

Schmid, Jochen; Olaru, Marieta; Verjel, Ana-Maria

## Article

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## THE EFFECT OF SUSTAINABLE INVESTMENTS TO THE ECONOMIC OBJECTIVES OF THE COMPANY IN RELATION TO THE TOTAL QUALITY MANAGEMENT

Jochen Schmid<sup>1</sup>, Marieta Olaru<sup>2\*</sup> and Ana-Maria Verjel<sup>3</sup>  
<sup>1)2)3)</sup> *The Bucharest University of Economic Studies, Bucharest, Romania*

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### Abstract

The implementation of the sustainability mega-trend has been increasing in large companies, listed for many years in order to respond to stakeholder's interests. One of the objectives of the paper is to identify how the sustainable investments behaves with business objectives in terms of total quality management. This remains unclear in the given studies.

The paper highlights part of the value of research based on the survey conducted on German corporations that were quoted on the DAX30 stock index during 2007-2014. Public annual reports as well as company figures from the base of this paper.

As a result of the study, it appears to be difficult forming a unique interpretation of complex company structure, but there are detectable correlations between sustainable investments and economic objectives in total quality management that have been found in the research.

**Keywords:** sustainability, sustainable investments, economic objectives, total quality management (TQM), corporate social responsibility (CSR), economic value

**JEL Classification:** M1

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\* Corresponding author, **Marieta Olaru** – olaru.marieta@gmail.com

## Introduction

The global competition in nearly all branches is becoming harder. Companies are trying to find a new manner to keep the status in international markets and invest more money in new technologies. But this kind of investments, such as disruptive technologies, represent only one side of the medal. On the other side, we can observe global megatrends such as the “new” way of Sustainability. That means, engineers follow the innovations to things even more “smart” and convenient. Productions should be more and more efficient. Efficiency means saving resources and finally saving money by lowering costs. The present and the future objective of the companies is to follow up the megatrends – a pure economical issue – and there are different ways to achieve this goal. It is not the objective what comes in the focus of the customers, but the way to achieve it. How will things be created, what will be the way of production, what kind of resources will be necessary and what are the implied risks? This kind of questions and much more others show the way companies conduct business nowadays. But, if this is the way of doing business, is this way a real successful one or is it only a trend without any substance for the economic values?

The following review of the literature gives a clear view to Status Quo and what the current theory is. In the second part of this paper, we show our analysis within which we have found out if measurable effects exist. Finally, we overview in our conclusion what the results will represent and how the data could be interpreted in the light of the given theory which is reviewed by the named authors.

## 1. Review of the scientific literature

If we discuss the theory of sustainability, we encounter very often within the given literature the reference “Brundtland Report” which follows a definition of the sustainable development(WCED, 1987). Since this report was published and discussed, the mainstream of sustainability was in the mind of different groups and started to be a part of business strategy. The focus was simple: taking all responsibility to the future of the children and keep the environment for future generations (Elkington, 1994). While this report focuses more on a humanity issue, the companies tried translating it in business cases creating a way of business and calling it *corporate sustainability* for the need of stakeholders and shareholders (Dyllick and Hockerts, 2002; Remmers, 2006; Schank, 2006).

According to other authors, sustainability is defined as development that meets the needs in the present without compromising the ability for future generations to meet their own needs (Verjel, et al., 2015; WCED, 1987).

The International Organization for Standardization follows the ISO 9000 and ISO 9001 and defines seven Quality Management Principles (QMP): QMP 1 – Customer focus, QMP 2 – Leadership, QMP 3 – Engagement of people, QMP 4 – Process approach, QMP 5 – Improvement, QMP 6 – Evidence-based decision making and QMP 7 – Relationship management(ISO, 2015). Within these principles, we can read the topics of economic value and different kind of Sustainability including the themes of the well-known CSR approach. The report shows how companies can improve their business intelligence and performance as well as organizational excellence (ISO, 2015).

The “Brundtland Report” additional shows the approach of the “triple P” which defines the “people” as the social component, the “Planet” as an ecological component and the “profit” as an economic component(Elkington, 1994; WCED, 1987). To bring together these three

components in a complex system like big companies will do, it is necessary an efficient total quality management. Nowadays we know this as the “bottom line” which should find the balance between these three “P’s” (Elkington, 1994; Cramer, 2002).

Focusing on the Total Quality Management (TQM), it is a given fact that Top Management Team, especially the Members of the Board and Supervisory Board, should manage the ISO 9001. Within this system, there are different highly important attributes: customer satisfaction for the brand, the company and its products. Of course, this includes a regularly motivation to improve skills, products and processes and can upgrade the complete performance of the company or institution (Angheluta, et al., 2012; Sandru, et al., 2015; Oghojafor, et al., 2012).

Following this way of thinking, we have given the argument that the performance of an enterprise could be positively affected by the goals of sustainability. Companies are considered as capitalistically motivated institutions with unique economic goals. Both economic and sustainability could be complementary goals in a business strategy (Angheluta, et al., 2012; Broekhuis and Vos, 2003). In the process of the sustainable development, the companies are motivated to follow even more aspects. If we talk about the aspects of sustainability, one fundamental value is the transparency to all Shareholders and to all stakeholders (Remmers, 2006). This transparency is an important asset in the public reports (Angheluta, et al., 2012).

Sustainability means additional, to work responsible with resources lowering its use to a minimum and avoiding all kinds of wasting. This aspect is important both for the production and even for the planning of new products – leading to the development of new products which aim the fulfillment of the customers’ requirements and do not waste resources. One of the pillars on which business efficiency is built up is a reliable supply-chain system. Companies engaged in the global economy are dependent on trustworthy suppliers and invest great assets in consolidation to the created relationship (Gavril, et al., 2007). For this, the total quality management must create and control efficient and effective processes and maximize the results (Angheluta, et al., 2012).

In another context, we found the description of “organizational sustainability” which is in the context of the total quality management (Broekhuis and Vos, 2003). Finally, it means, that the thematic way of sustainability provides more of an organizational context and less of a *one man show* way. Implementing in strategy, communication to all stakeholders and shareholders and implementing in the total quality management (TQM) process is necessary. As Sustainability and TQM are characterized by a mass of different indicators, depending on the branch, region and country and depending on the key markets of the firm, an economic dimension should be added (Isaksson, 2006) to find the link between the two fields. These economic dimensions are describing the competition, operative processes and external drivers such as markets and customer behaviour (Isaksson, 2006), there is a measurable link between innovation and firm performance (Mishra and Napier, 2015). This correlation is based under the umbrella of quality management and its processes within a company and its environmental management.

The dynamic markets and the change of customer behaviour are only two external based reasons why it is so hard for the companies to fulfil the expectations (Angheluta, et al., 2012; Broekhuis and Vos, 2003).

If companies focus on the total quality management, this puts them one step closer to the customer. The customer is the center of all actions and its satisfaction represents one of the

main goals, no matter if there are tangible or non-tangible products. The satisfactions are mainly influenced by a high product quality or a product quality, which reflexes the price and the benefits (Angheluta, et al., 2012). In this context, we can divide the product in a technical and a functional benefit.

While technical characteristics are more focused on innovation, the functional benefit is finally what the customer needs – it is the core competence of the product. But all of these are the product itself. The total quality management goes one step further and defines how it will be produced (Elkington, 1994; Sarbutts, 2003). Customers do not only want to use a product, they are interested in its material, the workmanship, the resources and much more stakeholder interest. Finally, it means that we must understand what the sustainability means: it is a process from development to the customers and it is the given benefit of the product (Broekhuis and Vos, 2003; Schmid, et al., 2016).

Companies' strategies were also represented by the implementation of the Corporate Social Responsibility (CSR), which is focused on the "social" attributes. As example, there are studies who are focused on the topic of gender equality and its effect to company performance (Schmid, et al., 2016). This means, to respect any human being's, civil rights and women's rights (Caroll and Shabana, 2010). In this perspective, there is a definition which CSR includes. These dimensions are divided in social aspects, stakeholder interests, economics and environmental aspects (Dahlsrud, 2006; Verjel, et al., 2015). However, implementing CSR can reduce the costs and risks by managing communities, creating relationships to communities, proactive on environmental issues, diversity can cause higher turnovers and long-term shareholder values (Caroll and Shabana, 2010). Finally, it becomes a competitive advantage in the markets (Bhattacharya and Moffitt, 2013; Kaufmann and Olaru, 2012). CSR can cause links to monetary performance and economic and financial terms (Caroll and Shabana, 2010; Zairi, 1996). The perspective of the shareholder is very important, as all activities must be communicated and stakeholders must accept it (Williamson, et al., 2006; Dahlsrud, 2006).

To implement the CSR and the general field of sustainability to gain economic performance, it is necessary to interdigitate the Total Quality Management (TQM). TQM affects the organizational performance and the economic performance by its various instruments such as innovations (Gomišček and Matjaž Maletič, 2016). The presupposition is that in companies there are sustainability-orientated innovation practices. This includes the CSR by its specific topic "social" as well as the general sustainability of stakeholder and shareholder issues Bhattacharya and Moffitt, 2013; Dahlsrud, 2006; Verjel, et al., 2015). Basically, the literature shows a way to measure the impact of CSR to firm performance, but the given models are limited in their conclusions (Kaufmann and Olaru, 2012). To follow the given approaches, we decided to design a new way and create a new link between TQM, Sustainability and company performance by using different databases.

## **2. Research methodology**

To achieve the objectives of research, we decided to use the public database of the public business reports from the German DAX30 listed companies between the years of 2006 2014. The public reports included all necessary information like economic characteristic numbers, essays about sustainability and business goals, development, research and strategic ways. In addition, we found all necessary information about the individual and

general quality management systems which were directly connected to the topics of sustainability and to the topics of economic values.

Our database, based on these public reports contains an amount of over 1800 characteristic numbers having a real and representative source. For the measurement of sustainability, we decided to use the well-known ranking of the institution *Sustainalytics* which is a proofed scientific source and a great database to evaluate the DAX30 companies in this field.

Finally, to bring all the data together, we mostly used correlations, linear, polymeric,  $R^2$  and cross-correlation. Our analysis focused both on the correlation and  $R^2$  as it shows us the variation in the model of regression between the dependent and independent variable. It shows us the quality of linear approximation.

The paper presents the results of research conducted as tablets and figures, based on our own analysis on our database.

### **3. Results and discussion**

To find out how companies act in markets, especially in competition situations, we highlighted the characteristic numbers of the investments. Investments are monetary transfers to Research and Development, in new machines, employees and in marketing processes. In these fields, the different sustainable instruments include the following: machines with low energy consumption, product development by respecting the availability of natural resources and ethical marketing and announcements to respect the equality of men and women. The instruments of the companies are very different, depending on the activity branch. However, the investments are a good indicator to find out how strong companies look in the future business and include – but must not – sustainability as top management strategy.

In the aspects of Total Quality Management, we found out that all DAX30 companies use TQM in its processes. This is not new = nor surprising as it is a standard. The main contents of the quality management represent the most interesting part of these findings. Of course, some issues differ as the companies are active in different branches and the focus will be different. However, as quality management is a way of process management, all TQM include the sustainability and the economic attributes in its strategy and in its processes, of course. Economy and sustainability is in general a quality management theme and in respect to this, it is part of the strategy.

In 2015, only 15 companies published a separate sustainability report in accordance to the standards of GRI - Global Reporting Initiative which is known under the name “G4” (Hecht, et al., 2016). The G4 report includes aspects of economy, ecology and governance such as human rights and compliance (GRI, 2015).

The other indicator is the Tobins Q. As the difference between book value and market value, it shows us perfectly the “Good-Will” of shareholders and how these investors evaluate a company. Of course, investors have different goals and each investor has another focus on company. One is looking straight to the dividend, another is looking for the sustainability. But the sum of all investors and their evaluation can indicate the market value. Tobins Q makes this “Good-Will” comparable to all companies in the analyzed DAX30 listing. The following figure highlight the results of the first analyze.

It is easy to see that the average of the Tobins Q between 2007 - 2014 is mostly negative. This means, the “Good-Will” has a trend to lower down in the timeline. On the other side, we have the investments which are mostly positive. This means that they are growing in the showed timeline. This is different to the given literature, as there is the basic belief, that investments will higher the Tobins Q by the effect of upgrade both market shares and competition position. Our analysis showed, that the trend line becomes more like a scissor – the more companies invest, the lower the Tobins Q will be. But not just this conclusion could be wrong, as we have to view the complete company including the other characteristic numbers. Till the investors will not take an overview of the company or to the complete investments, the explanation of the Tobin Q is simple: investors focus their view on very specific attribute and characteristics of a company and evaluate exactly this (Figure no.1).

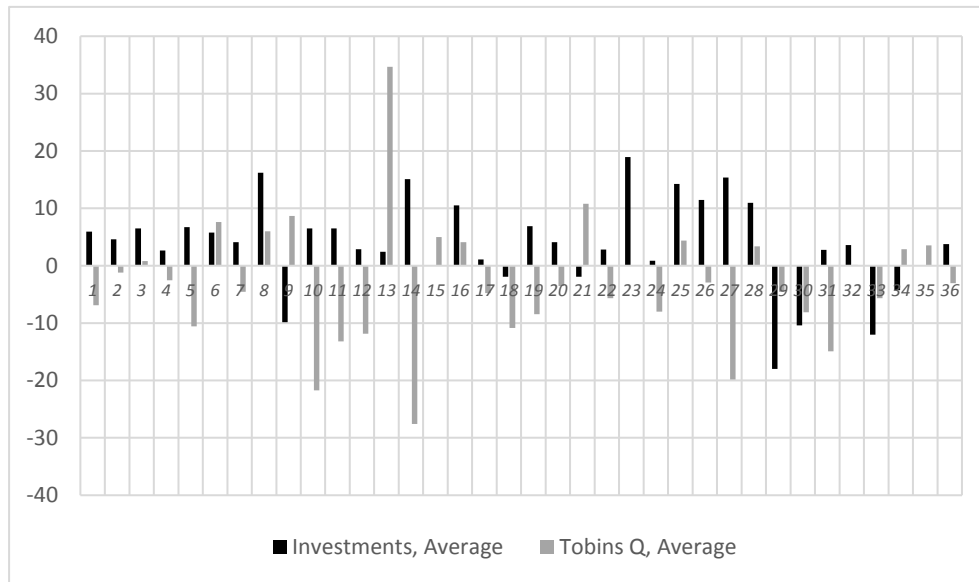


Figure no. 1: Investments and Tobins Q of DAX30 companies, Average in %, 2007-2014

Correlations between investments and the Tobins Q could be more luck then a real relation. But with this explanation we found out, what are the specific attributes for the shareholders – what is important and what makes finally the value of the firm?

Our studies show us the complete public reports, hundreds of pages were read and thousands of characteristic numbers were analyzed and calculated. As we additionally know from the present literature that the total quality management is a factor influencing the performance of the enterprise, we double checked all quality driven arrangements including the themes of sustainability.

To have a clear view of the total quality management driven factors of sustainability, we decided to choose the ranking of the well-known ESG-model of the institution “Sustainalytics”. This ranking shows the score of the attributes Environment, Social and Governance. We concluded, that the ESG is a very good proxy to measure the sustainability. For this, we combine the three attributes to the economical values of the

firm, represented by the characteristic numbers turnover, investment absolute in currency Euro, EBIT and finally Tobins Q. The Tobins Q shows the relation between market value and book value. The higher the Tobins Q is, the higher evaluate the goodwill by the shareholder. They expect a rising value of the firm in the future and are willing to pay more for the share than represent the real book value.

Moreover, it is a question of the interest payment, what is known as the yearly dividend. However, we formulated four characteristic numbers as proxy variables for the economic value and three proxy variables for the sustainability. All attributes – economic and sustainable – were directly connected to the total quality management systems of the companies and were part of the strategy. This means, there is a direct influence from the total quality management to the attributes and to the strategy of each firm. As the board and the supervisory board controls the companies, there is a perception of these themes in the higher management levels and it is communicated to shareholder and stakeholder.

The combination of these seven characteristic numbers are measured by their correlations and shown in the following table (Table no. 1). We can highlight, that the correlation between the economic numbers are much higher than the correlation between ESG and economic values. In the economic field, it is the correlation between Turnover and the EBIT which is given with 0,681. This high correlation shows, that there is a high relation that could mean, the higher the turnover is, the higher the EBIT could be. But we know, that the mathematical form of the EBIT will additional represent the side of the costs. So, this is an interesting result, but not the focus in the analysis. The focus are on the three attributes Environment, Social and Governance. In this sustainable field we can see that the correlation between EBIT and Environment is 0,457 what is mid to high classified. A bit lower with 0,426 is the correlation between Turnover and Social. Social Attributes are mainly characterized e.g. by keeping human rights and follow the rights of employees as well as equality of all stakeholders. Turnover could be influenced by different factors, e.g. the pricing and quality of goods, the main market situations and the individual decisions of customers and their expecting benefits. If we follow the main explanation that customers shall request goods with a high benefit (price-benefit relation) it could mean, that mainly customers will request items from companies and brand which respects social aspects. This is in accordance to the mainstream trend of sustainability. Customers prefer items produced under the label of sustainability such as “Bio” or “Fair”. Customers honor the compliance with regulations and evaluate this as an additional benefit.

On the 3<sup>rd</sup> place, we have the correlation Tobins Q to Governance with -0,406. We cannot say exactly why it is as it is, but we know that the attribute Governance includes transparent and responsible behavior of the Top Management Team (TMT). It is hard to believe, that nontransparent behavior has no effect to the Tobins Q, as the Tobins Q reflects the “Good-Will” of shareholders. Do shareholders really trust a TMT, when it is not responsible in its behavior? However, this paper is not a personal statement of the authors, but we recommend having an additional analysis of this thing. If we view the Governance-Social relation, we see 0,386, what is very strong for the Governance. This seems irritating to the Tobins Q. It could mean, that Governance should be focused on social aspects, but not on the shareholders. We will come back to this interesting point in the conclusion as we must get a view to the other correlations to get an overview.



**Table no. 1: Correlation of economic Values and Sustainability**

COR	Sustainability (E=Environment; S=Social; G=Governance)			Economic Values			
	E	S	G	Turn over	Invest	EBIT	Tobins Q
Environment	1,000	0,221	0,226	0,334	0,331	0,457	-0,309
Social	0,221	1,000	0,386	0,426	0,272	0,295	-0,362
Governance	0,226	0,386	1,000	0,067	-0,031	-0,047	-0,406
Turnover	0,334	0,426	0,067	1,000	0,612	0,681	-0,380
Invest	0,331	0,272	-0,031	0,612	1,000	0,656	-0,189
EBIT	0,457	0,295	-0,047	0,681	0,656	1,000	-0,180
Tobins Q	-0,309	-0,362	-0,406	-0,380	-0,189	-0,180	1,000

The most interesting result is, that all analyzed sustainable attribute will correlate with different economic characteristic number. That could mean, that companies, who are willing to raise the ESG performance (Environment, Social and Governance), must optimize all economic goals. Finally, as described in the given theory, it will mean that all ESG attributes will always be influenced massively by economy. Companies, who are very focused on their economic goals, will affect the sustainable goals, too. The goals are complementary and do influence each other's.

It is also interesting, =that the influence of the ESG attribute to each other is low. So, if companies try to upgrade their performance in social attributes, it has only low influence and correlation to governance and environment. For this surprising result, we tried to focus a bit more.

Figure no. 2 shows the correlation of investments to the EBIT of the firm. While the X-Axis shows the investments in Thousand Euro, the Y-Axis shows the EBIT in Million Euro. The figure shows a visible correlation of the two characteristic numbers. It seems like a cloud and gives a final R<sup>2</sup> of 0, 3049. This result could be classified as a statistical mid-correlation which shows an effect. Under the umbrella of a huge company – what the DAX30 companies are definitely – and in view to these complex systems, the mid-correlation it a good statistical result.

The higher the investments, the higher EBIT. According to the study conducted we found out, that companies plan their investments in the background of clear goals like a maximum of Return on Investments. Because this is a given strategy and a given fact it seems that companies control their decision not by investment, they control it by results. This means, the way to maximize the EBIT is not so important. But if a decision make is going to find a way to define complementary goals, he will always choose the more stakeholder friendly strategy. In the final step it will mean, that companies choose sustainability themes and investments only, if the result –shown here as the EBIT – will be the same or better compared to alternative investments.

In the public reports of the companies we found many essays of the CEO and other decision makers which includes sustainability as a given instruments. They point out the importance

of such responsible business developments and the monetary benefit if the institution will choose such a business way. Decision makers must combine the two sides of the medal – the economic and the sustainability. We can call this way of strategy as the “Sustainable Economics”.

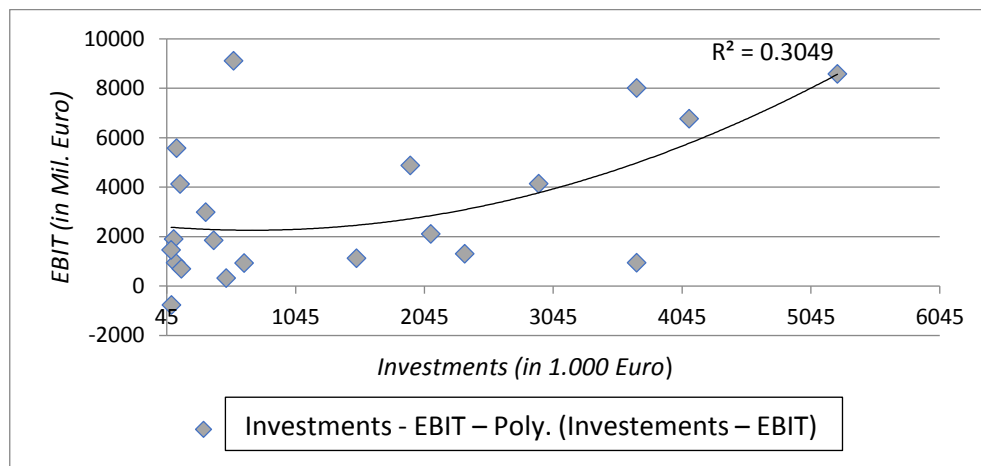


Figure no. 2: Polynomial correlation of Investments and EBIT

The results of the research reflect that the public megatrend of end-users will affect the business institutions with a kind of “Sustainable Economics”.

**Conclusions**

In the first analyze, we can show that the link between investments and the economic characteristic number of Tobins Q is not what we expected. As the Tobins Q is mostly negative and the investments are mostly positive, there is no clear link or even a correlation measurable. It seems that both characteristic number will be very different. However, on the other side or from another point of view we can conclude, that the Tobins Q is not a result of investments, no matter if they are focused on sustainable themes or if the investments are mostly economic or monetary motivated. It makes a non-measurable difference in our analysis of the German DAX30 listed companies. But it is the question not answered, what the effects of sustainable engagements are and what kind of effect the TQM has in all this scientific discussion.

Well, in our huge database we compared many characteristic numbers, in order to find out and highlight, what will be a real indicator and what makes a real and measurable effect. In this second analysis, we found out that the three attributes of sustainability – environment, social and governance – have their own specific correlations to the economic values of the firm. So finally, we can show, that the field of sustainability is not be controlled by only one indicator or that a company will use only one instrument to have an effect to the ESG. No, it is a various thinking in the firm strategy and a very complex system. Each attribute of the ESG has its own string correlation and some more lower correlations. This is a very interesting finding, as the economic characteristic numbers are heavily influenced by other

economic numbers while the ESG attributes are mostly independent from other ESG attributes.

Thus, we must add a limitation of the Modell with correlations. The highest correlation is EBIT-Turnover with 0,681 what mean 68,1% of the data shows us a relation. The rest – 31,9% - is not explainable with our test. We finally do not know what exactly the reason is, we only can recommend for future studies to make an additional test of correlation and try to find out, why the 31,9% do not have a measurable correlation and what it means. Basically, we showed in upper conclusion the possible explanations, but to test this additional will be our goal for the next paper.

In the conclusion it means, sustainability is influenced by economic values. The economic values are influenced by other economic values.

To have a clear view on the involvement of the total quality management, we had a straight focus to the investments as they are heavily controlled by TQM processes. The investments show us a mid to strong correlation to the EBIT. This means, the more a company will invest, the higher EBIT could be. This is a contrast to our first analyze with the number of Tobins Q what is highly influenced by shareholders.

The negative correlations of the E, S, and G to the characteristic number of Tobins Q is eye-catching. As we know it the Tobins Q is the rating of investors. The negative correlation explains us, that investors are not interested in sustainable actions or strategies. It could be an explanation, that most of the investors – or the investors with the highest investments – are only monetary driven and have a clear focus to the economic values. In fact, the correlation among the economic values is high. So, if investors are interested in the highest Return on investments, a view to EBIT, turnover and investments makes sense. Investors are more influenced by economic results, basically not focused on the way how to achieve these results. But if this will be the final explanation it is a good cause to ask the following questions: if sustainable strategies are only for stakeholders and capitalistic motivated strategies are more for shareholders. Are these two sides of the same medal? Is it an opportunistic behavior of the Top Management Team to call a part of the strategy as a sustainable way of business?

The only logic conclusion is that economic values will influence the complete company, including its performance. This key fact is not based on a shareholder's value or even a strong sustainable goal, it is more a way of investments – unlikely no matter if these investments are sustainable or not. This means, that the phrasing “Sustainable Economics” is a perfect description of what we have in the German DAX30 companies. The analyzed companies are capitalistic systems with clear economic goals. To achieve the goals, they use in parts and only additionally the themes of sustainability and anchoring these themes in the total quality management. Under the umbrella of sustainability, the companies follow the megatrends and can do what they always do: maximize the earnings. This is what we call a “Sustainable Economics”.

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