

STUDY REGARDING THE USE OF THE TOOLS OFFERED BY MICROSOFT EXCEL SOFTWARE IN THE ACTIVITY OF THE BIHOR COUNTY COMPANIES

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Abstract: *A business activity involves many decision situations. These include organization, aggregation, processing, modelling and analysis of large volumes of information. By using specialized software that provides tools for analysis, aggregation and data modeling, company managers can quickly obtain significant information about company activity. For different reasons some companies are opting for a summary analysis of data, while others for a complex analysis of the data. Many companies use spreadsheet applications for inventory, data processing, modeling and analysis, useful for business activities. Microsoft Excel software is used by many of those who know and use spreadsheet applications for carrying out the work. Using tools to organize, aggregate, modelling and data analysis provided by spreadsheet application, these companies can make complex economic analyses and prognoses that lead to better decisions. For example, the Pivot tables are a simple way to extract relevant information from complex data sets in a quick and simple manner. Solver can be used to solve optimization problems. Correlation is useful in interpreting the relationships between various indicators. Based on these considerations we conducted a study in which we sought to obtain information on how instruments such as Pivot tables, Solver and Correlation are used in the business activities of companies. Companies that attaches high importance of using Pivot tables are medium and large companies. Among the companies using Solver tool, very little use GRG Nonlinear and Evolutionary Algorithms. Therefore, the Solver is used more to resolving optimization problems involving linear modeling. Correlation tool, which could help decision makers to understand more easily why the increasing of one of the factors implies the change of other factors and consequently help them make better decisions, is used far too little. Still too many companies give less importance to data organizing, aggregation, processing, modelling and presentation in a manner suitable for efficient decision making. This is due mainly because of insufficient knowledge of the Microsoft Excel abilities by the employees. Collected and stored data are not used to their full value. In this way, companies do not have information that could provide advantages in a rapidly changing market.*

Keywords: data analysis; spreadsheet software; economic analysis activity

JEL classification: M21; C83

1. Introduction

A business activity involves many decision situations. They may have a lower or higher complexity and involve organization, aggregation, processing, modelling and analysis of large volumes of information. By using specialized software that provides tools for analysis, aggregation and data modelling, company managers can quickly obtain

significant information about the company's activities, can obtain overview, image synthesis of certain aspects of the company's activities.

Specialized tools for analysis, aggregation and data modelling allows capitalization of the information found in databases for effective decision making, both at the strategic and technical levels (Soares, Peng, Meng, Washio and Zhou, 2008). For different reasons some companies are opting for a summary analysis of data, while others for a complex analysis of the data. For this aim traditional analysis software tools or specialized analysis software tools are used.

Many companies use spreadsheet applications for inventory, data processing and analysis. Microsoft Excel software is used by many of those who know and use spreadsheet applications for carrying out the work.

Microsoft Excel 2010 allows you to analyse, manage and share information in more forms than ever before, so that the user can make better decisions. Visualization tools and data analysis enables us to track and highlight important trends in a timely manner (Vătuțiu and Guran, 2012).

2. Tools for analysis, aggregation and data modelling offered by Microsoft Excel software

Tools for analysis, aggregation and data modelling offered by Microsoft Excel software are used more or less in different companies.

For example, in small companies, Microsoft Excel software is primarily used for recording data as spreadsheets by using simple formulas, common functions, sorting, filtering. These companies are devoid of information that might help in the development of efficient activities.

For medium and large companies, computing power and data analysis provided by Microsoft Excel is appreciated a lot, but still not enough. Using tools to organize, aggregate, modelling and data analysis provided by spreadsheet application, these companies can make complex economic analyses and forecasts that lead to the best decisions.

Microsoft Excel software provides efficient solutions to many situations for a business activity. Among these are:

- Pivot tables that offer great flexibility in data presentation (Jacobson, R. 1997). Represents a fast and simple way extract relevant information from complex data sets. Allow organizing data stored in multiple spreadsheets, change in the pattern or level of detail displayed.
- Solver, useful in optimization problems. Most common problems are those related to optimization. They consist of an objective function that must reach an optimum (minimum or maximum) and of some restrictions (limitations of the existing natural resources). In order to solve them, Solver Excel provides a strong element analysis using more variables and restrictions in order to find the best solution for solving a problem (Vătuțiu and Guran, 2012). Solver can use linear algorithms (Simplex LP) and nonlinear (GRG Nonlinear and Evolutionary) depending on the nature of the optimization problem to be solved. Solver is useful, for example, in determining the optimal mix of products, in determining the optimum distance, efficient organizing of human resources, in solving the problems of transport and distribution, efficient allocation of financial resources, financial planning (Bălan and Dumitru, 2011).
- Correlation tool, useful in interpreting relationships between various indicators. It offers the possibility of getting relevant information regarding the way in which different indicators evolution are correlated. Using this tool could help decision makers to understand more easily why the increasing of one of the factors implies

the change of other factors and consequently to make better decisions (Bălan and Dumitru, 2011).

Microsoft Excel software has the status of a standard in spreadsheet software. It is integrated with Microsoft Office software so that the data and the processing results can be transferred between all components of Microsoft Office software, which is an important advantage.

3. The premises of the research

In the performed research we started from the following hypothesis:

- Tools for analysis, aggregation and data modelling offered by Microsoft Excel software are used in Bihor companies' activity.
- Tools for analysis, aggregation and data modelling offered by Microsoft Excel software are used more in companies with more than 100 employees.
- There is a positive correlation between the size of the company and how much they use the tools for analysis, aggregation and data modelling offered by Microsoft Excel software

4. The research methodology

As a result of a previous study regarding the use of Microsoft Excel in Bihor companies' activity, we achieved a database with 744 companies which use Microsoft Excel software in their activity. A classification of these companies sorted by size is presented in Table 1.

Table 1: Companies using Microsoft Excel software grouped by size

Number of companies/ Company's size	Total number of companies
up to 10 employees	148
between 10 and 50 employees	256
between 50 and 100 employees	226
with more than 100 employees	114

To collect the necessary information we used questionnaires which we sent to all companies in our database. A number of 736 of the total questionnaires were returned and used for analysis, resulting a response rate of 98,92%. Response rate for each category considered is presented in the Table 2.

Table 2: Response rate for each category considered

Response rate / Company's size	
up to 10 employees	97,30 %
between 10 and 50 employees	98,83%
between 50 and 100 employees	99,55 %

with more than 100 employees	99,12%
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It is observed that the response rate is very high. The cause could be that the companies used in our research are companies that responded and at other times to other questionnaires sent to us. It seems that these companies are interested in conducting studies of this nature.

The questions were grouped as follows:

- Questions related to the company's size.
The companies were structured as follows:
 - up to 10 employees
 - between 10 and 50 employees
 - between 50 and 100 employees
 - with more than 100 employees
- Questions related to departments that used Microsoft Excel software.
- Questions related to activities involving the use Microsoft Excel software.
- Questions related to position which the employees (Microsoft Excel software users) hold in the company.
- Questions related to the complexity of the reports needed in activities which they carried
- Questions related to the analysis activity of the economic data.
- Questions related to the graduated domain and software applications known by the employees.
- Questions related to the software applications they currently use in the analysis, aggregation, modelling and data presentation.
- Questions related to how much Microsoft Excel software is used in analysing, aggregating, modelling and data presenting.
- Questions related to the tools which they use for analysing, aggregating, modelling and data presenting offered by Microsoft Excel software and used in company activities.
- Questions related to the importance given by the company manager in improving the employees' knowledge in using Microsoft Excel software.

5. Data analysis and interpretation

Regarding the first two hypotheses, collected data showed that:

- In 76,39% of the companies with less than 10 employees Microsoft Excel software is used mainly in data inventory using spreadsheet forms, due to lack of knowledge in how to use Microsoft Excel software. Only simple formulas are used, sorting and usual functions, filtering and in the best case subtotal function. Using the results, a person can make a decision, usually regarding to what to do in the upcoming month, based on the current data, compared to the data acquired in the previous month. In some companies, by applying simple filtering techniques are quickly found and highlighted information that meet certain criteria. By using the subtotal function, detailed information such as lists of expenses, individual sales records, number of articles in each type of inventory could be used effectively in the decision making process.
- Pivot tables are used to a lesser extent (23,61%) in companies with less than 10 employees. Therefore, we noticed that still too few companies give importance in analysing, aggregating, modelling and data presenting in a manner which allows effective decisions.

- Pivot tables are used more, but still not enough (68,44%) in companies with a number of employees between 50 and 100.
- Companies that attaches the highest importance to use pivot tables are companies with more than 100 employees (73,45%). Pivot tables allow dynamic summaries for efficient data analysis. Allow quickly aggregation of large amounts of data. The way in which data is presented can be changed easily, by changing either the configuration or the level of the details displayed. Stored data can be organized in multiple spreadsheets. All required details can be displayed or hidden.
- In companies with less than 10 employees Solver tool is used in a very small extent (3,47%) and Correlation tool is not used at all. Expected, due to lack of knowledge in how to use Microsoft Excel software.
- Companies that use mostly Solver tool in solving optimization problems are those with more than 100 employees (53,98%).
- Among the companies using Solver tool, very few using GRG Nonlinear and Evolutionary algorithms. Therefore, the Solver tool is used more in solving optimization problems involving linear modelling.
- Even in companies with more than 100 employees, Correlation analysis tool is used in very small extent (13,27%). Using this tool can be identified factors that escape in case of a rapid analysis of data. Using this tool could help decision makers to understand more easily why the increasing of one of the factors implies the change of other factors and consequently to make better decisions
- Too few companies, especially of those who have less than 50 employees, using the tools for analysis, aggregation and data modelling offered by Microsoft Excel software. This is because employees have only basic knowledge in using Microsoft Excel.
- A large number of companies do not give enough importance to analysis, aggregation and data modelling tools offered by Microsoft Excel software, tools that could bring multiple benefits.

Results are synthesized in the Table 3:

Table 3: Usage of tools offered by Microsoft Excel software in the activities, depending on company size

Instruments used/ Company's size	N	PivotTables	Solver - Simplex LP	Solver - GRG Nonlinear and Evolutionary	Correlation
up to 10 employees	%	34 23,61	5 3,47	0 0	0 0
between 10 and 50 employees	%	117 46,06	36 14,17	2 0,78	2 0,78
between 50 and 100 employees	%	154 68,44	87 38,66	12 5,33	28 12,44
with more than 100 employees	%	83 73,45	61 53,98	8 7,08	15 13,27
Total	%	388 52,72	189 25,68	22 2,99	45 6,11

For a visual presentation of the data and better understanding of their significance, the data is represented as a chart, in Figure 1:

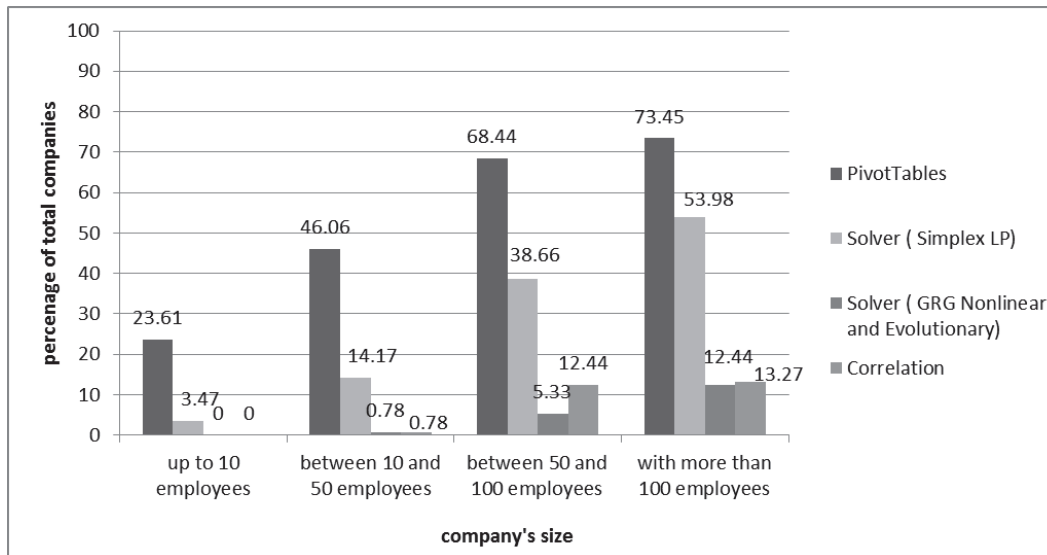


Figure 1: Usage of Microsoft Excel software by companies

Regarding the last hypothesis, collected data showed that:

- In all four cases, the correlation indicator has values close to 1, which means that there is a strong and positive correlation between the size of the company and how much they use the tools for analysis, aggregation and data modelling offered by Microsoft Excel software.

To verify the last hypothesis, we used the Correlation tool that is part of the package of data analysis tools. Results are synthesized in the Table4.

Table 4: Correlation indicator values

	Company's size	Pivot Tables
Company's size	1	0.970557
Pivot Tables	0.97055671	1

	Company's size	Solver Simplex LP
Company's size	1	0.98992481
Solver Simplex LP	0.98992481	1

	Company's size	Solver (GRG Nonlinear and Evolutionary)
Company's size	1	0.946978408
Solver (GRG Nonlinear and Evolutionary)	0.946978408	1

	Company's size	Correlation
Company's size	1	0.92138736
Correlation	0.921387357	1

6. Conclusions

Conducted research shows that Microsoft Excel software is used quite enough in Bihor companies' activity, but tools for analysis, aggregation and data modelling offered by Microsoft Excel software are used too little. Collected and stored data are not used to their

full value. In this way, companies do not have information that could provide advantages in a rapidly changing market.

In most of the companies with less than 10 employees, are used only elementary techniques of Microsoft Excel software, due to lack of knowledge in how to use Microsoft Excel software. Tools for analysis, aggregation and data modelling are known and used to a limited extent. Very few of the respondents use Solver tool in solving optimization problems. Correlation tool is not used at all. Using this tool could help decision makers to identify factors which are omitted in the quick analysis of data, to understand more easily why the increasing of one of the factors implies the change of other factors and consequently to make better decisions.

Regarding the second hypothesis, we found that companies that attaches the highest importance to use pivot tables and Solver tool (Simplex LP) are indeed companies with more than 100 employees. Instead, Solver tool (GRG Nonlinear and Evolutionary) and Correlation tool are used in a very small extent even in these companies.

Companies in Bihor county should give more importance to analysis, aggregation and data modelling tools offered by Microsoft Excel software, tools that could bring multiple benefits. Should give more attention to improving employee knowledge in how to use Microsoft Excel software.

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SUB-SECTIONS: MANAGEMENT I, II

