Integrated Reporting and performance management

How to report about the relationship between business performance and value creation in terms of natural capital and social & relationship capital

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Master's thesis

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Abstract

Integrated Reporting <IR> is a promising new standard for external corporate reporting that provides shareholders a better explanation of how a company creates value. An integrated report is "a *concise communication* about how an organization's *strategy*, *governance*, *performance and prospects*, in the context of its *external environment*, lead to the creation of value in the *short, medium and long term"* (The IIRC, 2013). An organization benefits from <IR> by getting an improved holistic view of the organization and a better understanding of how the company creates value. Currently, <IR> is in the 'breakthrough' phase of adoption of the International <IR> Framework. This thesis contributes to the adoption of <IR>, by studying how business performance leads to value creation. Yearly research on the progress of Integrated Reporting in the Netherlands shows that Dutch companies have real difficulties with operationalizing <IR> and that especially reporting about non-financial performance in challenging (Deloitte, 2014). Therefore, the research question of the graduation project is:

How can companies show in an integrated report how their performance leads to value creation in terms of natural capital and social & relationship capital?

The research shows that reporting about business performance is not just putting a standardized list of performance indicators in the report. An integrated report should contain qualitative and quantitative reporting about how their performance leads to value creation. The quantitative part mainly consists of performance indicators and the qualitative part should contain an explanation about the performance indicators, the measurement methods and their relevancy for the organization. Performance indicators have to be presented for multiple consecutive years, against peer groups, and it should be linked to previously reported targets and future targets. This enables benchmarking, comparability and showing trends. Literature research has yielded specific guidelines about individual KPIs and about structuring them. Performance indicators have to be measurable and controllable by the company. Moreover, they have to be consistent, reliable, relevant and in line with the strategy of the company. This last aspect is important because the strategy determines how the company aims to create value.

The International <IR> framework does not provide any specific measurement methods or performance indicators though. Nowadays, annual reports or sustainability reports often show a quite standardized list of performance indicators, and the question is if these are actually related to value creation in their business. A statistical analysis was performed during this project, on historical performance data of Dutch listed companies, that are related to social & relationship capital and natural capital. This analysis is based on the value creation figure from the International <IR> Framework, that shows that a company owns six types of capital: financial, manufactured, intellectual, human, social & relationship and natural capital. The analysis showed that there are no KPIs that are in general significantly explanatory for value creation. This means that organizations should not all report the same standardized list of KPIs, but they have to select individually what KPIs are relevant for their value creation process and strategy. To accomplish that, an organization should align their internal performance management with what they want to report externally, and structure the KPIs by the six capitals.

Keywords: Integrated reporting, Key Performance Indicators, Natural capital, Performance management, Social and relationship capital, value creation.

Contents

Foreword

This thesis is written as completion to the master Industrial Engineering and Management, at the University of Twente. I followed the specialization track Financial Engineering and Management, which is focused on valuing financial products, corporate finance and financial risk management. The focus on value creation of an organization was an interesting part of Integrated Reporting for my field of knowledge. I have chosen to approach Integrated Reporting from the perspective of the company to contribute to operationalizing of the new reporting standard.

I am grateful for the graduation internship that Deloitte Consulting offered me within the service line of C.F.O. services. During a period of 5 months, I had the opportunity to work in a specialized Integrated Reporting team that shared valuable knowledge and insights with me. They really helped me with this research project and with writing this thesis. Special thanks go to Olivier van Thuijl who offered me helpful guidance during the project and was always willing to think along with me when I was struggling. He and my other colleagues, made me feel very welcome within the services line and contributed to the nice time I had during the internship.

I would also like to thank my first and second supervisor from university, Henk Kroon and Peter Schuur respectively. The feedback sessions during this project were always interesting and helpful. Henk's eternal willingness to discuss project related issues really contributed to making this graduation project successful.

1 Company profile of Deloitte Consulting

This master's thesis is written during an internship at the Strategy & Operations department of Deloitte Consulting Netherlands. The service line C.F.O. Services, which is part of Strategy & Operations, has a team that is specialized in Integrated Reporting and performance management. They accommodate this research because they want to keep expanding their knowledge about Integrated Reporting to offer the best services to their clients. This company profile gives insight in the service line and its position within the organization.

Deloitte is a collective brand name for a group of separate firms that offer professional services in the fields of accounting, consulting, financial advisory, risk management, tax advice and other related services (Deloitte, 2015). These specialized firms are part of the Deloitte Touche Tohmatsu Limited (DTTL) group, which was founded in 1845 as an accounting company in London. Today, Deloitte employs over 200.000 people, spread over 150 countries. Deloitte Consulting in the Netherlands, which employs over 800 consultants, supports this Master's graduation study. Figure 1-1 shows a detailed structure of Deloitte consulting and highlights the service area and service line where the internship takes place. The consulting department of Deloitte contains three service areas: Strategy & Operations, Human Capital and Technology. CFO Services is the largest service line of Strategy and Operations and supports this graduation project.

CFO services can be roughly divided by finance strategy and finance operations. Finance strategy is dedicated to strategic questions within both private and public sector, and helps improving the finance function of organizations. They benchmark the quality of the finance function in an organization and support them by making the financial department more effective to improve decision-making on managerial level. Financial operations focuses more on improving efficiency and effectiveness of financial processes.

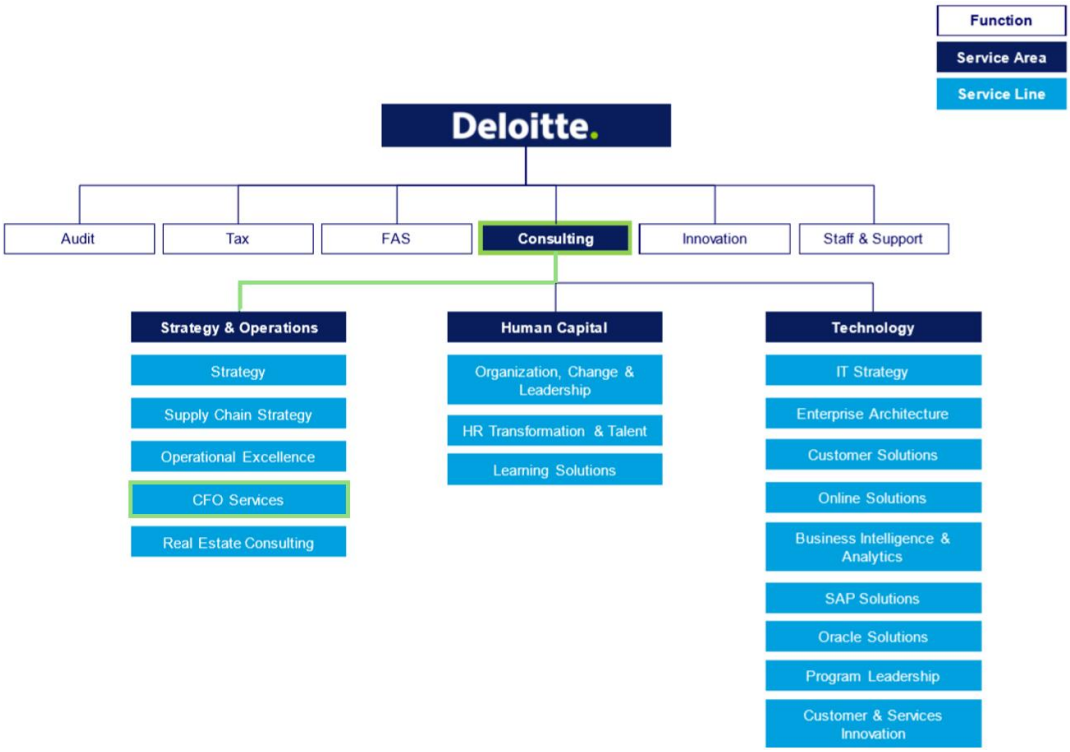

Figure 1-1: Organization structure Deloitte Consulting Netherlands

2 Introduction to the study

The central subject of this thesis is Integrated Reporting (from now on referred to as <IR>), which is a new global reporting standard. An international committee, which is called the International Integrated Reporting Council (IIRC), published a report in 2013, in which they proposed a new corporate reporting standard. The new type of reporting claims to improve the external communication of a company about how they plan to create value for their stakeholders in the short, medium and long term. The release of the International Integrated Reporting Framework in 2013 had an impact on the awareness of businesses about the importance of their stakeholders and environment. <IR> is based on the principle that creating value for stakeholders is the only way to accomplish a sustainable shareholder value for the organization itself.

The purpose of this thesis is to contribute to the operationalization of the new concept of Integrated Reporting from a C.F.O. perspective. Where most academic literature is written about the external reporting and assurance, there is a lack of knowledge about embedding the <IR> principles in the organization.

This section describes the research design of this study, which results in a central research goal. The guidelines of Verschuren & Doorewaard (2005) will structure the design of this study (figure 2-1). The first step is to fully understand the concept of Integrated Reporting and in what context it is introduced. Therefore, Section 2.1 describes the main ideas behind <IR>, the committee behind <IR>, the benefits of the new reporting standard and finally the progress of implementation at companies in The Netherlands. This leads to a research goal in Section 2.2 and in Section 2.3 the scope of the study will be narrowed towards a central problem statement. The research questions of Section 2.4 show the structure of how this central problem statement will be approached. This will also be the structure of this thesis. For all sub research question there is described a methodology, in Section 2.5, on how these questions will be answered.

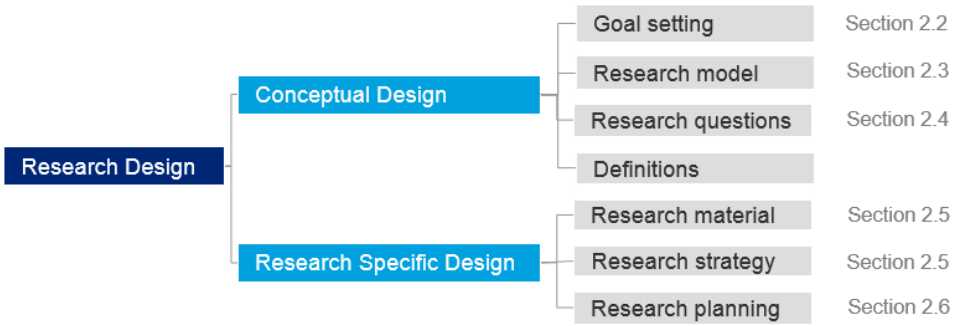

Figure 2-1: Structure of research design according to Verschuren en Doorewaard (2005)

2.1 Current situation of Integrated Reporting

First, the principles of <IR> will be described by starting with the committee that introduced it and what their motives were. Followed by a description of what Integrated Reporting exactly is and what benefits it should give. Finally, it is interesting to see in what way the new reporting standard already has been implemented at Dutch companies and what the possible areas of improvement are.

2.1.1 The introduction of <IR>

In December 2013 the International Integrated Reporting Council (IIRC) published a proposal for improvement of corporate reporting, which is called Integrated Reporting. The main goal of <IR> is that organizations can better explain to providers of financial capital how they will create value over time (The IIRC, 2013). The IIRC is a global committee that brought together regulators, investors, companies, NGOs and other key representatives, to develop an internationally accepted <IR> framework (figure 2-2). The committee is convinced that corporate reporting should shift towards a value creation focus and therefore they designed the International <IR> framework during a four-year process (figure 2-3). The framework guides the preparation of integrated reports and is based on the principles of integrated thinking, which is aiming to create awareness that organizations own financial and non-financial capital that both contribute to value creation. The IIRC defines an integrated report as "a *concise communication* about how an organization's *strategy*, *governance*, *performance and prospects*, in the context of its *external environment*, lead to the creation of value in the *short, medium and long term*" (The IIRC, 2013).

Figure 2-2: Backgrounds of the members of the IIRC

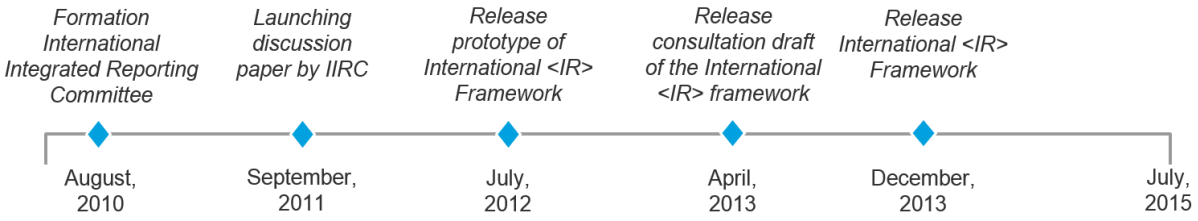

Figure 2-3: Timeline of construction International <IR> Framework

A report should inform an organization's stakeholders about how their business model, strategy, governance, performance and prospects, lead to value creation in the short, medium and long term. The IIRC believes that companies can not only create a sustained shareholder value when it does not create value for employees, customers, suppliers, business partners, local communities, legislators, regulators, and policy-makers. Integrated Reporting is based on the principle that companies create value through a broad range of capitals (financial, manufactured, intellectual, human, social and relationship, and natural) and not only by financial capital. These capitals can be interpreted as a set of resources and relationships. The awareness of relationships between the capitals is important to understand an organization's value creation process and should become important in future decision-making.

2.1.2 The International <IR> Framework

To achieve these improvements in corporate reporting, an International <IR> Framework was designed around the key process of value creation. To create a certain level of comparability a set of content elements and guiding principles are formulated (figure 2-4), that are required to follow when creating an integrated report (The IIRC, 2013). The Guiding Principles show how the information of

the report should be presented. The content elements give a practical overview of the fundamental information that has to be reported. These elements together influence an organization's ability to create value and are fundamentally linked to each other. The challenging part is to describe them, report relevant information, and show their connection with value creation.

Guiding Principles	Content elements
• Strategic focus and future orientation • Connectivity of information • Stakeholder relationships • Materiality • Conciseness • Reliability and completeness • Consistency and comparability	• Organizational overview and external environment • Governance • Business model • Risks and opportunities • Strategy and resource allocation • Performance • Outlook • Basis of presentation

Figure 2-4: Guiding principles and Content elements of the International <IR> Framework

Figure 2-5 shows a graphical representation of the value creation process, designed by the IIRC. It includes all the above-mentioned content elements that are required to assess a company's ability to create value. The input of the framework consists of the six capitals and the middle compartment shows how its business activities convert these input capitals into output capitals. Notice that the value creation process is a cycle, where created value becomes new input capital for the cycle. The strategy, risks and opportunities, performance and outlook determine the conversion of the input in the output

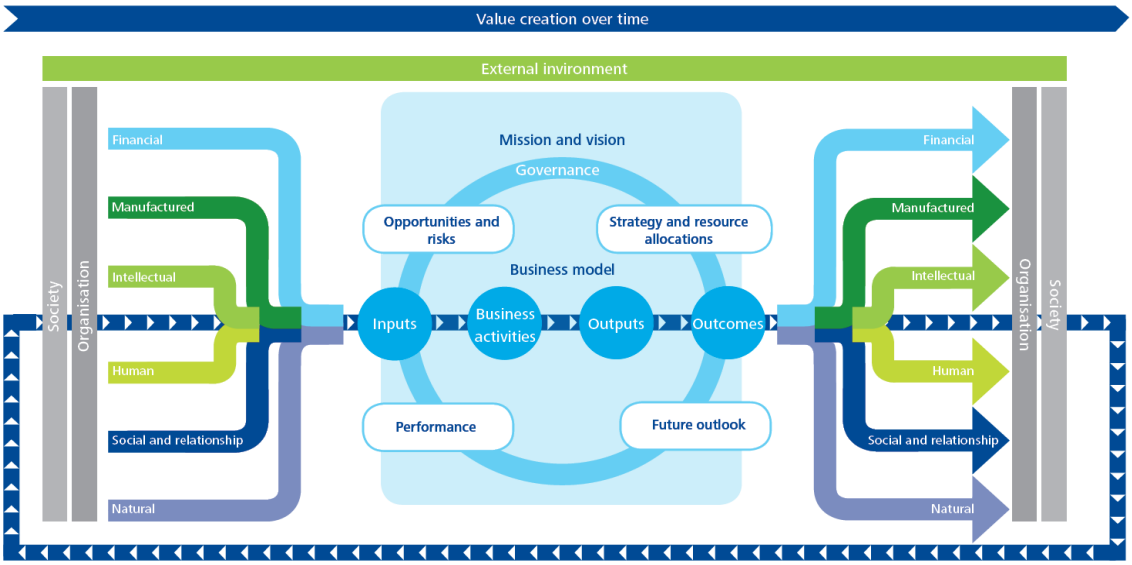

Figure 2-5: The value creation process of the International <IR> Framework. Modified (Deloitte, 2013)

The framework offers a set of guidelines and content elements, but is still quite abstract and does not offer an explicit format for the reports. Although it tries to accomplish a certain degree of comparability, it does not prescribe specific performance indicators, measurement instruments, strategy benchmarks or timeframes. The framework intends to keep being flexible and useful for a broad range of organization. It does not prescribe anything that is company specific and it should be applicable for every company in the private sector.

2.1.3 Benefits of Integrated Reporting

The implementation of <IR> should result in more cohesive, qualitative, and concise reporting. Conciseness is an urgent topic since the average number of pages in annual reports is exponentially increasing over the last decade (Investis Research, 2008). The quality and cohesiveness should be accomplished by reporting not only about financial capital, but also by showing value-added through non-monetized capitals and their interconnectivity. It breaks with the traditional silo thinking and integrates different types of capitals within an organization and extends its timeframe in terms of short, medium and long term. The importance of non-monetized capital in the <IR> framework fits well with the trend that intangible assets increasingly determine the market value of a company (Ocean Tomo, 2015). Since the goal is to offer stakeholders more relevant information about the company, the role of intangible capital cannot be withhold anymore (Figure 2-6).

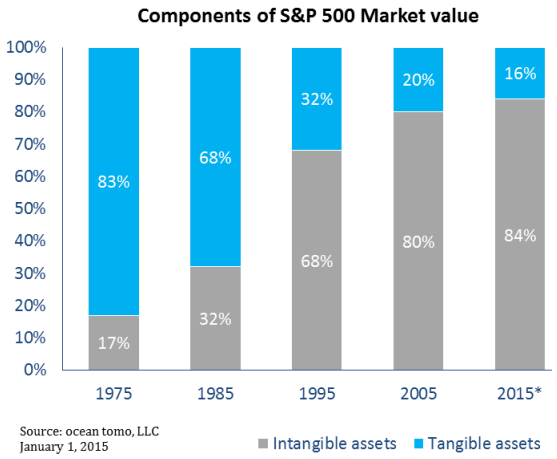

Figure 2-6: Increasing fraction of market value of a company consists of intangible assets

The importance of <IR> for external stakeholders can be directly deducted from the guideline principles in the framework, but the awareness of importance for the internal stakeholders is also growing (Deloitte, 2014). An integrated view on the current status of the organization is really helpful for decision making, data analytics and management control.

Because of the novelty of the <IR> concept there still is little empirical research published about the (positive) results of <IR>, at companies that aligned their reports to the new standards. The IIRC itself has performed a case study, in collaboration with communications consultancy Black Sun, on 66 listed companies that took a lead on changing their corporate reporting and participated in a three-year pilot program (The IIRC & Black Sun Plc, 2014). The most convincing results were about the improvement of engagement with internal stakeholders, and were published in a report that is called “Realizing the benefits: The impact of Integrated Reporting” (2014). For example, 92% of the participants experienced an increased understanding of value creation and 84% saw an improvement of data quality. In addition, the management information, decision-making and the connectivity between departments of the organizations was drastically improved.

Although a bit less convincing, the study also showed new proof that relations with external stakeholders improved. The survey showed that a better understanding of the strategy at providers of financial capital was created and in about half of the collaborating companies the relationships with institutional investors and analysts actually improved. The same aspects are also tested in a control group of organizations that still have not published an integrated report yet, which resulted in a significant lower score on internal understanding of value creation, quality of performance information and decision-making processes.

2.1.4 Progress with implementation of <IR> in The Netherlands

According to the planning of the IIRC, the global adoption of the International <IR> Framework is in the *breakthrough phase.* Because in this phase the majority of the companies still have not published an integrated report, there is a lack of empirical research publications about the effects of publishing an integrated report. The IIRC is convinced though, that <IR> becomes the global standard in corporate reporting and therefore it becomes important for companies to understand the principles of integrated thinking and gather the required skills to create such a report. Over the last years, an increasing number of firms enclosed a stand-alone sustainability report to their traditional financial report, but the step towards one integrated report still has to be taken by many companies.

In the Netherlands there is no regulation about <IR>, but in other countries there are slowly taken some initiatives. In 2010 South Africa was the first country that added some regulations for listed companies towards <IR> (King III, 2009). Although the International <IR> Framework was not published yet, the concept was introduced and companies were required to explain to what extent they already complied their report with the <IR> principles. South Africa was followed by France who made it mandatory for 2016 (Grenelle II article 225, 2012). Besides that, there are also a few countries that did not regulate by law, but made some softer regulations at the stock exchanges. In countries like Denmark, Malaysia, Brazil and Singapore, an environmental, social or governance report is required (EY, 2012).

To observe the implementation progress of <IR> in The Netherlands, Deloitte performs a yearly study on the status of <IR> in the Netherlands. The purpose of this publication is to show in what stage the implementation of <IR> is in Dutch companies. Therefore, they defined the following four stages: *Starting journey*, *Progressing*, *Leading*, or *Innovating*. These stages represent the maturity of reporting on a both Guiding principles (Figure 2-7) and Content Elements (Figure 2-8) of the International <IR> Framework.

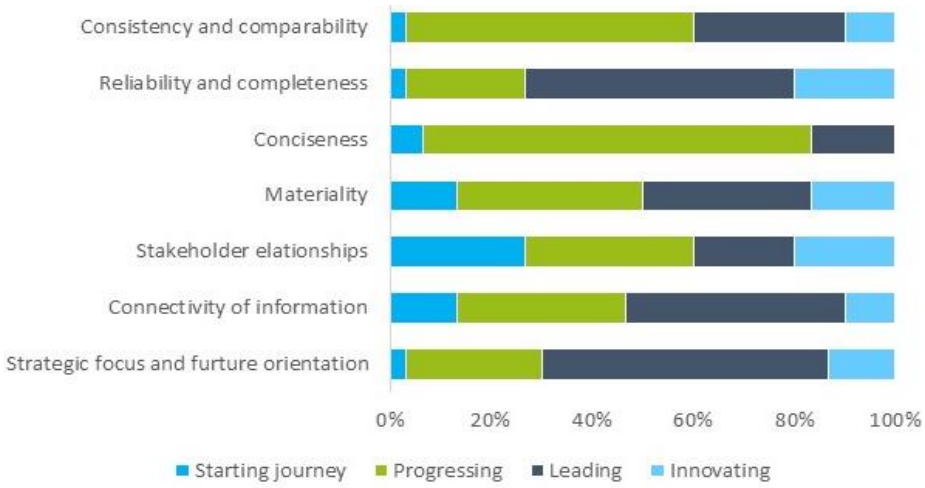

Figure 2-7: <IR> Performance of Dutch companies on the Guiding Principles

There is an observable trend where companies prefer combined or integrated reporting over two separate financial and sustainability reports. Companies seem to have most difficulties with *conciseness* and *comparability*. Apparently, firms are not capable of reducing pages and cutting irrelevant information. Reports in general, also lacked strategic targets, and trends overtime, which

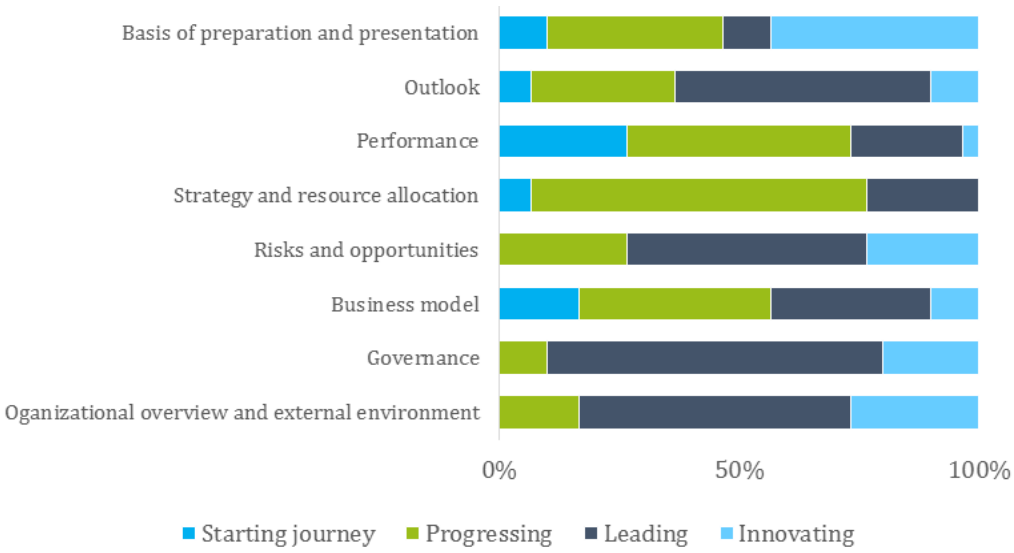

Figure 2-8: <IR> performance of Dutch companies on the eight content elements

makes it impossible to evaluate performances against benchmarks and competitors. *Reliability and completeness* appeared to be the best-applied guiding principle at Dutch companies. As showed in Figure 2-6, the great majority of the companies scored a 'leading' or 'innovating' level on these principle aspects. On the other hand is *conciseness* the most difficult guideline to follow for companies.

The fact that companies in general scored better on the *content elements* also has something to do with the inability to meet the guiding principles. Adding some content element to the report obviously conflicts with the conciseness guideline. Companies simply add more content to meet the content requirements for <IR>. The most poorly reported content elements are *Strategy and resource allocation* and *Performance*. It appears to be difficult to show how these elements will affect the value of the capitals in the future.

2.2 Research goal

All in all, <IR> is a promising concept that will revolutionize annual reports, but because of the novelty of the framework companies have real difficulties with applying the <IR> principles. <IR> is becoming a global standard of reporting, so companies have to be prepared and gather the required knowledge and skills. Currently, companies start to use the <IR> framework without understanding integrated thinking.

This study aims to contribute to the understanding of integrated thinking and operationalizing Integrated Reporting. This fits with the third category of future research opportunities that Cheng et al. (2014) proposed in their paper about the key issues with <IR>. To enter this challenge, the actual scope of this thesis has to be narrowed to a manageable scale for this graduation research. The Deloitte report about <IR> in the Netherlands that was mentioned in section 2.1.4 designated the guideline principles and content elements of the <IR> framework that have most room for

improvement. Reporting on performance and its influence on value creation is difficult for companies and therefore the relationship between those two aspects is an interesting subject.

The main goal of the research is to improve performance reporting and showing the relationship with value creation of a business. Ultimately, this leads to improvement of an integrated report. This study is about the essence of <IR>, which is the process of value creation via the six capitals. The research will be reduced to only natural capital and social & relationship capital (Figure 2-9). These capitals are difficult to measure, but are still often important for a company's strategy. This study will give insights in the characteristics of social & relationship capital and natural capital and their relationships with stakeholders. An additional goal is to prove statistically if there are performance indicators that are relevant for value creation and therefore should be included in an integrated report.

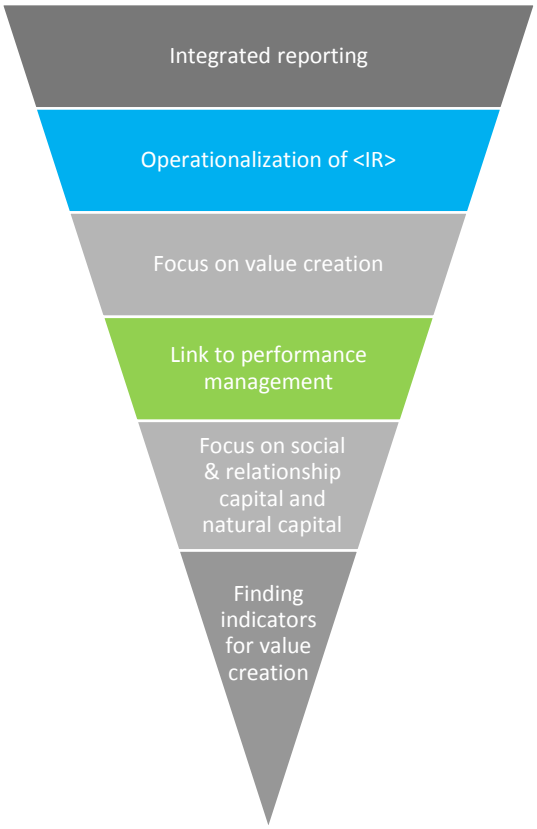

Figure 2-9: Narrowing down the research scope

2.3 Problem statement

To reach this research goal, a central problem statement has to be solved. The first aspect of the research goal is about understanding the role of the six capitals in the value creation process, according to the International <IR> framework. The focus of the research is on social & relationship capital and natural capital, so the goal is to find out how these capitals contribute to value creation and how these performances can be reported. Therefore, the problem statement of this thesis is:

How can companies show in an integrated report how their performance leads to value creation in terms of natural capital and social & relationship capital?

2.4 Research questions

The purpose of the research design is to solve this problem in a structured way. Therefore, a set of research (sub) questions form the structure towards solving the main problem statement. The key aspects of the problem statement are *value creation*, *performance* and *natural capital & social and relationship capital*. The research questions will be structured in a way that these three aspects will be treated in the first two questions and finally be integrated with each other. The following research questions will guide this process:

1. What is value creation and what is the role of value creation according to the International <IR> Framework?
- What is value creation of an organization?
- What is the position of value creation in the <IR> framework?
- What is the role of different time horizons of value creation?

According to the IIRC, <IR> should lead to better reporting about how a company will create value in the short, medium and long term. The purpose of the first question is to get an understanding of the value creation process of a company. Defining *value creation* contributes to creating a starting point for further research on this subject. Important aspects are the relationship with stakeholders and the role of the different time horizons (short, medium and long term).

2. *What are social & relationship capital and natural capital and how can related performance be measured?*

- What is social & relationship capital and how is it related to value creation?
- What is natural capital and how is it related to value creation?
- In what way is the performance with respect to social & relationship capital and natural capital currently reported?
- What are the properties of good Key Performance Indicators?

The second question brings focus to just social & relationship capital and natural capital. Answering the research question should result in an extensive definition of the two capitals and their characteristics. In addition, the second section will treat how these capitals can be used to create value. It is also interesting to see in what way these capitals are already represented in annual reports. The IIRC has established guidelines to report on business performance, and these will be completed with academic literature about this topic.

3. *What Key Performance Indicators that are related to natural capital and social & relationship capital are explanatory for value creation of a company?*

The last research question is focused on the additional quantitative analysis, which purpose is to find performance indicators that are statistically relevant for value creation. By answering this research question, the concepts of the first two questions will be brought together. The goal is to find performance indicators that have explanatory properties with respect to value creation, based on historical performance data of listed companies.

2.5 Methodology

According to the method of Verschuren & Doorewaard (2005), now follows a research technical design. This contains the necessary material, research strategy and planning. The answering of the three research questions will consist of a qualitative and a quantitative part. The first question about value creation has a qualitative character, because it is about finding good definitions. Answering the research question will start by giving a historical overview of what is written about value creation and the involvement of stakeholders in that process. A literature review will be performed to find studies that have been performed on value creation. The knowledge of Deloitte in this area, as well as the different views in academic literature will be used for this part of the study. Useful resources are scientific databases like Scopus, Google Scholar and the Library catalogue of the University of Twente. The next step is to place that definition of value creation in perspective of the International <IR> framework. Understanding and interpreting the International <IR> Framework is necessary to perform a study on value creation. The framework explains how they define value creation and what short, medium and long terms are. Answering this research question qualitatively, will be supported by an

attempt of modelling the value creation process. This enables further quantitative research in the remaining section of the study.

Answering the second research question starts with describing natural capital and social & relationship capital and how they are related to different stakeholders. Therefore again, a broad spectrum of scientific literature is used to come to the final definitions. The section will show how the view of the IIRC matches with earlier academic literature and studies of other specialized institutes. Subsequently, the section will give insight in performance reporting with respect to social & relationship capital and natural capital. This starts with the guidelines that the International <IR> framework provides about how performance should be reported. That results in an overview of what aspects are defined by the IIRC, and what aspects still have to be interpreted by the companies. A literature research will be used to fill the gaps of the <IR> framework. Properties of good performance indicators and structuring methods of performance management will be key issues in this section.

The third question is an attempt to connect value creation and performance management with a quantitative method. The ultimate goal to find the KPIs that are relevant to measure as input and output for natural and social & relationship capital. Therefore, performance data of listed companies will be collected and the KPIs will be ranked on the frequency of occurrence in reports. The KPIs that are often reported can be used for statistical tests to find what KPIs show the most accurate indication of value creation.

For this quantitative analysis Environmental, Social and Governance (ESG) data will be used. This requires a big database with historical performance numbers of different companies. A statistical regression analysis will be used for finding what performance scores have the most explaining ability for company value creation. This can contribute to improvement of performance reporting in an integrated report. Regression analysis is a method for finding single or multiple explanatory variables of the response variable (Y). The response variable is the dependent variable, which in this case should be "value creation". Because *value creation* is not that easy to determine, a representative indicator needs to be chosen for natural and social value creation. The independent variables X_i will be formed by company performance scores on natural and social KPIs. Figure 2-10 shows an illustration of the theoretical model of the statistical analysis.

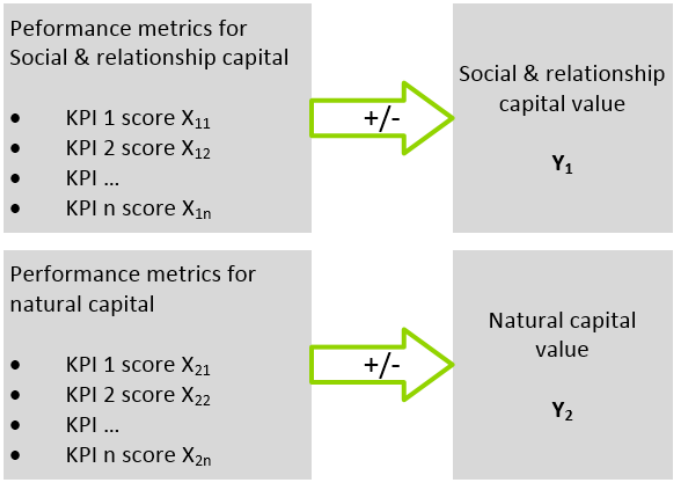

Figure 2-10: Conceptual model of the quantitative research about the relationship between KPI scores and value creation

Along the research process, it appeared to be difficult to find a representative indicator for social & relationship capital and natural capital. Measuring social & relationship capital and natural capital is no exact math discipline and is definitely not reported in annual reports. Therefore, the total enterprise market value is chosen as an alternative dependent variable. Social & relationship capital and natural capital represent a certain fraction of the total market value of a company. Figure 2-11 shows how the conceptual model for the statistical analysis is changed compared to the initial model in figure 2-10. The challenges, restrictions and execution of this quantitative research are discussed further in Section 5.

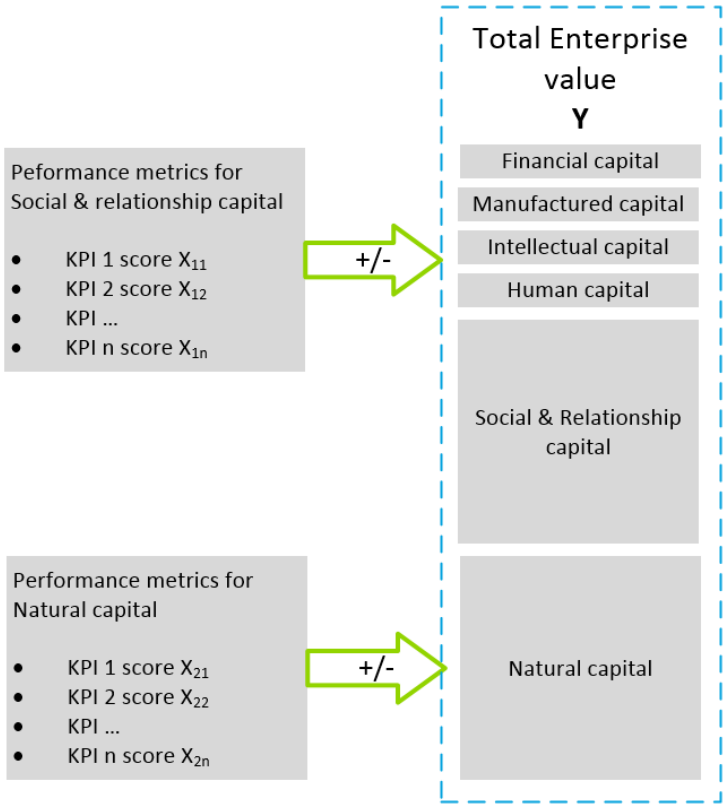

Figure 2-11: Revised conceptual model for quantitative analysis, due to difficulties of valuating social & relationship capital and natural capital

2.6 Research planning

The completing part of the research design is the planning and can be found in Appendix A. This study is in a twenty-week graduation project for getting a Master's degree in Industrial Engineering and Management. The structure of the planning corresponds to the research questions defined in Section 2.4.

3 Value creation

This section will answer the first research question: *What is value creation and what is the role of value creation in the International* <IR> *Framework?* The International <IR> Framework and a literature study will contribute to defining value creation. Value creation is different for many types of stakeholders and can be explained in a qualitative and a quantitative way. The purpose of this section is to understand the meaning of value creation. Section 3.1 introduces the value creation concept by giving some literature background and the historical development of theories about the concept. Section 3.2 describes the specific role of value creation in Integrated Reporting as argued by the IIRC. The purpose of Section 3.3 is to create an understanding of the role of value creation in the International <IR> Framework by showing a graphical representation of the value creation process. This process can also be modelled to a certain extent, which is an essential step towards quantitative research. The remainder of this thesis is all built on the assumptions made in that model. The modelling process is showed stepwise, by first showing a static model and by adding a time dimension in Section 3.4. Finally, Section 3.5 sums up the most important findings with respect to value creation. It will also give a preview on how this can be used for performance reporting in the next sections of this thesis.

3.1 Value creation in context of academic literature

To understand what value creation is and what its role is in the <IR> framework, this section gives some context about the concept by summarizing what is written about it in academic literature. It is interesting to see how versatile the term *value creation* is and how the interpretation has changed over time. The literal meaning of value creation is the increase or decrease of value, but this term is often used in many contexts. The main purpose of a company is delivering value to customers, for which they are willing to pay, and to convert those payments to profit (Teece, 2010). A business model describes the way that a company wants to accomplish that. The business model closely relates to a company's strategy. A strategy describes the long-term direction and is aimed to acquire a sustainable competitive advantage by setting objectives and goals. A business model is more generic and describes how it will achieve those goals by creating value.

Value creation is key in a business, so there are many theories published about it in academic literature. Traditionally, a shareholder view on companies was very popular, which main objective is to maximize shareholder value over time (McTaggart, 1994). Other traditional theories often focus on economic value creation, which argues that value is only created when the price paid by the customer is higher than the production cost. This 'economic surplus' is profit for the owners of the company.

More recently, the awareness of value creation for others is introduced by the stakeholder theory (Freeman R. E., 2002). The first concept of stakeholder theory has already been published in 1984 by R.E. Freeman, but the improved version of 2002 was really adopted by economists. The theory identifies interests of groups or individuals in the company and describes how they could be dealt with. The definition of a stakeholder in an organization is given by: "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman R. E., 1984).

Over the last decade, the awareness about the importance of stakeholders has grown fast, and companies are publicly showing their commitment to their environment and stakeholders.

Organizations often report on their contributions to society, relationships with suppliers, philanthropy, arrangements with governments, customer satisfaction and collective employment contracts. This is either put in an additional chapter in the annual report or published in a separate sustainability report. Integrated Reporting is based on the principle that companies can only create sustained shareholder value by creating value for other stakeholders, so companies should additionally explain how these stakeholder relationships contribute to value creation.

3.2 The role of value creation in the International <IR> framework

<IR> elaborates on this increasing importance stakeholder engagement. This section shows how the IIRC defined value creation in their <IR> framework and what striking aspects that definition contains. The members of the IIRC have reached consensus about the definition (Figure 3-1), but also keeps things quite abstract.

Value creation

Value created by an organization over time manifests itself in increases, decreases or transformations of the capitals caused by the organization's business activities and outputs. That value has two interrelated aspects – value created for:

- *The organization itself, which enables financial returns to the providers of financial capital*
- *Others (i.e., stakeholders and society at large)*

Source: International <IR> Framework Section 2.4

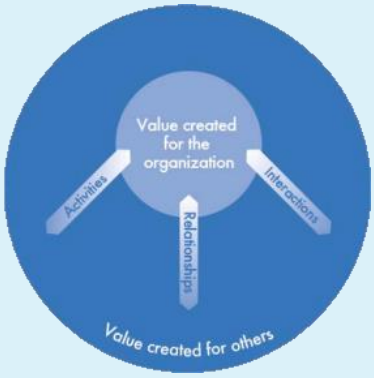

Figure 3-1: Relationship between value created for the organizations and for others (source: IIRC (2013))

What immediately stands out in this definition is the distinguishing of internal and external value creation. Integrated thinking is built on the belief that shareholder value can only be sustained by creating value to other stakeholders. Providers of financial capital are interested in the value of the organization itself, which is expressed by the share price on the stock exchange. They also become interested in the value that is created for others, when it influences the value of the organization.

Figure 3-1 illustrates how the IIRC sees the relationships between value creation for the own organization and for others. What is striking, is the importance of relationships and interactions like for example customer satisfaction, supplier relationships or brand value. This confirms the importance of social & relationship capital in the <IR> framework, but also shows the complexity of the capital type. It implicates that the value creation for the company itself comes from the business activities that are directed to increasing own value, but also a fraction of the value that flows to other stakeholders indirectly increases the company value. The question however is how big that fraction is and to what capital the value flows. Another important property of value creation is that it is relative and it should be compared to the period before. For example, earnings per share in one year is just a number, but if it is higher the next year, then there is value created. This is directly expressed by an increasing stock price when the company performs better than a period before.

That relativity of value creation comes back in the six capitals of the <IR> framework. The framework is built on the process of value creation by transforming the six capitals into output capitals. The six capitals are financial, manufactured, intellectual, human, social & relationship and natural capital. The challenge for a business is to increase the value of the capitals over time and use their capitals in the most effective way. The capitals can also be interpreted as a company's resources and relationships. The scope of this study is restricted to the value streams of natural and social & relationships capital (Figure 3-2). The value creation via the six capitals means that there is interdependency between the capitals. This means that for example financial capital maximization can be at the expense of one of the other capitals.

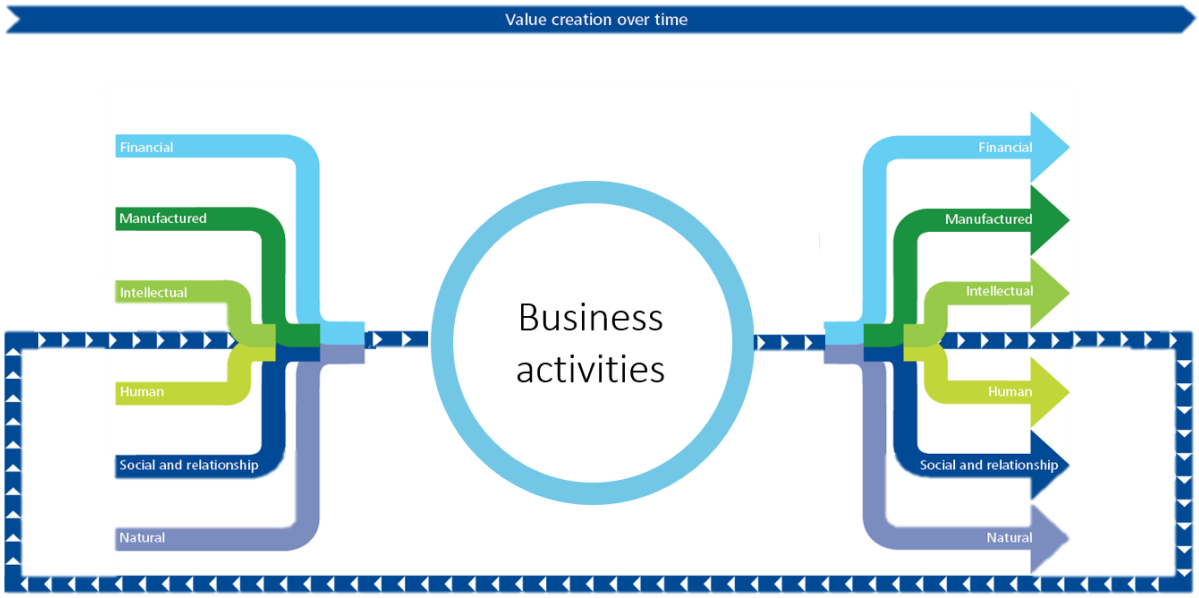

Figure 3-2: Simplification of the value creation process and focus of this study

3.3 Measuring value creation via stakeholder value

Integrated reporting is based on the belief that companies can only create sustained value by serving all stakeholders instead of only the shareholders. It is remarkable that this splitting between shareholders and other stakeholders is not included in the main figure of the value creation process (Figure 3-2). For better understanding of the dynamics of value creation via stakeholders, it is interesting to add this in a value creation figure (Figure 3-3). The figure shows that an organization has six input capitals that are used to execute their business activities. Instead of the value flowing directly to the output capitals, there should also be a value stream via other stakeholders. Those other stakeholder also indirectly contribute to creating value in the six capitals. In principle, the value creation process for the shareholders and other stakeholders could look like presented in Figure 3-3.

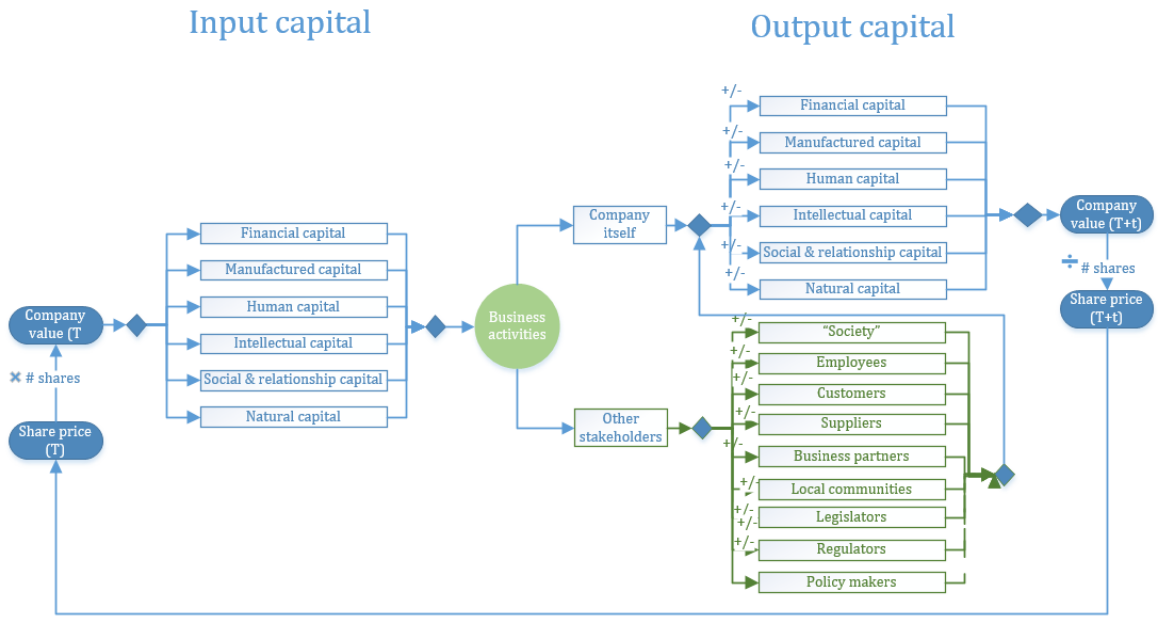

Figure 3-3: Process of value creation via stakeholders

In principle, a company is financially valued by the shareholder and the value is expressed by the share price at the stock exchange. The number of outstanding stocks multiplied by the share price is the total market value of the company. Therefore, in theory, the total value has to be equal to the sum of the financial, manufactured, intellectual, human, social & relationship, and natural capital. Value creation for the organization means that the sum of value of the capitals increases. These different capitals are re-used as input of the business activities to make it worth more. This six capitals-principle can also be the basis of a value creation model. Figure 4-3 shows the basis of a model that describes the abovementioned value creation process.

Static function of company value at time T.

$$Y_T = m_T * S_T = \sum_{i=1}^{6} C_{i,T}$$

Parameters	Constraints
m_T = total number of outstanding shares of the company, at time T	$Y_T, S_T, m_T, t > 0$
Y_T = Total company value, at time T.	$T, t, C_{iT} \geq 0$
S_T = Stock price, at time T.	$0 \leq s \leq m \leq l$
$C_{iT,}$ = value of capital i at time T, with i = 1. Financial, 2. Manufactured, 3. Intellectual, 4. Human, 5. Social & Relationship, 6. Natural.	

Figure 3-4: Time-static model of value creation

This is still a static model of the value of a company, but the value creation process in the <IR> framework is a dynamic process, so the model also has to be extended with a time dimension.

3.4 Value creation in the short, medium and long term

The <IR> framework is not clear about what the concrete periods are, with respect to short, medium and long term. What is known is, that in general <IR> will typically be longer term oriented than regular reporting, but the exact time lengths are dependent of the organization's investment cycles, strategy and its key stakeholders' legitimate needs and interests (Section 4.57 of the <IR> framework). For example, the technology sector has much shorter product cycles than pharmaceuticals, so it is evident that the reporting time horizon is adjusted to that. The length of the reporting timeframe also influences the character of the report. Long-term information is probably more affected by uncertainty, which results in reporting of more qualitative nature, while short term reporting can be better expressed quantitatively.

When an organization's objective is to increase its value over time, according to the <IR> framework this is done by all the business activities together that affect the input capitals. Let us say that these business activities that are determined by the business model, together form a black box. However, after a short, medium or long period, they affect the six capitals separately. This will be added to the model by an extra variable v_i that is a multiplier of the capital that is called value creation coefficient. Therefore, when the organization performs well in a certain period, capital C_i will be multiplied with a value bigger than one. These values have to be variables, since the short, medium and long term is dependent of the industry, company maturity and product cycles. The starting point is the capital that a company owns and the business activities that generate an output value of the six capitals in the short, medium and long term.

Optimization function of company value in the short, medium and long term

Max $Y_{T+t} = m_{T+t} * S_{T+t} = \sum_{i=1}^{6} v_{iT+t} * C_{iT}$

Parameters:

m_T = Total number of outstanding shares of the company, at time T

Y_{T+t} = Total company value, at time T.

S_{T+t} = Stock price after period t, with starting time point year T, and t = s: Short term, m: medium term, l: long term*

v_{iT+t} = influencing coefficient of capital i on after period t, with i = 1. Financial, 2. Manufactured, 3. Intellectual, 4. Human, 5. Social & Relationship, 6. Natural.

$C_{iT,}$ = value of capital i, with i = 1. Financial, 2. Manufactured, 3. Intellectual, 4. Human, 5. Social & Relationship, 6. Natural.

*t = s, m, or l and these terms are company specific.

Contraints :

$Y_T, S_T, m_T, t > 0$

$T, t, C_{jT} \geq 0$

$0 \leq s \leq m \leq l$

Figure 3-5: Time-dynamic model of value creation

The value creation process of an organization can never be completely modelled, because there are infinitely many factors that influence the exact increase/decrease of the company value. This model is the base of this research though, and is helpful for understanding and quantifying the value creation principle. Since the problem statement is about how value is created by social & relationship capital and natural capital, so there has to be found a way to estimate the value creation coefficients v_5 and v_6. v_5 and v_6 are the value creating coefficients in the model, and the research scope is to find out how performance influences those coefficients. In Section 5, this will be investigated further by finding performance indicators that have the best predictive properties for estimating value creation coefficients v_5 and v_6.

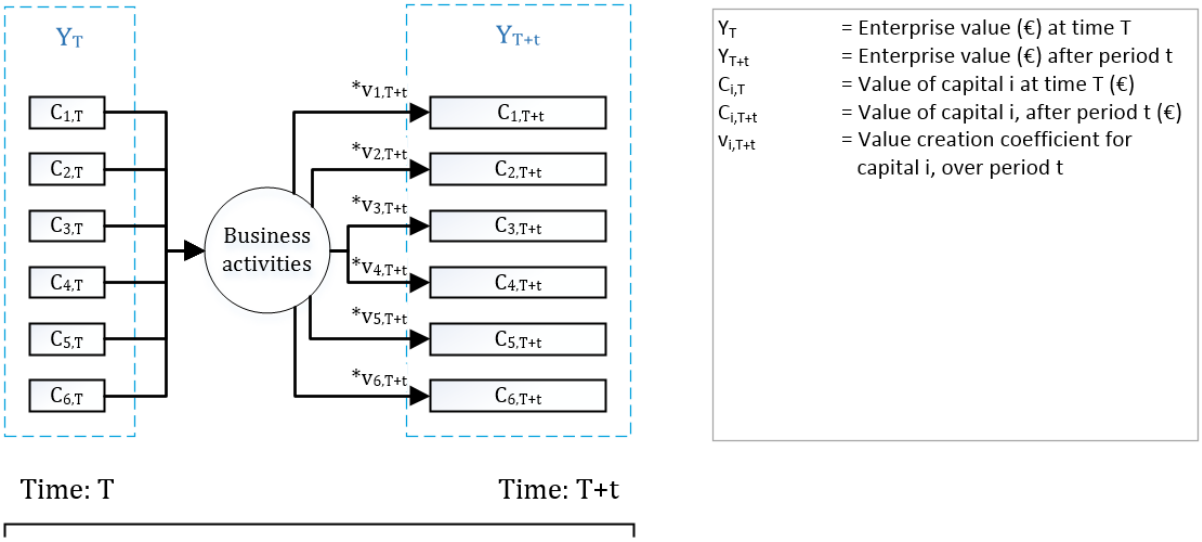

Figure 3-6: Graphic representation of the value creation model

3.5 Conclusion

The purpose of this section was to create an understanding of the most important aspect of <IR>, which is value creation. Therefore, the following research question had to be answered: *What is value creation and what is the role of value creation according to the International <IR> Framework?* There is chosen for a pragmatic way of interpreting the value creation process to build the further research on. Value creation or value destroying is the increase or decrease of the total company value. This company value is divided by six capitals in the framework; namely financial capital, manufactured capital, intellectual capital, human capital, social & relationship capital and natural capital. Those six capitals should cover all possible company value, but in reality, companies do not always own all capitals. The concept of the <IR> framework is that all business activities that are determined by the business model affect the value of the six capitals separately. Therefore, the starting point is a certain amount of capital and after a period the capitals are increased or decreased separately and the sum of those capital values determine the total company value creation.

The IIRC believes that an organization can only create sustained value by serving all their stakeholders. A stakeholder is a group or individual who can affect or is affected by the achievement of the organization's objectives. Examples of stakeholders of a company are customers, employees, suppliers, shareholders, governments, or unions. The IIRC only makes a distinction of importance between providers of financial capital and other stakeholders.

It is remarkable that the IIRC report puts emphasis on the importance of the stakeholders, but did not include them in the central figure of the value creation process. Figure 3-3 shows a conceptual value stream of how this value creation process via stakeholders also could look. For a better understanding of the value creation process, it was also interesting to attempt to model the process. Figure 3-4 and 3-5 show a simplified static and dynamic model with respect to time. The framework does not define the exact times for short, medium and long term, because this is company specific. The model shows that the value of the six separate capitals are multiplied by a value creation coefficient $v_{i,T+t}$ after period t. In quantitative terms, it is the challenge in the next sections, to find out how performance influence them and how that can be communicated in an integrated report.

4 Performance measurement of natural and social & relationship capital

Section 3 explained the concept of value creation and showed a simplified value creation model that will be the basis for the remainder of this study. The purpose of this section is to explain the concept of social & relationship capital and natural capital. In addition, this section will pay attention to how these capitals relate to business performance. This should enable that in Section 5, the relationship between company performance and value creation can be studied. The central question for this section is: *What are social & relationship capital and natural capital and how can related performance be measured?*

In my opinion, external reporting is the last step in the business chain. A company starts with a mission and vision, and then defines a strategy and business model to create value for the customers and convert that into shareholder value. All the business activities should be aimed to execute the business model, which results in a certain company performance. Providers of financial capital and other parties are interested in those performances and therefore, an annual report is provided to them.

This section describes how company performance relates to the capitals of the <IR> framework and in particular social & relationship capital and natural capital, which are in the scope of this thesis. The general principles of <IR> are described in Section 2, but Section 4.1 will focus especially on the position of the capitals in <IR>. Subsequently, Sections 4.2 and 4.3 address the definitions of both selected capitals and how they can create value for a company and how stakeholders can be involved. This forms the basis for Section 4.4, which is focused on exploring how companies currently measure these performances and in what kind of format they are displayed. As a preparation for finding good performance measurements for social and natural capital (Section 5), Section 4.5 describes what good properties are for performance measurements and how that relates to social & relationship capital and natural capital. The purpose of the research is to find out how performance can be reported for in an integrated way. Section 4.6 explains that internal performance management must be aligned with external reporting and shows some well-known examples of structuring methods performance management. Section 4.7 concludes what social & relationship capital and natural capital are, and how this relates to value creation. In addition, the findings on the role of performance management in <IR> will be presented. Afterwards, Section 5 will link these findings to the value creation concept, and finally find a good way to report about company performance in an integrated report.

4.1 The role of the capitals in <IR>

The six capitals are included in the <IR> framework to attribute companies to describe all the capital that they use to execute their business activities. In reality, not all companies use all six capitals of the framework, but they should cover only the capitals that a company can possibly use or affect to describe their strategy. The definition of capital is “a stock that yields a flow of valuable goods or series into the future” (Costanza, 1997). The key role for the capitals is to explain the value increase or decrease of the company value in more detail. All the content elements (table 2-1) should be addressed separately in the report, to what extend they influence the capitals. The content element of Performance is the central element for this thesis and the goal is to demonstrate the connectivity with everything that is covered by social & relationship capital and natural capital. Respondents to the IIRC discussion paper (2011) argued that there is an overlap between intellectual capital, human

capital and social & relationship capital. The IIRC did not want to make the framework unnecessarily complicated by combining them to one capital, so the proposed way to interpret them is from the point of view of the "carrier". So for human capital is that the individual person, for social & relationship capital it is the intra/extra-organizational networks and for intellectual capital it is the organization itself.

4.2 Social & relationship capital

The fifth capital type in the framework is social & relationship capital. What immediately stands out is that the IIRC chose for combining social capital and capital in form of relationships. Especially social capital is a widely used concept in academic literature for many years, whereby many different definitions are made. This section contributes to gathering some context from academic literature and will describe the role of social & relationship capital in the International <IR> framework and how it relates to different stakeholders.

4.2.1 Social & relationship capital definition

There are many articles written about social capital and other social science. The <IR> framework positions social capital next to for example financial capital, which has very different characteristics. Financial capital is a given amount of money that a company can spend or not. This is different for social capital, which is in the first place difficult to monetize and secondly it cannot really be spent. The concept of social capital is not invented by the IIRC, but is introduced in earlier literature. Pierre Bourdieu already did an attempt in 1985 to distinguish economic capital, cultural capital and social capital, which he defined as: "*the aggregate of the actual or potential resources which are linked to a possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition"*. The distinguishing of social capital came from the idea that powerful and wealthy people have more advantages with their relationships, which maintains inequality between social groups in society. Despite the different focus of social capital in <IR>, it does mention the advantages a company can have from a social network. Putnam (1995) and Pennar (1997) brought the concept of social capital a step further by linking it to value creation by determining the following definitons respectively: *"features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit"* and *"the web of social relationships that influences individual behavior and there affects economic growth".*

The thread that links those definitions can be characterized by the creation of economic benefits by using a network of social relationships. Besides defining social capital, academic literature also provides many theories about how social networks can be optimally embedded in the business model, but that is a whole different research area. The <IR> committee has also come to a definition that in their opinion covers the concept of social & relationship capital the best (Figure 4-1).

Social & relationship capital

The institutions and the relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being. Social and relationship capital includes:

- Shared norms, and common values and behaviours.
- Key stakeholder relationships, and the trust and willingness to engage that an organization has developed and strives to build and protect with external stakeholders.
- Intangibles associated with the brand and reputation that an organization has developed an organization's social license to operate.

Figure 4-1 IIRC definition of social & Relationship capital (source: Section 2.15 of the International <IR> Framework)

4.2.2 The relationship between social and relationship capital and stakeholders

Many stakeholders do influence the value creation of social and relationship capital. An organization needs to manage their relationships with stakeholders to create trust and loyalty, which at the end can be converted into profit. For example, relationships with suppliers are important for companies in many ways. Especially for manufacturing companies that rely on quality of supplied materials to offer good products to their customers. In addition, appointments with respect to supply time, payment periods, and product development can be essential for the value creation ability of an organization. However, other stakeholders like the end customers, employees and society can also influence social & relationship capital. Obviously, the relationships with customers are important for value creation. Loyalty of customers towards a brand or a product is essential for generating sustained revenues, so the relationship and trust that a company creates at their customer base is part of the social and relationship capital. Especially the customer relationship capital of companies has changed over the last decade because of the increasing importance of digital relationship management. Profiling on social media can help creating brand value and reputation as well as destroying it. The appearance towards a local community and society at large are part of the social & relationship capital too. The reputation and identity of a firm can be an important asset, but can also destroy many social & relationship value because of reputational damage

4.3 Natural capital

The definitions of natural capital in academic literature are not as diverse as the definitions of social & relationship capital. This section will start with the definitions of natural capital in both literature and the <IR> framework, and will be followed by the connection with different stakeholders.

4.3.1 Definition of Natural capital

Natural capital is "the spectrum of physical assets within the natural environment that deliver economic value through ecosystem services (IISD, 2008). The natural capital committee (2013) is also an authority in this area and defines natural capital as "the elements of nature that produce value (directly and indirectly) to people, such as the stock of forests, rivers, land, minerals and oceans".

There has been several initiatives to measure natural capital, but it keeps difficult. For example, Dixon and Hamilton (1996) attempted to calculate the value of natural capital for a certain region.

Nevertheless, there is still no standard method for calculating the natural capital of a company that can be used for reporting. The definition that the IIRC has come to is shown in Figure 4-2.

Natural capital

All renewable and non-renewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organization. It includes:

- Air, water, land, minerals and forests
- Biodiversity and eco-system health.

Figure 4-2: IIRC definition of natural capital (Source: Section 2.15 of the International <IR> Framework

The IIRC has made an explicit distinction between renewable and non-renewable environmental resources. The availability of non-renewable resources can have a big negative impact on sustained success of a company. Non-renewable resources have more risk of becoming scarce in the future, which can form operational risk. Natural resources can be accounted for as company assets. Figure 4-3 shows some examples of those natural assets.

Two categories in natural capital assets

- Natural assets, which are non-renewable and traded, such as fossil fuel and mineral "commodities";
- Natural assets, which provide finite renewable goods and services for which no price typically exists, such as clean air, groundwater and biodiversity

Figure 4-3: Two types of natural capital assets (Source: Section 3.1 of Trucost natural capital risk report)

Trucost performed an interesting study on natural capital risk. Trucost is an organization of experts that identifies environmental risk and opportunities across company operations, supply chains and investment portfolios (Trucost, 2015). They tried to monetize the dependence of natural capital and the impact on their revenues. Companies often only take into account the resources that they have to pay for, but due to the scarcity of resources valuing unpriced natural capital consumption becomes increasingly important. The global natural business demand for natural capital conflicts with the environmental degradation and can result in failing supply, so this can really affect business results and the value creation. A set of six environmental performance indicators are used to measure: land use, water consumption, greenhouse gases, air pollution, land/water pollution, and waste.

4.3.2 The relationship between natural capital and stakeholders

Several stakeholders, like suppliers, customers, and governments, also affect value creation of natural capital. Especially at manufacturing firms, suppliers need to source materials and are dependent of the availability of the materials. When the materials become scarce, the more expensive they will be which negatively influences the value creating ability of the company. In addition, customers have an influence on the value creation of natural capital. Currently, there is an ongoing trend of customer awareness about the environment and resources that are harmful for the environment, so customers can consciously choose not to buy those environment-damaging products anymore. In that case, the resource can still be available for the company, but it becomes useless and the value declines. Those damaging materials or processes can also be prohibited by regulation. In that situation, resources can become useless for companies have to search for alternatives that can be more expensive. Purchasing

non-environmental friendly materials can be charged with higher tax rates, which can negatively influence value creation.

4.4 Performance Reporting about natural and social & relationship capital

According to the value creation framework of <IR>, the capitals that a company owns at a certain point in time have some value. These capitals are used as resources for executing the business model of the company, which is aimed to create new value. Now organizations have to comply with the new standards of <IR>, they have to communicate how they use their capital and what the final yield is. In other words, how did the company perform in perspective of the six capitals? This section shows what the <IR> framework prescribes for performance reporting.

4.4.1 External reporting about performance

The International <IR> Framework distinguishes eight content elements, of which 'performance' is the most important for this thesis. The IIRC describes this as: "To what extend has the organization achieved its strategic objectives for the period and what are its outcomes in terms of effects on the capitals?" (The IIRC, 2013).

According to the <IR> principles, performance of a company should be explained in an annual report by both qualitative and quantitative information. This is not entirely new, because many 'traditional' reports and sustainability reports do that this way already. The qualitative aspect is often a textual explanation of the initiatives the firm took over the last year and what results that has given. In other words, it is mostly about explaining of strategic and management choices. In an integrated report, those explanations have to be more focused on how the strategic choices and business activities relate to value creation of the capitals.

The quantitative aspect of external reporting is more focused on performance reporting. Quantitative performance information is often presented by a table of key figures. Those important quantitative performance measures are called Key Performance Indicators (KPIs). An organization can choose what KPIs they want to report and what they think is important performance information. To comply with the <IR> principles, the KPI framework that a firm reports probably has to be categorized by capital to show an integrated view. Choosing KPIs on separate capital performance is a challenge, because indicators generally reflect organization-wide performance and overlap with more than one capital (Association of Chartered Certified Accountants (ACCA), 2013).

4.4.2 Lack of specific quantitative guidelines.

The goal of this thesis is to help companies operationalize Integrated Reporting by showing the relationship between performance and value creation of social & relationship capital and natural capital. According to the conceptual model of value creation in Section 3.4, value creation is a quantitative increase of the capitals so, quantitative reporting is essential for an integrated report.

However, the International <IR> Framework does not prescribe what specific KPIs a company should include in their report or what measurement methods companies should use (The IIRC, 2013). The reason is that performance measurement methods are too company specific, while the purpose of the new IR framework is to provide a universal manual to improve external reporting. Moreover, the

framework does not clarify how to quantify or monetize the value of the capitals or the total value of the company. The same goes for the creation of more value per capital per period.

In fact, the IIRC demands that organizations report both qualitative and quantitative information about performance and about value creation in the short, medium and long term, but they do not describe how this quantification should be performed. The framework stays abstract and does not provide solutions to companies for these difficult requirements.

4.5 Properties of good Performance measures

This section shows an overview of what requirements good performance measures should meet, to bring quantitative performance reporting a step further for <IR> purposes. Therefore, the guidelines from the <IR> framework will be completed with academic literature and knowledge of Deloitte Consulting.

4.5.1 Guidelines for KPIs from the international <IR> Framework

Although the <IR> framework does not provide clear and specific KPIs, it does contain a list of characteristics for suitable KPIs (Figure 4-4). What is known is that an integrated report should contain a combination of qualitative and quantitative information. This information should include targets, past and current performance, the state of key stakeholder relationships and the effect on the capitals of the organization (The IIRC, 2013). Presenting targets against past and current performance increases comparability and are inevitably quantitative.

Common characteristics of suitable quantitative indicators

- Relevant to the circumstances of the organization
- Consistent with indicators used internally by those charged with governance
- Connected (e.g., they display connectivity between financial and other information)
- Focused on the matters identified by the organization's materiality determination process
- Presented with the corresponding targets, forecasts or projections for two or more future periods
- Presented for multiple periods (e.g., three or more periods) to provide an appreciation of trends
- Presented against previously reported targets, forecasts or projections for the purpose of accountability
- Consistent with generally accepted industry or regional benchmarks to provide a basis for comparison
- Reported consistently over successive periods, regardless of whether the resulting trends and comparisons are favourable or unfavourable
- Presented with qualitative information to provide context and improve meaningfulness. Relevant qualitative information includes an explanation of:
    - measurement methods and underlying assumptions
    - The reasons for significant variations from targets, trends or benchmarks, and why they are or are not expected to reoccur.

Source: Section 4.53 of the International <IR> Framework

Figure 4-4: Characteristics of suitable quantitative performance indicators according to the International <IR> Framework

Figure 4-5 shows an impression of how a key performance indicators framework could look like if it complies with the abovementioned characteristics of suitable quantitative indicators. To make it fit better with the six-capitals-principle it is worth considering categorizing existing performance indicators by the six capitals. In this concept, the target horizon is adjustable, because the relevant future periods are different per organization, as mentioned in section 4.4,

Short term	*1*	*Years*
Medium term	*3*	*Years*
Long term	*5*	*Years*

		Historical performance						Targets			Trend
								Short term	Medium term	Long term	
		2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2018**	**2020**	
Financial Capital	KPI 1	12	10	13	14	14	**16**				
	Industry peer group	14.6	14.3	12.1	13	13.1	12.2				
	KPI 2										
	Industry peer group										
Manufactured capital	KPI 1										
	Industry peer group										
	KPI 2										
	Industry peer group										
Human capital	KPI 1										
	Industry peer group										
	KPI 2										
	Industry peer group										
Intellectual capital	KPI 1										
	Industry peer group										
	KPI 2										
	Industry peer group										
Social & relationship capital	KPI 1										
	Industry peer group										
	KPI 2										
	Industry peer group										
Natural capital	KPI 1										
	Industry peer group										
	KPI 2										
	Industry peer group										

Figure 4-5: Conceptual framework for reporting Key Performance Indicators in an Integrated Report.

4.5.2 Deloitte research

In Section 2.1.4 was mentioned that Deloitte Netherlands performs a yearly research about Integrated Reporting in The Netherlands. This research shows to what extend Dutch (listed) companies complied with the principles of <IR> in their annual reports. The Integrated Reporting Scorecard that is used for this assessment, which assesses all eight content elements and seven guiding principles and results in a balanced overall score about the progress with <IR>. Part of this assessment is how good the *content element* 'performance' is treated and this is done by checking whether the following aspects are included in the report:

- Multiple years reported
- Current and previous targets
- Qualitative explanation
- Compared with peer group

Depending on the scores on these aspects, the company is placed in one of the following four categories: Starting journey, Progressing, Leading, or Innovating.

4.5.3 Properties of Good KPIs from academic literature

Besides the International <IR> framework and Deloitte knowledge about performance measures, there is also written many academic articles about performance indicators. Performance indicators are tools to compare actual results with targets that has been set (Fortuin, 1988). Organizations are always trying to outperform competitors and to accomplish that they need to adjust their strategy to their external environment and improving continuously. To accommodate this improvement, companies need to measure their performance and follow the progress that the organization makes, in order to improve processes, or parts of processes (Fortuin, 1988). Performance indicators must be aligned with the business strategy and are useful to see the consequences of an organization's actions (McAdam & Bailie, 2002). KPIs are the performance indicators that a company actually uses to assess their performance. The principles of <IR> aligns with the idea of Neely (1999) that a company should not only use financial measurements, but also non-financial measurements such as social & relationship aspects. Kaplan and Norton (1992) suggest that firms should not have more than twenty KPIs that are focusing on those performance aspects that are most crucial for the success of an organization. When choosing a set of KPI's it is useful to use the list of requirements for good performance indicators from Fortuin (1988):

- The goal of the organization is clear
- All users accept the PI's as measures
- The PI's yield insight into the state of affair
- The PI is derived from quantities that can be influenced, or controlled
- Both supplier as customer agree that given PI indeed are relevant for customer satisfaction
- Good PI are available on time with the frequency agreed on
- The frequency should be tuned to the rate of change of the process so that each new edition shows progress
- PI's should be consistent and reliable

4.6 Structuring of performance management

If an organization wants to comply with all the above-mentioned requirements for external quantitative performance reporting, companies also have to manage their internal processes. In principle is the external report a reflection of how the company has performed with executing their business model and strategy. Therefore, it is a challenge to select a set of performance indicators that align with the firms' strategy and show a complete view of all the business processes. Section 4.3 showed desired characteristics of individual KPIs, but it is also important to choose a good set of KPIs to measure the performance of a full department or company.

The balanced scorecard is probably the most known methodology to structure performance indicators for an organization (Kaplan R. N., 1992). The balanced scorecard is the first performance measurement system that provided top managers with a comprehensive view of the business with a combination of financial and operational measures. The scorecard is derived from the firm's strategy by setting specific goals and connects them to performance indicators (Appendix B). The four main categories of the scorecard that structure the performance indicators are Financial, Customers, Internal business processes and Learning and Growth.

Deloitte developed its own method to determine important performance measures for a company. In 2004, Deloitte designed the Enterprise Value Map (Appendix C), which is a tool to structure a companies' paths to create shareholder value. The purpose of the framework is to increase shareholder value and structure the way that this can be done best and what are the areas of improvement. Below the shareholder value are several value drivers that determine how an organization creates value. This can be an activity or organizational focus and depends on the strategy of the company. The next level of the tree shows what should be improved to improve the company's value drivers. Those value drivers and improvement aspects are company specific and need to be aligned with the strategy. The Enterprise value map is an excellent tool to link strategic priorities to KPIs.

4.7 Conclusion

The purpose of this section was to get an understanding of the two capitals from the International <IR> Framework that are in the scope of this research; namely social & relationship capital and natural capital. According to the value creation process (Figure 2-3) are the six capitals input for the business activities and processes that an organization performs. The research objective is to find a way to measure the performance of these business activities and how they relate to the six output capitals. The research question for this section was: *What are social & relationship capital and natural capital and how can related performance be measured?*

Social & relationship capital can be summarized by all relationships with stakeholders, communities and other networks and the ability to share information to enhance individual and collective well-being. Natural capital represents all environmental resources and processes that provide goods or services that support prosperity of an organization. Natural capital comes closest to 'traditional' financial capital, because it can be spend or invested for creating value for customers. Social & relationship capital has different characteristics, because it is not something an organization spends but it is even vice versa by becoming less valuable when not spending it.

Besides a good understanding of what social & relationship capital and natural capital are, companies also have to know how they have to report about the performance with these input capitals. This section has shown that a combination of quantitative performance measures and qualitative description about strategic choices and measurement methods is most desirable in an integrated report. The problem is though, that the International <IR> Framework does not prescribe explicit performance indicators, because the IIRC argues that the indicators are company specific. The only thing that the framework provides is a set of characteristics of good performance indicators and Section 4.5 puts this in perspective of academic literature. What the <IR> framework also does not provide, is a method to select a complete set of performance indicators that represent the total performance of a company. Frameworks like Balanced Scorecard and the Enterprise Value Map can help with structuring performance management.

However, when companies intend to create an external integrated report, the internal performance management also must align with the <IR> principles. To report how performance leads to value creation of the six capitals, the performance indicators also have to be linked to those capitals. The next section will be an attempt to connect specific performance indicators to the capitals, to make companies able to show how their performance contributes to value creation per capital.

5 Connection between business performance and value creation of social & relationship capital and natural capital

This section brings value creation (Section 3) and performance measurement (Section 4) together. The challenge is to find the best way to show how performance leads to value creation in terms of social and relationship capital and natural capital. The research question that will be answered is: *What Key Performance Indicators that are related to natural capital and social & relationship capital are explanatory for value creation of a company?*

A combination of qualitative and quantitative reporting is desired, but the only guidelines that the <IR> framework provides are requirements for good performance indicators. This part of the research is aimed to find performance metrics that are statistically proven to be related to value creation of companies. Ultimately, these performance metrics can be included in an integrated report and can be divided over the six capital of the <IR> framework. A statistical approach will be used to prove if there are performance indicators that are representative for value creation. This result will help improving internal performance management in companies and external reporting about how performance has helped creating value. In practice there will be searched for KPI(s) that have a predictive ability for social/natural value creation.

Section 5.1 shortly refers to the value creation model (Figure 3-4) of Section 3 that forms the fundament of the quantitative research. Section 5.2 shows what data is available and describes the data source, followed by explaining the best fitting regression model in Section 5.3. In Section 5.4 the results of the regression analysis are showed and finally the results are checked with the guidelines that the <IR> framework provides. The section is finalized by a conclusion about the findings of the quantitative analysis and the final recommendations.

5.1 Underlying model of value creation

Section 3 of this thesis was dedicated to understand the value creation process. By translating the process to a mathematical model, the <IR> figure for value creation was stripped down to a simple model with six input capitals, a black box of business activities, and six output capitals. The principle is that the value of capitals $C_{i,T}$ at time T, are transformed into capitals $C_{i,T+t}$ during period t. The model explains value creation by a value creation coefficient v_i, which is a multiplier of $C_{i,T}$. The purpose of the following experiment is to find explanatory factors for the value creation coefficients v_i.

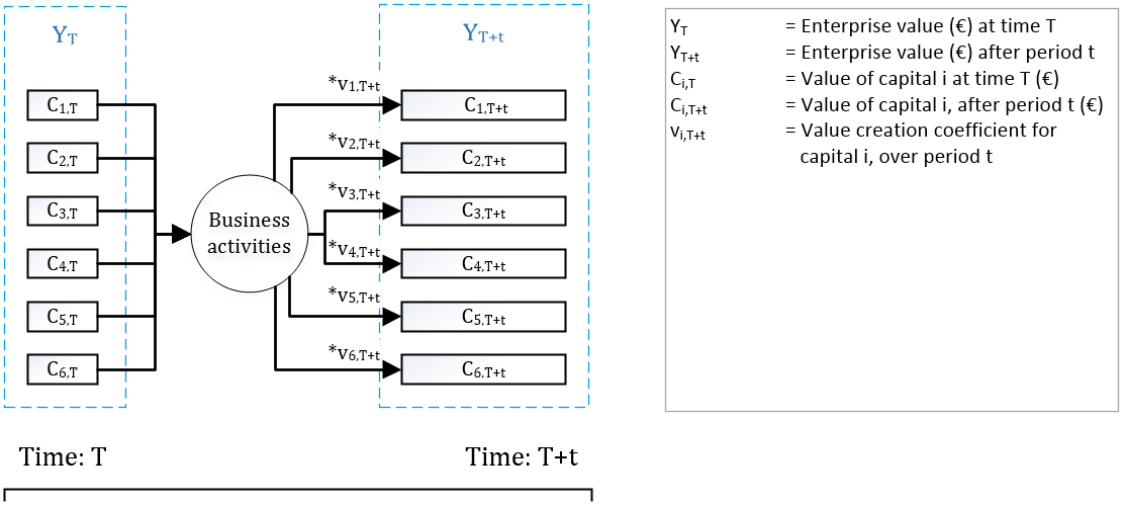

Figure 5-1: picture of modelled value creation process (copy of figure 3-6)

Although, it is not the purpose of an integrated report itself, to quantify or monetize the value of the organization or capitals (The IIRC, 2013), it is an interesting addition to this research. It is important to realize that the following statistical analysis is purely for understanding of the value creation process and not necessarily to include in an annual report. The next section explains what data is available for the analysis.

5.2 Dataset for statistical analysis

The purpose of the quantitative analysis is to show the effect of company performance on value creation by performing a regression analysis. A regression analysis tests the explanatory ability of social and natural KPI scores towards company market value. The following two sections are about exploring what data is available and what useful information can be deducted from this dataset. After finding the right information, the best matching regression model will be explained in Section 5.3.

5.2.1 Independent variables: Environmental, Social and Governance KPI data

The independent variables should be representative for company performance that can influence social & relationship capital and natural capital. This is an explorative experiment, so a big set of performance data is desirable. Asset4, which is a business unit of Thomson Reuters Datastream, has collected a huge database of historical Environmental, Social and Governance performances of listed companies (Figure 5-2). This data is collected from annual reports (including sustainability reports) and other agencies and is the most extensive dataset that is publicly available. All this data cannot be separately allocated to social & relationship capital or natural capital, but covers a broad range of these capitals.

The Asset4 ESG data consists of more than 750 data points, which are transformed in more than 250 KPIs. The KPIs can be grouped in 18 different categories of ESG data (Figure 5-2). Appendix D shows an overview of all types of KPIs on a more detailed level. Because the awareness of importance of ESG data has just grown recently, the data does not go far back. Asset4 has collected data from 2002 until now, but many companies only started measuring these ESG KPIs later, consequently there are many empty entries in the dataset.

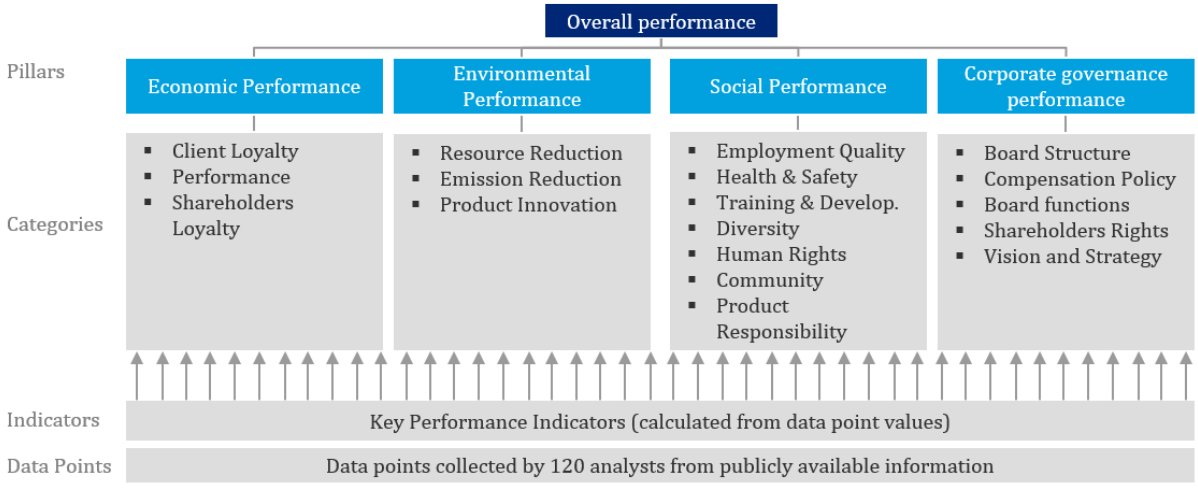

Figure 5-2: ASSET4 ESG Data Structure (Source: Thomson Reuters extranet.datastream.com)

The purpose of the regression analysis is to find one or more KPIs that have explanatory properties for value creation social & relationship capital and natural capital. The KPI scores need to be categorical or continuous to be useful for the analysis. The time horizon that is used depends on the availability of the company performance data in the databases.

5.2.2 Dependent variable: Enterprise market value

The Asset4 ESG data represents the 'company performance', but the statistical analysis also requires data that represents 'value creation'. According to the proposed conceptual model (Figure 2-7), a representative value is needed for both social & relationship capital and natural capital, to express the increase or decrease of the capitals over the years, for a certain company. This is the biggest challenge for this statistical experiment, since those capitals cannot be valued exactly and definitely is not published information. There are no explicit measurement methods for monetizing social & relationship capital or natural capital and they consists mainly of intangible aspects.

The underlying assumption of this research, that the six capitals together form the total value of the firm, means that the value of both social & relationship capital and natural capital are a fraction of the total enterprise value. Because these fractions are different for every company, the closest data available is the total market value of a company. Therefore, instead of using the two specific capital values as dependent variable, the total company value will be used as best alternative for the regression analysis. The total company value is referred to as 'enterprise value' in Thomson Reuters Datastream. Enterprise value is a continuous measurement, which makes it useful for statistical analysis.

In terms of the model of Figure 5-1, it appears to be impossible to calculate value creation coefficients v_5 and v_6 separately from historical data. Therefore, a different approach is chosen by showing the effect on the sum of capitals $C_{i,T}$ at time T instead. Value creation coefficient $v_{i,T}$ is calculated by:

$$Value\ creation\ coefficient\ v_{i,T} = \frac{\sum_1^6 C_{i,T} - \sum_1^6 C_{i,T-1}}{\sum_1^6 C_{i,T-1}} + 1$$

The total Enterprise value of a company is equal to $\sum_1^6 C_{i,T}$ and is defined by Thomson Datastream (code: WC18100) as:

$$Total\ enterprise\ value = Market\ capitalization\ at\ fiscal\ year\ end\ date + Preferred\ stock + Minority\ Interest + Total\ debt - Cash$$

This definition for determining the enterprise value consists of a few building blocks that require some explanation. The main aspect of the enterprise value is the market capitalization, which is the share price multiplied by the number of outstanding shares. In addition to the common shares, companies can also issue preferred stock, which gives buyers a privileged position against common shareholders when dividends are paid out. These preferred shares often have company specific properties and are traded in the same way as common shares. In addition to the publically traded

stocks, investors or other parties can have a minority interest in a company, which also represents some of the company value. The final aspect of this valuation method is the net debt that the company has issued to perform their business activities. Net debt is in this case debt minus cash and due from banks for banks, cash for insurance companies and cash & short-term investments for all other industries (Thomson Reuters, 2015).

5.3 Statistical method for panel data

In this section, the right statistical method will be determined stepwise, to find explanatory KPIs for value creation. First, the data has to be structured and cleaned to make it ready for analysis. The second step is to determine what the properties of the dataset are and what the best fitting model is. The third step shows a description of the analysis that has to be performed on the dataset and which estimators will be used.

5.3.1 Structuring and cleaning the data

To make the statistical analysis as powerful as possible a high quality dataset is essential. Therefore, the data has to be complete and measured consistently and regularly. The KPI variables as well as the enterprise values are obtained from the Thomson Reuters Datastream, which is a big advantage with respect to the consistency. The definitions are standardised, so the data is calculated in the same way. The most important drawback of this dataset is that is contains many empty cells and unusable KPIs. Initially the database of more than 750 data points looked very promising, but in reality, the majority was unusable.

KPIs with many empty cells had to be excluded as well as KPIs that were not measured numerical (Figure 5-3). The database also contains many KPIs with non-numerical scores, like yes/no or other textual scores. In addition, many KPIs were reported as Z-score, which is a calculation based on other peer-companies. This results in interdependency between individuals and causes unreliable test results. All these unusable data were list wise excluded for the dataset.

Criteria for KPIs from initial dataset
▪ Boolean entries
▪ Z-scores
▪ KPIs with only empty cells
▪ Textual answers
▪ KPIs unrelated to Social & relationship and natural capital

Figure 5-3: Criteria for excluding KPIs from the initial dataset from Thomson Reuters Datastream

5.3.2 Properties of the dataset

Structuring the collected dataset as described in Section 5.2, shows a typical *panel data* set (Figure 5-4). The main property of panel data is that it provides information on individual behaviour across individuals and over time. In other words, it has a cross sectional and time-series dimension. In this case, the companies are the individuals, the data provides behaviour about all those companies separately and are available of year 2002 to 2014. So a panel data model is used with N = 33 Dutch listed companies (appendix E) and T = 13 regular periods (2002-2014).

Company name	Year	Market Enterprise value (Y)	kpi 1 (X_1)	Kpi 2 (X_2)	Kpi i (X_i)
Company 1	2014				
	2013				
	2012				
	2011				
	…				
Company 2	2014				
	2013				
	2012				
	2011				
	…				

Figure 5-4: Structure of collected panel data with KPI scores and enterprise value

Before being able to perform statistical tests, the dataset has to be characterized by determining what type of panel data this is. The following properties help with characterizing the dataset and finding the most suitable test model in the next section:

- The dataset is *unbalanced* because the data is not available on every behavioural aspect in every year. The number of observations is not equal to NT.
- The data is *short* panel data, because there are few periods (maximum of 13) and many individuals (33 listed companies in The Netherlands).
- The data has *varying* regressors x_{it}. The KPI scores change per individual and over time.
- The variation for the dependent variable and regressors, is *overall variation*, which means that it has variation over time and per individual.

5.3.3 Panel data modelling

Choosing the best fitting model is important before performing the tests. The panel data is a linear model with time series data of every single year. A normal linear regression is not sufficient though, because the panel data consist performance data of individual companies that are independent of each other. Therefore, it is not right to regress the independent variables of one individual on the dependent variables of other individuals. Another difficulty with panel data is that there is inference in the data, because each year is not independent of the previous year, because it is performance data of the same company.

The panel data can both be approached by a pooled model, where the population is averaged, or an individual-specific effects model (Figure 5-5). Pooled Ordinary Least Squares (OLS) is a general linear approach that approaches all individuals as one, assuming that there is no individual effect. Common sense rules out this assumption, because in doing business there is always individual effect. The panel data will be tested for fixed effects and random effects, by using different models. The fixed effects model and the random effects model are the two types of individual-specific analysis for panel data. The desired result is to find individual fixed effects on the total enterprise value. The pooled model will still be performed though, as a reference point for determining fixed or random effects.

Three possible panel data models:	
Pooled OLS model $Y_{iT} = \beta_{ij} X_{it} + \alpha_i + \epsilon_{it}$ (u_{it}=0) **Fixed effect model** $Y_{iT} = \beta_{ij} X_{it} + \alpha_i + u_{it}$ **Random effect model** $Y_{iT} = \beta_{ij} X_{it} + \alpha_i + u_{it} + \epsilon_{it}$	**Parameters:** Y_{iT} = Dependent variable of company i at time T = $\sum_1^6 C_{i,T}$ X_{ijT} = Independent variables of company i and KPI score j, with i = 1. Social, 2. Natural, at time T α = Regression constant β_{ij} = The regression coefficient for one independent variable x_{ijT}, for company i, and KPI score j, with j = 1. Social, 2. Natural and j = 1…n u_{it} = Error term

Figure 5-5: Summary of different panel data models (source: (Park, 2011))

5.3.4 Testing for fixed or random effects using estimators

The next step is to check whether the dataset consists fixed and/or random effects. Estimators are used to test if the dataset is consistent with the fixed effect or the random effect model. Fixed effects are tested by an F-test, which tests if the null hypothesis can be rejected. If not, the pooled OLS regression is favoured. The assumption is that the individuals behave differently and this should be confirmed by no correlation between the entity's error term and the *fixed effects,* so the net effects of the predictor variables can be assessed. Testing random effects works the same way, but uses the Lagrange multiplier as indicator. The Breusch and Pagan's Lagrange multiplier tests if the individual variance is equal to zero. The effects are tested with the pooled OLS model as reference. As the null hypothesis can not be rejected, the dataset fits best with the pooled OLS model.

Afterwards, the so-called Hausman test is used to show difference between fixed effects and random effects estimates. Individual effects (u_i) will be tested if they are uncorrelated with other regressors. If the null hypothesis is rejected, there are fixed effects and otherwise random effects.

Three different estimating methods will be performed in statistical software, that is called STATA, to test for fixed effects, random effects, and pooled OLS. Pooled OLS is used as a reference point and has its own estimator. For testing for fixed effects, the within or fixed effects estimator is used. The Within or fixed effects estimator compares value with their own average. Additionally, the Hausman test and Breusch and Pagan's LM test are performed afterwards. See Appendix F for the used STATA commands.

5.4 Analysis performed in STATA

The statistical tests described in Section 5.3 are performed with statistical software STATA. Figure 5-5 shows the different estimators with their STATA commands. All used commands are registered in the Do.file, which is attached in Appendix F, as well as the outputs in Appendix G. This section gives insight in the interpretation of the output to conclude whether a KPI is significantly explanatory for the enterprise value.

	Estimator	Model	Command
1.	Pooled OLS estimator	Pooled model	.reg
2.	Within or fixed effects estimator	Fixed effects model	.xtreg, fe
3.	Random effects estimator	Random effects model	.xtreg, re theta
4.	Breusch-Pagan LM test	Random effects vs. Pooled OLS	quietly xtreg, re .xttest0
5.	Hausman test	Fixed effects model vs. Random effects model	quietly xtreg, fe estimates store fixed quietly xtreg, re estimates store random .hausman fixed random

Figure 5-6: Used estimators to test panel data models and their STATA commands

An impression of the STATA output, as result of the commands mentioned in Figure 5-6, is attached in Appendix G. First, it shows a summary of the total dataset about the number of observations, individuals and periods. Also the variances of the observations are given both *within* the individuals, as well as *between* the individual companies. These value are used later for the within and fixed effects estimator and the random effects estimator. The five performed statistical tests in STATA (Figure 5-6), give five separate outputs that have to be interpreted to conclude if the estimators fit with the underlying model.

5.4.1 Interpretation of the STATA output to determine the panel data model

In general, such an output as showed in Appendix G consists of general information about the total model, and specific information of the different analyzed KPI scores. The output can be roughly divided in two parts where the lower table is about the specific information of the independent variables (KPI scores), and the information above the table is about the model as a whole. The first part shows information about observations, groups and about the significance and the explaining ability of the model. The table below provides information about the coefficients, which explains how much the enterprise value (Y) changes when the particular KPIs (X_i) increases with one unit.

The STATA output data of all five tests are quite comprehensive and all have different characteristics. The most important thing is to find out what model fits best to the dataset that is gathered from the Thomson Reuters Datastream, so below is given an overview of the important aspects in the STATA output to check if the panel data model is sufficient. For every estimator separately, the most important information aspect is designated to check if the concerned model fits. The Pooled OLS estimator output is initially excluded, because the panel data has to be tested for fixed or random effects first. If these effects are both not significant, the Pooled OLS model is preferred and should be used afterwards to judge the individual KPIs separately.

- Fixed effects:
  Prob > F: This is an F test, with N-1 degrees of freedom, that shows whether all KPI coefficients are different than zero. This value should be smaller than confidence level α. In case of a confidence level of 95% is α equal to 0,05. When it is lower than α, the null hypothesis must be rejected and that means that the fixed effects model is ok.

- Random effects:
  Prob > chi2: This is also an F test, but the initial command is different than for the fixed effects option.
  Lambda = random effects are closer to within effects than the OLS effects.

- Hausman test:
  The null hypothesis of the Hausman test is that the random effects model is preferred. This can be rejected only when *prob > chi2* is lower than α.

- Breusch-Pagan Lagrange multiplier:
  The null hypothesis is that the variances between the companies is zero. Testing if the random effects model is appropriate is done by checking that *prob > chi2* is lower than α. If this is not the case, than the pooled OLS is the best fitting model.

5.4.2 Interpretation of STATA output to find explanatory KPIs for enterprise value creation

The STATA output generates the data of the three different estimators and the two extra tests afterwards. The first step is to determine what estimator is significant, and then only the output data of that panel data model has to be interpreted. The problem with the dataset is that it is very difficult to find significant estimators. The optimal situation is to find several KPIs that fit with the fixed effects model, which means that despite the different characters of the individual companies, the KPI has a significant relationship with the enterprise value. Another problem with this analysis of this much KPIs, is that they have to be checked in different combinations by excluding the independent variables list wise. It turns out that KPI scores that are related to social & relationship capital and natural capital do not have enough explanatory properties towards enterprise value.

Figure 5-7 shows an example of output data from STATA. The coefficients in the table show how much the total enterprise value of an individual company increases when the individual KPI scores increase with one unit. To proof if this is the case, the KPIs are tested separately by a two-tail test, with the null hypothesis that the individual KPI does not have influence on the enterprise value. P > |t| should be lower than α to reject that hypothesis and significantly proof the explanatory property of the KPI towards total enterprise value.

```
. * Fixed effects or within estimator
. xtreg $ylist $xlist, fe

Fixed-effects (within) regression               Number of obs      =        23
Group variable: id                              Number of groups   =         9

R-sq:  within  = 0.2036                         Obs per group: min =         1
       between = 0.1069                                        avg =       2.6
       overall = 0.0634                                        max =         6

                                                F(1,13)            =      3.32
corr(u_i, Xb)  = -0.5486                        Prob > F           =    0.0914

------------------------------------------------------------------------------
     wc18100 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   socodp029 |  -1.146852   .6290806    -1.82   0.091    -2.505898    .2121943
       _cons |   2.76e+07    3802104     7.26   0.000     1.94e+07    3.58e+07
-------------+----------------------------------------------------------------
     sigma_u |   32298080
     sigma_e |  3390242.6
         rho |   .98910194   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(8, 13) =    95.17                 Prob > F = 0.0000
```

Figure 5-7: example of fixed effects output file

5.5 Conclusion

The purpose of an integrated report is for companies to explain to providers of financial capital how they will create value in the short, medium and long term. The framework prescribes that the role of eight content elements should be included in this explanation. One of those content elements is 'performance', so the report should show how company performance contributes to value creation. The IIRC demands to do that in both a qualitative van quantitative way, but does not provide any specific measurement methods or performance indicators. The research question for this section is: *What Key Performance Indicators that are related to natural capital and social & relationship capital are explanatory for value creation of a company?*

The final part of this study aimed to provide some performance indicators that are statistically proven related to value creation of a company, with the main assumption that value creation is the increase of total enterprise value. The problem is though, that social & relationship KPIs and natural KPIs do not have enough influence on enterprise value. The other four capitals of the <IR> framework probably have more influence on value creation of an organization. Another important issue is that companies have to show what drives their value according to their strategy. Companies often have different strategies and therefore different value drivers. This also means that different aspects of their performance are important for the total enterprise value. As a result, it should be difficult to find KPIs that are important for business value creation in general.

5.5.1 Align with internal performance management

So, KPIs have to be selected in a different way to create a good chapter about performance in an integrated report. Companies still have to keep in mind that they should align their internal performance management system with six capitals principle of <IR>. KPI measurement is an internal activity from which the results can be put later in the external report. Therefore, it is recommended

to allocate the KPIs in the performance management system to one of the six capital. This makes it easy to do the same thing in a chapter about performance in an integrated report.

5.5.2 Qualitative validation

This section was focused on finding good KPIs for reporting about value creation of social & relationship capital and natural capital. Besides that the KPIs should have a significant relationship with enterprise value, they also should comply with the qualitative requirements that resulted from the research in Section 4.5. The KPIs have to be measurable, controllable, match with international standards, and consistent with the company's strategy. In the integrated report they also have to be reported with historical performance of more than two years and should be linked to short, medium and long term targets.

5.5.3 Limitations

The correlation between enterprise value of individual companies is quite high, because of many macro-economic factors that influence the total (Dutch) stock market. This an important weakness of this research design. The natural and social & relationship performance is probably a small influencing factor on the enterprise value.

A choice for companies could be to lower the confidence of the statistical test and choose KPIs that are 'close to significancy'. In this it still is not an exhaustive list of KPIs, but they can be relevant for reporting about how performance leads to value creation. That those KPIs appeared to be related to the market value of company, also does not mean that companies only have to invest in those aspects to create value growth, but they are just relevant to include in an integrated report.

6 Conclusion

Integrated reporting is all about showing to the providers of financial capital, how the business will create value in the short, medium and long term. According to the International <IR> Framework of the IIRC, is value creation equal to increase, decrease or transformation of the six capitals caused by the organization's business activities. Business performance has big influence on the value creation of an organization and therefore the central research question of the thesis was:

How can companies show in an integrated report how their performance leads to value creation in terms of natural capital and social & relationship capital?

An integrated report should contain qualitative and quantitative reporting about how their performance leads to value creation. The quantitative part mainly consists of performance indicators and the qualitative part should contain an explanation about the performance indicators, the measurement methods and their relevancy for the organization. The International <IR> framework does not provide any specific measurement methods or performance indicators though. The framework does give guidelines about how the KPIs should be reported. They have to be presented for multiple consecutive years, against peer group performance from the market and it should be linked to previously reported targets and future targets. This enables benchmarking, comparability and showing trends.

Literature research has yielded specific guidelines about individual KPIs and about structuring them. Performance indicators have to be measurable and controllable by the company. Moreover, they have to be consistent, reliable, relevant and in line with the strategy of the company. This last aspect is important because the strategy determines how the company aims to create value. Organizations are often searching for structure in their collection of performance indicators. Structuring these performance indicators is part of performance management. There are different frameworks that can help approaching the challenge to create a complete and exhaustive set of performance indicators that accurately represents the performance of the company.

To show in an integrated report, how performance leads to value creation of a specific capital, KPIs should be linked to those capitals. Nowadays, annual reports or sustainability reports often show a quite standardized list of performance indicators, and the question is if these are actually related to value creation in their business. The last section of this thesis showed a statistical analysis on historical performance data related to social & relationship capital and natural capital. The analysis showed no KPIs that are significantly related to our perception of value creation. The purpose of the analysis was to find a set of KPIs that are statistically proven to have explanatory properties towards value creation. This should made them relevant to report. The analysis is based on the assumption that the six capitals together form the total enterprise value. These capitals are input capital at a certain point in time and after a short, medium or long period, the business activities of the organization result in new values of the six capitals.

These findings do not mean that business performance can not create value for the social & relationship capital and natural capital of an organization. It does indicate though, that a standard list of key performance indicators is not sufficient for every company to show how they will create value in the short, medium and long term. The set of performance indicators has to be somehow related to the strategy and value drivers and must be company-specific. To accomplish that, an organization should align their internal performance measurement with what they want to report externally. Companies should therefore structure their performance management by the six capitals, to enable external integrated reporting about how the separate capitals contribute to value creation

7 Discussion

A research project like this, where new conceptual ideas are operationalized to real business, always requires making assumptions and interpreting statistical test results. This applies most for the quantitative part of this thesis, which is based on the value creation model created in section 3. This master's study was structured to ultimately test historical businesses performance data, related to social & relationship capital and natural capital, against value creation. Therefore, the value creation process was reduced to a value creation model with six equally important input capitals, and a black box of 'business activities' that converted them to six output capitals, after a period *t*. The historical Total Enterprise Value was used as dependent variable that should represent 'value creation'. The result of the analysis was that it did not result in a set of KPIs that is in general representative for value creation in terms of social & relationship capital and natural capital. The statistics did not show significant fixed effects of KPIs on the total enterprise value of the company sample.

7.1 Limitations

This result does not mean that the business performance does not influence company value at all. There will probably be individual companies of which the total market value is influenced by social & relationship KPIs and natural KPIs. It is very difficult though, to show this statistically. The correlation between enterprise value of individual companies is quite high, because of many macro-economic factors that influence the total (Dutch) stock market. This is an important weakness of this research design. The natural and social & relationship performance is probably a small influencing factor on the enterprise value. Financial results, political issues, and external market sentiments determine a big part of stock price movements. Listed companies do also behave less or more to market movements, which adds noise to the statistical analysis.

It should also be born in mind that if the statistical test performed in this study had resulted in a set of KPIs that was related the market value of company, it would not have meant that companies only had to invest in those aspects to create value growth. They would have had just an indicative character and could therefore be relevant to include in an integrated report.

Finally, it is important to realize that the interpretation of the value creation process by the IIRC is also just conceptual. The assumption that all capital that a company owns, can be categorized in the six capitals is to discuss. In reality, this is very hard to allocate and to monetize. On top of that, there is also connectivity between those capitals, which means that they influence each other. This connectivity differs per company and is impossible to include in a model. Therefore, in this study was chosen to simplify the value creation process by defining value creation coefficients for every capital. This allowed a quantitative approach to the concepts of <IR> and will hopefully lead to further research to accelerate the adoption of the new global corporate reporting standard.

7.2 Future research

Based on a cross-industry sample of historical business performance data, the statistical analysis showed no significant explanatory properties with respect to total enterprise value. That provided some suspicions about what the reasons could be. For example, that social & relationship capital and

natural capital have too little influence on value creation of a company, or that only for companies with the same strategy the same KPIs lead to value creation. Further research could focus on checking these hypotheses by adjusting the research design. To accomplish that, the other four capitals have to be neutralized in the sample somehow. It could also be interesting to search for ways to categorize companies by their strategy.

What is also interesting to investigate is what the relationships are between the capitals and if this is somehow possible to model. The value creation process according to the International <IR> Framework suggests that the six capitals stand next to each other, but during this study, the suspicion occurred that this is not exactly the case. All the capitals have different characteristics and influence each other all in a different way. For example, financial capital can be spent concretely as input capital, but spending social & relationship capital is vaguer. Despite these research suggestions, this study showed that the value creation process is no exact science and it will be a journey to mature Integrated Reporting.

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Abbreviations

BM = Business Model

ESG = Environmental, Social and Governance

EVM = Enterprise Value Map

IIRC = International Integrated Reporting Counsel

IEM = Industrial Engineering and management

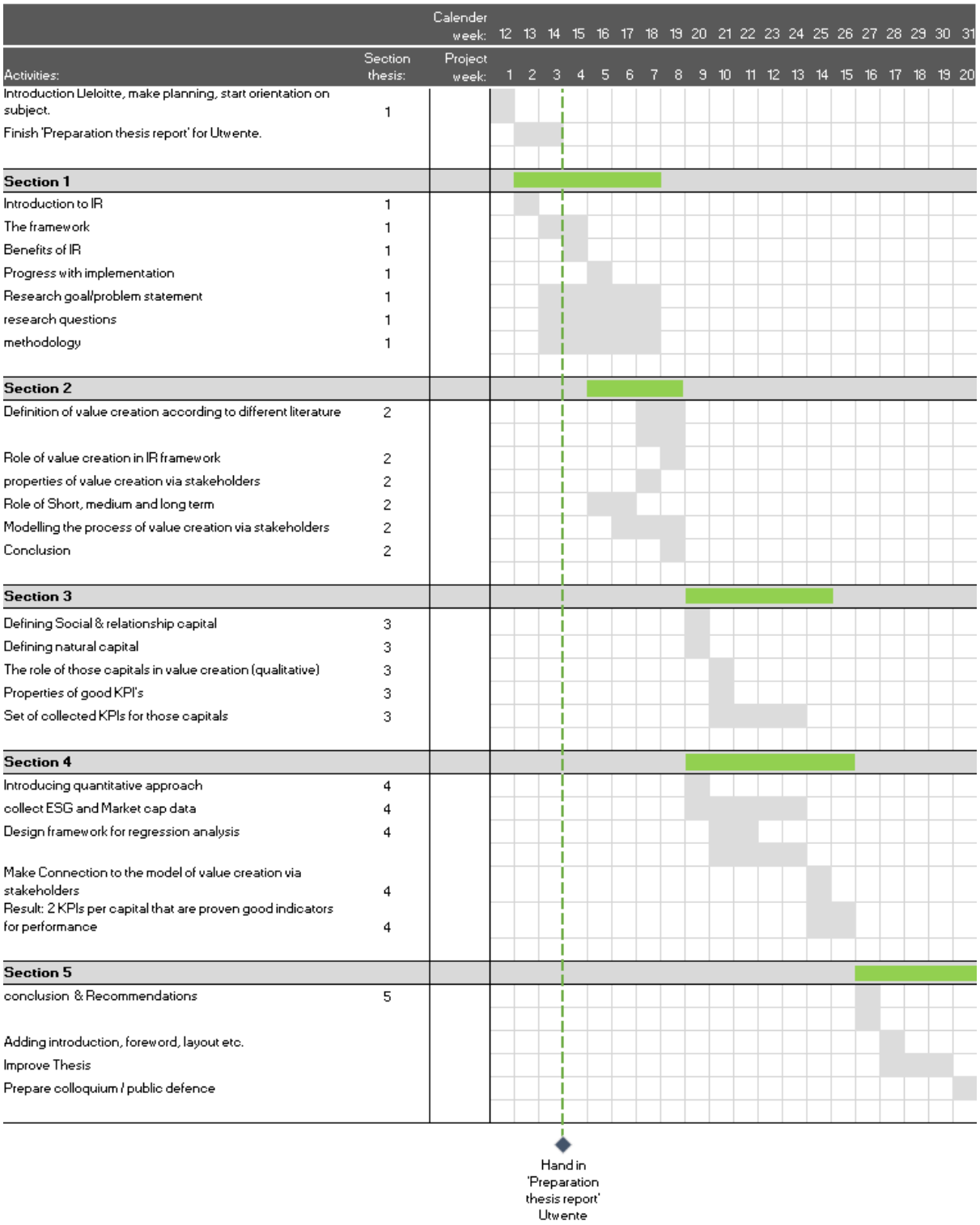
<IR> = Integrated Reporting

KPI = Key Performance Indicator

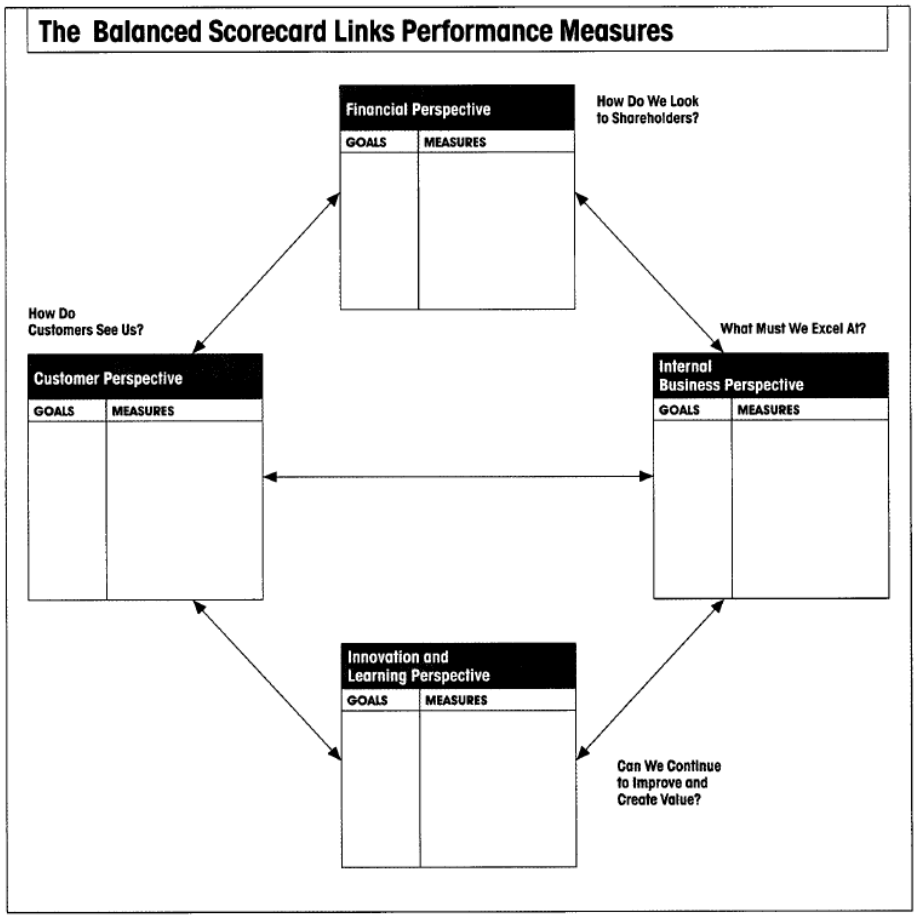
OLS = Ordinary Least Squares

List of figures

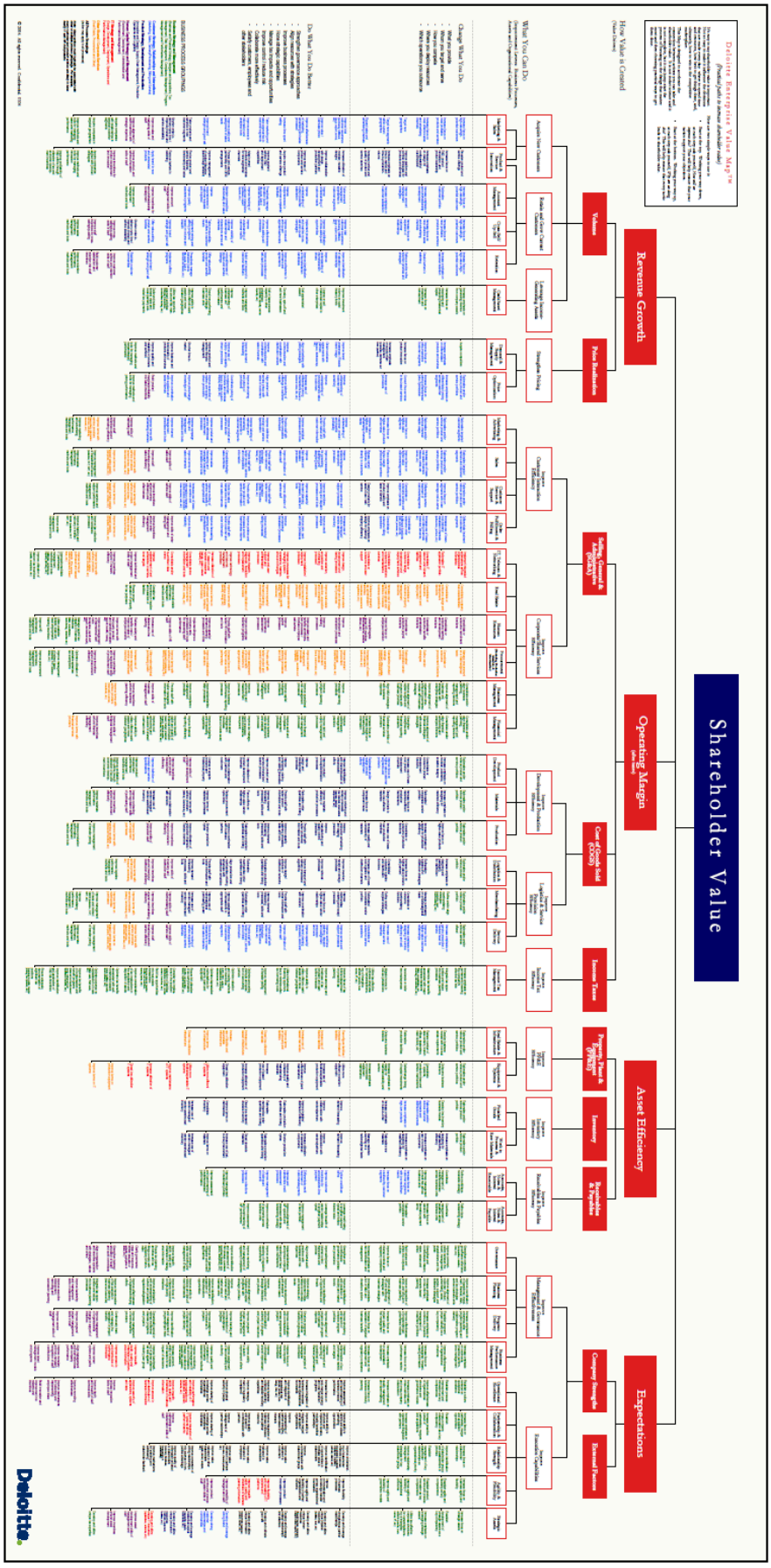
Appendix A: Research planning



Appendix B: Balanced Scorecard



Appendix C: Deloitte's Enterprise Value map (impression)



Appendix D: Asset4 ESG datatypes of Thomson Reuters Datastream

Sample of ASSET4 ESG Datatypes available on Datastream Premium and Direct		
Environmental	**Social**	**Corporate Governance**
Environmental Pillar Score	Social Pillar Score	Corporate Governance Pillar Score
Emissions Reduction Policy	Employment Quality/Policy	Board Structure/Policy
CO2 equivalents Emission Total	Employee Satisfaction	Board Structure/Background and Skills
Emission Reduction/CO2 Reduction	Employment Quality/Salaries	Board Structure/Size of Board
Ozone-Depleting Substance Reduction	Employment Quality/Salaries Distribution	Board Structure/Board Diversity
Waste Total	Bonus Plan for Employees	Board Meeting Attendance Average
Non-Hazardous Waste	Generous Fringe Benefits	Compensation Policy
Hazardous Waste	Employment Quality/Employment Awards	Highest Remuneration Package
Emission Reduction/ Waste Recycling Ratio	Trade Union Representation	Board Member Compensation
Water Pollutant Emissions	Employees Leaving	Stock Option Program
Waste Reduction Total	Turnover of Employees	Audit Committee Independence
Environmental Expenditures	Health & Safety/Policy	Audit Committee Management Independence
Energy Efficiency Policy	Total Injury Rate	Audit Committee Expertise
Energy Use Total	Lost Time Injury Rate	Compensation Committee Independence
Renewable Energy Use	Lost Days	Senior Executive Long-term Comp Incentives
Green Buildings	Average Training Hours	Vesting of Stock Options/Restricted Stock
Water Efficiency Policy	Training Costs Total	Shareholder Rights/Policy
Water use Total	Management Training	Voting Rights
Water Recycled	Diversity and Opportunity/Policy	Ownership
Environmental Supply chain Management	Women Employees	Classified Board Structure
Energy Footprint Reduction	Women Managers	Staggered Board Structure
Environmental R&D Expenditures	Flexible Working Hours	CSR Sustainability Committee
Renewable/Clean Energy Products	Day Care Services	CSR Sustainability Report Global Activities
Water Technologies	Human Rights/Policy	CSR Sustainability External Audit
Product Innovation/Product Impact Minimization	Donations Total	GRI Report Guidelines

Appendix E: Sample of Dutch Listed companies for statistical analysis

1	AALBERTS INDUSTRIES
2	AEGON
3	AHOLD KON.
4	AKZO NOBEL
5	APERAM
6	ARCELORMITTAL
7	ASM INTERNATIONAL
8	ASML HOLDING
9	BAM GROEP KON.
10	BOSKALIS WESTMINSTER
11	CORBION
12	DELTA LLOYD GROUP
13	DSM KONINKLIJKE
14	EUROCOMMERCIAL
15	FUGRO
16	GEMALTO
17	HEINEKEN
18	ING GROEP
19	KPN KON
20	OCI
21	PHILIPS ELTN.KONINKLIJKE
22	POSTNL
23	RANDSTAD HOLDING
24	REED ELSEVIER (AMS)
25	ROYAL DUTCH SHELL A
26	ROYAL IMTECH
27	SBM OFFSHORE
28	TNT EXPRESS
29	TOM TOM
30	UNILEVER CERTS.
31	VOPAK
32	WERELDHAVE
33	WOLTERS KLUWER

Appendix F: .Do-file STATA

```
clear all
set more off

use C:\Master_thesis_Aron_Steenwoerd\STATA

global id id
global t t
global ylist wc18100
global xlist

describe $id $t $ylist $xlist
summarize $id $t $ylist $xlist

* Set data as panel data
sort $id $t
xtset $id $t
xtdescribe
xtsum $id $t $ylist $xlist

* Pooled OLS estimator
reg $ylist $xlist

* Fixed effects or within estimator
xtreg $ylist $xlist, fe

* Random effects estimator
xtreg $ylist $xlist, re theta

* Hausman test
quietly xtreg $ylist $xlist, fe
estimates store fixed
quietly xtreg $ylist $xlist, re
estimates store random
hausman fixed random

* Breusch-Pagan LM test
quietly xtreg $ylist $xlist, re
xttest0
```

Appendix G: Output tables of STATA per estimator*

Summary:

```
. summarize $id $t $ylist $xlist
```

Variable	Obs	Mean	Std. Dev.	Min	Max
id	429	17	9.533022	1	33
t	429	7	3.746026	1	13
wc18100	378	2.02e+07	3.82e+07	154169	2.18e+08
cgbfdp024	287	7.707317	2.808214	2	24
cgbfo10v	287	7.707317	2.808214	2	24
cgbsdp060	300	7.983333	2.824236	3	20
cgbsdp55	272	3.702206	.7704857	1	5
cgbso01v	301	1.581395	1.634274	0	10
cgbso05v	293	5.424403	1.691385	.67	11
cgbso11v	300	2.941333	1.484769	0	10.25
cgbso13v	272	3.702206	.7704857	1	5
cgbso14v	300	7.983333	2.824236	3	20
cgbso15v	300	7.886667	2.853237	0	20
cgcpdp040	238	3.168067	.7270462	0	9
cgcpdp053	104	599614.7	633000	3832	3653000
cgcpdp054	286	9605813	1.15e+07	13118	8.26e+07
cgcpdp058	250	3.172	.8726178	0	9
cgcpo02v	264	2918437	2233061	13118	1.69e+07
cgcpo03v	298	1.53e+09	2.64e+10	4022.07	4.55e+11
cgsro06v	301	2.239203	1.860804	0	6
ecclo01v	239	.0975314	.4072651	-.37	4.22
ecclo02v	301	3.10e+10	7.33e+10	1.79e+08	4.70e+11
ecclo08v	255	.0708627	.0937624	0	.72

* This is an impression of possible STATA output. The output file was too big to include in this report and there have taken place many experiments with different combinations of KPIs that can not all be included in the appendix.

Description:

```
. xtdescribe

      id:  1, 2, ..., 33                                     n =         33
       t:  1, 2, ..., 13                                     T =         13
           Delta(t) = 1 unit
           Span(t)  = 13 periods
           (id*t uniquely identifies each observation)

Distribution of T_i:   min      5%     25%       50%       75%     95%     max
                        13      13      13        13        13      13      13

     Freq.  Percent    Cum. |  Pattern
 ---------------------------+---------------
       33    100.00  100.00 |  1111111111111
 ---------------------------+---------------
       33    100.00         |  XXXXXXXXXXXXX

. xtsum $id $t $ylist $xlist

Variable         |      Mean   Std. Dev.       Min        Max |    Observations
-----------------+--------------------------------------------+----------------
id       overall |        17    9.533022          1         33 |     N =     429
         between |               9.66954          1         33 |     n =      33
         within  |                     0         17         17 |     T =      13
                 |                                             |
t        overall |         7    3.746026          1         13 |     N =     429
         between |                     0          7          7 |     n =      33
         within  |              3.746026          1         13 |     T =      13
                 |                                             |
wc18100  overall |  2.02e+07    3.82e+07     154169   2.18e+08 |     N =     378
         between |              3.74e+07    1128861   1.75e+08 |     n =      33
         within  |              1.18e+07  -4.72e+07   1.11e+08 | T-bar = 11.4545
                 |                                             |
cgbf~024 overall |  7.707317    2.808214          2         24 |     N =     287
         between |              1.926225          4   12.66667 |     n =      33
         within  |              2.286045   1.457317   19.04065 | T-bar = 8.69697
```

Pooled OLS:

```
. * Pooled OLS estimator
. reg $ylist $xlist
note: cgbfo10v omitted because of collinearity
note: cgbsdp55 omitted because of collinearity
note: cgbso14v omitted because of collinearity
note: cgbso15v omitted because of collinearity
note: cgcpdp058 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =      28
-------------+------------------------------           F( 17,    10) =   81.30
       Model |  6.1179e+16    17  3.5987e+15           Prob > F      =  0.0000
    Residual |  4.4265e+14    10  4.4265e+13           R-squared     =  0.9928
-------------+------------------------------           Adj R-squared =  0.9806
       Total |  6.1621e+16    27  2.2823e+15           Root MSE      =  6.7e+06

------------------------------------------------------------------------------
     wc18100 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   cgbfdp024 |   -1436956    1619902    -0.89   0.396    -5046324     2172411
    cgbfo10v |          0  (omitted)
   cgbsdp060 |    3694234    1704113     2.17   0.055    -102765.3    7491234
    cgbsdp55 |          0  (omitted)
    cgbso01v |   972347.8    1728068     0.56   0.586     -2878029    4822724
    cgbso05v |    3659813    2068978     1.77   0.107    -950158.2    8269784
    cgbso11v |  -170766.7    2091434    -0.08   0.937     -4830773    4489239
    cgbso13v |    7546616    9148835     0.82   0.429    -1.28e+07    2.79e+07
    cgbso14v |          0  (omitted)
    cgbso15v |          0  (omitted)
   cgcpdp040 |   -8669838    5271624    -1.64   0.131    -2.04e+07    3076071
   cgcpdp053 |  -64.47388   36.65619    -1.76   0.109      -146.149   17.20119
   cgcpdp054 |   1.396987   1.271654     1.10   0.298    -1.436436    4.23041
   cgcpdp058 |          0  (omitted)
    cgcpo02v |   -1.23936   1.224586    -1.01   0.335    -3.967908    1.489188
    cgcpo03v |   51.21568    27.6394     1.85   0.094    -10.36874    112.8001
    cgsro06v |   422491.9    2336227     0.18   0.860     -4782945    5627929
```

Fixed effects:

```
. * Fixed effects or within estimator
. xtreg $ylist $xlist, fe
note: cgbfo10v omitted because of collinearity
note: cgbsdp55 omitted because of collinearity
note: cgbso13v omitted because of collinearity
note: cgbso14v omitted because of collinearity
note: cgbso15v omitted because of collinearity
note: cgcpdp058 omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =        28
Group variable: id                              Number of groups   =        11

R-sq:  within  = 0.9969                         Obs per group: min =         1
       between = 0.5331                                        avg =       2.5
       overall = 0.6161                                        max =         4

                                                F(16,1)            =     20.42
corr(u_i, Xb)  = -0.9054                        Prob > F           =    0.1724
```

wc18100	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
cgbfdp024	62402.26	839044.2	0.07	0.953	-1.06e+07	1.07e+07
cgbfo10v	0	(omitted)				
cgbsdp060	-1221801	583014.4	-2.10	0.283	-8629702	6186100
cgbsdp55	0	(omitted)				
cgbso01v	-1529635	673243.8	-2.27	0.264	-1.01e+07	7024739
cgbso05v	985.5991	914318.1	0.00	0.999	-1.16e+07	1.16e+07
cgbso11v	3108843	783413.8	3.97	0.157	-6845374	1.31e+07
cgbso13v	0	(omitted)				
cgbso14v	0	(omitted)				
cgbso15v	0	(omitted)				
cgcpdp040	-3619789	2256958	-1.60	0.355	-3.23e+07	2.51e+07
cgcpdp053	-30.06913	8.398551	-3.58	0.173	-136.7828	76.64459
cgcpdp054	.1565024	.3133541	0.50	0.705	-3.825039	4.138044
cgcpdp058	0	(omitted)				
cgcpo02v	-.5138142	.4377225	-1.17	0.449	-6.075605	5.047977

Hausman:

```
. hausman fixed random

Note: the rank of the differenced variance matrix (10) does not equal the numbe
        problems computing the test.  Examine the output of your estimators for
        coefficients are on a similar scale.
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
cgbfdp024	62402.26	-1436956	1499358	.
cgbsdp060	-1221801	3694234	-4916036	.
cgbso01v	-1529635	972347.8	-2501982	.
cgbso05v	985.5991	3659813	-3658828	.
cgbso11v	3108843	-170766.7	3279609	.
cgcpdp040	-3619789	-8669838	5050049	.
cgcpdp053	-30.06913	-64.47388	34.40475	.
cgcpdp054	.1565024	1.396987	-1.240485	.
cgcpo02v	-.5138142	-1.23936	.7255455	.
cgcpo03v	28.30194	51.21568	-22.91374	.
cgsro06v	835343.9	422491.9	412852	.
ecclo01v	2.02e+07	-3.73e+07	5.75e+07	.
ecclo02v	-.0001692	.0005519	-.0007211	.0001496
ecclo08v	6321328	1.39e+07	-7587866	.
ecclo14v	13.07997	-2.810886	15.89085	9.44391
ecpeo02v	627034.1	4744505	-4117471	.

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

  Test:  Ho:  difference in coefficients not systematic

              chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =       67.29
            Prob>chi2 =      0.0000
            (V_b-V_B is not positive definite)
```