

Company Performance Analysis in Management: Current Preferences and Possible Trends

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Abstract – The objective of this paper is to identify key expressions appearing in scientific papers related to the management of company performance and its analysis. There are various ways of looking at the evaluation of performance of a company. Most commonly they fit into the following categories: financial, social, environmental, and global. Based on a study of several papers and publications in the field of company performance evaluation a list of key words and expressions was set up. These were then evaluated for number of occurrences in google.com search engine in 5-year intervals from 2000 to 2020 included. Similar measurements were done with the google trends tool where monthly “popularity” is measured by the companies own index since 2004. Results show an increase of popularity in social and environmental performance evaluation. Approaches such as the Triple Bottom Line reporting and the Global reporting initiative gain volume in terms of publications on the internet. They are likely to be complemented by tools/approaches related to sustainability and RMSE and ensemble model methods.

Keywords – management, company performance, trends, terms and expressions, google trends tool.

1. Introduction

There are various ways and methods on how to measure the performance of a company. At first the financial approach has evolved. However with time came other approaches, mainly environmental, social and the global one [7], [14].

For each of this approaches a list of related tools and methods is given by authors. Over the time new ways of evaluation of company’s performance evolve and experience various levels of popularity [3], [8].

It’s also possible that new elements need to be added to the list provided by the mentioned authors. The knowledge of major research domains and the terms and expressions that are used in newly published papers can indicate the future trends [1], [11]. It can also support the orientation of further research and potentially help to develop new products on the market [6], [10].

Another tool that can indicate the coming preferences on the market is the internet, more specifically the search engines. They can show popularity of individual tools and methods in time [2], [5]. They can also show “internet consumer” preferences in terms of what is being searched for. These inputs can be used to focus on subjects that will interest not only the scientists but also the public, i.e., a better use can be made of the research that is being done [13].

Findings of this paper are classified into several major groups based on their main field or topic. Each expression is analysed for its presence in internet search results and search popularity [4], [9], [12]. The findings of this analysis will show the dominant expressions. They can also mark possible trends in the field of management of company performance analysis.

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2. Methodology

The presented article was created based on a structured literature review and analysis. Over 25 papers were analysed for keywords on the topic of company performance (financial, social, environmental, and global performance). Articles were searched for on the Web of Science platform and the target was to use publications with the

highest number of citations possible while remaining related to the subject of company performance. The average number of citations of each of the selected papers was 388 based on the data available in the Web of Science during the paper research.

In total 71 expressions related to the subject of company performance were identified and classified into 5 categories: financial, social, environmental, global and methodology related (Table 1).

Table 1. Number of expressions per category

Type	Environmental	Financial	Global	Methodology	Social	Total
Expressions	15	19	17	11	9	71

A detailed list of the 71 expressions found in journals is provided in the following table (Table 2). These expressions are sorted per category to form

consistent groups in relationship to the category title. This means 5 clusters of expressions are formed (Table 2).

Table 2. Expressions per category

Category	Expressions
Environmental	Eco-friendly initiatives, EMAS, Environmental accounting, Environmental corporate social responsibility, Environmental disclosure, Environmental disclosure, Environmental footprint, Environmental performance, Green governance, Green logistics, Green marketing, Green supply chain management, ISO 14000, Proactive environmental strategy, Supply chain environmental management
Financial	Accounting performance, Cash flow, Cash Flow Return On Investment, Corporate financial performance, Discounted Cash Flow, Internal Rate of Return, Net Present Value, Profit before taxation, Resource based view, Return on assets, Return on capital employed, Return on Equity, Return on investment, Return on sales, Risk management index, Shareholder value, Stock market performance, Stock return
Global	Balanced Scorecard, Brand equity, Corporate Governance, Disclosure of non-financial information, Global reporting initiative, High sustainability company, Integrated reporting system, ISO 26000, Non-Financial disclosure, Stakeholder engagement, Superior sustainable practice, Supply Chain Resilience Assessment and Management, Sustainability, Sustainability policy, Sustainable supply chain, Triple Bottom Line reporting, Voluntary disclosure theory
Methodology	3SLS, Confusion matrix, Ensemble model, Fuzzy TOPSIS, Granger causality, Legitimacy theory, Log loss, Mixed method triangulation, Regression discontinuity, RMSE, Structural Equation Modelling
Social	Corporate social performance, Corporate social reporting, Corporate social responsibility, Norm AA 1000, SA 8000, Social accounting, Social disclosure, Social responsibility, Socially responsible investing

The expressions found in the paper analysis were further evaluated in two different but complementary ways. The first analysis consisted of evaluating the number of occurrences of a given expression in a full calendar year in google.com search engine in 5-year periods starting in 2000 and ending in 2020, this means 5 values were found for each expression.

The values show the number of occurrences of a given expression on the Internet (based on the google search algorithms). The advantage of this approach is that in case of changes of google methodology during the period, all results are affected in the same way. The limitation is that only a single search engine is used.

Table 3 shows the expressions in the field of company performance that have been the most numerous in calendar year 2020 in the google.com search results. For comparison the average number of search results from the 71 expressions analysed is shown in the last line. The average was approx. 97 million occurrences. The two most numerous expressions were “Log loss” and “Green marketing” with 652 and 649 million occurrences respectively. This is over 6 times more than the average number of occurrences in this 71 expressions. Expressions “Stock return”, “Sustainability” and “Return on Sales” form a second group with 302 to 329 million occurrences. This is still over 3 times the value of occurrences of an “average” expression.

Table 3. Expressions with the highest number of occurrences in 2020

Expression	2000	2005	2010	2015	2020
Log loss	122 000	7 780 000	43 400 000	213 000 000	652 000 000
Green marketing	1 190 000	3 860 000	28 300 000	149 000 000	649 000 000
Stock return	797 000	5 130 000	19 000 000	91 300 000	329 000 000
Sustainability	2 500 000	7 610 000	52 800 000	220 000 000	319 000 000
Return on Sales	76 000	2 440 000	12 600 000	78 800 000	302 000 000
Average expression	234 881	838 483	5508 805	27 089 428	97 467 522

Figure 1 provides a visualisation of the above-mentioned data. The growth rate of the number of search results is similar to an exponential curve. The values for year 2020 visualise the gap between the average number of occurrences of the 71 expressions

(97 million) on one side and the number of occurrences of the most dominant expressions on the other side. The latter having between 302 to 652 million occurrences.

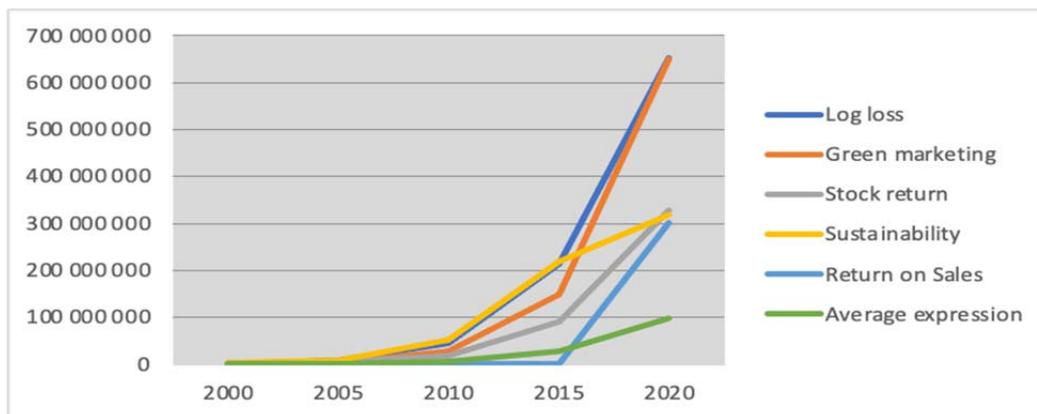


Figure 1. Expressions with the highest number of occurrences in 2020 and their evolution

The 5 most numerous expressions from the list of 71 expressions in 2020 search results represent almost 33% of the total number of internet search results of this group (Figure 2).

This means that they are largely mentioned and published in the internet content.

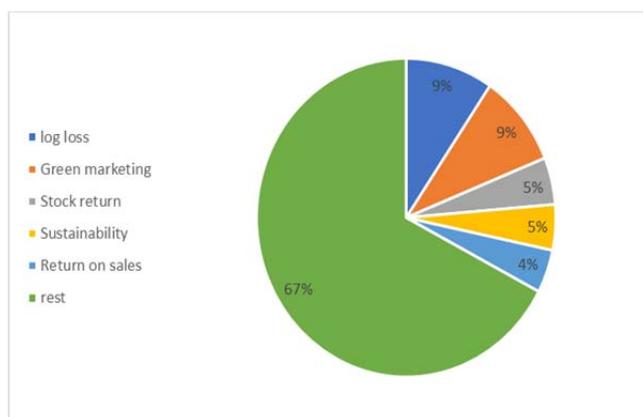


Figure 2. Expressions with the top 5 highest number of occurrences in 2020 and their share in total occurrences

Another way to identify important tools and trends in the field of company performance is to search for the fastest growing expression.

Table 4 shows the fastest growing expressions between 2000 and 2020.

A clear dominance of the environmental aspect is visible. These expressions grow from 5 to almost 9 thousand times in their presence on the internet over 20 years while an average growth in the group of 71 expressions was slightly over 400 times. This means that this field of company performance measurements is growing in average over 10 more quickly than the other expressions.

Table 4. Expressions with the highest growth of occurrences between 2000 and 2020

Expression	2000	2020	Growth 2000 vs 2020
Supply Chain Resilience Assessment and Management	1 670	14 400 000	8623
Sustainable Supply Chain	9 210	51 800 000	5624
EMAS	8 950	49 800 000	5564
Green supply chain management	15 600	86 400 000	5538
Green governance	15 900	87 200 000	5484
Average expression	234 881	97 467 522	415

Table 5 shows the same analysis but focuses more on the recent years. This time the growth in number of search results between 2015 and 2020 is considered. The environmental aspect is not directly visible, rather the global conception of company performance steps forward.

Table 5. Top 5 expressions with the highest growth of number of occurrences between 2015 and 2020

Expression category	Expression	Growth 2015-2020
Global	Supply Chain Resilience Assessment and Management	297,5
Global	Global reporting initiative	83,7
Global	Disclosure of non-financial information	78,9
Methodology	Confusion matrix	77,3
Global	Triple Bottom Line reporting	74,6
All	Average expression	3,6

The dataset used in this paper is shown above since it has been created by the author based on manual search for each expression. A different person might obtain different search results based on the constant evolution of the google search engine.

The number of occurrences obtained in the above way shows already significant differences between expressions analysed. The lowest number of cases in 2020 was 5000 and the highest 650 000 000. Analysing data with such magnitude of differences between each other is complicated and the lower values can get neglected.

To better understand the evolution and growth in such a diverse group of results a 5-year growth index was created. In this manner it was possible to analyse the average growth over the 20-year period as well as the differences between individual measurement periods. This meant however that one value for each expression was lost, i.e., only 4 values per expressions are available. The use of indexes showed expressions that were gaining presence in the highest 5-year pace. An additional analysis was carried out on the last value of each index, i.e., between 2015 and 2020. The objective was to point out the strongest growth of given expressions in the more recent past.

In the last step of this analysis of expressions the above selected were submitted into the google trends website. Here an analysis of the popularity in internet searches is evaluated by google. Data from their evaluation can be downloaded and analysed. Based on a trend analysis several expressions with increased popularity in the recent years have been identified.

The advantages of the above methodology are that many input data are analysed in bulk due to the use of an internet search engine.

Limitation of this study can be the choice of articles selected for analysis. The selection of the articles could be considered subjective even though they were selected based on the number of citations provided by the Web of Science while targeting the most recent publication years and publication before 2000.

3. Results and Discussion

In the group of finance related expressions Stock return, Return on sales, Corporate financial performance and Resource-based view have similar presence on the internet reach results in 2020 ranging between 329 000 000 and 279 000 000 cases. The strongest growth in the 2000-2020 period is seen in Return on sales, Net Present Value, Corporate financial performance, Return on investment, Stock market performance, the average growth being between 7.1 and 8 (i.e. the number of occurrences multiplies by 8 over a 5 year period).

This means that the “classic” indicators are still highly used, and investment aspect remains crucial in this field of evaluation.

Between 2015 and 2020 Cash Flow Return on Investment has risen 35x in the term of number of appearances, i.e., it certainly requires attention together with Return on assets which has risen 12.2 times at the same time.

In the group of social related expressions Social responsibility, Corporate social performance, Corporate social responsibility show the dominance of the social responsibility aspect of performance evaluation with internet reach results in 2020 ranging between 138 000 000 and 247 000 000 cases. The strongest growth in the 2000-2020 period is seen in Corporate social performance, Corporate social responsibility and Social accounting. The average growth being between 7.2 and 8.4 (i.e. the number of occurrences multiplies by 8.4 over a 5 year period).

Between 2015 and 2020 socially responsible investing, Corporate social reporting and Social disclosure have risen the most, between 6,6 and 8,7 times. This is nowhere near the fastest growing terms in the field of finance and similar to the average growth of the major terms.

In the group of environment related expressions the Green marketing clearly dominates the presence in the search results with 649 000 000 appearances. It’s one of the 2 most present expressions in this whole study. This shows that in the non-financial sphere of evaluation of company’s performance this subject must be considered. The strongest growth in the 2000-2020 period is seen in EMAS and Green

governance, which grow in average 8.1-8.4 times over a 5-year period.

Between 2015 and 2020 Supply chain environmental management has grown 41.6 times and is certainly a field to focus on in the performance evaluation of a company.

In the group of globally related expressions Sustainability and Sustainability policies show the dominance of this aspect generally with internet reach results in 2020 ranging between 319 000 000 and 282 000 000 cases. The strongest growth in the 2000-2020 period is seen in Corporate Governance. The average growth being 8.1 (i.e., the number of occurrences multiplies by up to 8.1 over a 5-year period).

Between 2015 and 2020 Supply Chain Resilience Assessment and Management has risen the most, by 297,5. We see a strong growth of the supply chain in the environmental field as well. The subject might need to be evaluated further for possible correlation.

In the group of methodology related expressions, the Log loss dominates with 652 million reach occurrences results in 2020. Its not only the most present in this group but dominates the total group of 71 expressions studied in this paper. Between the years 2015 and 2020 the Confusion matrix and „RMSE” that are in the methodology group have multiplied their number of occurrences by over 70 times. They are clearly gaining presence in internet publications.

Log loss, Green marketing, stock return, Sustainability, Return on sales have the strongest

presence in the internet search results in 2020 and represent over 30% of all search results of the 71 expressions analysed in this paper.

Log loss, EMAS, Corporate social performance, Green governance, Corporate Governance show the highest average growth between 2000 and 2020 and grow in average 8 times over a 5 year period.

Supply Chain Resilience Assessment and Management, Global reporting initiative, Disclosure of non-financial information, Confusion matrix and Triple Bottom Line reporting have shown the strongest growth in search results between 2015 and 2020 in all expressions analysed and we recommend that a future company performance evaluation model takes them into account (Figure 3).

The 71 expressions analysed in this paper were also subject to an analysis in the google trends tool. The Ensemble model, Sustainability, Confusion matrix, Stakeholder engagement, High sustainability company and RMSE have the strongest growth over a period from 01/2004 until present. When subject to a linear regression analysis the following results are obtained from google trends data:

- Stakeholder Engagement, $y = 0,0086x - 311,77$, $R^2 = 0,4868$
- Confusion Matrix, $y = 0,0108x - 416,01$, $R^2 = 0,6093$
- Sustainability, $y = 0,0021x - 19,02$, $R^2 = 0,1253$
- RMSE, $y = 0,0061x - 212,7$, $R^2 = 0,3483$
- Ensemble Model, $y = 0,0066x - 242,55$, $R^2 = 0,3569$

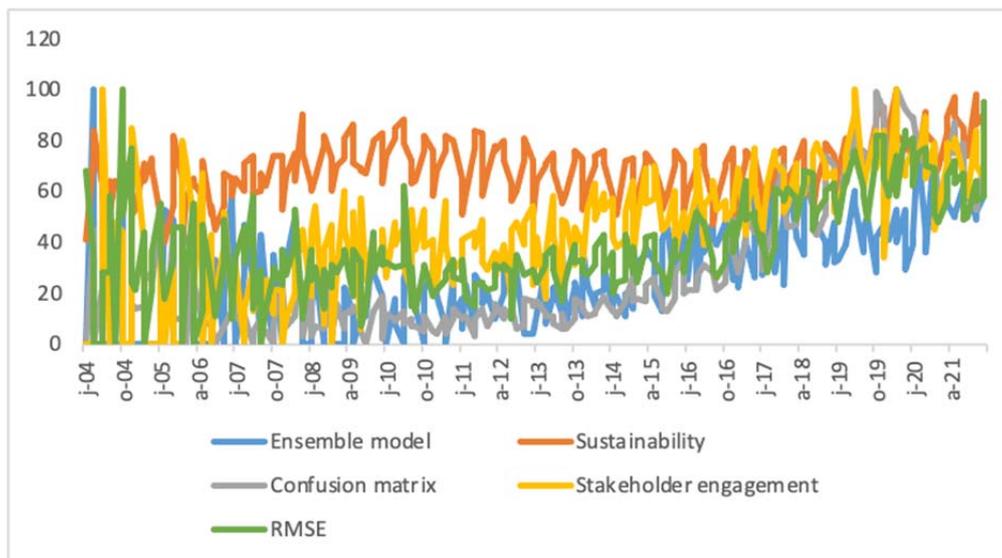


Figure 3. Expressions with the top 5 highest number of occurrences in 2020 and their share in total occurrences

The confusion matrix has the strongest growth rate in the evaluated period and has the highest dependency on time from all other expressions as shown by the R^2 .

When 60 period extrapolation is applied on the available data, Stakeholder engagement, Confusion matrix and Sustainability reach the highest values. This seem to be then the trends to follow in the field of performance evaluation based on the number of research queries by internet users.

4. Conclusion

The analysis of over 25 scientific papers shows a variety of expressions and terms related to the subject of company performance evaluation. Their split into several categories enables a better focus on details of each individual group. The internet search engine shows its use not only for the common internet user but offers space for scientific data creation and analysis. The advantage being an extensive and ever-growing number of users and content publishers. The search engine also has advantages in the quick accessibility of data for researchers with stronger programming skills the data is even more at hand.

71 expressions were studied in this paper. Their classification into 5 groups shows trends that occur in each cluster. The Financial expressions are dominated by Cash Flow Return on Investment. The cluster of social expressions manifests the importance of the Social responsibility. Green Marketing and Supply Chain Environmental Management dominate the Environmental expressions. Expressions classified into the Global domain show the rise of Supply chain resilience. The methodology group is dominated by the Log loss approach while the Confusion matrix shows high gains in research occurrences.

The above terms and expressions are from various fields of the company performance evaluation. They show the number of appearances in search results as well as in the search preferences of internet users. These outcomes of the present paper show basic trends and preferences in the field of company performance evaluation. The target of the analysis was reached.

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