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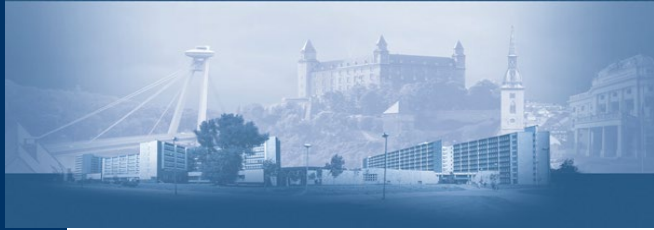
Contextual Non-financial Analysis of Annual Reports of Slovak, Turkish and Ukrainian Companies

Objective: The aim of this paper is the evaluation of annual reports through a text analysis tool, which evaluates their focus according to the sentiment of the words used. We tested the hypothesis whether it is possible to detect uncertainty of the business environment in annual reports or companies by textual analysis.

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Literature review

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There are few papers which examined whether the tone and complexity of annual papers relate to a companies' financial situation.

Bakarich, Hossain, Weintrop proved that companies provide qualitatively different disclosures and shows that disclosure varies according to cycle stages.

El-Haj et al. analyzed Portuguese reports and using a random sample of 586 reports their method confirmed an accuracy of 95%.

Loughran and Mcdonald published another paper in 2016 in which they reviewed textual analysis papers from previous years, and they concluded that a traditional concept of readability and Fox Index is ineffective because measuring sentence length does not determine comprehension and most long multisyllabic words are easily understood in financial documents.



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Methodology and data



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For the purposes of the analysis, we selected 400 annual reports from Turkey, Slovakia and from Ukraine for the years 2008-2018.

We could only choose only annual reports prepared in English.

When selecting, we tried to choose companies from different sectors.

As a source of GDP growth data of selected countries the web page <https://countryeconomy.com/gdp>.

For text analysis we used Linguistic Inquiry and Word Count (LIWC 2015) software. This software analyses the text and calculates the percentage of words that reflect different emotions, thinking styles, social interests and sentence structure.

The text analysis module identifies and categorizes words and the core of the program is a group of dictionaries. For each word in the dictionary, there is a corresponding dictionary entry that defines one or more categories of words.



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Results

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For analyzing we have chosen four categories of emotions – risk, reward, positive emotions and negative emotions.

Table 1 Expression of emotions focused on risk in annual reports (in percentage)

	Average TR	Average SK	Average UA
2008	0,8394	0,9200	0,9200
2009	0,9518	0,9768	0,9067
2010	0,9132	0,9308	1,0533
2011	0,8889	0,9129	0,9433
2012	0,8657	0,8904	1,0100
2013	0,9843	1,004	1,0300
2014	0,9597	0,9709	1,0800
2015	0,9250	0,9425	1,1133
2016	1,0088	1,0106	1,0633
2017	0,9719	0,9763	0,9700
2018	1,0347	1,0394	1,1300

Risk is expressed by words problems, protection, prevent, safety, hazard, security etc. Reward is expressed by words get, approach, promote, take etc.



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Results

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Table 2 Expression of emotions focused on reward in annual reports (in %)

	Average TR	Average SK	Average UA
2008	0,8706	1,0600	0,8467
2009	0,9323	0,9423	0,8433
2010	0,9458	0,9558	0,7767
2011	0,9011	0,9074	0,9033
2012	0,8704	0,8800	0,8767
2013	0,9303	0,9403	1,1033
2014	0,9675	0,9753	0,7833
2015	0,9459	0,9584	0,7900
2016	0,9681	0,9728	0,7700
2017	0,9878	0,9869	0,7833
2018	0,9900	0,9903	0,8133



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Results

Table 3 Expression of emotions focused on positive emotions in annual reports (in percentage)

	Average TR	Average SK	Average UA
2008	2,3783	2,8433	2,2067
2009	2,6332	2,6618	2,1833
2010	2,7054	2,7329	2,4600
2011	2,4444	2,4667	2,5000
2012	2,4378	2,4681	2,5700
2013	2,4521	2,5189	2,9000
2014	2,5113	2,5338	2,5600
2015	2,4763	2,5066	2,5667
2016	2,5313	2,5388	2,4700
2017	2,4772	2,4875	2,4433
2018	2,5234	2,5422	2,5567

Positive emotions from analyzed annual reports are according to the software expressed by the following words – forgiving, healthy, support, respect, sure, freedom, challenges, greater, encourage, care, importance, helps, save, agreed, satisfy, improvement, well, safety, security etc.



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Results

Negative emotions are for example: problems, abuses, exhaustible, hazard, critical.

Table 4 Expression of emotions focused on negative emotions in annual reports (in %)

	Average TR	Average SK	Average UA
2008	0,7022	0,7500	0,7800
2009	0,8205	0,8414	0,7867
2010	0,7825	0,7954	0,9333
2011	0,7659	0,7893	0,8300
2012	0,7250	0,7468	0,8900
2013	0,8487	0,8663	0,9500
2014	0,8244	0,8369	1,0533
2015	0,8000	0,8184	1,0700
2016	0,8491	0,8575	1,0033
2017	0,8309	0,8419	0,9167
2018	0,8744	0,8853	1,0467

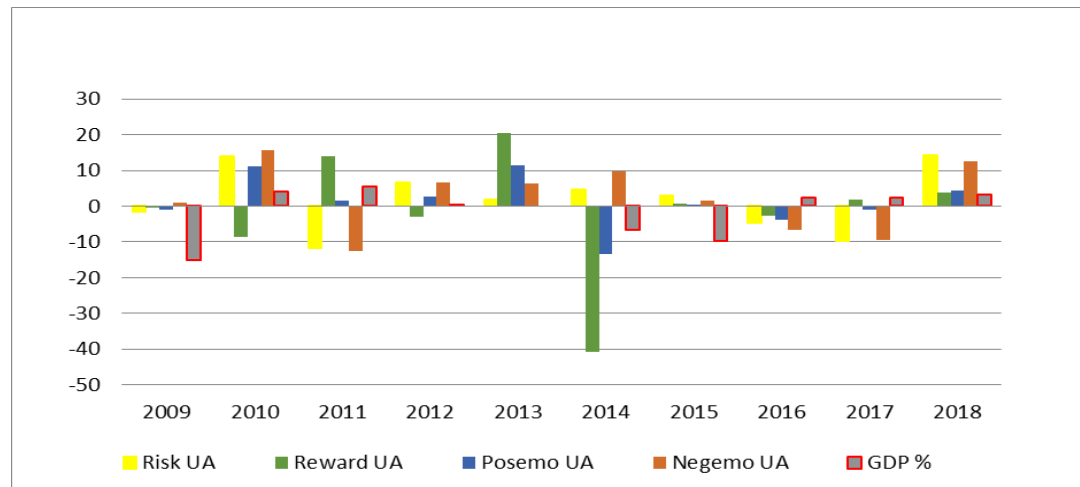


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Results

Based on the performed analysis, we can state that in the Ukrainian annual reports negative emotions clearly prevail over positive ones when decreasing GDP is expected in the following period. We assessed that this is due to the composition of stakeholder groups of companies in this environment. Products from analyzed companies are often exported to the Russian Federation and they are sensitive to the Ukrainian-Russian conflict.

Graph 1 Expression of emotions focused in Ukrainian annual reports compared with GDP



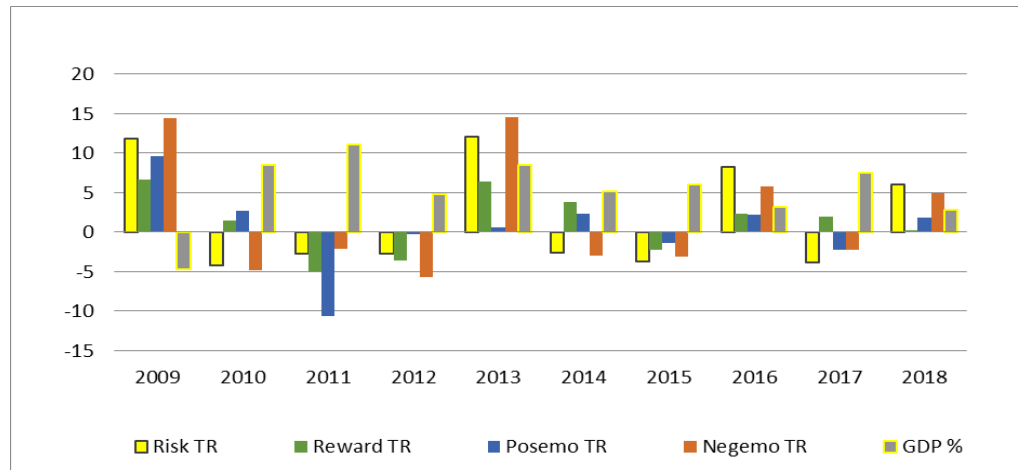


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Results

In Turkish annual reports there is not such a high and obvious correlation of emotions in annual reports and GDP growth at first sight, but looking into the details we can also confirm it. We can state that trend of prevailing positive emotions over negative ones was repeated in analyzed annual reports but the growth or decrease of these emotions in comparison to the previous year is not always so one-sided. Also, the results are influenced by the fact that analyzed Turkish companies are from various industrial sectors (airlines, car production, food industry, telecommunication industry etc. not only in agriculture industry as in the example from Ukraine and therefore the companies face different level of risks that their industry brings.

Graph 2 Expression of emotions focused in Turkish annual reports compared with GDP



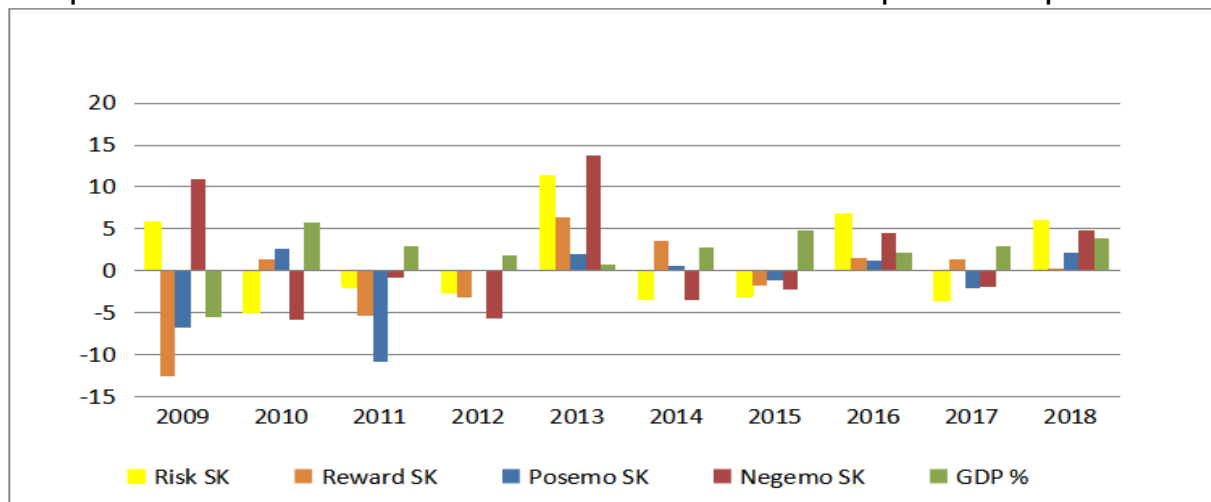


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Results

The annual reports of companies from Slovakia confirmed the opposite trend. In all years the positive emotions growth or decrease between the years correlated with economic growth. This follows from the nature of the companies themselves, mostly companies from the car industry. The car industry clearly has a negative impact on the environment, and the compilers of the annual reports cannot omit these impacts (risk and negative emotions) in the annual reports however there was economic growth.

Graph 3 Expression of emotions focused in Slovak annual reports compared with GDP





Conclusion

Non-financial data as well as financial data are intended for various stakeholders. Information in companies' annual reports should be legible for potential investors, employees, clients, regulators. Annual reports within their company revealing their activities, results, developments and future trends are available from available sources of information. The annual reports also include non-financial information, which gives broader insights into the business and performance of the company. With the growing range of interest rate reports being observed, or the growing interest of investors or analysts in the non-financial information from past reports they find in support of their decisions. In this paper we tested the hypothesis whether it is possible to detect uncertainty of the business environment in annual reports or companies by textual analysis and we found out that correlates with the changing GDP growth of the country.



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