterprise sizes into consideration, it is recommended to develop an executive information system that contains data based on the enterprises' financial and accounting system.)

- Increased efficiency can be reached by more effective usage of resources and by thoughtful cost management.
- Financial problems can be decreased by governmental investment subsidisations.
- The basis of increased efficiency is producing high-quality food products. This should be conducted by giving priority to the appliance of food-safety systems. It is important to increase organisation of food industrial enterprises, development of these organisations should have priority.
- Consumer protection authorities can help reduce the amount of low-quality products on the market, increasing consumers' trust in food products.
- Efficiency-analysis based on accounting information system is vital for food industrial small and medium enterprises. These figures are available to all enterprises; indices calculated from them require only basic-mathematics, but calculating them regularly can greatly increase efficiency, as they help indicate possible problems, which supports fast interference.

4. NEW AND ORIGINAL ACHIEVMENTS OF MY DISSERTATION

1. **The efficiency of food industrial enterprises depends on their information and decision support system.** The usage of these systems makes it possible to supervise and study resource-efficiency continuously in order to increase overall efficiency. Factor elements influencing efficiency can be monitored this way. In a rapidly changing economic environment it is vital to harmonise planning, controlling and information-gathering. Taking my survey-results into consideration, I came to the **conclusion** that mainly micro-, small- and medium enterprises are the ones, which do not enjoy the benefits of having a controlling system.

For established decision-making it is inevitable to take internal and external factors into consideration, in order to run the enterprise as efficiently as possible. The **source of information for established decision-making is accounting**, mainly managerial accounting, which should be established in a way so that it helps with the coordination of planning, management and controlling. Establishing an executive information system is not obligatory according to the Hungarian Accounting Law. **In my opinion** though, a well developed and structured executive information system is vital for the efficient operation of enterprises.

2. In order to be able to create comparable analyses, comparable data is required both in space and time. Modern and unambiguous accounting evaluation methods can fulfil these requirements. This is provided by applying the International Accounting Standards. Applying these Standards is increasingly important in a more and more globalized economic environment. My **conclusion** is that the presence of multinational enterprises requires coordinated accounting regulations at all units of economy.

3. In my dissertation I took factor elements that influence efficiency of food industrial enterprises into consideration. I studied the methods and elements of yield-calculation. It is very important what we take into consideration when calculating yield-indices. We can calculate only with realised yield or also with not (yet) realised yield. Profit and loss calculations also influence efficiency- and profitability-indices. I introduced profit and loss calculations both from accounting's

and business economics' point of view. **I am of the opinion that** analysis based on **revenues** (net sales), **net income and pre-tax income** is the most accurate when calculating and measuring efficiency and profitability. Net income and pre-tax income show great differences due to tax-regulations and tax base correction elements. Because of this, pre-tax income shows a better picture of the enterprises' ability to create profit, while net income provides the inner-source for developments, if it is not allocated between owners and shareholders as dividends. This is their decision, taking their short- and long-term aims into consideration.

In order to measure the efficiency of separate business-branches, the **operation of which connect to each other vertically** we need to define efficiency and production value by branches, calculating their "yields" on market value. This way it becomes obvious, which activities are profitable and which should be outsourced.

4. I created a **model that supports established managerial decisions**. Regularly calculating the model's recommended indices makes operative interference in processes possible, in order to carry out mid-term and long-term plans.
5. Apart from yield-calculation I also introduced the dilemma of **expenditure-calculation**. I studied the **effects of fixed and consumed expenditures on efficiency-measurement**. It is very important what we take into consideration during calculations and at what value. Evaluation is one of the most disputed questions of accounting, as it can influence the enterprises' performances, profits and losses and through these all the efficiency-indices. **In my opinion** it is not possible to meet the requirement of both aims the same time, so enterprises must prioritise in all cases. During analysis it is vital to take fixed and consumed expenditure's efficiency into consideration. When analysing time series it is important that data we use is from financial reports that use the same evaluation-methods.
6. Among food industrial enterprises **medium sized enterprises are the most efficient** and their operation is the most balanced compared to others.
7. **Increased efficiency can be reached by more effective usage of resources and reduced amounts of expenditures**, because there are not many opportunities to

increase revenues. Price increase is a very limited option, because there are huge amounts of cheap products on the market (China, South-America), which also limits quantity increases.

- 8. The main impediment of food industry's efficiency is the lack of innovation and qualified workforce.**

5. PRACTICAL APPLIANCE OF THE RESULTS

The main results of my dissertation are based on my conducted survey. No similar comprehensive surveys have been performed on food industrial enterprises recently.

The enterprises' product-profitability can be increased by using the observations of my study.

The statements of my dissertation can be used in education as well. Efficiency-indices and factor elements influencing them can be utilised by the education of subjects that teach analysis. Figures, diagrams and tables help the understanding of coherences and demonstrate the topic very well.

The results of my study provide valuable and useful information for further studies and examinations, food industrial enterprises, other market actors and different levels of economic management and leadership.

6. PUBLICATIONS IN THE TOPIC OF MY DISSERTATION

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