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Doctoral Thesis Review

Title: **Sustainability Reporting and the Use of KPIs in Sustainability Performance: A Study in German Large Listed Firms**

Výkaznictví a použití KPI v oblasti udržitelnosti: Studie velkých německých firem

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The doctoral thesis with the title „*Sustainability Reporting and the Use of KPIs in Sustainability Performance: A Study in German Large Listed Firms*“ can be considered as high actual and appropriate issue in the research area of Economics and Finance.

The author investigated the new concept of firm's reporting system including KPIs indicator in the context of sustainability indicators reporting and financial performance issue (measured by market firm value) in the conditions of large listed companies in Germany.

From the submitted doctoral thesis it is evident that its main objective was to present a comprehensive research in this research area. The research is very important in current conditions in terms of sustainability, social and environmental issue, and also climate change crisis.

I declare, that in generally this thesis is processed at a very good level of elaboration. The main chapters are organized in logical and correct order. The thesis includes the chapter Introduction including research gap, five main chapters - Literature review (chapter 2), Research design and hypotheses development (chapter 3), Research methodology (chapter 4), Research results and discussion (chapter 5), and the last chapter no. 6 Conclusion including contributions and implications to the theory and practice.

a) Appropriateness of the research topic and research objectives fulfillment (i.e. academic/applied significance) - research topic is highly actual and appropriate. The thesis provides an adequate scientific contribution to the discipline of Finance, and special KPIs in the context of sustainability issue. The issue brings also practical benefits for the selected sectors of automotive and financial services in German Large Listed Firms.

As the main objective of the research is to examine the relation between firm value and disclosures of sustainability performance, and to identify KPIs using in sustainable performance in large listed firms in Germany. This scientific research goal of the thesis was formulated relatively clear and adequate to research topic. I can state, that the research goals were mostly fulfilled.

- b) **The methodological framework, research results and contribution** - author chose appropriate methodological procedures to solve the given research problem, taking into account large amount of foreign scientific literature.

One of the more contributions of this thesis is a comprehensive analysis of the current state in the research area from a theoretical point of view (chapter 2 - Literature review). Author analyzed a large amount of foreign scientific literature. I appreciate that more than 190 literature sources mostly foreign scientific journals articles were used. On the other hand, more than 100 of these sources (approx. 60-70%) are older dates of their publication (year 2012 or before).

Based on the research results achieved in the analytical part (chapter 2 - Literature review), author proposed research goals, research hypotheses and the methodology of the doctoral thesis (chapter 3).

As the main objective of the research is to examine the relation between firm value and reporting of sustainability performance, and to identify KPIs using in sustainable performance in large listed firms in Germany. The scientific objective of the thesis is formulated sufficiently and the research partially contributes to further development in this research area. On other side, the focusing of the research solely on 1 country (Germany), without comparison with another EU country(s) can be considered as a gap. In general from previous research worldwide, it is well known that Germany is a leader in this area. So challenging research question is, how are performing also other EU countries in this field comparing to Germany.

Research questions, and also partial research objectives and research hypothesis are developed in the chapter 3.2 (Research Questions and Hypotheses Development, pp. 44 - 54). Based on the results of the literature review 3 research questions, 7 partial research objectives and 11 partial research hypotheses were developed. I can state, that all research questions, partial research goals as well as research hypotheses are formulated and developed logically and in accordance with the main research goal. On the other hand, the literature sources used to the development of partial research objectives and hypotheses are out of date again (for example the key literature sources used in sub-chapter 3.2.1, pp 44-47 - see Research question 1, Partial Objective 1, Hypothesis 1 - Thinggaard and Damkier, 2008; Serrasqueiro and MacasNunes, 2008; Cormier et al., 2009; Aerts and Cormier, 2009; Guidry and Patten, 2010; Clarkson et al., 2010; Dhaliwal et al., 2011; Anam et al., 2011; Berthelot et al., 2012; Arnold et al., 2012; Shamki and Rahman, 2012; Momin and Parker, 2013).

Conceptual research framework is illustrated in Figure 3.1 (p. 55) and logically and fully incorporates previously set all partial research objectives and hypotheses.

The research methodology is proposed in Chapter 4. In this part are mentioned several aspects of the methodology such as research methods used, data collection for the individual research questions, and also statistical methods (descriptive statistics, Pearson correlation analysis) and models proposed to the testing of research hypotheses using multidimensional data analysis techniques (regression models). In general the research methodology applies quantitative research methods (research question 1 and 2) and a

mixed research approach which consists of both quantitative and qualitative research methods (research question 3). In research question 3 as a quantitative method uses Likert questionnaire survey (five point Likert scale) and interview method as a qualitative research approach. Data collection approaches (chapter 4.2) are selected correct and in logical structure to answer individual research questions and to achieve all partial research goals. The choice of statistical methods is correct and their use is appropriate for verifying research hypotheses. Regarding to research methodology as a whole, I really appreciate it due to its comprehensive view, logical structure and selection of appropriate statistical methods and models.

Research results are listed in chapter 5. The Quantile regression results stated in Table 5.6 demonstrate a mix result mostly insignificant connection between firm value and sustainability disclosures. I consider this result to be unexpected. Therefore I cannot accept the statement mentioned in the last period on the p. 74 *“To sum up, the results partly accept hypothesis 1 which states that German large listed firm with more sustainability disclosure tends to have higher firm value.”*. Based on the results mentioned in the Table 5.6., I am considering, that the research hypothesis 1: *German large listed firm with more sustainability disclosures tends to have higher firm value*, was not confirmed. On other hand, in the case of control variables such as company size, company age, company performance measured by ROA or leverage effect, I can agree with conclusions and this final statement of the author: *“These impacts can be interpreted that indicated financial information are used more frequently than sustainability information in supporting investment decision”*, mentioned on the p. 78.

Also the logistic regression results (chapter 5.2) for the association between sustainability disclosure and impacted factors (board size, board independence, board diversity, board committees, and board meetings) not confirmed the research hypotheses 2, 3, 4, 5, and 6. The second investigated independent variables groups related to firm's features which consist of firm size, firm age, firm performance, and firm industry. The significant outcomes only indicate that the bigger and older of firm is the more sustainability activities are disclosed in German large listed firms. These findings are consistent with hypotheses 7 and 8. On other side, insignificant results was achieved relating to firm performance and firm industries. These outcomes are inconsistent with hypothesis 9 and hypothesis 10. The last independent variable involves firm external assurance. Significant positive association between firm sustainability disclosures and external assurance on sustainability reports was confirmed (hypothesis 11). The overall summary of the testing of research hypotheses is shown in the table 5.15. (pp. 91-92). Out of total eleven research hypotheses tested, only 3 were confirmed. Complementary research result for industry separation into sensitive and friendly sectors also does not provide any extraordinarily new and different results (see tab. 5.14.).

The last part of the research (mixed quantitative and qualitative - a questionnaire and interview methods were used) analysed the use of KPIs for sustainability performance in automotive and financial services sector in large listed firms in Germany. The partial result in this part of the research is a Roadmap of the implementation of KSPIs in Automotive and Financial Services sectors (Figure 5.9.).

- c) **Theoretical and practical contributions** - I believe that the achieved results are sufficiently significant from the perspective of the science and practice. The thesis brings adequate scientific contribution in the area of theoretical analysis and quantitative research between firm value and disclosures of sustainability performance and its key contribution is a theoretical model (Roadmap) to implementation of KSPIs in Automotive and Financial Services sectors. The issue brings partially also practical benefits for the

selected sectors in large listed firms on the case of Germany. These can be also a motivation for other companies actuating in other countries.

- d) **Formal aspects and correctness of the language** - the thesis is a very good level of elaboration. Also citations of the literature sources used in the text are correct.

However I have some comments:

- P. 68 - Last part: "*the size of firms referring to total assets was diverse from 59.7 million Euros to 1,709 billion Euros in which the average value to total assets was around 62 billion Euros.*" This description does not correspond to the values mentioned in the table 5.1 above.
- P. 74 - second period - "*As for firm performance, a positive significant link between firm value and firm size is found...*" Instead of "firm size", the expression "firm performance" measured by ROA should be stated.
- P. 98 - "*All disclosures, key sustainability figures and KSPIs using in observed automotive firms are shown in Appendix 1.*" The correct number is *Appendix 2*.

- e) **Publications performance of the author** - List of publications stated by the author (see p. 165) contains 6 scientific publications, from which only 1 publication is from the category of impact journals registered in Web of Science database (Journal of Competitiveness) and 1 in Scopus database (ACTA Universitatis Agriculturae et Silviculturae Mendelianae Brunensis). Other articles were published in the form of the conference proceedings papers. I note that the List of publication does not cite these publications correctly according to the citation standards. I appreciate that all the articles were published with a direct connection to the research area. On the other hand, the publishing activities of the author can be evaluated only as average.

Questions for the discussion:

I have the following questions for the final defense:

1. Could you explain more detail your partial research results conclusion: "*To sum up, the results partly accept hypothesis 1 which states that German large listed firm with more sustainability disclosure tends to have higher firm value*" (see 5.15., p. 91) also comparing to the tables 5.6. and 5.7. (pp. 72–76)?
2. Could you present your own synthesis opinion form the results achieved in relation to these main stakeholders and interconnections among them: *capital market investors - firm management - customers - employees - people and planet?*

Final statement and recommendation:

The strengths of the thesis are as follows:

- Topic of the thesis - the research is very important in current conditions in terms of sustainability, social and environmental issue, and also climate change crisis.
- General structure and logical procedure of the thesis - generally is processed at a very good level of elaboration.
- A comprehensive view in selected research area.
- Appropriate methodological procedures to solve the given research problem, taking into account large amount of foreign scientific literature.
- Research methodology - logical structure and selection of appropriate statistical methods and models.

- Formal aspects and correctness of the language - the thesis is a very good level of elaboration.

As **the weaknesses** of this thesis may be considered:

- Chapter 2 - Literature review - more than 100 literature sources (approx. 60-70%) are older dates of their publication (year 2012 or before).
- The focusing of the research only on the 1 country (Germany), without comparison with another EU country(s). In general, it is well known from previous research that Germany is a leader in this field. So challenging research question is, how are performing also other EU countries in this field.
- The value of research hypotheses setting is questionable (only 3 from 11 hypotheses in total were confirmed).
- The publishing activities of the author can be evaluated only as average.

Therefore, I declare that the submitted Doctoral thesis meets almost all the requirements and therefore *I recommend it to its final defense*.

After a successful defense *I recommend Mrs. Nguyen Thi Thuc Doan to award* by the title "*Ph.D. - Philosophiae Doctor*" in the Study course "*Finance*".

Zlín, January 15, 2021



Prof. Ing. Rastislav Rajnoha, Ph.D.

