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The role of enterprise resource planning in corporation efficiency

Anna Juhász

Supervisor: Márta Szabóné Bohus

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THE ROLE OF ENTERPRISE RESOURCE PLANNING IN CORPORATION EFFICIENCY

INTRODUCTION

The subject of my paper was the evaluation of a working ERP system (software) at a limited company. My decision on which company to analyze was based –besides its being a partner company- on its having headquarters in Békéscsaba, and having an adequate size necessary to use an ERP system. The management and staff of the Marzek Kner Packaging Ltd. willingly offered me information for my paper.

We live a time of the expansion of IT knowledge: the golden age of information. Nowadays the pace of life has quickened and the accumulated massive amounts of information can only be processed and stored through informatic software. Information technology cannot be ignored in the life of corporations either. With its help one can get information in seconds that obtained manually would take a much greater amount of time.

During my research my main questions were the following. How can a complex enterprise resource planning software help a company's activities? Can outcome and productivity be increased with the help of enterprise resource planning software? Does such software provide companies which use it a competitive advantage, and if it does, I will attempt to determine how it does so.

1. INTRODUCTION TO MARZEK KNER PACKAGING LTD.

The Marzek Kner Packaging Ltd. had two outstanding predecessors: Kner Izidor founded it in 1882, and Tevan Andor established a technical workshop in its surroundings in 1903. The company has more than 120 years of experience in the printing industry, and for decades it has been a key player in manufacturing packaging materials here in Europe.

The present owner -Marzek Etiketten GmbH- bought Kner Press from Mondi Packaging in October of 2005. Between 2006-2011 there was an investment of 2.5 billion forints in the company. With the adoption of a new name, the firm became Marzek Kner Packaging Ltd. in January of 2011.

Its main area of production is the fabrication of paper based packing materials consisting of sheets and rolled labels, as well as the production of bent walled cardboard boxes. Generally speaking, one can say that the company manufactures products for the pharmaceutical,

household chemical, food processing, candy, wine, spirit, tobacco, and soft drink industries. Mostly, it targets its packaging materials to meet the requirements of the pharmaceutical industry. For example, its customers include Richter Gedeon Plc., EGIS Plc., TEVA Magyarország Plc., Béres Gyógyszergyár Plc., Nestlé Hungaria Ltd., Törley Pezsgőpincészet Ltd. and Unilever Magyarország Ltd.

The company manufactures its products from chiefly imported materials. Suppliers are from Germany, Scandinavian countries, and also numerous south-west European countries as well; however, it does not import from any foreign continents. Basically, the prices offered for an identical item determine which supplier will be chosen; it can be said that, however for the most part, geographically closer suppliers are the cheapest, owing to, amongst other things, the high cost of fuel. On a yearly rate, the firm purchases millions of euros worth of materials needed for thousands of tons of products (paper, cardboard, foil, and different kinds of paints and varnishes).

The company's competitors are from its own segment, that is, domestic packaging producers, which, like Marzek Kner Packaging Ltd., manufacture primarily for the pharmaceutical and food processing industries. The plants of these other firms have approximately the same equipment, and thus technically they offer the same results, bringing about a stiff price competition between them. In the fourth part of my paper I will compare these factories with the help of an index –a supported evaluation.

2. INTRODUCTION OF THE USED SOFTWARE

2.1. Installation history

Before the new owner took over, Mondi Packaging, instead of the currently used and Microsoft developed Axapta ERP system, used its own, in-house developed DOS-based system called GYIR, Gyártási Irányítási Rendszer (Manufacture Controlling System). It was slower and had limited functions and some different departments were not installed into the system. Thus double or multiple data entry occurred in order to enable all company departments to use the system correctly. Accordingly, work was less efficient and less transparent with GYIR.

One of the reasons for choosing Axapta was that the parent company was already using that system. The company got a standard system that had been developed for a printing house working with coil-press machines, while most of the products of the actual company were produced with a different technique. The installation process started with a gap-analysis, in

which they examined the features and functions of the old system, and defined the ones that the new system was required to know.

Then for every department they designated a so called key user –typically the leader of the department- to stay in touch with the firm who was responsible for the installation and to inform them about the work needs of the work of that given department. In 2005, they installed the software in two steps. In May it was put into the finance department and in November into the manufacturing department. Over a weekend they imported the database from the former system, and continued by manually entering the data concerning the then works in progress.

In the following half year there were serious problems mostly affecting the manufacturing. The main cause was that the software was not customized for this company. Only under the new owner –Marzek Etiketten GmbH- did the customization of the software begin. Axapta is a system with open-source code, therefore it allows further development and customization.

The development was entrusted to the IT staff which worked for Kner before the „Mondi times” and which knew the press industry very well. They developed a completely customized manufacturing module based on the specific features and needs of this exact printing house. Thanks to the customized production programming the procedures can be monitored, thereby providing the opportunity to plan –obviously with regards to orders and order’s demands- for utilization of the plant with maximum capacity. The installation of the system was not followed by any decrease in administrative costs (e.g. dismissing a certain number of employees responsible for administration could reduce expenditures on wages and benefits), as due to the steady growth of the company even more employees than before were required.

The planned sum for the installation was exceeded multiple times over during the two year period of development until the, now smoothly working, system was born. At first the company worked with outside developers, which in 2005 money was about 100 euros/developing hour. Later the previously mentioned Kner- IT staff worked on it during regular working hours. This group of three is presently still working at the company and daily help run the software and also work on needs as they arise.

At the installment all staff took part in training. The production supervisors each received 20 hours of training, the mid-level managers in small groups got 10-15 hours, and the laborers, also in smaller groups, got 3-4 hours.

Today, except for payroll, the software covers all the important modules which are needed for the efficient functioning of the company. The reasons that the payroll module was not able to

be parameterized in Axapta are complex Hungarian laws and the specific payroll structure of the printing industry. This function is provided by another program connected to Axapta.

Concerning the usage of this system, the next challenge the company is going to face with is the upcoming version update of the software. This process will be first carried out at the Austrian mother company, followed by the update of the software used at the Ukrainian, and finally at the Hungarian subsidiary. The complexity of the software update is mainly due to the large amount of customized developments.

2.2. Introduction of practical usage

- There is an opportunity for a symbiotic relationship between a procurer's system and the company's system. This is beneficial for both parties. A procurer can monitor an ordered product, and can save time and staff through the opportunity of ordering faster or altering a previous order through the system, and also thanks to the symbiosis, he can see his orders 4-8-12 months in advance.

It is beneficial for the company, because production can be shaped to the needs of a contracting party, and furthermore the maximum factory capacity can be foreseen and planned, so the supplies can be taken care of, and last but not least, it can help maintain customer loyalty. This competitive advantage can only be held by companies who have these complex systems; however only few can afford to investment in them.

- Every employee of the company uses only those functions of the software that are related to their respective work area and responsibilities. The production department's workers prepare and submit a worksheet every day. In this worksheet they record the description, time, and quantity of every workflow the product was involved in, as well as if scrap material was produced, and if there was overtime. After all data are added, the worksheet gets digitally signed and sent to the supervisor at the end of every shift. The calculation of the monthly wage of the workers will be based on their performance. In addition, they are also responsible for the logging of some materials with high priority. These materials are assigned to a specific process that gives a higher value to the base or auxiliary materials. Therefore, the system logs separately the quantity and the time of its usage, and also records the employee who used it.

The production preparation manager designs the incoming order regarding the necessary time, quantity of materials and capacity in the software. Then he gets a precise, fast calculation of the costs and the total production process. The data needed for these calculations can be gained and filtered via so-called reports. For instance, it is possible to generate a report on the level of free storage capacity within or over 30 days.

The employees working for the purchasing department are the ones who insure a continuous supply of base and auxiliary materials for production; therefore they track all changes in inventory. New orders are generated here as well.

The mould creation manager sees in the system the department's needed amount of basic and auxiliary materials in storage, selects the needed quantity and which warehouse he or she wants to receive it from. The software tracks the moved materials. Furthermore this manager's duty is to control the worksheet of the workers and to determine their performance in percent. If this were noticeably high or low, the manager first checks to see if the number was a typo. If there is no error, then it is likely that there is a problem with a machine's configuration and that's the cause of the low numbers. Accordingly the problem can be resolved without talking to the workers.

The production programming manager ranks the duties in the engine-room, and this is called production programming. The production assistant times the work phases needed for production. Then the needed base and auxiliary materials are transferred to the respective department with the help of material transition tickets. Finally, the manager confirms the orders by preparing the supplier contracts.

Finished products are deposited at logistics. They book them with the help of barcodes, store and deliver them by due deadlines. The program assembles the order lines from the list of contractors. These will be printed and the storekeepers, with the help of a barcode reader, look for the finished products, take the proper quantity to the preparation area, then put them on the trucks. A delivery note is made from the drawdown of contractors as well, also the finance department prepares the bill according to it. Besides the delivery note, the manager also prints a quality certificate. If there are any problems, it cannot be printed and the system automatically generates an e-mail to the quality inspector to take action. One can see the materials' actual quantity too. It occurs that they have to order transport when the products are in fabrication. In such cases they calculate what size vehicle to order by the used quantity of materials.

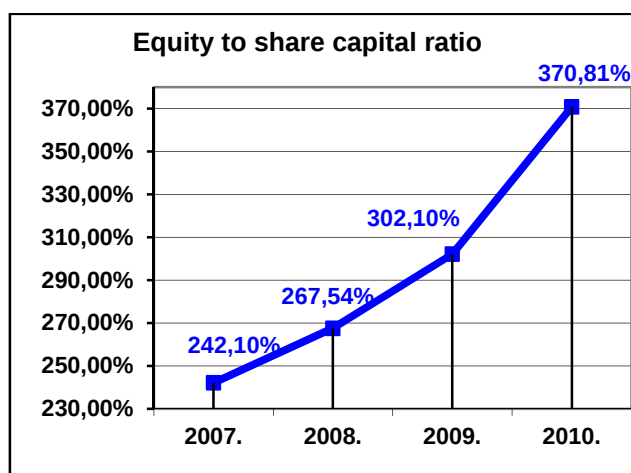
The responsibility of the finance department is to monitor the company's operations professionally. According to the accounting laws, the system of accounts is in the ledger of the software, the chart of accounts is built up from analytics. Everything is booked through the log, into a given transaction, a given log. The customers and the suppliers have separate customer and supplier strain data processing units. Their data are stored here and the software also books their transactions on their accounts. The e-bank and the software are connected through an interface, so, i.e. the recent transactions can be imported from the bank module to

the e-bank. When taking stock, the inventory list is printed from the stock accounts. The great advantage of this software is that the accounts' balances can be deeply systemized, giving the possibility of the view of the contained items which give the accounts' balance.

Moreover, we have an opportunity of making microeconomic statements. These are not regulated by law, every manager can decide whether he or she needs this kind of information or not. The company has a monthly closing. At the end of every month they close the ledgers, account for corporation tax, bind the batches which have not yet procured bills and they reevaluate some batches. The data is rolled up in monthly closing (current year rolling) and are calculated for the given month. This is the decision of the company, which the sharp competition between its competitors has made a must. After the closing of controlling they generate data, which are not necessarily seen in the ledger. For example, commercial data is contracted weekly, which shows a trend. They always speculate on the trends, and talk about trouble when the orders tend to drop for a longer time.

3. ANALYSIS OF THE COMPANY'S INDEXES

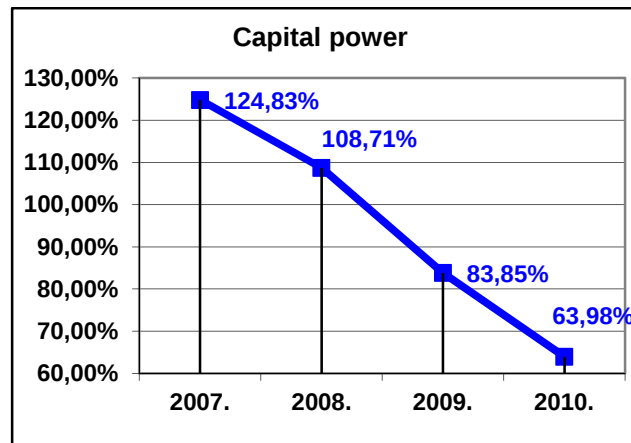
Figure 1



Source: own calculation based on yearly account data

The equity to share capital value of the company stood at 242.1% in 2007 (Figure 1). As the ratio exceeded 100%, it indicated a growth of equity capital over share capital during the preceeding years. Based on this fact, an efficient administration of finances is presumable. Having a look at the same ratio three years later, it already stood at 370.81% after an annual growth of 53.16% in 2010. These figures mean that the equity capital nearly quadrupled over the share capital in total, which fact – among other factors – can be explained by the well functioning EPR system that helps company leaders make better business decisions.

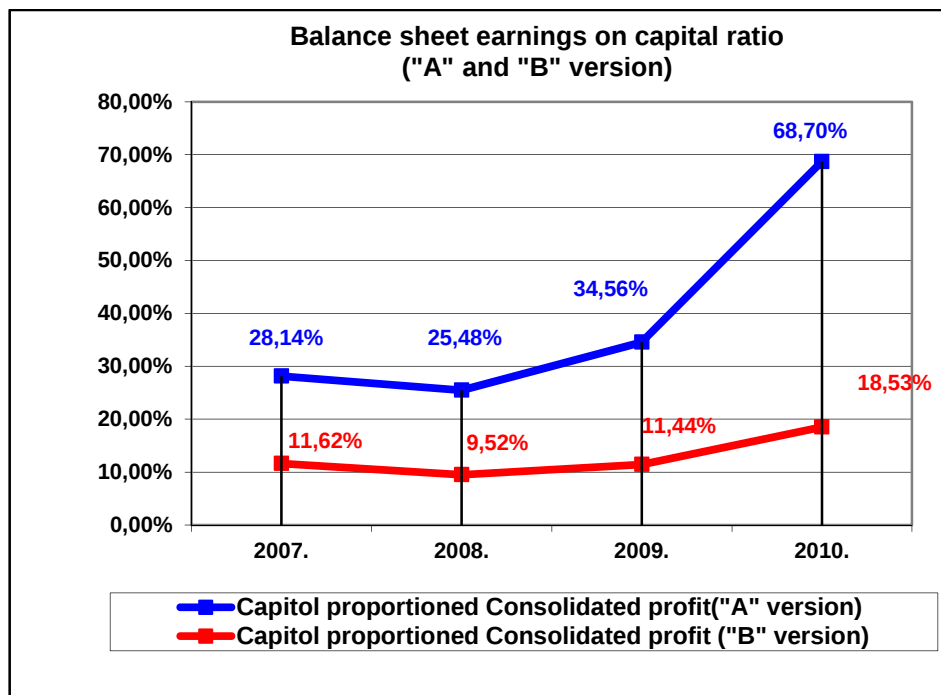
Figure 2



Source: own calculation based on yearly account data

The debt to equity (D/E) ratio of a company shows the level of external financing over equity capital. The ratio stood at 124.83% in 2007, meaning that value of liabilities and debts definitely exceeded the value of equity in that year. This figure decreased by 48.75% in the following three years, and stood at 63.98% (Figure 2) in 2010, indicating the gained dominance of internal financing over external financing.

Figure 3

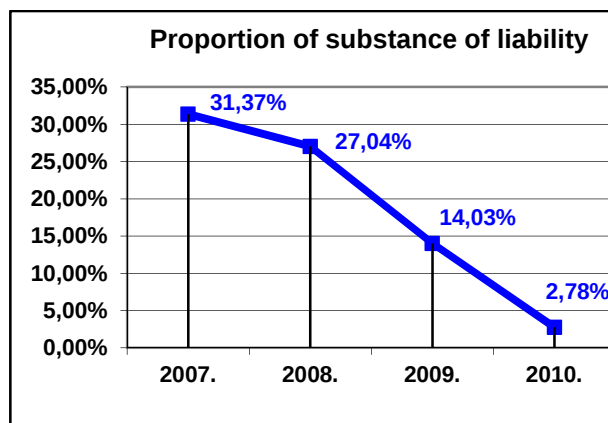


Source: own calculation based on yearly account data

The balance sheet earnings on share capital ratio stood at 28.14% in 2007, and after an increase of 114.14% it reached 68.7% in 2010 (Figure 3). If we modify the formula and calculate the balance sheet earnings on equity capital instead, that gives us a value of 11.62% in 2007 and shows a growth of 59.47% to 18.53% in 2010. As the company's complex ERP

has several features and functions that support the collection and systematization of multiple data, the use of this system may explain the figures above.

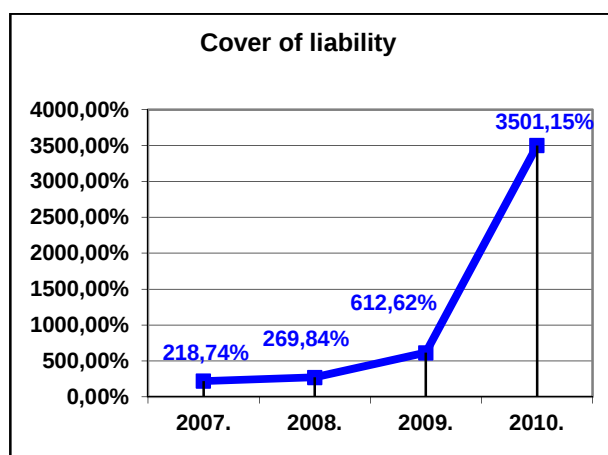
Figure 4



Source: own calculation based on yearly account data

The next indicator focuses on the percentage of long-term external debt over all long-term liabilities. In 2007, the company stood at 31.37% in this category, and the ratio decreased by 91.14% to 2.78% in 2010 (Figure 4). The critical maximum for this indicator is around 60-65%, which the company is not even close to

Figure 5

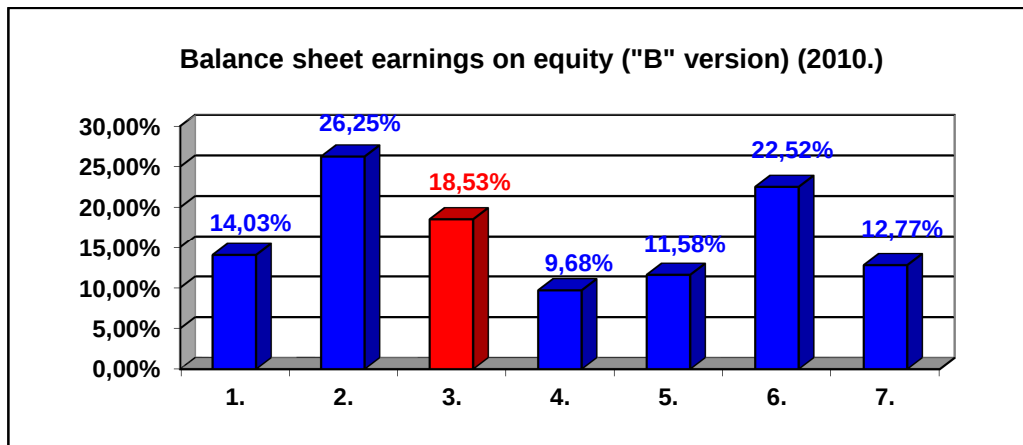


Source: own calculation based on yearly account data

The cover of liabilities ratio was 218.74% in 2007, which means that its equity capital could finance more than twice the company's long-term external debt in that year. After a growth of 1500.62%, the indicator reached a peak at 3501.15% in 2010, making it possible for the company to have 35 times more equity capital than long-term external liabilities.

4. COMPARISON WITH COMPETITORS

Figure 6



Source: own calculation based on yearly account data

According to the yearly accounts in 2010, the Keskeny és Társai Nyomdaipari Kft. (2.) had the highest ratio in the category of balance sheet earnings on equity, followed by Pharma Print Kft. (6.) and Marzek Kner Packaging Kft. (3.). Their percentage was significantly higher than the value of STI Petőfi Nyomda Kft. (1.), Körös Print-Pack Kft. (7.) the Javipa Nyomdaipari Kft. (5.), or Kartonpack Dobozipari Nyrt. (4.). (Figure 6.) According to these figures, the company examined by me definitely belongs to the front-runners.

5. FLAWS IN THE SOFTWARE

During my research different department managers reported insufficiencies in the software:

- The acquisition department manager's experience was that the software contains unreliable data in short term of time of the suppliers quantity orders. It happens that the material need does not disappear immediately when they take it out of the storage.
- At this time the logistics team has to manually set the supply tolerance every time at deliveries: namely, the percentage (positive or negative) of the possible lapses in ordered deliveries. This could be done on the customer card in advance. Furthermore, they could use the capability of filling up repositories in the storage system, meaning that the same specific finished products would always be stored in the same place. This would need a picking strategy and also they could optimize the loading with the fewer loaders needed for 1-1 truck load because they could targetedly search for the products.
- The managing director said that they can gain the information from the system with the help of recent standard reports which means that information can be filtered with only latter-advanced options. This could be improved by purchasing an OLAP based data mining

software and interlocking it with the extant ERP system. The point of OLAP systems is that the information can be filtered in several different ways and can be aggregated with these aspects, showing them to the users, who can also group and filter them and analyze them online. With its help basically any report can be made without development, because these software save to so called datacubes. The data is stored on the different sides of the cubes and these can be moved at will.

6. SUMMARY

According to the company's current managing director, Kása István Zoltán, it is extremely important that the Axapta is an open source-coded system, thereby permitting further development of the software. Software developers make industry specific ERP software in vain, there will be a standard system for a sector, which can be customized for a given company. What is approved through its own development offers many more opportunities and is more nuanced, gives finer modules, especially in the fabricating module for the companies which chose to install these software.

One of the advantages of a built up and smooth-working ERP system is that the data needs only to be taken in once and all the modules can work with it from then on. The 10% chance of flaws via manual entry can be reduced. Furthermore time can be saved which the worker can spend on other activities.

The company's supply chain's efficiency can be extended by eliminating the machine stand caused by absence of information (i.e.: the production line has to stop because of the processing of a long order).

There is an opportunity for a symbiotic relationship between a procurer's system and the company's system. This is beneficial for both parties. A procurer can monitor an ordered product, and can save time and staff through the opportunity of ordering faster or altering a previous order through the system, and also thanks to the symbiosis, he can see his orders 4-8-12 months in advance.

It is beneficial for the company, because production can be shaped to the needs of a contracting party, and furthermore the maximum factory capacity can be foreseen and planned, so the supplies can be taken care of and last but not least, it can help maintain customer loyalty. This competitive advantage can only be held by companies who have these complex systems, however only few can afford to investment in them.

The final conclusion is that complex ERP systems contribute to the success of companies. What is more, if we view it globally we can determine that its existence is important for our

country because it can improve exports by capitalizing a factory's capacity based on the easily estimated foreign procurers' needs. Consequently, the more companies can pre-plan, the more the export quota can grow, supposing the ideal amount of orders, certainly.

Acknowledgement

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ABSTRACT

According to your opinion, what role does Business Management Systems (BMS) play in company success? The aim of my research was to find the answer for this question by examining the practical use of the BMS software applied at Marzek Kner Packaging Ltd.

Good management decisions are essential to success. However, they require accurate situation analysis that cannot be made without properly filtered data. Such information can be easily obtained by the use of a developed, efficient business management system, as it stores all past data in a structured way.

Time factor has a highlighted role nowadays, and due to taut competition, good decisions must be made rapidly.

Software companies tend to develop industry-specific programs, therefore their final output is a standard system that must be customized according to the specifics of the certain company. The most economical way to implement such adjustments is the use of an open source code system, as it allows own developments.

Such a customized software ensures the possibility for company leaders to be aware of all circumstances due to properly filtered data. This also guarantees that they do not get lost in details, thus they are able to make the optimal decision.

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APPENDICES

1. appendix: Company indicators (EFT= Thousand Forint)

INDEX NAME	CALCULATION	2007.	2008.	2009.	2010.	CHANGE 2007=100%
1. Equity on share capital ratio	Equity capital / Share capital * 100	1.116.713 EFT / 461.330 EFT * 100 = 242.1%	1.234.256 EFT / 461.330 EFT * 100 = 67.54%	1.393.694 EFT / 461.330 EFT * 100 = 302.1%	1.710.644 EFT / 461.330 EFT * 100 = 370.81%	370,81% / 242,1% = 153.16%
2. Debt on Equity ratio	Debt /Equity Capital* 100	1.394.009 EFT / 1.116.713 EFT /* 100 = 124.83%	1.341.750 EFT / 1.234.256 EFT * 100 = 108.71%	1.168.611 EFT / 1.393.694 EFT * 100 = 83.85%	1.094.477 EFT / 1.710.644 EFT * 100 = 63.98%	63,98% / 124,83% = 51.25%
3/a Balance sheet earnings on capital („A”version.)	Balance sheet earnings / Share capital *100	129.797 EFT / 461.330 EFT * 100 = 28.14%	117.543 EFT / 461.330 EFT * 100 = 25.48%	159.438 EFT / 461.330 EFT * 100 = 34.56%	316.950 EFT / 461.330 EFT * 100 = 68.7%	68,7% / 28,14% = 244.14%
3/b Balance sheet earnings on capital („B”version.)	Balance sheet earnings / Equity capital * 100	129.797 EFT / 1.116.713 EFT * 100 = 11.62%	117.543 EFT / 1.234.256 EFT * 100 = 9.52%	159.438 EFT / 1.393.694 EFT * 100 = 11.44%	316.950 EFT / 1.710.644 EFT * 100 = 18.53%	18,53% / 11,62% = 159.47%

4. Proportion of debt-stock	(Subordinated liab. + long term liabilities) / (Subordinated liab. + Long term liab. + equity capital) * 100	$(0 \text{ EFT} + 510.525 \text{ EFT}) / (0 \text{ EFT} + 510.525 \text{ EFT} + 1.116.713 \text{ EFT}) * 100 = \mathbf{31.37\%}$	$(0 \text{ EFT} + 457.402 \text{ EFT}) / (0 \text{ EFT} + 457.402 \text{ EFT} + 1.234.256 \text{ EFT}) * 100 = \mathbf{27.04\%}$	$(0 \text{ EFT} + 227.495 \text{ EFT}) / (0 \text{ EFT} + 227.495 \text{ EFT} + 1.393.694 \text{ EFT}) * 100 = \mathbf{14.03\%}$	$(0 \text{ EFT} + 48.859 \text{ EFT}) / (0 \text{ EFT} + 48.859 \text{ EFT} + 1.710.644 \text{ EFT}) * 100 = \mathbf{2.78\%}$	$2,78\% / 31,37\% = \mathbf{8.86\%}$
5. Debt coverage	Equity capital / (Subordinated liab. + Long term liab.) * 100	$1.116.713 \text{ EFT} / (0 \text{ EFT} + 510.525 \text{ EFT}) * 100 = \mathbf{218.74\%}$	$1.234.256 \text{ EFT} / (0 \text{ EFT} + 457.402 \text{ EFT}) * 100 = \mathbf{269.84\%}$	$1.393.694 \text{ EFT} / (0 \text{ EFT} + 227.495 \text{ EFT}) * 100 = \mathbf{612.62\%}$	$1.710.644 \text{ EFT} / (0 \text{ EFT} + 48.859 \text{ EFT}) * 100 = \mathbf{3501.19\%}$	$3501,19\% / 218,74\% = \mathbf{1600.62\%}$

2. appendix: Indexes of the comparison with competitors (EFT= Thousand Forint)

Index name	Calculation	STI Petőfi Nyomda Kft	Keskeny és Társai Nyomdaipari Kft	Marzek Kner Packaging Kft	Kartonpack Dobozipari Nyrt
3/b Balance sheet earnings on capital („B”version.)	Balance sheet earnings / Equity capital * 100	$871.063 \text{ EFT} / 6.207.227 \text{ EFT} * 100 = \mathbf{14.03\%}$	$352.825 \text{ EFT} / 1.344.228 \text{ EFT} * 100 = \mathbf{26.25\%}$	$316.950 \text{ EFT} / 1.710.644 \text{ EFT} * 100 = \mathbf{18.53\%}$	$111.895 \text{ EFT} / 1.155.741 \text{ EFT} * 100 = \mathbf{9.68\%}$

Index name	Calculation	JAVIPA Kft	Pharma Print Kft (ONIX)	Körös Print-Pack Kft	Zalai Nyomda
1/b Balance sheet earnings on capital („B”version.)	Balance sheet earnings / Equity capital * 100	76.364 EFT / 659.715 EFT * 100 = 11.58%	48.679 EFT / 216.199 EFT * 100 = 22.52%	17.747 EFT / 138.992 EFT * 100 = 12.77%	Cannot be defined due to negative balance sheet earning