POSSIBILITIES OF SALE FORECASTING BY THE COMPARISON OF BRANCH STORES RESULTS

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Abstract: *The paper deals with the possibilities of sale forecasting by the comparison with other branch stores owned by one company but located in different regions. The location and especially population of a particular region can play an important role to precise forecasting. This paper shows how the forecasting can be created when no data from other branch store exists or what expectations could be when new branch store is opened. There is still other information available, which can be useful for forecast creation.*

Key words: *forecast, sale, branch store, group of products, region.*

1   INTRODUCTION

There are many companies, especially trade companies that have their branch stores spread out in different regions in Slovakia. Although Slovakia is a relatively small country, but the divergence among some regions can be quite large, because differences between very east and very west regions are large in purchasing power, the population density, in the lifestyle and traditions. However, when comparing the neighbouring regions, the mentioned differences would not be so great and various neighbouring regions might be regarded as similar. This is precisely the situation on which this paper is based, and delivers the study of forecasts creation of sales of goods in an unknown branch store in the neighbouring region with known parameters such as the sale data from known (sample) branch, the geographic size and density of the population in the neighbouring region where an unknown branch store operates or will operate [1]. It is the analogy approach in forecasting which uses the quantitative methods of forecasting. The observed company is the distributor and seller of consumer electronics goods, but it refused to mention its company brand because of providing the confidential information, which is purposely changed but trends and graph curves were kept.

2   THE FORECAST CREATION OF SALE IN THE SAMPLE BRANCH STORE

A forecast sale of selected products for the year 2015 was created on the basis of the monthly sales of previous two years i.e. 2013 – 2014 in the region of Košice. The selected products are televisions, refrigerators and washing machines because it is the most sold products by experience of sellers [2]. Next, these selected products were not differentiate by type and brand, just to keep simple calculation of forecast therefore these products are marked as product groups further (i.e. group televisions, group of washing machines and group refrigerators). It was needed to use different method for forecast creation to each group, because the sale of products in each group has a different behaviour, which depends of a number of factors [3, 4]. For example, typically most TV-sets are sold before the Christmas time - about a month ago, when people buy it for themselves or for their relatives to make them happy. Also it is not a rarity that the purchasing of TV-sets continues in January during big sale discounts. White appliances are the most sold in early spring and during the summer, what is explained by the increase number of re-works of customer households [2].
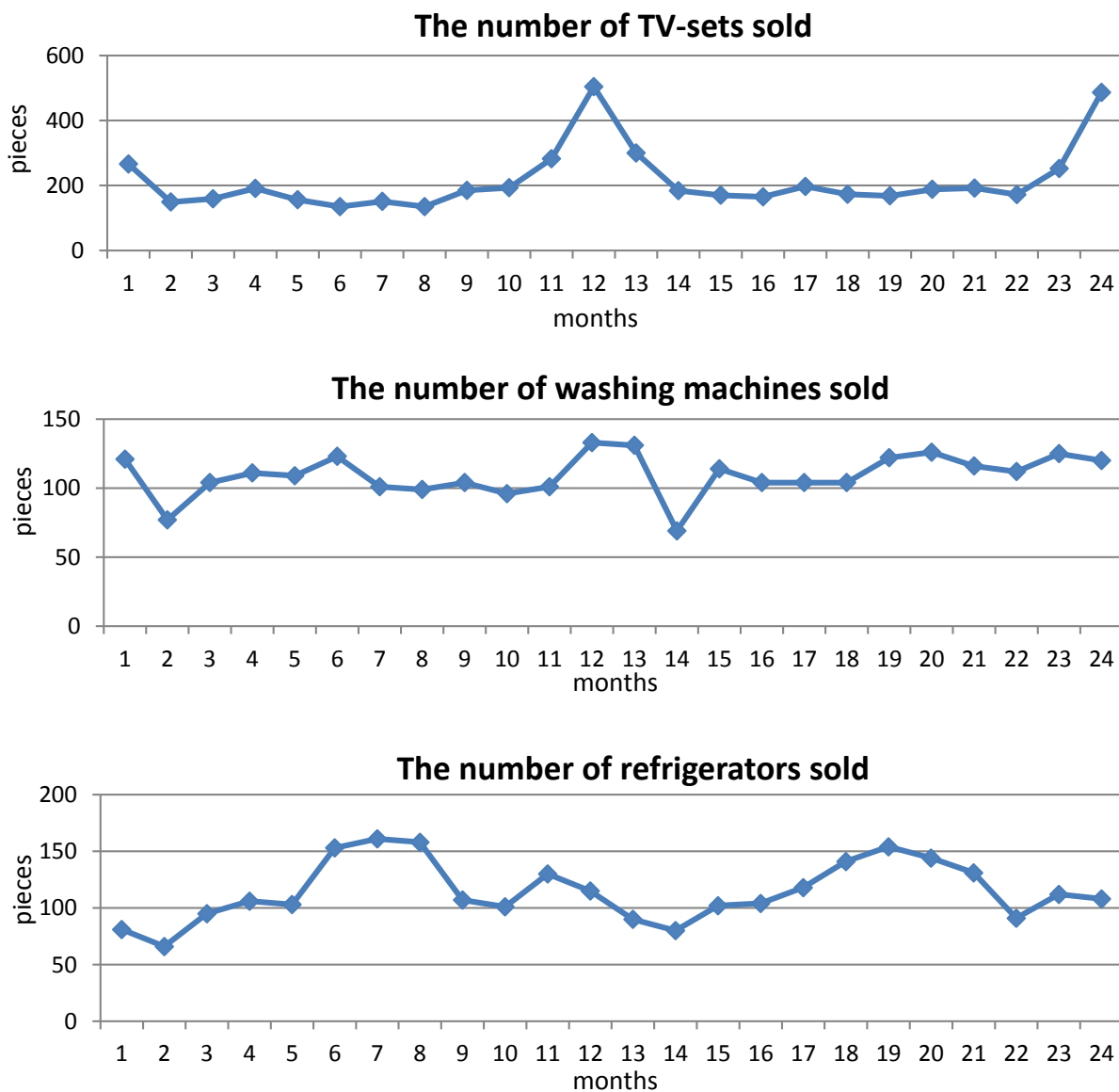

Fig1. The sale of the chosen groups of products [2]

Tab 1. *The real sale and forecast overview of the selected product groups [2]*

Product group	Real Sale			Forecast			Deviations [%]		
	Jan 2015	Feb 2015	Mar 2015	Jan 2015	Feb 2015	Mar 2015	Jan 2015	Feb 2015	Mar 2015
TV-sets	296	171	173	324	198	189	8,64	13,64	8,47
Refrigerators	82	84	90	85	86	94	3,53	2,33	4,26
Washing machines	122	90	125	122	103	124	0,00	12,62	-0,81

3 THE FORECAST CREATION OF SALE IN THE BRANCH STORE IN NEIGHBOURD REGION.

The following considerations will show the applicability of the above-obtained data (Table 1) for making forecasts in Prešov neighbouring region. The reason of comparison with this region is because the city of Prešov is also located in eastern Slovakia, residents have much in common with the residents in the Kosice region, and in both cities are branch stores of one company, including the rivalry. An assessment of statistical data about demography and the average wage will give sale forecasting of the number of group of products in branch store in the Prešov region. The real data, finally obtained from so-called unknown branch store in the Prešov region is good for evaluation of the forecast.

Tab. 2 *Comparison of Košice and Prešov regions [6]*

Region / Parameter	Residents:	Average salary:
Košice region	794 756 people	916 EUR
Prešov region	818 916 people	757 EUR

The calculation of Prešov region coeficient is provided based on weighted average when the bigger weight is given to average salary, what is more important parameter at decision of purchasing [2, 5].

Tab. 3 *Ratio value of parameters from Prešov region point of view*

Parameter	Ratio value of Prešov region	Weight
Residents	1,03	0,3
Average salary	0,83	0,7

Resulted region coefficient (RC): $RC = \frac{(1,03.0,3)+(0,83.0,7)}{1} = 0,89$.

Forecast of the selected products goods in Košice region branch store are corrected by the region coefficient and the forecast results for the first quarter of the year 2015 are listed in the table 4.

Tab 4. *The real sale and forecast of "unknown" branch store of the selected product groups*

Product group	Real Sale			Forecast			Deviations [%]		
	Jan 2015	Feb 2015	Mar 2015	Jan 2015	Feb 2015	Mar 2015	Jan 2015	Feb 2015	Mar 2015
TV-sets	278	151	155	288	176	168	3,47	14,20	7,74
Refrigerator	63	75	73	76	77	84	17,11	2,60	13,10
Washing machine	117	88	96	109	92	110	-7,34	4,35	12,73

4   CONCLUSION

If the mean percentage absolute errors of forecasting (MAPE) for individual product groups are compared, the predistion for the Košice region branch store, calculated directly from obtained data is more accurate than the derived forecasts for an unknown branch store in the neighboring region (Table 5).

Tab. 5 *The MAPE comparison of product groups forecast in both regions*

Product group	Košice region Branch store MAPE	Prešov region Branch store MAPE
TV-sets	11,50%	9,51%
Refrigerator	3,49%	12,79%
Washing machine	5,08%	8,66%

But even in case of derived forecasts, the MAPE ranges around of 10% level, what means that the derived forecast can be considered as good and acceptable. This option can be used in the case studies at designing of establishment a new, not-yet existing, branch store in the neighbouring region.

References

[1] Makrydakis, S., Wheelwright, S. C., Hyndman, R. J., Forecasting methods and applications. (2003), West Sussex, Wiley, 642 p. ISBN 978-81-265-1852-4.
[2] Hudáčková, K., Hudáčková, K., Prognóza predaja vybraných výrobkov vo viacerých pobočkách, Diplomová práca. (2015), Košice, F BERG.
[3] Kačmáry, P., Malindžák, D., The forecast methods of Sale and Production in dynamically changing Market Economy. (2013), Ostrava, Ediční středisko VŠB-TU Ostrava, ISBN 978-80-248-3200-5.
[4] Spišák, J.: Komerčná logistika − učebné texty, Fakulta Berg Košice 2001
[5] Malindžák, D. jr., Model for combined coal sale forecast [on/line]. Transport & Logistics international journal, 8, 2005. http://web.tuke.sk/transportlogistics/issues/normal/2005/N08/04_malindzak_jr.pdf
[6] The Statistics institute of the Slovak Republic http://slovak.statistics.sk/wps/portal/ext/home/!ut/p/b1/04_Sj9CPykssy0xPLMnMz0vMAfGjzOIDzT0tnJwMHQ0s_IJcDTxDHAPcg7xMDA1MTIEKIoEKDHAARwNC-sP1o8BKnN0dPUzMfQwMLHzcTQ08HT1CgywDjY0NHI2hCvBY4eeRn5uqX5AbYZBl4qgIAL9TbiU!/dl4/d5/L2dBISEvZ0FBIS9nQSEh/