Business Administration and Business Economics

Optimising Sales by Using Econometric Models Combined with Business Intelligence Solutions

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Abstract: In this article we presented the importance of the implementation of both an econometric model useful for making the correlations required in order to make managerial decisions as well as of a Business Intelligence solution useful for the optimization of a company management. The case study was conducted on a company that distributes food products. In order to determine the connection between the average price and the quantity of products sold, in order to determine the trend and certain accurate forecasts, we used econometric regression models and in the end we also prepared a number of sales analysis reports projected by using the QlikView application. The projection of the reports, charts, and monitoring tools contributes to the business performance measurement, the analysis of the trends, and the measurement of the results. In our opinion, in order to stay competitive on the Romanian business market, company managers need all this items of information in order to have an image as clear and as accurate as possible of what they have done, what they do, or will have to do tomorrow.

Keywords: econometric models; analysis; trends; reports; Eviews; QlikView

JEL Classification: C51; M12; M15

1 Introduction

Lately, an increasing number of companies have understood that the success of a business is insured by implementing Business Intelligence (BI) solutions that enable the real-time procurement of information and its display as charts and/or tables(Zillman, 2010). A BI solution provides the company management with all the information required to monitor the progress of the specific activities (Moss & Atre, 2003). However, in order to answer the question "What will we do tomorrow?" we need to apply a few econometric models in order to determine the trend and to obtain accurate forecasts about the activities performed in the company. In this article we combined statistical methods with econometric models and BI applications in order to optimise sales in a company that distributes food products.

In this study we used information related to the sale of 8 categories of products, analyzed over a period of 8 months, more specifically March – October 2013. For

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each category of products we selected, for analysis, the selling price and the sold quantity.

The analysis of the links between the average selling price and the quantity of products sold can be exemplified using the correlation and regression method (Săvoiu & Necșulescu, 2009).

The regression model used to analyse the link between the two variables is linear: quantity= a + b*price +ε, where: the quantity is the dependent variable, the price is the independent variable, and ε is the random variable of the model that describes the influence of other factors on the dependent variable.

The intensity of the link between the two variables is measured using the correlation ratio (Multiple R) and the accuracy with which the dependent variable is explained is given by the coefficient of determination (R-squared) (Anghelache et all, 2009).

The selected econometric model is deemed valid if: the hypothesis of the independence of the random variables is verified (the Durbin–Watson test), the parameters are significantly different from zero (the t test) and if the model is adequate to the data (the F test) (Șerbănescu & Necșulescu, 2013). For the descriptive and econometric modelling statistics we used a software package called Eviews.

The combination of the econometric models with the implementation of a Business Intelligence solution leads to the guaranteed success of a company. The projection of the charts and monitoring instruments contributes to the business performance measurement, the analysis of the trends, and the measurement of the results (Bălăceanu, 2007).

2. Using Statistical Methods and Econometric Methods to Analyse the Sales of a Company

Table no.1 shows the main statistical indicators characterising the two variables, the quantity of sold products and the average selling price (Secară & Necșulescu, 2009).

Table 1. The descriptive statistics of the quantity of products sold and the average selling price on categories of products and as a total

	Quantity (Kg)	*Price (lei)*	*Quantity (Kg)*	*Price (lei)*	*Quantity (Kg)*	*Price (lei)*
	total		*MF1*		*MF2*	
Mean	1691246	8,07595	501299	9,482901	6529479	7,05737
Median	660267	7,760888	571763,5	9,546008	6579318	6,63399
St Dev	223768,6	1,528102	218258,6	1,003475	1475933	0,905165
Kurtosis	1,696166	-0,42775	-1,60036	-0,16073	0,546936	-1,32749
Skewness	1,679909	0,146648	-0,50636	0,054254	-0,28375	0,743375
Jarque-Bera	6,625916	0,852088	1,000522	1,186642	0,123846	1,035939
Probability	0,036408	0,653088	0,606372	0,910901	0,939955	0,595729
	Quantity (Kg)	*Price (lei)*	*Quantity (Kg)*	*Price (lei)*	*Quantity (Kg)*	*Price (lei)*

	MF3		*MFA*		*MFG*	
Mean	444882,2	8,688186	997814,5	8,135828	3854992	8,328071
Median	430176	7,972921	1079343	7,377878	3929581	7,414899
St Dev	155198	1,346698	180973,9	1,299194	917794,7	1,373553
Kurtosis	0,082806	-1,5306	2,520571	-1,47516	0,835093	-1,81631
Skewness	0,602621	0,75087	-1,62125	0,794003	-0,70358	0,734971
Jarque-Bera	0,442414	1,132418	1,244976	1,165226	0,448975	1,244920
Probability	0,801551	0,567673	0,536608	0,558437	0,798926	0,536623
	Quantity (Kg)	*Price (lei)*	*Quantity (Kg)*	*Price (lei)*	*Quantity (Kg)*	*Price (lei)*
	MFO		*MFP*		*MGS*	
Mean	328231,3	8,915003	600045,4	8,103673	273221,9	5,896569
Median	378980	8,139148	715775	7,613793	272683	5,928032
St. Devi	117989,8	1,428152	297603,9	0,872995	95200,28	0,901589
Kurtosis	-0,12829	-1,09445	-1,3456	-1,58615	2,456705	-0,83907
Skewness	-1,2579	0,867051	-0,67312	0,771362	-1,24729	-0,13237
Jarque-Bera	1,532808	1,114706	0,958155	1,184007	1,417887	0,393986
Probability	0,464681	0,572723	0,619355	0,553218	0,492164	0,821196

The analysis of the descriptive statistics of the variables concerning the sold quantity and the average selling price on categories of products and as a total led to the conclusion that all the value series are normally distributed (the critical value of the Jarque-Bera test $< \chi^2 = 5.99$ and the probability is $> \alpha = 0.05$), within normal, asymmetry and vaulting limits, homogenous (the homogeneity coefficient has values between 10 and 40%) (in compliance with table no. 1).

The total product sales average is 1691.25 thousand Kg, with a high homogeneity level, i.e. 13.23% and a left asymmetry of 1.68. The monthly selling price average is 8.08 RON, sufficiently representative (the homogeneity coefficient is 18.92%) and with a left asymmetry (0.15).

The quantity of products sold, from the MF2 category, is significantly larger compared with the other categories of products ($p = 0.0003315$ the Student test) and the selling price is positioned below the average value (7.06 RON compared to 8.08 RON). This category is followed at a big distance by the MFG category of products (3854992 Kg compared to 6529479 Kg) for which the selling price is positioned above the average value (8.33 RON compared to 8.08 RON).

Based on the results presented in Table no. 1 we also notice that for the MGS category of products we have the smaller quantity sold as well as the lowest selling price (273221.90 Kg, and 5.9 RON respectively).

The two variables analysed, i.e. the quantity of products sold and the average selling price, are strongly influenced by the category in which the products are included, for example for the quantity $F_{calculated} = 103.38 \geq F_{crit} = 2.18$ and $F_{calculated} = 7.53 \geq F_{crit} = 2.18$ respectively for the average selling price.

We continued by analysing the evolution of the quantity of products sold, and the average selling price by means of the analytical functions: $y_t = f(t) + \varepsilon$, where: t is the independent variable and represents the time variation, y_t is the dependent variable (the quantity of products sold, the average selling price) and ε is the

random variable, which variable represents the action of other random variables on the dependent variable.

According to Table no. 2. the evolution of the average selling price, for all the categories of products, in the period between March and October 2013 recorded a slightly increasing trend, with a monthly average of 6.72 RON. The trend line of the average selling price a, Preț = 6.72 + 0.32*t, shows that the average selling price will increase by 0.32 RON from one month to the next.

The quantity of products sold, in the studied period, increases by a monthly average of 10281.17 thousand Kg. The linear trend line that modelled the trend of the quantity of products sold takes the form Qunatity = 10281.17 + 677.17*t, which means that, from one month to the next, the quantities sold have increased on average by 677.17 thousand Kg.

The equation of the trend of the average selling prices of the products in the MF1 category in the form Preț = 11.15 – 1.31*t + 0.17*t^2 suggests that, in the analysed period March – October 2013. the price monthly average is 11.15 RON, with a monthly average decline of 1.31 RON, while the coefficient c=0.17 shows an increase. The second degree function of the sales is: Quantity = 195.66 + 368.29*t – 37.17 *t^2 suggesting that the sales of products in the MF1 category had a monthly average of 368.29 thousand Kg as well as the fact that after reaching the peak point given by the value of the coefficient c = - 37.7 thousand Kg the sales begin to decrease. For the MF2 category of products, both the quantity of products sold as well as the selling price, increase from one month to the next (by 436.31 thousand Kg, and by 0.34 RON respectively). The quantity of products sold from the MF3 category decreases, from one month to the next, by 26.7 thousand Kg (the trend line is C = 565.05 -26.70* t) on the other hand, the average selling price for this category of products increases by 0.48 RON each month (the trend line is Preț = 6.52 + 0.48*t).

The monthly reduction of the sold quantity can also be seen in the products in the MGS category (by 4.89 thousand Kg) as a result of the monthly increase in the average selling price (0.31 RON).

For the other categories of products, both the quantity sold as well as the average selling price increase from one month to the next. All these positive trends of the two variables analysed are shown by means of linear analytical functions.

Table 2. The analytical functions that describe the trend and the forecast of the average price and the quantity of products sold

Indicators	Analytic function	Forecast	
		XI	XII
Trend and forecast for all products			
Average sales price (RON)	Price = 6,72 + 0,32*t t_c^a = 11,57; t_c^b = 2,81 p_a = 0; p_b = 0,031 F_c = 7,89 p = 0,031 Multiple R = 0,75 R Square = 0,56	9,63	9,95
The	C = 10281,17 + 677,17*t	16376	17053
quantity of products sold (thousand Kg)	t_c^a = 20,23; t_c^b = 4,30 p_a = 0; p_b = 0,005 F_c = 18,7017; p = 0,005 Multiple R = 0,87 R Square = 0,75		
Trend and forecast for the product category MF1			
Average	Price = 11,15 - 1,31*t +	12,77	14,61

Indicators	Analytic function	Forecast	
		XI	XII
sales price (RON)	$0,17*t^2$ t_c^a = 17,11; t_c^b = 3,93; t_c^c =4,59 p_a=0; p_b=0,011; p_c=0,006 F_c = 13,65; p = 0,009 Multiple R = 0,919 R Square = 0,845		
The quantity of products sold (thousand Kg)	C = 195,66 + 368,29*t - 37,17 $*t^2$ t_c^a = 2,69; t_c^b = 9,01; t_c^c =8,64 p_a = 0,04; p_b = 0; p_c = 0 F_c = 40,81; p = 0,0008 Multiple R = 0,97 R Square = 0,94	499,49	161,55
Trend and forecast for the product category MF2			
Average sales price (RON)	Price = 5,52 + 0,34*t t_c^a = 19,26; t_c^b = 6,04 p_a = 0; p_b = 0,0009 F_c = 36,45; p = 0,00093 Multiple R = 0,93 R Square = 0,86	8,60	8,94
The quantity of products sold (thousand Kg)	C = 4566,09 + 436,31* t t_c^a = 14,52; t_c^b = 3,21; p_a = 0; p_b = 0,018; F_c = 10,35; p = 0,018 Multiple R = 0,79 R Square = 0,63	8493	8929
Trend and forecast for the product category MF3			
Average sales price (RON)	Price = 6,52 + 0,48*t t_c^a = 11,997; t_c^b = 4,486 p_a = 0; p_b = 0,0042 F_c = 20,12; p = 0,0042 Multiple R = 0,88 R Square = 0,77	10,86	11,34
The quantity of products sold (thousand Kg)	C = 565,05 -26,70* t t_c^a = 4,77; t_c^b = 3,13; p_a = 0,0031; p_b = 0,029; F_c = 12,961; p = 0,0298 Multiple R = -0,42 R Square = 0,18	324,71	298,01
Trend and forecast for the product category MFA			
Average sales price (RON)	Price = 6,06 + 0,46*t t_c^a = 11,202; t_c^b = 4,301 p_a = 0; p_b = 0,005 F_c = 18,498; p = 0,005 Multiple R = 0,87 R Square = 0,76	10,21	10,67
The quantity of products	C = 845,97 + 33,74* t t_c^a = 16,57; t_c^b = 2,97; p_a = 0,0031; p_b = 0,025; F_c = 8,812; p = 0,025	1150	1183

Indicators	Analytic function	Forecast	
		XI	XII
sold (thousand Kg)	Multiple R = 0,77 R Square = 0,59		
Trend and forecast for the product category MFG			
Average sales price (RON)	Price = 6,16 + 0,48*t t_c^a =10,409; t_c^b = 4,110 p_a = 0; p_b = 0,006 F_c = 16,891; p = 0,006 Multiple R = 0,86 R Square = 0,74	10,50	10,98
The quantity of products sold (thousand Kg)	C = 3484,37+82,36*t t_c^a = 14,84; t_c^b = 2,533; p_a = 0; p_b = 0,044; F_c = 6,415; p = 0,044 Multiple R = 0,72 R Square = 0,52	4226	4308
Trend and forecast for the product category MFO			
Average sales price (RON)	Price = 6,63 + 0,51*t t_c^a = 11,23; t_c^b = 4,34 p_a = 0; p_b = 0,0048 F_c = 18,887; p = 0,0048 Multiple R = 0,87 R Square = 0,76	11,21	11,71
The quantity of products sold (thousand Kg)	C = 178,38 + 33,30* t t_c^a = 12,05; t_c^b = 4,07; p_a = 0; p_b = 0,0066; F_c = 16,57; p = 0,0066 Multiple R = 0,86 R Square = 0,73	478,08	511,38
Trend and forecast for the product category MFP			
Average sales price (RON)	Price = 6,81 + 0,29*t t_c^a = 15,74; t_c^b = 3,36 p_a = 0; p_b = 0,015 F_c = 11,30; p = 0,015 Multiple R = 0,81 R Square = 0,65	11,20	11,71
The quantity of products sold (thousand Kg)	C = 416,98 + 40,68*t t_c^a = 73,71; t_c^b = 3,48; p_a = 0; p_b = 0,013; F_c = 12,17; p = 0,013 Multiple R = 0,82 R Square = 0,67	783,11	823,79
Trend and forecast for the product category MGS			
Average sales price (RON)	Price = 4,46 + 0,312*t t_c^a = 11,80; t_c^b = 4,26 p_a = 0; p_b = 0,005 F_c = 18,19; p = 0,005 Multiple R = 0,87 R Square = 0,75	7,25	7,56
The quantity of products	C = 295,22 – 4,89 *t t_c^a = 100,70; t_c^b = 3,99; p_a = 0; p_b = 0,0072;	251,23	246,34

Indicators	Analytic function	Forecast	
		XI	XII
sold (thousand Kg)	F_c = 15,95; p = 0,0072 Multiple R = -0,85 R Square = 0,73		

For all the analytical functions presented in Table no. 2 the probabilities are low compared to the significance threshold $\alpha = 0.05$ and $tc \geq t_{0.05;6} = 2.45$ therefore we can say that all the parameter estimators are significantly different from zero. Moreover, the calculated values of the F test are high compared to the table value ($F_{0.05;1;6}$=5.99) which means that the time variation is an important variable that influences the average selling price and the quantity of products sold.

If we analyse the values of the correlation ratio we can see that in most cases, between the time variation and the two studied variables, there are intense and direct relationships (Multiple R has values higher than 0.70). The only exceptions from these situations are the correlations between the time variation and the quantity of products sold from the MF3 category (Multiple R is -0.42 – which means that we have a average intensity and inverse relationship) and from the MGS category (Multiple R is - 0.85 – which means that we have an intense and inverse relationship).

The short-term forecast of the analysed indicators, November - December 2013 is based on the previous trend and on the estimates made. From the forecasts shown in Table no. 2, we can notice an increase in the average selling price for all the categories of products. For the products in the MF1, MF3 and MGS categories, the forecast values of the quantity sold decrease from one month to the next.

One of the factors that influence the level of the quantity of products sold is the selling price. For this reason we propose analysing below the relationship between the quantity of products sold, which is deemed the dependent variable in the regression model, and the average selling price, i.e. the independent variable.

Table 3. The econometric regression models between the average selling price and the quantity of products sold

	Regression unifactoriala function	Multiple R	R Square
The quantity of products sold – dependent variable The average selling price – the independent variable	quantity = 7637,51 + 724,44* price+ε t_c^a = 7,944269; t_c^b = 9,730345 p_a = 0,03815; p_b = 0,02927 F_c = 20,533404; p = 0,02927 Durbin-Watson stat = 2,125113	0,534539	0,285732
The quantity of products in category MF1 – dependent variable The average selling price of the products in categoty MF1 – the independent variable	quantity = 1724,45 – 128,99* price +ε t_c^a = 2,531100; t_c^b = 2,804082 p_a = 0,0446; p_b = 0,01213 F_c = 3,254713; p = 0,0121265 Durbin-Watson stat = 1,196	-0,59303	0,351682

The quantity of products in category MF2 – dependent variable The average selling price of the products in categoty MF2 – the independent variable	quantity = -775,08+ 1035,03* price +ε t_c^a = 3,663125; t_c^b = 4,000524 p_a = 0,0105; p_b = 0,00924 F_c = 4,002095; p = 0,0092359 Durbin-Watson stat = 1,924710	0,634763	0,400126
The quantity of products in category MF3 – dependent variable The average selling price of the products in categoty MF3 – the independent variable	quantity = 814,54 – 42,55* price +ε t_c^a = 3,121994; t_c^b = 2,973080 p_a = 0,0281; p_b = 0,03681 F_c = 6,946884; p = 0,03681 Durbin-Watson stat = 2,141414	-0,608276	0,36919
The quantity of products in category MFA – dependent variable The average selling price of the products in categoty MFA – the independent variable	quantity = 877,34 + 14,81* price +ε t_c^a = 2,886142; t_c^b = 3,1082 p_a = 0,0261882; p_b = 0,008022 F_c = 7,068582; p = 0,008022 Durbin-Watson stat = 1,591288	0,58902	0,346945
The quantity of products in category MFG – dependent variable The average selling price of the products in categoty MFG – the independent variable	quantity = 3799,42 + 6,67* price +ε t_c^a = 2,65; t_c^b = 3,02 p_a = 0,0149; p_b = 0,00981 F_c = 0,0005; p = 0,981 Durbin-Watson stat = 1,609441	0,632534	0,400099
The quantity of products in category MFO – dependent variable The average selling price of the products in categoty MFO – the independent variable	quantity = 87,76 + 26,97* price +ε t_c^a = 4,305381; t_c^b = 5,846097 p_a = 0,007704; p_b = 0,004299 F_c = 6,715881; p = 0,004299 Durbin-Watson stat = 1,892037	0,574456	0,326489
The quantity of products in category MFP – dependent variable The average selling price of the products in categoty MFP – the independent variable	quantity = 794,58 – 24,01* price +ε t_c^a = 4,702; t_c^b = 3,172 p_a = 0,00508; p_b = 0,00868 F_c = 5,0299; p = 0,00868 Durbin-Watson stat = 1,684810	-0,543101	0,29495
The quantity of products in category MGS – dependent variable The average selling price of the products in categoty MGS – the independent variable	quantity = 240,46 + 5,56* price +ε t_c^a = 2,937; t_c^b = 3,129 p_a = 0,0384; p_b = 0,00901 F_c = 4,016; p = 0,00901 Durbin-Watson stat = 1,679000	0,559258	0,312769

For all the categories of products, the impact of the average selling price on the quantity of products sold has an average intensity and describes a direct relationship between the two variables (Multiple R is 0.534539). Moreover, following the analysis of the results presented in table no. 3, the average selling

price is not a very important variable that influences the quantity of products sold (it only accounts for 28.57% of the variation of the dependent variable).

The regression function that describes the relationship between the two variables analysed has the form: QUANTITY = 7637.51 + 724.44*PRICE +ε, which means that the increase in the prices by one RON leads to the increase in the quantity sold by 724.44 thousand Kg.

The relationship between the average price and the quantity of products sold is direct for the following categories of products:

- the MF2 category of products – the price variation only accounts for 40% of the variation of the quantity of products sold and determines its average monthly increase by 1035.03 thousand Kg;
- the MFA category of products – the increase in the average price influences the variation of the quantity sold in a percentage of 35% and leads to its average monthly increase by 14.81 thousand Kg;
- the MFG category of products – the monthly price variation accounts for 40% of the variation of the quantity of products sold (the latter increases by 6.67 thousand Kg at a price increase by one RON);
- the MFO category of products – the variation of the quantity of products sold is accounted for by a percentage of 33% by the price variation (the quantity sold increases by a monthly average of 26.97 thousand Kg);
- the MGS category of products - the average monthly increase by 5.56 thousand Kg of the quantity of products sold is accounted for by the price increase by a percentage of 31%;

For the other categories of products, the link between the average selling price and the quantity of products sold is inverse. Thus for the MF1 category of products, the price increase determines the decrease of the quantity sold by 128.99 thousand Kg, for the MF3 category of products, the decrease is by 42.55 thousand Kg and for the MFP category, the decrease in the quantity sold as a result of the price increase is by 24.01 thousand Kg.

3. The Implementation of a BI Solution for the Analysis of the Sales of a Company

While as a result of the application of the statistical methods and of the econometric models we have been able to determine which are the relationships and the trend between the average price and the quantity of products sold on each group of products, through the implementation of a BI solution we can have quick access to all the information related to sales, thus helping managers make the best decisions in a timely manner (Adelman & Moss, 2000). For the preparation of the sales analysis reports drawn up by a company for different periods of time, we used the QlikView application, which is a BI software package very easy to use (QlikTech International, 2010). Each report can be changed (Dresner, 2010), by

one click, either by changing the display form (table or chart), or by selecting another option from the defined groups (for example for the time dimension we defined the group "Period" made of: year, month, week, current date, weekend).

1. Sales trend. The chart in figure 1 shows the monthly quantity sold from each group of products as percentages. We can notice that this chart can be changed with a few clicks in order to display the quantity in kg, the average price or the value of the products. For each of them we can display the information monthly, weekly, annually, quarterly or for every day of the week. At the same time, we can choose to display the same information for each product, on groups of customers, the warehouse locations, invoicing code.

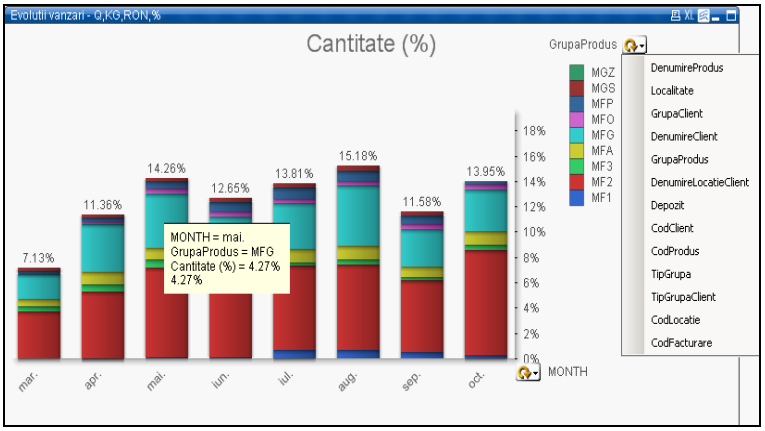


Figure 1. Sales trend

This chart provides very important information that helps us decide which the best selling groups of products are, which customers are the most active, and we can also monitor the daily, weekly, monthly, quarterly or annual trend of the quantities sold or of the average selling price. By only one click we can change the manner of presentation of this information, namely by choosing another type of chart, or as a table.

2. Total sales. This report shows both the total sales versus the average price for each group of product, and the total sales on locations. In the first chart, the grey points are the groups of customers, and by putting the mouse on a point we display the values for the average price and for the total sales obtained. The second chart presents the total sales in each warehouse location. By placing the mouse on a certain warehouse (Swoyer, 2008), we display all the groups of customers as well as the sales for each group (see figure 2).

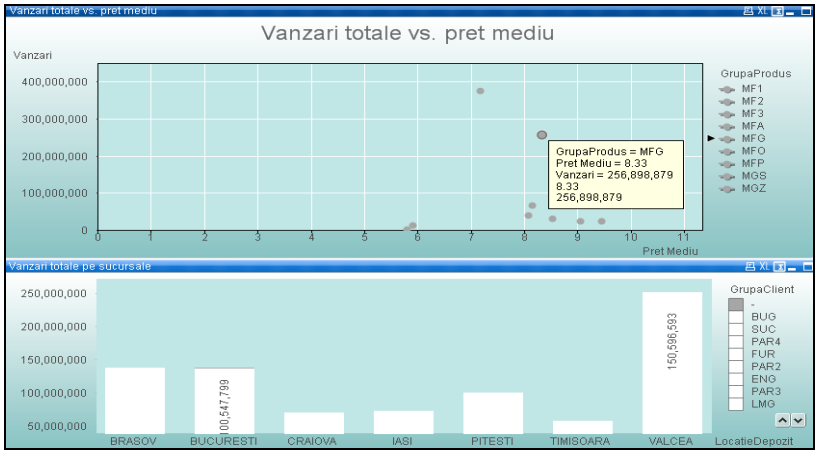


Figure 2. Total sales

3. The quantity sold on groups of products. We made a chart that highlights the quantity of products sold on each location. This report is used to determine the manner of selling the products for each location. We can notice for example that for the location Bucharest the best selling group of products is "MFG", which is not the case in the other locations (see figure 3).

By the simple or multiple selection (Manohar, 2008), we can have a clear image of the quantity sold or of the value obtained for each group of products:

- On a certain period of time (each day, week, month, or year, on several months);
- For a certain group of products or for a certain product;
- For a certain type of customer (partners or non-partners);
- For a certain sales point.

For example if we select a certain group of products we can see information related to the product group, the warehouse, the distributed quantity and the value obtained as a result of the product sale (if we change the chart by selecting from a product value menu, instead of quantity).

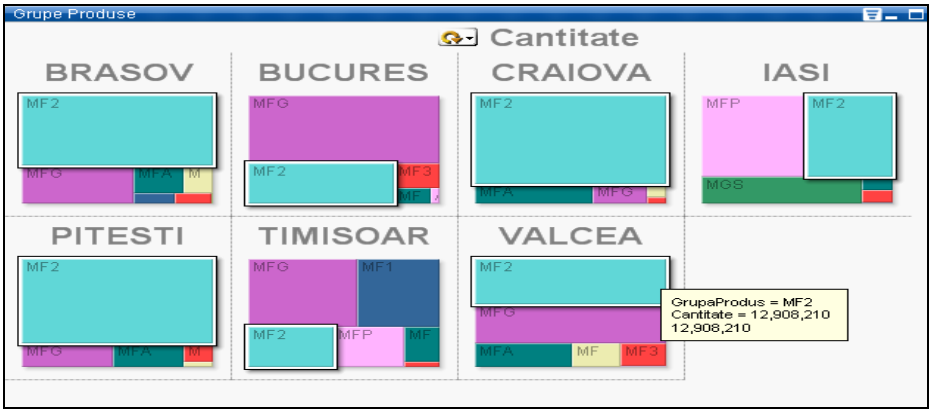
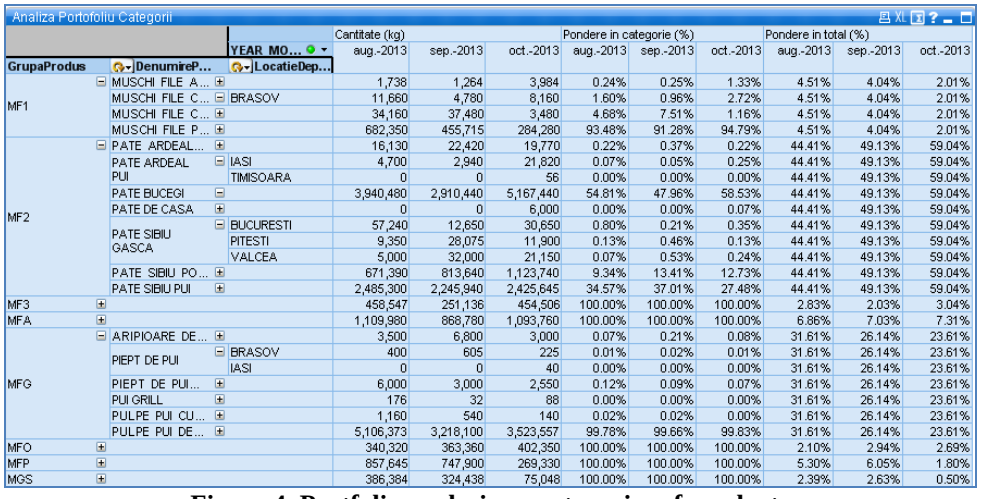


Figure 3. The quantity sold on groups of products.

4. Portfolio analysis on categories of products. In order to get information related to the better selling products or to the products that have to be replaced, we prepared a new report in which we presented the monthly quantity sold for each product in each group of products, as a total or on warehouse location, as well as the relative monthly percentage per quantity. Three consecutive months were selected, and for each group of products we displayed the name of the products belonging to the respective group and the location of the warehouses that distribute the products. If we don't display the information related to the product name or location we can determine the total quantity of the products sold from a group, or from a certain product, for the selected period of time. This can be easily done by selecting the display of the information briefly or in detail. At the same time we can determine for each group of products the quantities sold displayed on group of customers, name of the customer, type of customer, customer location name, etc.



Analiza Portofoliu Categorii

			Cantitate (kg)			Ponderi in categorie (%)			Ponderi in total (%)		
		YEAR_MO...	aug.-2013	sep.-2013	oct.-2013	aug.-2013	sep.-2013	oct.-2013	aug.-2013	sep.-2013	oct.-2013
GrupaProdus	DenumireP...	LocatieDep...									
MF1	MUSCHI FILE A...		1,738	1,264	3,984	0.24%	0.25%	1.33%	4.51%	4.04%	2.01%
	MUSCHI FILE C...	BRASOV	11,660	4,780	8,160	1.60%	0.96%	2.72%	4.51%	4.04%	2.01%
	MUSCHI FILE C...		34,160	37,480	3,480	4.68%	7.51%	1.16%	4.51%	4.04%	2.01%
	MUSCHI FILE P...		682,350	455,715	284,280	93.48%	91.28%	94.79%	4.51%	4.04%	2.01%
MF2	PATE ARDEAL...		16,130	22,420	19,770	0.22%	0.37%	0.22%	44.41%	49.13%	59.04%
	PATE ARDEAL PUI	IASI	4,700	2,940	21,820	0.07%	0.05%	0.25%	44.41%	49.13%	59.04%
		TIMISOARA	0	0	56	0.00%	0.00%	0.00%	44.41%	49.13%	59.04%
	PATE BUCEGI		3,940,480	2,910,440	5,167,440	54.81%	47.96%	58.53%	44.41%	49.13%	59.04%
	PATE DE CASA		0	0	6,000	0.00%	0.00%	0.07%	44.41%	49.13%	59.04%
	PATE SIBIU GASCA	BUCURESTI	57,240	12,650	30,650	0.80%	0.21%	0.35%	44.41%	49.13%	59.04%
		PITESTI	9,350	28,075	11,900	0.13%	0.46%	0.13%	44.41%	49.13%	59.04%
		VALCEA	5,000	32,000	21,150	0.07%	0.53%	0.24%	44.41%	49.13%	59.04%
	PATE SIBIU PO...		671,390	813,640	1,123,740	9.34%	13.41%	12.73%	44.41%	49.13%	59.04%
	PATE SIBIU PUI		2,485,300	2,245,940	2,425,645	34.57%	37.01%	27.48%	44.41%	49.13%	59.04%
MF3			458,547	251,136	454,506	100.00%	100.00%	100.00%	2.83%	2.03%	3.04%
MFA			1,109,980	868,780	1,093,760	100.00%	100.00%	100.00%	6.86%	7.03%	7.31%
MFG	ARIPIOARE DE...		3,500	6,800	3,000	0.07%	0.21%	0.08%	31.61%	26.14%	23.61%
	PIEPT DE PUI	BRASOV	400	605	225	0.01%	0.02%	0.01%	31.61%	26.14%	23.61%
		IASI	0	0	40	0.00%	0.00%	0.00%	31.61%	26.14%	23.61%
	PIEPT DE PUI...		6,000	3,000	2,550	0.12%	0.09%	0.07%	31.61%	26.14%	23.61%
	PUI GRILL		176	32	88	0.00%	0.00%	0.00%	31.61%	26.14%	23.61%
	PULPE PUI CU...		1,160	540	140	0.02%	0.02%	0.00%	31.61%	26.14%	23.61%
	PULPE PUI DE...		5,106,373	3,218,100	3,523,557	99.78%	99.66%	99.83%	31.61%	26.14%	23.61%
MFO			340,320	363,360	402,350	100.00%	100.00%	100.00%	2.10%	2.94%	2.69%
MFP			857,645	747,900	269,330	100.00%	100.00%	100.00%	5.30%	6.05%	1.80%
MGS			386,384	324,438	75,048	100.00%	100.00%	100.00%	2.39%	2.63%	0.50%

Figure 4. Portfolio analysis on categories of products

4. Conclusion

One of the most efficient manners of improving the daily operations and the financial forecasts, the profitability of certain sectors and the hypothetical business scenarios (the variation of certain indicators as well as the number of products sold, the number of customers, the average price, the average quantity sold) is to implement a business software that enables managers and employees to make informed decisions when they are in the maximum impact point, easier and simpler than in the present. Thus, the person who is the most entitled to make a decision will have access to valuable information. This is the ultimate purpose of the Business Intelligence software solutions. By combining econometric models with BI applications we obtain fast and relevant information concerning the operations specific to a business. While the reports projected with a BI software provide us with real-time information the econometric modelling helps us set the trend and make real forecasts on the sales made by the company. Thus, if the

manager has access to the regression econometric models in order to set the impact of the average selling price on the quantity of products sold, then he can be sure that the decisions made lead to the success of the business.

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