Norwegian School of Economics

Bergen, Spring, 2017

Strategic responses of petroleum companies to the oil price drop of 2014

A multiple-case study on how investment and divestment behavior is shaped by internal and external firm factors

Kseniya Grasdal & Carolin Hölscher

Supervisors: Eirik Sjåholm Knudsen & Lasse B. Lien

Master thesis, Master of Science in Economics and Business Administration, Strategy and Management & Energy, Natural Resources and the Environment

NORWEGIAN SCHOOL OF ECONOMICS

Abstract

The drop in oil prices in 2014 induced various strategic responses among international oil and gas companies. This master thesis explores how petroleum companies responded to the oil price slump in terms of investments and divestments and how their internal and external factors influenced these decisions. Internal firm factors are assessed from the perspectives of the resource-based view and the theory of dynamic capabilities, while the external factors of a firm are analyzed with the game-theoretic approach. We conduct a multiple-case study and collect secondary data on six different oil and gas companies which have exploration and production operations. We find that internal firm factors, resources and dynamic capabilities, delineated the general directions for undertaken strategic responses, while strategic games defined the specific actions. Thus, evidence is provided on the characteristics that shape the strategic responses of firms, which can then be used by managers when making decisions in times of unfavorable changes in the economic environment. Likewise, our findings contribute to the further development of the dynamic theory of strategy by Porter (1991).

Preface

This thesis was written by two master students as a part of the Master of Science in Economics and Business Administration degree at the Norwegian School of Economics (NHH).

The idea of our work emerged from the two different academic profiles we have chosen along the course of our studies: strategy and energy economics. Quite early in our work it became apparent that the recent oil crisis and strategic responses of petroleum companies constituted an interesting area of research. However, it took extensive preliminary research to formulate our theoretical and methodological standing. Being mostly experienced with quantitative methods of analysis, we needed to conduct a comprehensive investigation on qualitative methods prior to proceeding with the study.

We are grateful to our supervisors, Eirik Sjåholm Knudsen and Lasse B. Lien, for their continued support, guidance and kind responses to all our inquiries. We are thankful to our advisors for listening, letting us set our own path for research, and further providing valuable and detail-oriented advices. We appreciate that we were able to understand each other both easily and amazingly well.

We could not have done it without all the support we received from our families and friends. We thank them for all the encouragements that we have received along the way.

Finally, as two students having been unacquainted with one another prior to this work, we are pleased by our wonderful cooperation. We supported and motivated each other and brought new insights in our mutual work. Staying open and understanding made it possible for us to achieve the final result and to enjoy the partnership throughout our endeavor.

We hope you enjoy your reading.

Kseniya Grasdal and Carolin Hölscher, Bergen, June 2017

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List of Abbreviations

Units of measures

b	billion, *e.g. bbbl = billion barrels*
bbl	Barrels
boe	Barrels of oil equivalent
boed	Barrels of oil equivalent per day
bpd	Barrels per day
m	million, *e.g. mbl = million barrels*
t	thousand, *e.g. tbbl = thousand barrels*
$	United States Dollar

Abbreviations

CapEx	Capital Expenditure
etc	et cetera
e.g.	exempli gratia: for example
ENGO	Environmental Non-governmental Organisation
NGL	Natural gas liquids
LNG	Liquefied natural gas
M&A	Mergers and Acquisitions
RBV	Resource-based view
U.S./U.S.A.	United States of America
U.K.	United Kingdom

1. Introduction

Since the internationalization of the oil and gas market, oil has become a strategic resource for industrialized economies (Bhattacharyya, 2011). As the most traded commodity in the world with 39.7 billion bpd of crude oil and 21.5 billion bpd of oil products in 2015 (BP p.l.c., 2016), oil shapes the world economy and the actions of its market players. The exploration of oil has caused great changes in the international distribution of power and money as one can see in the example of Saudi Arabia (Yergin, 1991).

Recently, the oil market was hit by a significant oil price drop. Between June and December 2014 the Brent oil spot prices plunged from above $100/bbl to around $50/bbl (Bloomberg, 2017a). We also observe persistent low oil prices after the drop such that oil prices fluctuate around $50/bbl with some downturn deviations two years after the shock (Oil and Gas 360, 2016).

The impact of previous oil price shocks on national economies has been widely researched. For example, Cuñado and de Gracia (2003) estimated the influence of oil price shocks on inflation, as well as Bruno and Sachs (1982) studied oil price shocks and output changes in manufacturing, and Papapetrou (2001) provided empirical evidence for an influence on employment.

Research on responses of the oil industry to the oil price drop in 2014 is still developing due to its contemporary nature. It is however evident that the drop has caused great distress for the oil industry, especially for companies operating in the upstream sector. A decrease in revenues has occurred for most major companies, one of them Exxon Mobil Corporation. The company's first quarter revenue dropped from $93.9 billion in 2014 to $42.3 billion in 2016 (Bloomberg, 2017b). In response to the falling prices companies have adopted various strategic changes. For example, in Canada alone the number of direct and indirect workers in the oil and gas industry has decreased by 185,000 in 2015 compared to 2014, presenting a 25.7% drop. In the same timeframe, spending in the oil and gas sector has decreased by $31 billion or 24.8% (Petroleum Labour Market Information, 2015).

Given the great impact the petroleum industry has on the economy, this thesis is focused on understanding how oil companies have responded to the oil price shock of 2014 and how this can be explained. We place an emphasis on companies that are present in the upstream sector

as those specifically are affected negatively by the oil price shock (Singh, 2015). This consideration leads to our main research question:

How did petroleum companies operating in the upstream sector respond to the drop in oil prices in 2014 and why?

We answer the research question by examining the various investment responses of petroleum companies in the upstream sector based on their specific firm characteristics. Two theory streams are used to explain the responses: theories of competitive advantage and game theory. Particularly, our conceptual considerations of the firm's internal strengths are developed upon the resource-based view (Barney, 1986, 1991; Peteraf, 1993; Wernerfelt, 1984) and the theory of dynamic capabilities (Teece, 2007; Teece, Pisano & Shuen, 1997; Winter, 2003). Our perspectives on firms' environments and competitive interactions build on the game-theoretic analysis based on Costa, Bottura, Boaventura and Fischmann, 2009.

We choose the six cases from the population of international petroleum companies, both independent and integrated, operating in the upstream sector of the oil industry. The data are obtained by thorough scanning of publicly available data sources such as annual reports, company presentations and news reports.

A multiple-case study is conducted to analyze the companies within their environment and examine specific characteristics of the firms. Our multiple-case analysis commences with an exploration of firms' specific characteristics prior to the crisis. In accordance with the theories, we take a look at firms' resources and capabilities and conduct an analysis of the competitive surroundings by revealing games that firms played. We proceed by identifying firms' responses during the crisis and analyze them based on each firm's characteristics. This aims to explain whether the responses stemmed from either firm's internal resources and capabilities or external games that firms play.

We investigate responses in terms of general investment levels, specific investments and divestments in a company's hydrocarbon resource base, change in the size of a company's workforce, and production volumes. We study the geographic dispersion and nature of responses, and timing of investments and divestments made.

We find curtailed investments and increased divestment behavior for all companies in the sample. For vertically integrated companies, investments were focused on upstream

operations while no increased spendings were attributed to downstream units. There was neither an increasing interest in gas, nor a shift towards renewable energy sources in our sample of petroleum companies. We discover that accumulated resources and dynamic capabilities shaped the general direction of the investments and divestments, while external games accounted for precise, definite investment and divestment actions.

The findings suggest that managers should pay close attention to both, internal and external firm factors. Our findings also contribute to the literature on the development of the dynamic theory of strategy (Porter, 1991). Our research suggests that two different streams of theory should not be viewed ultimately as rival approaches when analyzing company strategies, but rather as complementary to one another; they should form parts of an integrative approach to a better understanding of firm performance.

To deliver, justify and answer our research question, the research is structured as follows: In section 2 we review the theories of competitive advantage and the game-theoretic approach. In the same section we determine the firm characteristics that are relevant for our research topic and present our conceptual model. We proceed in section 3 with our choice of methodological framework. In section 4 to 9 we present our case studies in the following order: BP, Lukoil, Chevron, Suncor, ConocoPhillips and OMV. We begin each case by identifying the firm's resources, dynamic capabilities and games, and proceed with the identification of the firm's responses. We conclude each case with the analysis of the responses with respect to the identified characteristics. In section 10 we discuss the findings across the cases, and conclude with implications and suggestions for future research in section 11.

2. Theory and model presentation

Research on strategic management acknowledges two main theory streams in the approach to analyze firm performance. The first theoretical view accounts for a firm's internal strengths and weaknesses, while the second considers the firm's external environment, threats, and opportunities that shape a firm's competitive strategy. The two research streams have been viewed as opposing theories in strategic management. Porter (1991) discussed the development of a dynamic theory of strategy and underlined the importance of understanding how and why firms choose the different strategies. The scholar drew attention to the imperative roles of firm-level theories of strategy that analyze firms' internal resources and activities as well as theories that study firms' local business environments. One of the main questions Porter (1991) raised was whether different levels of success arise from the given competitive environment or from the commitments to various resources and activities. The author suggested that more research should be done to study the dynamics of strategy.

The mainstream theory within the analysis of internal factors is the resource-based view (RBV) described by Barney (1986, 1991), Peteraf (1993) and Wernerfelt (1984). They argued that a firm's sustained competitive advantage is due to its unique resource base. In past years, the resource-based view has been further developed to define the separate concept of dynamic capabilities. A more detailed description of the RBV and dynamic capabilities is provided in the following subsections.

The analysis of the external competitive firm environment is based on various types of market interactions. There are different frameworks and models to describe and study such interactions and their consequences (Day, 1981; Cook, 1994; Porter, 1979, 1980; Porter & Millar, 1985). One of the methods to study business strategies is the game-theoretic approach (Shapiro, 1989). Game theory is a powerful tool to examine classical and complex interactions between various decision makers (Reinganum, 1984). The theory allows to model business interactions in distinct manners and provides a possible set of explanations. As per Ross (2016), the game-theoretic approach gives the opportunity to study players in the local environment of a company, and evaluates the outcomes that can be achieved as consequences of interactions between them.

In the following, we elaborate on the theories that are important for our conceptual research model: the resource-based view, dynamic capabilities and the game-theoretic approach. We

further explain how these theories are applied in the context of the dropping oil price environment and present our conceptual model.

2.1 The resource-based view

The resource-based view is a conceptual approach which considers a firm's resources as the primary basis for competitive advantage, formulated by Barney (1986, 1991), Peteraf (1993) and Wernerfelt (1984). Barney (1991) defined resources as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (p. 101). Barney (1991) divided resources in the following three categories: physical capital resources, human capital resources and organizational capital resources. He defined physical capital resources as tangible assets, such as plant and equipment, access to raw materials, the presence of the firm in geographic areas, and a firm's technology. Barney (1991) described human capital resources as the abilities of all employees as well as specific individuals of the labor force. Whereas, abilities can be determined by training, skills and relationships. Organizational capital resources are defined as the systems and processes present in the firm, incorporating formal systems for reporting and controlling, but also informal coordinating systems and relationships. Beyond Barney's three categories, different scholars added various categorizations of resources such as financial, information and relational resources (Hofer & Schendel, 1978; Hunt & Morgan, 1995).

Barney (1991) developed a guideline to identify which resources are strategic – resources, that allow a firm to outperform competitors. First, to be classified as a strategic resource the asset or capability must be *valuable*. As such the resources must help the firm to neutralize threats or exploit opportunities. The value of a resource is usually content-specific. Apart from being valuable a strategic resource must be *rare*, *difficult to imitate* and *non-substitutable*. This is also often referred to as the VRIN criteria (valuable, rare, inimitable, non-substitutable). If a resource is not rare, it can only create competitive parity and no sustainable competitive advantage. Difficulty to imitate can be due to different reasons: historic conditions that led to path dependency, a causal ambiguous relationship between the resource and the competitive advantage, or the social complexity of the resource. Non-substitutable refers to the state where substitutes either do not exist or are themselves rare,

difficult to imitate, and not valuable. As a result, the VRIN criteria suggests that not all resources and capabilities are strategic. (Barney, 1991)

While the RBV approach is widely accepted, there were some scholars who disagreed with the theory for one reason or another. The RBV's critics were Priem and Butler (2001), criticizing the RBV for the broad definition of its framework. They challenged the argument that if everything that can create value is a resource the measurement and recommendation derivation can be difficult and as such is not helpful for the practitioner. Barney (2001) defended that the non-prescriptive nature of the RBV enhances the value of the theory. As the resources are manifold and content-specific, the RBV leaves enough scope for managers to identify the strategic resources valuable to them. As argued before, the VRIN characteristics constitute a clear guideline for strategic resource identification.

Mahoney and Pandian (1992) pointed out that especially intangible assets explain the heterogeneity across firms and sustain the ability to draw value from tangible resources. The latter argument underlines the importance to consider the configuration of resources, or *bundles of resources,* as the immediate precursor for a firm's competitive advantage (Prahalad & Hamel, 1990). The strategic bundling of resources can take place in different ways. A major corporate strategy that determines the bundling of resources is diversification. Markides and Williamson (1996) explained that "diversification will enhance performance, therefore, if it allows a business to obtain preferential access to skills, resources, assets, or competences that cannot be purchased by nondiversifiers in a competitive market" (p. 344). Diversified assets create the possibility to use market opportunities, they create the potential for economies of scale and scope, and they help to exploit core competences to the fullest (Hitt, Hoskisson & Kim, 1997). Hitt et al. (1997) suggested that international diversification incentivizes stronger resource build up to keep up with superior performance. Wernerfelt (1984) argued that the resource-based view helps to determine which resources diversification should be based upon, which resources should be developed and into which markets the firm should evolve. As follows, the firm's resource base and the determined diversification define favorable resource acquisitions. Wernerfelt (1984) underlined the importance of mergers and acquisitions (M&A) as a way of growing the resource base. He pointed out two specific types of M&A: related supplementary and related complementary. The supplementary resource extension is an addition of a core resource to the existing resource base, in the context of our research this could be for example the addition of a new oil reserve. A complementary resource extension constitutes an addition of a supporting

resource to the existing resource base and thus plays a collateral role in the resource bundle. In the case of the oil and gas industry, vertically integrated petroleum companies are defined by supplementary and complementary resource extensions within upstream and downstream units. Diversification, specialization and integration of a company, depicted by the unique bundle of resources, influence strategic actions available to firms, which, in turn, causes variances in performance.

Priem and Butler (2001) further criticized the static nature of the RBV. In an ever changing world with constantly changing customer preferences and improving technologies the VRIN characteristics of a resource change according to a firm's environment. A resource that was valuable at one point can be of no value following a change in the market settings. Leonard-Barton (1992) argued that core capabilities need to evolve in order to help a firm avoid inertia and operate in the dynamic world. As such the need of a more dynamic approach arises, to better understand the impact of resources and capabilities at firm level, and identify to what extent and how external factors influence this change. The need for a dynamic approach has been addressed by the introduction of dynamic capabilities, which we discuss in the next subsection.

2.2 Dynamic capabilities

Dynamic capabilities have been widely discussed and are described as processes that help a company adapt to and drive the markets in which they operate. In their highly cited paper, Teece et al. (1997) defined dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (p. 516). As this definition points out, dynamic capabilities are distinguished from ordinary capabilities and strategic resources that allow firms to conduct business and are crucial to their survival (Prahalad, 1993; Winter, 2003). Dynamic capabilities alter the set of resources and ordinary capabilities that the RBV sets in the center of competitive advantage. This distinction is supported by the majority of research on dynamic capabilities (Eisenhardt & Martin, 2000; Newey & Zahra, 2009, Teece et al., 1997; Winter, 2003). It is important to specify that the definition includes internal and external competences. A firm must be able to engage and incorporate not only their own competences, but learn from and work with external knowledge. As described by Teece et al. (1997, p.516), "integrate, build and

reconfigure" suggests that the firm needs to be able to incorporate new assets and resources, while working with the existing ones.

Eisenhardt and Martin (2000) added that change does not need to be rapid, such that the concept of dynamic capabilities is applicable in moderately dynamic markets. Zahra, Sapienza and Davidsson (2006) extended the definition by proposing that dynamic capabilities may not only address external changes, but may be attributed to internal pressure for change within the company. Furthermore, some scholars pointed to the important role of management within dynamic capabilities (Teece, 2007; Zahra, Sapienza & Davidsson, 2006). They infer that management's ability and willingness to enable and push the development of dynamic capabilities are key drivers of their existence and use. Ambrosini and Bowman (2009) sum up that dynamic capabilities are intentional organizational processes that aim to change the current resource mix in order to sustain a competitive advantage. The processes can thus respond to internal and external pressures, as well as to incremental and rapid change.

Dynamic capabilities have been embraced by many scholars as they tackle the problems arising from the modern dynamic world. However, there are challenges and criticisms to the theory of dynamic capabilities that cannot be ignored. The greatest criticism of dynamic capabilities is that the concept is vague and tautological (Williamson, 1999). For a long time there has been no accepted framework of exact processes that are classified as dynamic capabilities. Yet, Zahra et al. (2006) as well as Ambrosini and Bowman (2009) examined the concept and possibility of building specific frameworks. They provided evidence that even though there is no accepted framework, existing research has detected commonalities across firms that are associated with dynamic capabilities. Those commonalities stem from equifinality as Zahra et al. (2006) pointed out. Idiosyncratic paths in firms lead to the same dynamic capabilities. Common processes include, for example, research and development spending, product development, and resource divestment (Zahra et al., 2006; Ambrosini & Bowman, 2009). The claim that dynamic capabilities are tautological stems from the perception of dynamic capabilities as a source of competitive advantage. It is often argued that dynamic capabilities cause superior performance, such that if the firm performed better than average, then it must have deployed dynamic capabilities. Thus, it may be difficult to separate dynamic capabilities from their generated effects. This fact, of course, gives reason to criticize the dynamic capabilities theory. Based on the mainstream view that dynamic capabilities only impact firm performance indirectly, Eisenhardt and Martin (2000) defended

that dynamic capabilities can be disconnected from firm performance and measured based on whether they lead *to change in the ordinary capabilities*. This disconnection resolves the problem of tautology within empirical studies.

Another challenge lies in the distinction between dynamic capabilities and "ad hoc problem solving*"* as Winter (2003, p. 992) described it. In response to major incidents, for example a crisis, firms respond quickly in order to survive. Improvisation is, according to Winter (2003), however, not a dynamic capability, as it is lacking the intention and routine for change. Thus, to overcome this challenge, it is imperative to examine carefully whether *dynamic capabilities were established and developed* prior to an incident to delineate the responses from actions performed on an ad hoc basis.

2.3 RBV and dynamic capabilities in the petroleum industry

In this section we highlight important derivations from the resource-based view and dynamic capabilities in relation to the oil and gas industry. We explain how conceptual aspects of the theories are relevant to the industry specific context. We also discuss which resources are important within the upstream sector of the oil and gas industry. As for dynamic capabilities, we describe the framework proposed by Shuen, Feiler and Teece (2014), and review its relevancy to the oil crisis.

2.3.1 Resources in the upstream sector

Theory on the RBV does not provide specific resources that should be valuable in the oil and gas industry. As discussed previously, the significance of resources is content-specific and should be evaluated based on industry characteristics. The focus of our research paper lies on the upstream sector of the oil and gas industry. Core activities of the sector revolve around the identification of oil and gas deposits and their further extraction and production. Thus, reserves, physical assets such as different types of oil and gas, fields and licensing areas, where reserves are deposited, together with companies' memberships in Exploration and Production (E&P) venturing projects play a crucial role in this part of the business area. Oil and gas reserves are spread worldwide with specific characteristics such as being of conventional and unconventional nature. Conventional oil and gas extraction includes traditional rig drilling and the extraction by pumping out the natural flow of hydrocarbon resources. Unconventional extraction encompasses a wide variety of hydrocarbon sources,

such as oil sands, shale oil, extra heavy oil and gas to liquids, and utilize specific and unique techniques and methods of extraction for further production. This broad contrast in the available upstream hydrocarbon resources implies different technological competences available for extraction of one or another type of the resource. It also implies that the geography of E&P operations is diversified based on the resource presence and concentration. Physical resources or bundles of geographically dispersed various types of resources are rare and valuable, inimitable and hard to substitute, thus playing a strategically important role for the companies operating in the upstream sector of the oil and gas industry.

Human, financial, organizational, informational and relational types of available resources in the industry play collateral roles. We recognize the value of these resources for competitive advantage and as the means to manage through the critical time of the oil slump. However, in the case of integrated companies – operating both in upstream and downstream – it is hard to separate which resources are specifically impacting operations in the upstream sector and which resources are valuable only for downstream operations. For example, the established corporate organizational resource may benefit both, upstream and downstream units, in various manners. Informational resources in the form of a corporate Enterprise Resource Planning system cover various types of business operations, beginning with upstream production to transporting downstream end products. This makes it difficult to evaluate how exactly the upstream unit of the large integrated company benefits from this type of resource.

As a result, physical resources, which are attributed solely to upstream operations of petroleum companies, represent the key strategic resources for our analysis. Such analysis of hydrocarbon assets and E&P projects delineate the conclusions over the diversification or specialization of the company. The whole physical resource base, including downstream assets, allows conclusions to be drawn over a degree of integration.

2.3.2 Dynamic capabilities in the upstream sector

Shuen et al. (2014) applied the dynamic capabilities framework to the upstream oil and gas industry. After thorough industry analysis of the historical trends and developments, they arrived at the following three specific dynamic capabilities that are important in the sector: ambidexterity, the management of the upstream business ecosystem, and the management of health, safety, security and environment.

Ambidexterity is the ability of firms to foster an entrepreneurial spirit while maintaining and operating old ordinary capabilities. Its aim is the integration of change with stability (O'Reilly & Tushman, 2008). In the oil market, established ventures are still strategically important while new unconventional technologies and geographies are disrupting the market. Hence, to be ambidextrous is imperative for petroleum companies, and is achieved by the development and promotion of ambidextrous leaders. "Ambidextrous leaders simultaneously promote both, establishing separate organizational entities, business models, processes, systems, and cultures for each, while holding them together through unified strategic intent, common values and linking mechanisms to leverage assets" (Shuen et al., 2014, p.7). Search and development of innovative approaches, embracement of varieties of methods and business operations together with the maintenance of established and proven processes underlies the basic meaning of ambidexterity for companies in the upstream oil and gas industry. An allocation of resources from mature projects to emerging ventures promotes operational flexibility and ambidexterity, and simultaneously fights business inertia.

The *management of the upstream business ecosystem* is crucial as the market is increasingly influenced by national market players, independent companies and service providers. The need to engage in ventures, manage contractors and source knowledge are key factors in the upstream oil and gas industry. This dynamic capability, according to Shuen et al. (2014), comprises several drivers of economic value: strategy formation, management of joint ventures, management of non-operated ventures, acquiring technical capabilities, and finally, the development and deployment of new technologies. Strategy formation includes the knowledge of market conditions, standards and existing regulations together with the ability to sense and seize opportunities. Management of joint and non-operated ventures stresses the significance of participation in various types of partnering projects and relationship-building within these ventures. Finally, acquiring technical capabilities, together with the development and deployment of new technologies, emphasize the importance of acquiring talent and appropriate knowledge from both sources, within a company and its environment. Technological knowledge and the competence of petroleum companies' operations in the knowledge-intensive oil and gas industry is increasingly important due to the shift to unconventional methods. During the fast-paced depletion of conventional pools, requirements for new technological solutions for unconventional oil and gas became increasingly imperative. In order for oil companies to reach complex deposits and to enter new geographical areas, characterized by harsh climate conditions, technological

achievements began to attract more managerial attention. The ability to establish effective and long-lasting research and development (R&D) processes in a form of higher-order capabilities, as Winter (2003) refers to dynamic capabilities, permits improvement of ordinary capabilities to extract and produce oil and gas. This brings the whole cycle of upstream business performance to the next level of operational establishment with better core capabilities and performance metrics. In like manner, Makkonen, Pohjola, Olkkonen and Koponen (2014), examining Finnish companies in the context of the financial crisis, allocated one of the crucial roles in their dynamic capabilities framework to R&D investments and routines.

The *management of health, safety, security and environment* was discussed with the example of the Deepwater Horizon oil spill in the Gulf of Mexico in 2010 (Shuen et al., 2014). It has caused damage to the whole industry and especially to the engaged companies – BP, Transocean and Cameron International. Shuen et al. (2014) set this dynamic capability apart from the general risk management, which should be considered an ordinary capability. The scholars argued that the management of health, safety, security and environment is a dynamic capability as it must be developed to avoid major disasters for a company that aims for long term growth and prosperity.

2.4 The game-theoretic approach

2.4.1 Game theory overview

Game theory allows to build explanations for interactions between companies in the market with the help of applicable models. The basic idea is the concept of a game, which is a formal description of a strategic situation. Games describe the decision-making processes of players, who employ specific strategies and whose choices affect the interests of other players (Turocy & von Stengel, 2001). Starting with the distinctive work by Von Neumann and Morgenstern (1944), the theory began to flourish with proposed miscellaneous game variations and practical applications to business situations. The prominent work by Nash (1950) demonstrated the existence of an equilibrium point for finite games with given choices for all players, which became a central concept for noncooperative game theory (Nash, 1951). An equilibrium point represents a balanced solution to the game, and suggests that any player's rationalized strategy converges from the starting point to this unique

solution (Harsanyi & Selten, 1988; Milgrom & Roberts, 1990). Nowadays, it is possible to distinguish between normative and positive game theory. The normative game theory aims to find universal properties for a solution to a formal game and uses axiomatic methods as the tools, while positive game theory tries to explain real world observed behavior and how players act in games de facto (Shubik & Powers, 2016). Accordingly, the ideas that game theory elaborates on are not mathematically inherent, but the theory uses mathematics to express its postulates. Thus, one can treat game theory as a social science to study interactive behavior between decision-makers (Osborne & Rubinstein, 1994). The use of formal analytical methods creates an independent mathematical interest, however, there are sources that show the integrative power of the game-theoretic approach revolving around mathematics and management sciences (Dixit, Reiley & Skeath, 2009).

A firm's business interactions or games, using the game theory terminology, form the focus of our academic attention. Narrowing down to the aspects of a game, we may distinguish between various dichotomies existent in the game theory (Osborne & Rubinstein, 1994; Shubik & Powers, 2016). One of the major distinctions is the juxtaposition of cooperative and non-cooperative games, where the former investigates coalitional games and how gains of a coalition should be divided between members, while the latter concerns the games with players making choices out of their personal interest (Friedman, 1990; Osborne & Rubinstein, 1994; Turocy & von Stengel, 2001). Another distinction is between strategic and extensive games. Strategic games are models of situations, usually outlined in a form of a payoff matrix, where players are uninformed about the plans of others and move simultaneously. Extensive games imply a sequential ordering of decision-making for players, and are depicted in the form of a decision tree (Dixit et al., 2009; Osborne & Rubinstein, 1994; Turocy & von Stengel, 2001). Further groupings are based on established differences between situational set-ups in the games, such as games with perfect and imperfect information, uncertain player types and solutions to these games (Shubik & Powers, 2016).

Game theory provides a wide variety of tools and methods for the analysis of strategic interactions (McCain, 2014). However, Camerer (1991) discussed some criticism of the game theory. The author stated that most research in business strategy was empirical, and game-theoretic methods did not generally show predicted regularities in hypothesis testing. Further, Camerer (1991) named the assumption of rationality of players as an impeding factor, and mentioned the general ignorance of strategy researchers towards the "brand" of the theory of games (Camerer, 1991, p. 138). The writer's argument was that these are poor

reasons for not using game theory for strategy research. Camerer (1991) mentioned the constant advances and development of the theory, which can help to overcome the brand-issue. The author also stated that valid research does not need to result necessarily in widespread regularities. Finally, Camerer (1991) reminded that there are methods to solve some type of games where less rationality is required to calculate the equilibrium point.

Later on, Brandenburger and Nalebuff (1996) used concepts of game theory for explanations of various business situations. The authors considered a number of non-zero-sum games as the descriptive tool for real-world examples of competitive and cooperative interactions or co-opetition. To point out, non-zero-sum games represent situations, when one player's gain does not result in the other player's loss. Brandenburger and Nalebuff (1996) also stressed the importance of players identification in the environment of a company and the right game to play. Knowing what game to play equips decision-makers with the necessary methods to act. Costa et al. (2009) took a step further in the attempt to develop a methodology for the right game identification. They propose the Strategic Games Matrix (SGM) as a conceptual framework to support decision-makers in various business situations. We elaborate on the SGM in the following section.

2.4.2 The Strategic Games Matrix

Costa et al. (2009) extended the concept of co-opetition, arguing that player's attitude toward competition, whether it is competitive or cooperative, should be paired with the player's power-ratio assumption. To be precise, the authors developed three dimensions for competitive posture: rival, individualistic and associative. Rival means that a company shows a "warrior attitude", individualistic means that a company demonstrates a "combative attitude" and associative points at a "cooperative attitude" (Costa et al., 2009, p. 140). Equally important, the authors identified three dimensions for the power-ratio assumption – stronger, balanced and weaker – to describe the relationship of forces when players are confronted with each other. The two measures, competitive posture and power-ratio assumption, determine the axes of the proposed matrix for strategic games (SGM). The mapping of classical games according to the dimensions allowed the scholars to distinguish five typical strategic situations, and led to assume the existence of four new situations (Figure 1, Figure 2).

Costa et al. (2009) proposed the following grouping of classical games depicted in Figure 1.

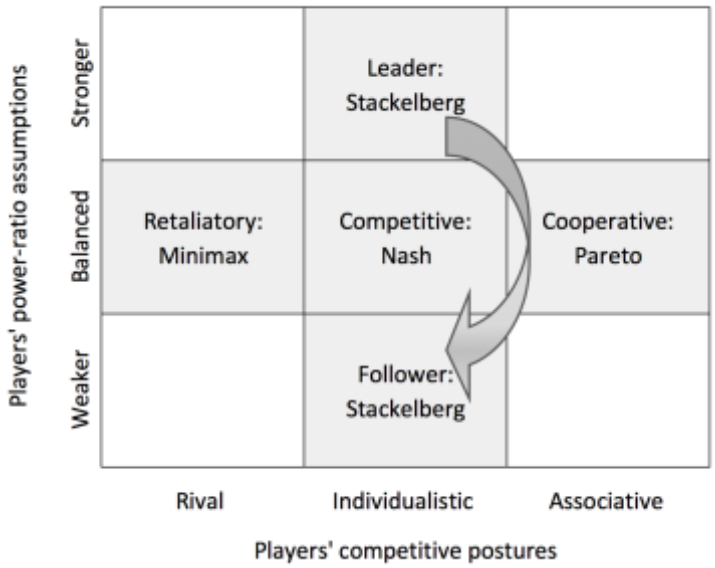

Figure 1. SGM with strategies for classical games. Reproduced from Costa et al., 2009, p. 144.

1. *Competitive type games* with the Nash equilibrium strategy correspond to game-theoretic situations characterized by perfect competition without the dominance by any single player. This situation corresponds to non-cooperative non-zero-sum games where players are preoccupied with optimization of personal objective functions. Solutions to these types of games constitute the set of decisions known as the Nash equilibrium point. The central cell of the matrix corresponds to this strategy.
2. *Cooperative type games* with the Pareto equilibrium strategy represent *win-win* games with established implicit or explicit agreements, where the solution is a Pareto optimum point. This means players cannot improve their outcomes without worsening the outcomes of others.
3. *Leader/follower type games* with the Stackelberg equilibrium strategy are characterized with unbalanced power-ratio assumptions of players pursuing individual competitive aims. The upper and lower cells correspond to the leader's and follower's strategies. The Stackelberg equilibrium point is the solution to this class of games, where a weaker player makes rational and optimal decision within the limitations set by a leader.
4. *Retaliatory type games* with the Minimax equilibrium strategy encompasses the zero-sum class of games with a saddle point as a solution. That is to say, zero-sum games illustrate situations, when one player's gain equals the loss of the other player. Each

player acts in accordance with strategies that optimize his objective function. Thus, the solution of pay-off matrix is the saddle point, which is a minimum of its rows and maximum of its columns. The saddle point in game theory is also called a minimax equilibrium point.

For the vertices of the SGM, Costa et al. (2009) proposed two limit-case situations – strategic situations with no corresponding classical games – with a pair of strategies that are displayed in Figure 2. The authors of the SGM approach underlined the need for further development of limit-case scenarios and the necessity to establish mathematical descriptions with deriving an equilibrium point for each of them.

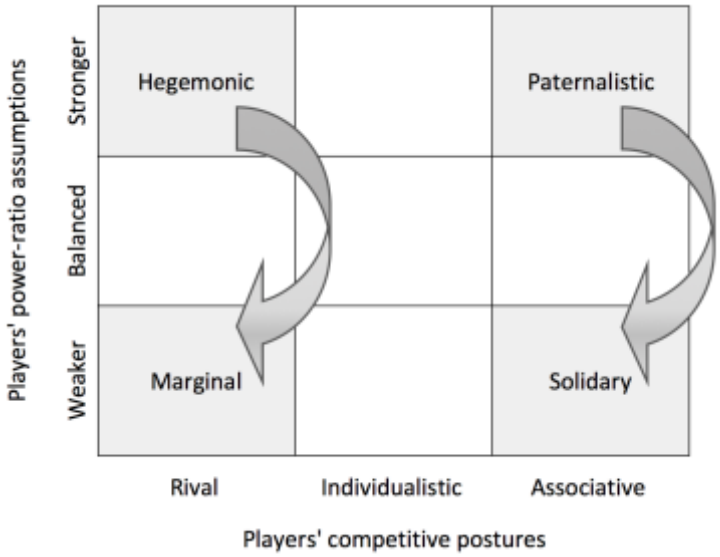

Figure 2. Limit - case situations in the SGM. Reproduced from Costa et al., 2009, p. 147.

1. *Paternalistic-solidary type games* with both the stronger and weaker player modeling their actions to develop the business as a whole for mutual benefit.
2. *Hegemonic-marginal type games* illustrate situations characterized by a rivalrous competitive attitude between the weak and strong players.

The SGM is the formalized tool for game identification, which permits a game-theoretic analysis of a firm's business surrounding. The application of this framework enables us to identify players and games in the surrounding business environment of oil and gas companies.

2.5 Conceptual model

During a frame-breaking change such as an oil price drop, firms redefine their disturbed strategies, as suggested by Tushman, Newman and Romanelli (1986). The redefinition of strategies is reflected in the strategic responses we observe, such as a change in investments, production adjustments and changes in the number of workforce. However, theory suggests that these responses occur within the limits set by internal or external factors. As outlined previously, one stream of theories suggests that internal factors, such as resources and dynamic capabilities, influence a firm's strategies. Another stream of theory, the game-theoretic approach, implies that the games played by firms in their competitive environment determine the strategy and actions of these firms. While the criticism for the resource-based view points out that the competitive environment cannot be left out of the picture to determine strategies, the position a firm takes in the games played also is influenced by the company's own resources. We therefore infer that the investment responses that petroleum companies show as a reaction to the dropping oil price of 2014 are influenced by both, their internal setup – resources and dynamic capabilities – as well as their external position – the games companies play. In the development of our conceptual model, we consider that physical resources play the key role for the upstream sector. The impact by financial, human and other resources is harder to identify due to their complex nature for vertically integrated companies, but the resources are nevertheless influential for the investment outcome. Dynamic capabilities, important for the petroleum companies in the upstream sector, include ambidexterity and management of the upstream business ecosystem. In our conceptual model, we exclude management of health, safety, security and environment as we found it irrelevant to the question we aim to answer. The development of health, safety, security and environmental management has its purpose in eliminating the possibilities of ultimately damaging long-term outcomes for the business and people involved within undisturbed competitive settings, and has a small impact on strategic investment responses due to the oil crisis. As for external factors, the competitive environment is characterized through the identification of the players and games the companies engaged in within the upstream sector. All things considered, we expect that strategic investment and divestment responses caused by the oil price drop are ultimately shaped by both, the internal firm's resources and dynamic capabilities, and external firm's competitive environment (Figure 3). Moreover, we assume that there is a connection between internal and external factors, and we aim to investigate the existence and nature of this link. We also distinguish responses that were influenced by other

unrelated reasons, such as ad hoc reactions to the frame-breaking change as suggested by Winter (2003). In our study, we explore the nature of the responses for the set of case companies and identify the underlying factors based on the employed theories.

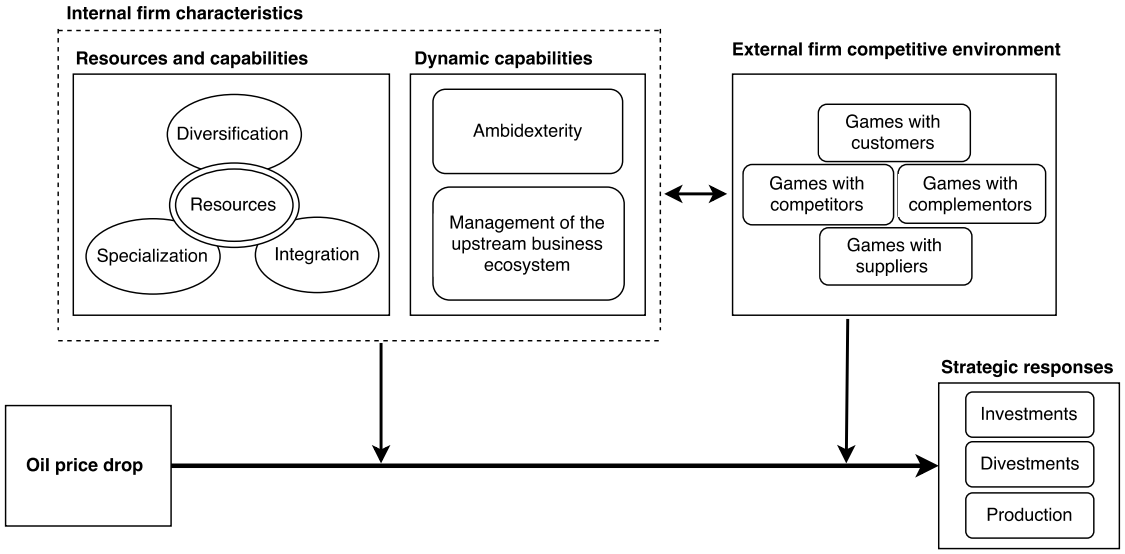

Figure 3. Model of influential factors shaping strategic responses of petroleum companies operating in the upstream oil and gas sector.

3. Methodology

In the present chapter we outline the methodological choice for our thesis. This chapter unfolds in three steps. First, we define the nature of our research design and methods and outline the arguments for the chosen research strategy. Second, we discuss our sample selection by employing sample techniques appropriated for our research purposes. Finally, we discuss the collection of data and our approach for its further analysis.

3.1 Research design

Our main research question guides us with the choice for a research design. The goal of our research is to get an insight in the phenomenon and appropriate a better understanding of the topic of interests. Therefore, designing an exploratory study is the valuable mean to achieve what we aim for in the present paper (Saunders, Lewis & Thornhill, 2016). An exploratory design allows for the flexibility to adjust our research development in accordance with new data and the understanding that may emerge subsequently. However, we are not fully unabridged in our approach. Our exploratory design is constrained by the set of theories we discussed, and therefore is constricted and circumscribed by the resource-based view, dynamic capabilities and the game-theoretic approach.

The challenges accompanying the pursuers of an exploratory research design include the absence of preset propositions, which presuppose detailed steps and actions for further research developments. However, as Yin (2009, p. 29) stated, a certain degree of direction and rationale should be identified for any exploratory endeavor. In our work, the direction is set by the theories we employed. Yin (2009) also stated, that any exploratory study should have its purpose. The purpose of our study is to understand how petroleum companies addressed the oil price crisis of 2014, how they responded, and why they responded in a particular manner. We theorize that two rivalrous theoretical trends influence strategic responsiveness of oil companies operating in the upstream sector. The resulting analysis infuses literature with more evidence and helps to reveal how different theoretical approaches can be incorporated in one general framework. Moreover, we want to enhance managers understanding of the reasons for strategic actions during adverse economic conditions. This is achieved by demonstrating how resources and capabilities together with strategic competitive games shape the responses of companies.

3.2 Multiple-case study

The main idea in our choice of research strategy is to determine which strategy allows us to achieve a coherence throughout our work in the best possible manner, and additionally, which strategy leads us to achieve the research aim in an optimized way. We decide for a multiple-case study as the most appropriate strategy for our research paper and present the following arguments for our decision.

Our main research question *How did petroleum companies operating in the upstream sector respond to the drop in oil prices in 2014 and why?* includes a *How?* and *Why?* question, which favors case study, experimental or historical approaches (Yin, 2009). Benbasat, Goldstein and Mead (1987) stressed that researchers should consider a number of conditions to judge whether or not the case study strategy is appropriate. First of all, the researchers should have a clear understanding of the possibility of a case to be studied outside its natural settings. In our study it is to note that we cannot separate our cases from the environment, as the surrounding environment of the petroleum company is the important part of our study. Furthermore, Benbasat et al. (1987) and Yin (2009) underlined the relevance of control. As the investigators in pursue for answers, we have no control over the subjects and conditions they developed in. As the authors imply, limited or absent control implies that a case study is an advantageous approach for the research design.

Another point concerns the contemporariness of events, which delineates the difference between historical and case study approaches. In our study, we have to carefully distinguish our chosen case study strategy from historical methods as there are many of the same techniques employed (Yin, 2009). The uniqueness of a case study is that it deals with a variety of evidence. As we discuss further, we utilize diverse separate sources of information. Besides, historical approaches do not account for the importance of entangled conditions (Yin, 2009, p.19), which is significant for our study as we investigate the responses of oil companies under the condition of the oil slump.

Finally, Benbasat et al. (1987) discussed the provision of a theoretical base for the research. The authors determined the case study as an appropriate strategy when there is no strong theory established to explain the phenomena. In the present paper, we identified different theories to account for the same course of events, but the interaction between the theories and companies' responsiveness during the oil price crisis is yet to be analyzed.

In summary, we use the case study method because we want to study a real-life phenomena in depth, and we cannot neglect the contextual conditions as they are germane to our phenomena of study.

The next fundamental step in the research design development within the case study strategy is the definition of its unit of analysis. Yin (2009) proposed that an appropriate unit of analysis can be deduced from the main research question. Our research question guides us to the topic of interest, particularly, responses of the petroleum companies to the oil price drop in 2014. We want to study the responses and the factors shaping them in the particular settings during the concrete time period. Studying the responses to the crisis, it is important to consider influential firm characteristics and competitive environment based on the established theories in order to understand how these responses can be explained.

The considerations of the unit of analysis itself take us further to the question of how many cases should be considered for our research. The case study approach consists of both single- and multiple-case studies. The multiple-case study approach has its advantages as it delivers more comprehensive compelling results (Yin, 2009, p. 53). The choice of a multiple-case study is also linked to the replication logic (Yin, 2009). There are two criteria for replication – literal and theoretical. Multiple cases can be chosen based on their typical resulting outcomes, which underlines the idea of literal replication. Theoretical replication represents a more sophisticated design as it chooses cases based on categories such that each case belongs to the group within each category. Thereupon, to produce a stronger effect and alleviate skepticism we conduct a multiple-case study.

3.3 Time horizon

The choice of a longitudinal study is advocated by both our research question and its advantage of studying the development and change. To understand what kind of capabilities and resources have been accumulated by the companies together with the competitive environment, players and type of games, we include two years prior to 2014: 2012 and 2013. The crisis year, 2014, is divided into two periods: from January to August and from August to December. The second part of the year is characterized by the rapid gradual oil price decrease. Expecting a lag in reactions we aim to include subsequent periods. However, we are limited by the availability of data. Our study is conducted in the first half of 2017 and most companies are still working on the issuance of their annual reports for 2016. The only

issued period available was 2015. Therefore, we focus on the period we can obtain all information about: 2012–2015 including the edge years.

3.4 Sampling

The population from which we select our sample are publicly traded petroleum companies with prevailing public equity and no significant state ownership, and main operations in the upstream sector of the oil and gas industry. This does not mean we focus only on independent E&P companies without downstream-tailored businesses, but we include integrated oil and gas producers as this increases the variety between business models. Diversity in companies' integration schemes is a particularly interesting topic as we aim to study firms' resources and capabilities. For example, the prevailing number of large petroleum companies are vertically integrated, including both, upstream and downstream units of operations. However, there are also independent E&P companies, which operate solely in the upstream oil and gas sector. As mentioned, we exclude companies that have significant state ownership. Our personal working experience shows that state-owned companies make frequent decisions that are based not only on finding the optimal market strategies, but also on political reasons. Therefore, companies like Statoil, ENI, Rosneft are excluded from our sample. We do not establish any geographic boundaries. On the contrary, we aim to choose from the population of companies with geographically distributed domestic markets to ensure a diverse set of specialization and institutional set-ups.

To conduct our in-depth study, we carry out a non-random sampling to select information-rich cases. As Saunders et al. (2016) pointed out, non-random sampling includes an element of subjective judgement. The purpose and focus of our research guides us in our judgement together with the availability of information. Our approach is to ensure that we are able to collect all possible information to answer our research question. Data on our cases should be transparent and credible with no delays in publishing, which makes our sampling purposive. Further, the strategy we employ is heterogeneous as we want to allow for variations between cases, so we are able to observe differences in the key themes of our study. As a result, we establish two groups of our cases to underline the difference between them. We present the groups in Table 1 and elaborate on our choice in the next paragraphs.

Table 1

Grouping of companies by revenue and production volume in 2012–2015

Large-scaled companies	2012	2013	2014	2015
BP				
Revenue	375,517	375,765	379,136	353,568
Production	3,331	3,230	3,151	3,277
Chevron				
Revenue	222,580	211,664	192,308	122,289
Production	2,610	2,596	2,570	2,622
Lukoil				
Revenue	116,335	119,118	124,405	85,356
Production	2,175	2,203	2,312	2,378
Small-scaled companies	2012	2013	2014	2015
ConocoPhillips				
Revenue	63,289	58,258	54,573	52,001
Production	1,578	1,502	1,540	1,589
Suncor				
Revenue	38,780	38,134	38,448	36,105
Production	549	562	535	578
OMV				
Revenue	47,416	54,842	56,339	47,710
Production	304	288	309	303

Notes: Revenue is portrayed in million US$. Production output is portrayed in tboed.

The first group includes large privately-owned integrated oil and gas companies with international operations. We populate this group with three companies with geographically disparate domestic markets to ensure resource diversification. Our first case is BP p.l.c. (BP), a British integrated company, with well-organized and rich annual documentation on its performance and no state involvement in its governance. BP is an interesting case mainly as it has a grim history of dealing with consequences from the biggest oil spill in the U.S. Gulf of Mexico dated 2010. We expect this choice to infuse our research with interesting aspects and informative outcomes. The second case is PJSC Lukoil (Lukoil), a Russian integrated oil

and gas company, which has avoided governmental interference and maintained its private status in the domestic market. Seemingly in the vulnerable position, Lukoil reported positive results in 2015 and avoided an increase in its liabilities, which attracted our attention. Lukoil provided a comprehensive supply of high quality annual reporting, which led to the choice of this company as the second case in the group of large integrated companies. Finally, topics on American shale oil have recently prevailed in the industry media announcements, which inevitably implies that one of the major American companies is the third case we concentrate on. Two major players, Exxon Mobil Corporation and Chevron Corporation (Chevron), dominated the U.S. domestic market. We found a minimal variation in companies' operations. Based on the revenue value in 2015, Exxon Mobil Corporation appeared similar to BP, while Chevron reported notably smaller numbers. The latter fact has favored the choice of Chevron as our third case to ensure a diverse set of companies.

To establish the second group of smaller-scaled companies, we ensure the variation based on concrete aspects of companies' characteristics. First, market capitalization and equity are the appropriated indicators of the company's value and used by market analysts to designate the size (Pitatzis, 2016). However, these two indicators only indirectly demonstrate the alterations in the performance – through change in the outstanding shares and change in assets and liabilities. In time of crisis, revenue and production changes provide with more actual information on a company's performance and scale of its operations (Saleh & Ahmed, 2005; Jaffe & Soligo, 2007). Revenue and production levels during 2012–2015 are employed as appropriate metrics to understand differences in performance and operational scale across companies, and allowed us to populate the second group with operationally smaller-scaled companies. The availability of information and diversification of the companies also impact our choice here. Analyzing recent industry news, we encounter interesting prognoses on Canadian oil sands operations to be in a questionable state due to the oil price slump (Austen, 2015). Suncor Energy Inc. (Suncor), the major integrated oil and gas player in Canada with special focus on oil sand operations, provides well-organized annual archives and is chosen to be the first case in the smaller-scale group of oil and gas companies. Further, one of our goals is to include an independent E&P company in the sample. Most companies are only hardly comparable with integrated behemoths in their operational scale, revenue streams and, most importantly, internationally standardized and transparent documentation. ConocoPhillips Company (ConocoPhillips) appears to be one of the relatively large independent E&P companies with an exhaustive data set, allowing us to

include it in our group. Finally, we look back to the Eastern hemisphere in order to find the third case for our second group – a publicly traded company with no major influence by state and with appropriate available information, which can be analyzed for our purposes. Our attention was attracted to OMV Aktiengesellschaft (OMV), an Austrian integrated oil and gas company, which recently proclaimed its increasing interest in upstream operations. All in all, Suncor, ConocoPhillips and OMW conclude our smaller-scale group of oil and gas companies as diversified and interesting cases for the following analysis.

Assuming rather large differences between companies in the larger- and smaller-scale groups, we also allow for some variance within the groups itself to increase within and across group heterogeneity. We aim to compare cases in an exploratory manner which implies that we do not have specific expectations regarding the possible results of the study for the established groups.

3.5 Data collection

Upon assurance of conducting the sampling, we turn to the questions of which data sources we utilize for the research. The main sources of information include companies' annual reports and news archives. In addition, we use companies' official website information, official published letters and additional reports such as investor's documentation or sustainability reports. We further include relevant information sources, as they become apparent throughout the data collection. To study the competitive surroundings and reveal opposing players in the games for each of our cases we utilize Spiderbook solution by Demandbase (https://spiderbook.com/). Spiderbook solution provides information on business relationships of companies by screening and analyzing electronic articles in the web. We carefully evaluate each of the purposeful links to ensure a delivery of credible information and whether the results are within our time horizon.

3.6 Data analysis

3.6.1 Analysis of the company's resource base

We conduct our data analysis in a number of steps. First, for each of our cases we collect pre-crisis information about the company's distinctive characteristics and resources. Physical

resources of the petroleum companies are of imperative importance. For each our case we distinguish various hydrocarbon resources, their production outputs and reserve base. Further, we will analyze international assets and global presence. The meaning of oil and gas assets encompasses exploration fields, license areas, joint E&P projects with controlling operations, or partial active or nominal membership, but with an impact to total company production. The fact that such memberships add on production makes it valuable to the company, and underlines the importance of consideration over such assets and partnerships. The analysis of the physical resources includes an assessment of the upstream product portfolio and related competences in order to understand diversification or specialization within the industry. For example, how much output is allocated to oil and how much to gas. At the same time, the IEA (2016) reports in the "World Energy Outlook" on the increasing divestments in the oil and gas industry, while energy substitutes are appropriating market share. Therefore, we include an assessment of companies' engagement in the market of renewable energy sources and evaluate their diversification outside the oil and gas industry. Finally, we appraise the downstream resource base if available, and compare capacities of both, upstream and downstream units. We also evaluate capital expenditure (CapEx) and earnings from these units, if applicable, to analyze the integrative schema and relative size of upstream and downstream operations. We draw conclusions on how integration supports the business and which of the units is the primary focus of the integrated company. We also report on human resources before the crisis, and other types of resources, such as financial resources, if we detect peculiar pre-crisis settings that may impact the company's responses to the oil price crisis.

3.6.2 Analysis of the company's dynamic capabilities

Our analysis of the dynamic capabilities is built upon the dynamic capabilities framework from Shuen et al. (2014) for the upstream sector of the oil and gas industry. For each of our cases, we study various sources of information to understand if there is evidence to consider the company to be ambidextrous. This means that we search for data and publications, which help us distinguish whether the company manages both current established business operations within the upstream sector and new ideas, development and trials of new approaches within various E&P operations. We also look for evidence of the dynamic capability of managing the business ecosystems. This is a complex capability that is built upon several elements. We evaluate strategy formation, management of joint and non-

operational ventures, and we analyze how the company appropriates technological knowledge and competences. Further, we look for established R&D processes, and assess the impact these higher-order capabilities have on core capabilities. Our research includes the findings on the relevant dynamic capabilities that are observable for each of the cases.

3.6.3 Analysis of the company's games

In accordance with the SGM, we start by defining opposing players in each of the following groups: suppliers, competitors, customers and complementors. Based on Brandenburger and Nalebuff (1996), we identify suppliers as the organizations that provide our selected case study companies with raw materials, labor and services. Customers are organizations that acquire the production output of our companies. Complementors are those organizations that enhance the value of the product of our companies for the customers. Competitors are organizations that make the product of our case companies less attractive to the customers. We utilize the Demandbase screening solution Spiderbook to reveal competitors, complementors, suppliers and customers for each company except Suncor. Data on Suncor is not available in Demandbase and is gathered from the additional web-sources that we reference. Finally, we analyze news attributed to the same time period to reveal particular interactions between players in the value network with each of our companies and elicit the games. The definitions of the games are based on the work of Costa et al. (2009).

As a side note, it is important to understand the specifics of competition in the upstream oil and gas market when we define competitors and associative games. There are two kinds of competition (Stabell, 2001). First, oil companies compete in the international arena by offering their services to national companies to enter their territory and assist with exploration and production efforts. The scale of such operations differs depending on geographic presence of the fields and license areas, requirements and details of the projects. The second type of competition is when oil companies compete within their domestic markets and try to get access to land and hydrocarbon beneath it. In such cases oil companies designate this task to their land departments. The latter organize the access by negotiating with owners, and federal or provincial authorities. The most common way to gain access to the valuable fields is to participate in tender games. Petroleum companies usually place requests for tenders and compete for appropriation of petroleum prospective licenses. The transparency of tender procedures depends on national governments, established economic

institutions and policies. Thus, we consider both competitors in international and domestic markets, bearing in mind the difference in the nature of competition.

3.6.4 Analysis of the company's responses

In the next step we reveal responses in the second half of 2014 to December 2015. The study of responses constitutes an analysis of investments and divestments in form of capital expenditures each company made in the upstream sector, as well as specific physical resource investments and divestments. Those include the appropriation of oil and gas fields, projects or licensing areas for further exploration, the enhancement of infrastructure of existing assets or the maintenance of facilities to increase production. In addition, we consider the change in workforce numbers and production levels as potential responses to the oil crisis, as those responses are tightly linked to the general investment and divestment responses.

Further, we research the link between the companies' characteristics – resources, dynamic capabilities and games they play – and the identified responses. We analyze news postings in the period of second half of 2014 – 2015 to better understand links and match responses to particular internal and external firm's factors. We conclude with a cross-case synthesis (Yin, 2009), by establishing integrative cross-case tables with tailored findings for each company and analyzing cross-case patterns relying on interpretative argumentations.

3.7 Quality of the research design

Our research design is primarily derived from the philosophical stand that we take upon being interpretivist researchers and conducting a qualitative study with both qualitative and quantitative data. In general, such an approach has its drawbacks, which are important to acknowledge and minimize. First of all, the process, from which researchers aim to gain in-depth knowledge and understanding of related reasons, is time-consuming. Such an approach includes a thorough analysis of resources to comprehend and elaborate on the intricate array of evidence and data, which also implies that potential problems can go unnoticed (Bowen, 2009). Further, we employ a variety of media sources written by industry analysts and observers, who had main control over the content they report. In many cases, we are limited in our ability to verify the stated facts. In addition, dealing with secondary data sources brings the challenge of dealing with different data presentation formats. The published

company reports have distinctive measurement characteristics, and differ in the categorization of data, so to say in the approach to convey specific information. The aggregation of data for each company's report is therefore performed in the firm's particular manner. Moreover, a qualitative approach implies that there is an increased possibility to draw different conclusions based on the same information depending on the personal characteristics of the researcher (Maxwell, 2005). The personal experience and knowledge can significantly influence the study of interpretivist researchers. In our perception, the most challenging part of our qualitative study approach is impossibility to statistically investigate causalities. Our research is therefore based more on the judgement, opinion and interpretative skills rather than mathematical results.

Bearing in mind, that all these challenges can possibly affect the quality of our study, we further discuss how we address them. In general, validity and reliability measurements are central to the assessment of research quality and credibility. However, following Saunders et al. (2016), quantitative-oriented criteria of validity and reliability are not quite appropriate to qualitative research. Instead, we need to employ alternative criteria to assess the quality of our study. Lincoln and Guba (1985) introduced dependability, credibility and transferability concepts as criteria for qualitative study works.

3.7.1 Dependability

Dependability is an alternative criteria to reliability. We must ensure that the same result will be produced if any other researcher would follow the same procedures. To ensure high dependability for our research, we, as a group of two researchers, document each meeting and discussions including the following planned actions. The archive of our minutes of meetings is established throughout the whole period of our work. Additionally, we protocol our meetings with the group of professors, who advise us on this research. We also create the case study database, where we appropriately categorize and sort all material pertaining to our work. The documents and files are organized and stored in an intuitively comprehensible manner. Moreover, dealing with a variety of data formats of companies' financial indicators, we converted all currencies into U.S. Dollars ($) based on the end of year conversion rates. This adds on the dependability as the same conclusions can be drawn from the standardized format of data representation. All in all, we believe that any other researcher and auditor will be able to understand the steps we took and, by employing the same data, will conclude the same results with high probability.

3.7.2 Credibility

To ensure the credibility of our research, we make sure to utilize credible sources of information. The transparency and accessibility of official company data are of imperative concern for us. We rely only on documentation published in accordance with industry appropriate requirements. For example, the New York stock exchange requires companies with stock trading operations through its platform to provide a wide range of informational disclosures within strict time periods. Consequently, the prevailing part of publicly traded companies have increased requirements to credibility and amount of data provisions. In addition, we aim to employ information from credible news agencies with established reputation for industry news.

We further aim to avoid situations where our preconceived expectations interfere with outcomes of the study. This is especially important for interpretivist researchers. To do so, we organize frequent detailed meetings, where we go through points of considerations, discuss concepts, approaches and resolve disputes to ensure the same standing on the matters of our study. Swanborn (2010) underlines the importance of having more than one researcher to conduct a qualitative study, as it helps to enlarge research capacity. Being two students helps us to conduct the multilevel analysis by dividing tasks, discussing the approaches and understanding of results upon the completion. As two researchers, we are also able to perform the same parts of work separately and compare results at the end. These approaches help to minimize the possibility of individual research bias. The latest point of having two researchers relates to analysts triangulation (Patton, 1999). We also utilize diverse sources of information which helps us to examine the consistency of various data throughout our study and accounts for triangulation of data sources. The use of triangulation adds depth and richness to the research and confirms credibility (Saunders et al., 2016).

3.7.3 Transferability

The transferability of the research is pertained to provision of our readers with the opportunity to judge whether our qualitative research can be transferred to another context. As the ability to transfer the research concerns rather the reader than researcher, we carefully describe the context and assumptions we make. In other words, our task is to equip the reader with enough adequate description of the phenomena, so he is able to establish associations between elements of the research and elements pertained to the external context

of his private experience. Conveying a well-written contextual and case depiction enhances transferability of the findings. Furthermore, as transferability is the alternative criteria to external validity, we fulfill our discussion based on Yin's (2009) views on external validity in qualitative research. The scholar suggests that within a case study the analytical generalization should be considered as the substitute for statistical generalization in quantitative studies. Theories must be tested based on the replication logic. Thus, an increase in the number of cases, as the multiple-case study design allows us to do, enriches our research and provides with stronger support for the theory.

4. Case 1 – BP

BP p.l.c. is an international integrated petroleum company with its headquarters in London, UK. It was established in 1909 and is listed on the London and New York stock exchanges.

4.1 The Deepwater Horizon oil spill

For this case study, it is important to consider the Deepwater Horizon oil spill in 2010, in which BP, as the main operator, was involved in offshore drilling together with Transocean, Cameron and Halliburton as partners. On April 20th 2010 an explosion on an oil rig in the Gulf of Mexico occurred, which led to an oil spill of approximately 210 million gallons of oil ("Oil Spills Fast Facts", 2017). This was one of the greatest oil spills in history, leading to a public outcry, costing the company billions in legal fees and consequently damaged BPs image to a high degree. In response to the great financial distress caused by the oil spill, BP set up a 10-point plan to restructure the business until 2014. The plan included divestments of $38 billion over a three-year period. The aim was to excel in key capabilities and streamline the corporate business. Still in 2013 the Gulf spill played a major role in BP's risk management, as not all legal claims were settled and new ones were made.

4.2 Resource identification

In this section we outline the specific resources that BP possessed prior to the oil crisis of 2014. Our detailed analysis includes considerations of the physical resources in terms of downstream assets – hydrocarbon reserves and production by type and area – as well as BP's business efforts apart from the upstream sector – the downstream sector and renewables. We also elaborate human resources in terms of number of employees and its change. The hereafter presented analysis of the specific resources leads to the general statement that BP's resource base stretched over an integrated model with strong *diversification* in terms of fossil fuel types and geography. Even though largely diversified, the company focussed increasingly on its *various specialization* areas and core competences. The *integrated* model provided supportive value to BP. We further determine that BP was still *constrained by its financial resource* due to the Deepwater Horizon oil spill. If not otherwise stated, the following information is retrieved from BP's annual report of the respective years – BP p.l.c. (2012, 2013, 2014).

4.2.1 Physical resources

The company operated in exploration and production in multiple fuel types: oil sands, shale oil, deep-water oil and natural gas. In 2012 and 2013 natural gas reserves represented 41% and 44% of total reserves, respectively (APPENDIX A, Table A1). The rising share in natural gas reserves was due to large additions to BP's reserve base. Even though BP was active across the industry, the company possessed expertise in its operations and had specialist areas in "deep-water operations, giant fields and the gas value chain" (BP p.l.c., 2013, p. 6).

In 2013, BP decreased its annual production by 3% (APPENDIX A, Table A2). The decrease was mainly due to divestments. Natural gas constituted 38% of the production volume. The expectation for 2014 production was a further decrease due to planned divestments and especially the termination of an onshore concession in Abu Dhabi.

BP's reserves and operations were spread over 80 countries on all continents. In multiple countries BP was a leader in oil and gas exploration and production. For example, in Azerbaijan BP was the main foreign investor since many years. Capital expenditure increased in 2013 as BP acquired a higher share in Rosneft, the biggest Russian oil and gas company (APPENDIX A, Table A3). BP sold its share of TNK-BP in return for the increase in Rosneft interest. BP's interest in Rosneft rose to 19.75%. Furthermore, the company carried out major projects across the world. For example, in 2012 BP started production from a subsea development project in Angola, which was considered one of the largest of its kind in the world. Besides the investments in major projects, BP on the other hand divested heavily across its whole value chain to complete the $38 billion divestment plan. Divestments were made across the world, for example in the USA, Canada, China and the North Sea. In addition to the $38 billion divestment that was carried out in response to the oil spill, in 2013 BP announced further divestments of $10 billion until 2015. The future investment plan underlined clear priorities, a quality portfolio and the application of their distinctive capabilities.

BP's business model was based on the integration of upstream and downstream operations. In terms of earnings the upstream business created 10 times the value of BPs downstream operations. The downstream business refined half the volume of barrels that BP extracted per day. As such, BP's upstream operations were more leveraged than its refining activities.

However, BP pointed out the importance of the downstream business assets as a resource. Downstream operations included the refining business, as well as petrochemicals. The downstream unit has shifted its shape over the course of the pre-crisis years; the shift was initiated in response to the Deepwater Horizon oil spill. Old refineries have been divested and the existing ones were upgraded to top-class refineries. The refining business, just as BP's upstream operations, was active across the world, with refineries concentrated in Europe, and petrochemical plants mainly located in Asia.

BP acknowledged the threat of climate change and the actions that needed to be taken. As a fuels provider, BP has invested in biofuels and wind energy to follow the market trend and build a foundation for long-term success. In the U.S., BP claimed to be amongst the top producers in wind energy. The renewable assets were seen as long-term strategic placements, but did not provide noticeable value in terms of earnings in the pre-crisis years.

4.2.2 Human resources

BP's average workforce has decreased in the pre-crisis period by 1,400 employees (APPENDIX A, Table A5). In 2013 4,300 people left BP due to divestments. As for human resource competences, BP underlined the importance of its board of directors, which was a set of experienced non-executives with backgrounds in different relevant industries.

4.2.3 Financial resources

In the case of BP, we pay special attention to the financial resource limitation, as the Deepwater Horizon oil spill damaged not only BP's reputation but also BP's financial position in the following years. Charges to the income statement originated from the general operational response, environmental costs as well as litigation and legal claims. In 2012 alone, the oil spill had a negative effect of $5 billion on BP's profit before tax (APPENDIX A, Table A4). The cumulated cost of the oil spill at the end of 2013 amounted to $42.7 billion. BP expected further charges, so that the provision connected to the spill amounted to further $9.3 billion in 2013. As such, we draw the conclusion that BP was heavily restricted in its financial resource prior to the oil price drop.

4.3 Dynamic capabilities identification

We identify dynamic capabilities for BP in the form of *ambidexterity* and the *management of the upstream business ecosystem*. BP set up dynamic processes, while dealing with the Deepwater Horizon accident, that were still prevailing and shaping their dynamic approach. The following information is retrieved from the annual reports of BP (BP p.l.c., 2012, 2013, 2014) if not otherwise stated.

4.3.1 Ambidexterity

The company presented itself ambidextrous as it had a long record of divestment and investment activities. BP managed multiple core competences and had a long record of investing in and developing new business models to better manage the needs of specific resources. Rosneft shares acquisition is the example of BP's approach to appropriate new type of business assets. The investment in a large state-owned competitor in a major market differed immensely from the approaches that BP pursued in prior market entries, where the company were mainly engaged in temporary partnerships for the specific projects. Furthermore, BP had a process in place for evaluating new found reserves for strategic and operational fit. The company sold unfitting reserves quickly to companies which could create better value from it. In this sense, BP was strong in evaluating and incorporating new physical and relational resources while managing old resources within one company. BP further underlined the importance of its board of directors, which prior to the oil price crisis was a set of experienced non-executives with a variety of expertise. The company drew value from a management board that had no preset limited opinion on what works for the industry and set an important cornerstone for the openness to new approaches.

4.3.2 Management of the upstream business ecosystem

Management of joint ventures

BP had a strong managerial approach to the upstream business ecosystem. The company was engaged in multiple partnerships across the countries it operated in. Cooperations included governments, competitors as well as the local communities. Across the world, BP engaged with local companies to ensure expertise and relations with the country of consideration. For example in Algeria, BP was involved in a joint venture with Sonatrach, a local state-owned petroleum company, while in India BP was engaged in a strategic partnership with Reliance

Industries Limited, a local diversified petroleum company. The systematic screening for suitable business partners, that provides greater value, was important for the company. BP tried to involve local companies wherever it could to ensure better value creation due to knowledge consumption pertained to specific place and projects.

Development and deployment of new technologies

BP further invested in and encouraged new ideas and technologies. The company's R&D spending was $674 million in 2012 and $707 million in 2013. BP's R&D history developed great advancements in terms of incremental improvements and disruptive technology changes. An example of a technological advantage was their advanced seismic imaging, which was able to create 3D demos of areas in an easier and faster way than before. The speed of calculations and modelling was based on "one of the world's largest civilian supercomputers" (BP p.l.c., 2013, p. 9). BP further engaged in research partnerships with universities for technology advancement, educational purposes, as well as recruitment in place. All these established technology and know-how developments enhanced the ordinary capabilities of BP, ensuring the company's leading role in the oil and gas industry prior to the oil price slump of 2014.

4.4 Game identification

In this section, we present opposing players in the group of customers, competitors, suppliers and complementors of BP as revealed by the Demandbase screening. By evaluating the competitive posture and power-ratio assumption, we identify that BP played paternalistic-solidary type games and leader/follower type games with its customers. The games with competitors were generally leader/follower types, as well as retaliatory types. Further, BP played leader/follower type games with its suppliers and complementors. We elaborate the specific players and games in the following subsections and present the findings in Figure 4.

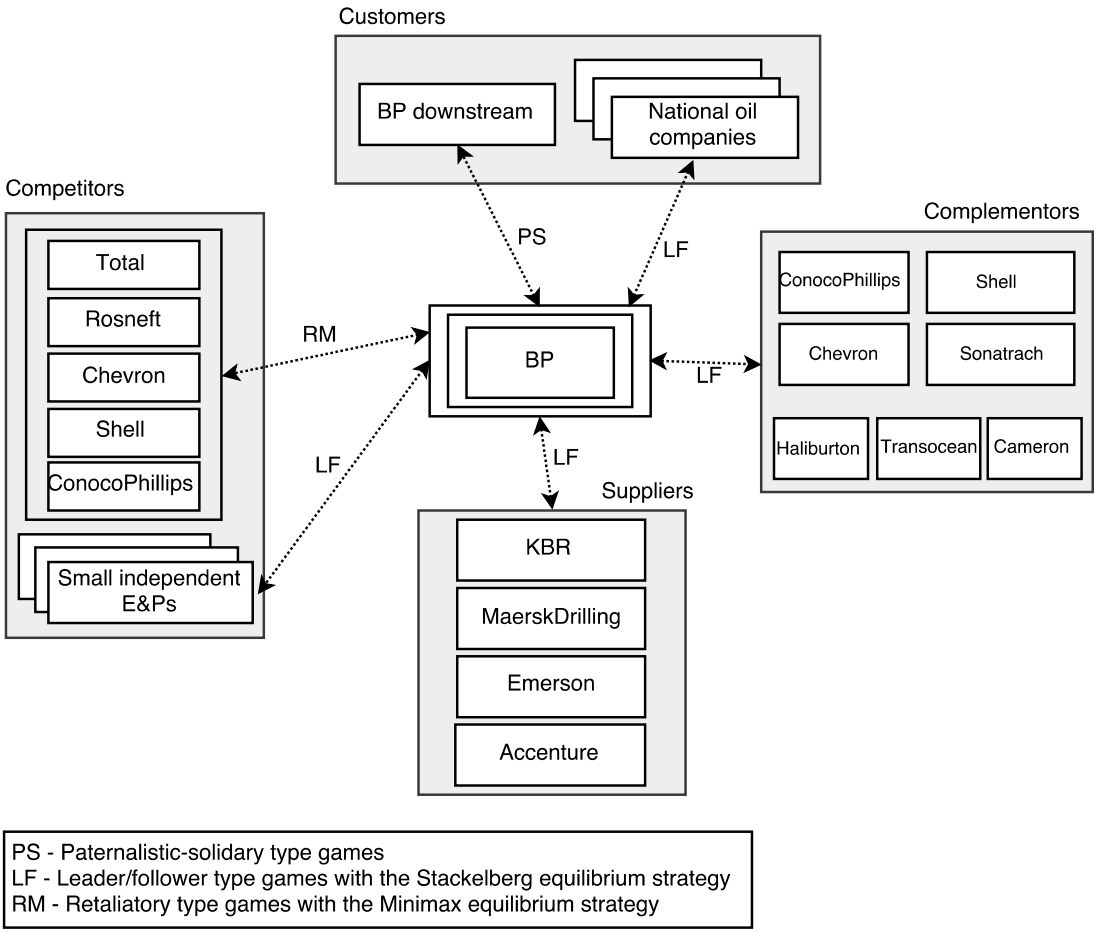

Figure 4. SGM Analysis of the BP case strategic games.

4.4.1 Customers

BP's upstream business unit supplied oil to its refineries, which indicates that, BP's downstream unit was the main customer (BP p.l.c., 2012, 2013). Both players were interested in mutual development of their business, which implies that the competitive posture was associative. With a throughput of 2,354 mboed and 1,791 mboed in 2012 and 2013, respectively, BP's production volumes exceeded the refining throughput. Leading to the assumption that, the power ratio was imbalanced, with the downstream unit as the weaker player. BP played an associative *paternalistic-solidary type game* with its own downstream operations.

Although BP had its own downstream operations, the company sold and bought globally due to excess production. Therefore, BP's upstream business had multiple other customers. As mentioned before, BP engaged with many players in the countries the company operated in. In Argentina, for example, BP was able to settle a contract with the local authorities: YPF,

Argentina's state-controlled energy firm (Vukmanovic, 2013). However, as YPF had further contracts with other oil and gas companies, such as Statoil and Gazprom, YPF had the stronger power position. As competition was strong and the state was in control of the reserves, BP was dependent on YPF. The competitive posture is classified as individualistic, as the companies were neither rivals, nor associates, and pursued their own interests from the business relationships. This scenario presents itself as *leader/follower type games* with the Stackelberg equilibrium strategy, which is representative for many games played by BP and other national companies prior to the crisis.

4.4.2 Suppliers

BP was engaged with many small, as well as large suppliers across the world. One example is KBR Inc. (KBR), an engineering and project management service provider that was appointed in 2012 for deepwater projects ("BP Selects KBR", 2012). KBR was also selected later for further projects. KBR was the relatively smaller company, which leads to an imbalanced power ratio between BP and KBR, where BP took the stronger position. This holds also true for other suppliers, such as Maersk Drilling ("BP Selects Maersk", 2013) and Emerson Electric Company, an automation contractor (Emerson Electric Company, 2012). Even with big companies such as Accenture (Business Wire, 2012), BP was in the stronger position due to its worldwide operations and business relations. BP was able to source resources and services worldwide and, as a powerful and influential company, was able to select its suppliers. Suppliers competed amongst each other to work with BP. At the same time, each supplier aimed to achieve its individualistic goals and benefit from doing business with BP. The latter fact implies that the competitive posture between BP and each of its supplier was individualistic. Therefore, BP played *leader/follower type games* with the Stackelberg equilibrium strategy.

4.4.3 Competitors

As one of the largest oil and gas firms, BP competed across the world with large market players, as well as small and local companies. Prior to the oil price drop main competitors were for example ConocoPhillips, Chevron and Royal Dutch Shell (Shell). Large rivalry evolved also between BP and Total S.A. (Total), both were competing for market share in the UK. Total built a new gas project off Scotland with the aim to overtake positions of BP as the UK's largest oil and gas producer (Holmes, 2013). In the international arena within

the upstream sector, BP also competed with smaller independent E&P producers. With all of its competitors, BP incorporated a rivalrous competitive posture due to the general resource limitations of the industry. Power ratios differed depending on size, scope and scale of each particular competitor. While prominent players were characterized by a balanced power-ratio, smaller locally focused independent E&P companies yielded to BP in many aspects, including the scale of operations, their resource base and revenues, which made them weaker players. Thus, the games BP played with each of the large international companies were *retaliatory type games* with the Minimax equilibrium strategies. The games played with the smaller independent E&P producers were of a *leader/follower type* with the Stackelberg equilibrium strategy.

Special attention should be drawn to the previously large competitor in the Eastern European region, Rosneft – the largest Russian oil and gas producer. As a strategic move to overcome the obstacle, BP grasped the opportunity to acquire one fifth of interests in the company. By doing so, BP changed the rivalrous competitive posture to an associative one. In this special case BP started to play a *cooperative type game* with the Pareto equilibrium strategy.

4.4.4 Complementors

BP is a strong supporter of partnerships, and has been collaborating with small and large companies. For example, BP partnered with ConocoPhillips, Chevron and Shell to execute the project off the Shetland Islands, while in Algeria BP worked together with Sonatrach, a large local oil and gas company (BP p.l.c., 2013). This shows that some of BP's competitors, large and small, are also its partners. However, BP and its partners did not act rivalrous in the partnerships. Instead, they were more individualistic – seeking for their best share of benefits from such collaborations. We also observe, that in the analyzed projects based on the annual reports (BP p.l.c., 2012, 2013, 2014), BP took operational control and had significant influence on the main course of the execution of those projects. Furthermore, BP also engaged in partnerships with suppliers. An example was the partnerships for the U.S. Gulf of Mexico drilling projects, during which BP worked with service providers Halliburton, Cameron and Transocean. In these partnerships BP held the stronger power-ratio assumption, as BP was appointed as the main operator and there was tough competition between service companies. The assumption of BP having the stronger power-ratio is also supported by resulting court resolutions that attributed the main guilt for the major historical oil spill to BP, which underlined the company's leading role in the specific project and in the

region in general (Stempel, 2012; Johnson & Fisk, 2013). In like manner, each supplier seeked for their own benefits from such collaborations, so we define the competitive posture as individualistic. As such we conclude that BP played *leader/follower type games* with the Stackelberg equilibrium strategy with each of its suppliers.

4.5 Responses

In the following section, we identify the responses of BP to the dropping oil price. We start by examining the investment responses, thereafter the divestment responses and conclude with the production responses. The information is retrieved from the annual reports (BP p.l.c., 2014, 2015) for the respective years if not otherwise stated.

4.5.1 Investments

BP maintained its balanced portfolio in terms of geography, integration and diversification. The investment policy has not changed in response to the dropping oil price, but was sustained. The focus was still on a simplified business with significant value projects. In 2015 BP reduced capital expenditure by 17.9% compared to 2014 (See APPENDIX A, Table A3). When considering the general level of capital expenditure, one needs to be careful to evaluate the 2013 value, as at this time BP acquired the Rosneft shares, which represented an extraordinary investment and affected financial indicators. The reduction in capital expenditure was mainly possible by restructuring and streamlining activities. The company invested in three major project startups in 2015: two deepwater projects in Angola and one liquefied natural gas (LNG) project in Australia. Investments were made across BP's international assets and the value chain. BP worked on building new and stronger relationships in order to better position itself for possible new projects. The company claimed to build even stronger relationships with Rosneft, especially for the West Siberian basin and Middle East exploration efforts. Further, BP was able to reach new agreements in China for LNG and shale gas. Within exploration BP's capital spending was reduced by 50% in 2014. This led to a reserve replacement ratio of only 63% and 61% in 2014 and 2015, respectively, pointing out decreasing reserves in both years.

In 2015, BP also restructured its business areas by separating the US Lower 48 states from the North American business unit. This way, BP expected to be able to respond faster to the changing environment.

BP profited from its integrated business model, as the downstream business unit rose its profit before interest and tax by 93% in 2015 compared to 2013 levels. This downstream performance, however, did not create any shift in focus towards the refinery business. Particularly, capital expenditure for the downstream unit decreased by 31.1% and 32.1% in 2014 and 2015, respectively (See APPENDIX A, Table A3).

Lastly, the research and development investments were reduced to $663 million in 2014 and $418 million in 2015. However, BP encouraged innovation and new ideas that would improve working processes and increase efficiency. For example, BP implemented helicopter-sharing for offshore platforms and simplified cleaning processes of refinery tanks.

4.5.2 Divestments

In the period of 2014 and 2015, BP divested approximately $10 billion, which fulfilled the target the company had set prior to that. A main divestment within this scope was a sale of 36% interest in a UK North Sea project. Additionally, the company sold two promising discoveries in the U.S. Gulf of Mexico, regardless of the region's importance for BP's upstream business unit. The general divestment strategy positioned the company to better deal with the oil crisis' negative consequences. Further estimated divestments of $3–$5 billion and $2–$3 billion were planned for 2016 and 2017, accordingly.

BP reduced its workforce in both the upstream and downstream business, with some employees being reallocated to the corporate business unit. The decrease was dispersed over all business units as well as geographic areas. The workforce was planned to be further reduced in 2016. The aim was to arrive at a workforce of 20,000 by the end of 2016. The average workforce in BP's upstream operations in 2015 was 21,700 (APPENDIX A, Table A5).

As for the renewable energy business, BP divested bioethanol assets in the U.K. in May 2015.

4.5.3 Production

BP increased production in 2015 by 4% including the production share from Rosneft (APPENDIX A, Table A2). However, this increase was preceded by a large drop in 2014 of 34% due to the transition of the disposal of TNK-BP and the acquisition of Rosneft shares.

Compared to previous levels, production remained stable. Production was equally distributed between liquids and natural gas as in the pre-crisis setting.

4.6 Analysis

In this section we proceed with the analysis of the responses and link them to the identified pre-crisis characteristics of the resources, dynamic capabilities and games BP played.

Reviewing the responses of BP, we see that the general pattern of investments did not change in comparison to the pre-crisis period. This general trend was consistent with BP's *resource base* such that the company was geographically diversified with internationally spread assets and projects. However, BP focused on specifics of each particular investment and divestment opportunity. Also, BP's expertise in diverse technologies provided the company with the opportunity to invest in a broad range of physical resources. In general, BP drew value from its existing diverse resources and kept investing accordingly to ensure the greatest value possible. We further reason, that the investment pattern remained stable due to the *dynamic capabilities* of BP. As BP had strong processes of evaluating and integrating old and new approaches and areas, the company was able to keep investing across the world in different technologies. The ability to sense business opportunities and integrate across different areas is ambidextrous and we can see this in their approach to invest diversely.

Divestment decisions, that were made, can be easily comprehended as the responses to the oil price slump. However it is to note, that BP had a $10 billion divestment plan in place prior to oil price crisis due to settlement charges linked to the Deepwater Horizon oil spill in 2010. We do not consider the overall divestments as a response to the oil price and leave it out of our consideration. However, we recognize, that the specifics of the divestments were influenced by the oil price drop, as it shifted the equilibria in the games BP played. One example was the game with Chevron over the promising discoveries in the U.S. Gulf of Mexico. BP, as one of the major player in the region, sold its assets to Chevron, enabling the latter to build up its presence in the region (Carroll, 2015; Macalister, 2015). The oil crisis together with the burden of large liabilities shifted the equilibrium in the *retaliatory type game* in the Gulf area, so that BP acted appropriately as the defeated party and sold its stakes to Chevron.

Another response we observe is the reduced investment in exploration efforts. As we have evaluated, BP was restrained by its financial resource due to the Deepwater Horizon oil spill. The company had to stay viable, so it appeared reasonable to cut spending on assets that were characterized by high uncertainty and would not lead to quick production and fast income. We argue that the reduced capital spending can be explained by the *limited financial resources* that restrained BP from investing.

We observe further that BP restructured its business units. The separation of the U.S. Lower 48 states from the North American business unit was the way of separating units with different needs from each other. We identified BP as an ambidextrous company, and restructuring fits within the ambidextrous nature of BP. The company recognized that different units have different needs for competence and management approaches. Because of this, streamlining and the separation of units benefitted the whole group. Consequently, we argue that BP's *dynamic capabilities* can explain the restructuring of the business.

BP underlined the importance of building stronger partnerships in response to the crisis. We identify that BP possessed the dynamic capability of management of the upstream business ecosystem. The company engaged actively in partnerships in order to broaden its opportunities. BP sought competence and support among large and small companies present in the market. Such collaborations added value and reduced the cost of conducting business. The fact that BP valued the importance of relationships and strengthened them can be explained by the *dynamic capability of managing the upstream business ecosystem*. Nevertheless, when considering the specific situations, such as with Rosneft and interests in the Western Siberian region, we should consider the particular games that BP played with this company. As pointed out, Rosneft was a competitor, but BP disrupted the game by acquiring 19% of Rosneft's shares by selling its interests in the Russian non-governmental oil company, TNK-BP. The game BP played with Rosneft transformed from rivalrous to associative. The engagement into joint projects and operational relationships with Rosneft can be attributed to the disrupted equilibrium *in the game.* As our analysis showed, such move significantly benefited BP and redeemed positive operating income from Rosneft in 2015 (APPENDIX A, Table A4).

We further observe that BP decreased its investments in its profitable downstream business unit. However, when shedding light on this from a resource perspective, the decrease might be questionable. We argue, that BP drew value from the integrated model; the downstream

resources were strategic and valuable resources. One could have argued that the most valuable source should guide further investment decisions. Instead, the capital expenditure decreased. With this in mind, we recall that BP not only faced opportunities due to its integrated model, but also faced a restriction in terms of financial resources. Setting this into context with the general decrease in capital expenditure, the drop in downstream investments can be attributed to the limitations in *financial resources* and strategic priorities, such as the need for remaining financial resources to support important upstream operations.

BP also decreased its R&D spending after the oil price drop. Recalling that BP was a company with dynamic capabilities and drew great value from its R&D, the decreased spending does not appear reasonable. Considering the *financial resource* limitation however, we argue that the decrease can be attributed to the efforts to redirect internal finances to essential high priority upstream operations as they ensure future growth.-

4.7 Conclusion

Concluding, we argue that all three factors - internal resources, dynamic capabilities and the games - played important roles in determining the responses of BP. Physical resource configuration directed BP's investments and underlined its continued course to keep an internationally spread focus, while the financial resources and prioritization strategy restricted the amount of investments. BP's dynamic capabilities enabled the company to engage in favorable business activities, including BP's beneficial North American units restructuring as well as its approach to collaborate and use partnerships to further develop its business. Lastly, games with competitors played a role in determining the opportunities for investments and divestments in specific regions within the scope of BP's general investment strategy.

5. Case 2 – Lukoil

PJSC Lukoil is a Russian integrated oil and gas company established in 1991, with its headquarter in Moscow, Russia. Lukoil is listed on the Moscow stock exchange. The company also has depositary receipts listed on the London stock exchange, US OTC market, Frankfurt, Munich and Stuttgart stock exchanges.

5.1 Resource identification

In this section we elaborate on the specific resources that Lukoil possessed prior to the crisis. Our detailed analysis includes considerations of the physical resources in terms of downstream assets – hydrocarbon reserves and production by type and area – as well as Lukoil's business efforts apart from the upstream sector – the downstream sector and renewables. We also elaborate human resources in terms of number of employees and its change. The hereafter presented analysis of the specific resources leads to the general statement that Lukoil was *moderately diversified* within the industry with E&P operations in conventional oil and increasing gas extraction. Lukoil was also *internationally diversified* with prevailing drilling operations in the international arena. However, Lukoil was mainly dependent on its national operations. The value of the *integrated model* was underlined by top managers expressing their satisfaction with downstream performance. If not otherwise stated, the following information is retrieved from Lukoil's annual reports and analyst databook of the respective years – PJSC Lukoil (2012a, 2012b, 2013a, 2013b, 2014a, 2014b).

5.1.1 Physical resources

Lukoil's core competence laid in the development of conventional oil. In addition, high-viscosity oil accounted for 4.7% of the proved reserves, offshore fields encompassed 5.5% of the proved reserves, based on data for 2013. The company operated a number of projects in exploration and production of natural gas, which encompassed 22.6% of all proved reserves (APPENDIX B, Table B1). An analysis of the production levels shows that natural gas accounted for approximately 15% of the whole production portfolio in the period of 2012–2013 (APPENDIX B, Table B2). In 2012, the company announced long-term ambitions to increase the share of gas in its total hydrocarbon portfolio. The prior investments in Russian

Western Siberia were payed off by demonstrating stable oil production levels in the period of 2012. The following year was declared as the best year of geological exploration by Lukoil for the last 5 years, and resulted in the discovery of 9 hydrocarbon fields, which added to the total resource base.

As of 2012, exploration work was carried out in 11 different countries. Lukoil underlined that its focus lies in Western Siberia, where the company concentrated 44.8% of its drilling operations. Central Russia together with the Urals region accounted for 36.3% of the company's exploration drillings. Drilling in the rest of Russia constituted 8%, and international drilling almost 11%. In addition to exploration work, Lukoil possessed proved reserves in international projects, such as in Azerbaijan, Kazakhstan, Egypt, Uzbekistan, Iraq and Venezuela. In 2013, Lukoil entered the Norwegian territory of the Barents Sea, which had high potential for development. In the same year, Lukoil completed construction work at West Qurna-2 in Iraq with production to begin in 2014. International projects in 2012–2013 accounted for 7% and 6% in the whole hydrocarbon production portfolio accordingly. Although the impact is relatively small, Lukoil underlined the importance of further development of international E&P. The prevailing part of capital expenditures was also allocated to Russian E&P projects (APPENDIX B, Table B3). In addition to further development of existing fields and operations in Russia, the company acquired a number of domestic projects, Samara-Nafta and Kama-Oil, to strengthen its resource base.

Lukoil was a vertically integrated oil company with eight refineries in Russia, Europe and Africa. Analyzing the letters to shareholders in the pre-crisis period, we found that in 2012 Lukoil emphasized its focus on development of downstream business and was highly satisfied with its performance in 2013. However, in their declared strategy for 2012–2021, Lukoil aimed to allocate 80% of its investments to their E&P business unit. An analysis of the CapEx numerically supports the execution of the strategy and demonstrates that approximately one fifth of the total capital expenditures was allocated to downstream activities in the pre-crisis period (APPENDIX B, Table B3).

The analysis of oil production and supply structure shows that in 2013 Lukoil sold 286.7 bboe of crude oil to both, its national and international markets, while 438.9 bboe of crude oil were refined in both domestic and foreign refineries. Thus, the company used only 65.3% of the whole crude oil production output for its further refining and production of petroleum products.

Furthermore, according to the Lukoil's sustainability reports for 2011–2014 (PSJC Lukoil, 2012c, 2014c), the company was the only Russian investor with a ten-year history of renewable energy sources development. Lukoil listed the number of projects that have been carried out before the oil price shock in 2014. An example was the development of wind projects in Bulgaria and Romania. The company also successfully launched a photo-electrical station in Bulgaria. Additionally, Lukoil implemented sun light collectors to provide energy for its refinery facilities in Orenburg. In total, the company demonstrated interest and development in the area of renewable energy sources and claimed to be open for beneficial cooperation and participation in the joint projects. Diversification outside the oil sector to the market of renewable resources was however not significantly scaled and is therefore characterized as collateral business purposes.

5.1.2 Human resources

By 2012 the company completed organizational optimization by eliminating duplication of functions and inefficient management links together with a centralization of accounting services. This led to a decrease in employees number by 2.1%, while productivity measures rose by 4% of revenue per employee. The annual numbers of employees are reflected in APPENDIX B, Table B5.

5.2 Dynamic capabilities identification

We further elaborate on Lukoil's dynamic capabilities in terms of the company's strategy formation and R&D. The information is retrieved from the respective annual report and sustainability report (PJSC Lukoil, 2012b, 2012c, 2013b, 2014b, 2014c) if not otherwise stated.

5.2.1 Management of the upstream business ecosystem

Strategy formation

The analysis of media articles for 2012–2013 showed that Lukoil took careful consideration before investing and participating in new project. The company screened projects opportunities, while simultaneously performing evaluation and risk analysis. For example, Lukoil refused to invest in Arctic shale oil development in light of the failure of Shell's

operations in Alaska, which consumed large investments with no consequent success ("Russia's Lukoil Buys", 2013).

Throughout the annual and sustainability reports, Lukoil continuously underlined that the company was eager to invest and participate in conventional and unconventional oil, and renewable projects abroad if the local state policy allowed for beneficial development. This can imply that sensing favorable conditions added security to the new investments, which was also a unique capability developed internally by the company.

Development and deployment of new technologies

Technological specialization of the company was in the area of conventional oil extraction and its increase in efficiency. Lukoil reported that the number of E&P operations employing new technologies of crude oil extraction rose eight times since 2009. Dedicated investments in high-tech field development methods, such as horizontal drilling and hydraulic fracturing, enabled Lukoil to start development of the additional reserves in Western Siberia and the Northern Caspian region. At the same time, 90% of Russian total production was concentrated in the fields discovered prior to 1988. The latest discoveries of Lukoil resided in remote areas with harsh climate conditions, which underlined the importance of innovative and more efficient approaches to exploration activities. Lukoil allocated $160 million for science and technology programs, including $25 million for R&D in 2014. As such, we observe that higher-order capabilities of the company - R&D development - enhance its first-order capabilities - to extract and produce oil. To point out, Lukoil used its advances in technology to strengthen and improve its core operations, crude oil E&P, and therefore, we consider Lukoil's technology development activities as a dynamic capability in the upstream sector in accordance with Shuen et al. (2014).

5.3 Game identification

In this section, we present opposing players in the group of customers, competitors, suppliers and complementors of Lukoil as per the Demandbase screening. By evaluating the competitive posture and power-ratio assumption, we identify that Lukoil played competitive type games and paternalistic-solidary type games with its customers. The games with competitors were retaliatory types. Further, Lukoil played competitive type games and leader/follower type games with its suppliers and paternalistic-solidary type games with its

complementors. We elaborate on the specific players and games in the following subsections and present the findings in Figure 5.

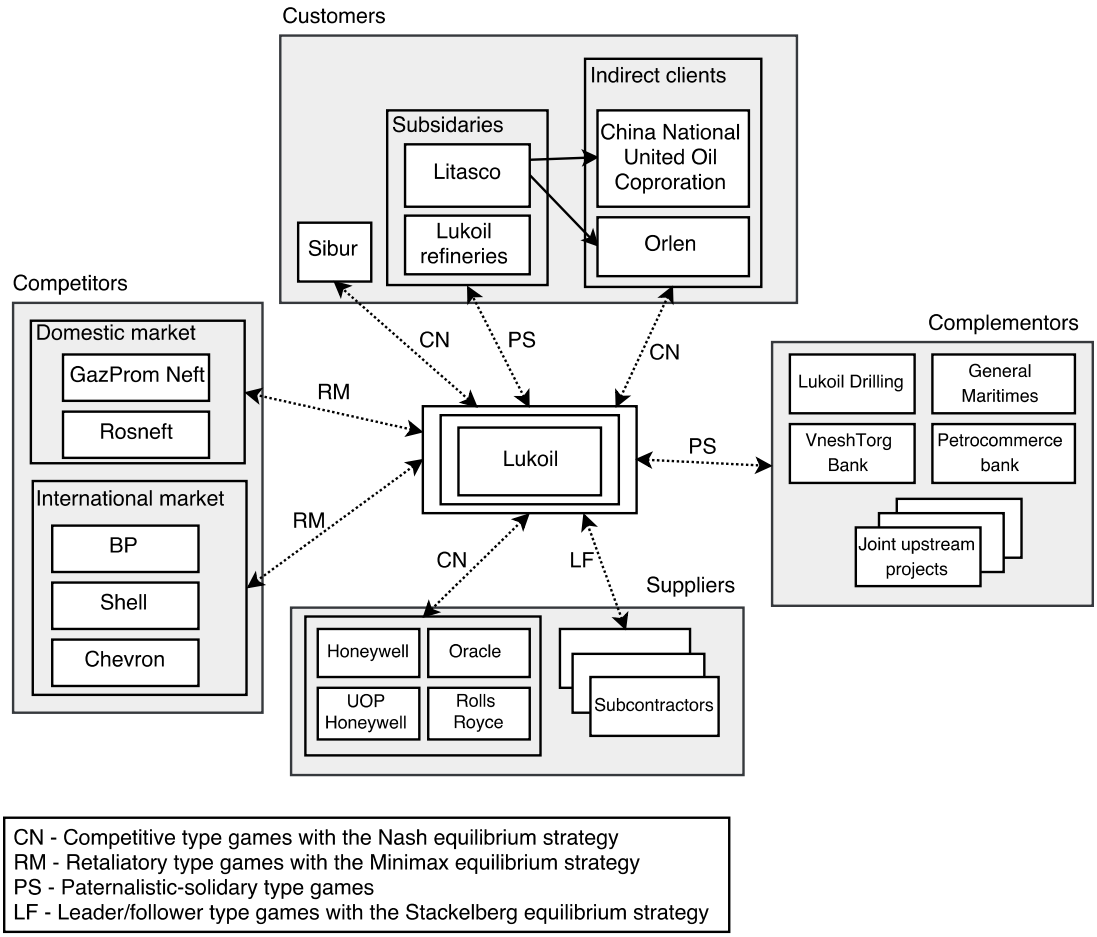

Figure 5. SGM Analysis of the Lukoil case strategic games.

5.3.1 Customers

Lukoil's downstream business unit was the main client for the upstream unit. Most of the produced crude oil was supplied to Lukoil's refineries (Polivanov, 2013). We also find information on Sibur, that signed a contract with Lukoil for gas supply in the period of 2011–2015. One of the most significant buyers of Lukoil's crude oil was Litasco, an international trading and supply company. Litasco was only a mediator, who distributed crude oil to companies in China and Europe. In 2015, Lukoil further supplied to China National United Oil Corporation and Polish Orlen (Vanke, 2016). Lukoil's downstream operations and Litasco were part of the Lukoil's business operations and characterized by an associative competitive posture. This means that these customers of Lukoil's upstream business unit were interested in mutual developments of the business. The capacity of

downstream operations accounted for 65.3% of the total company's upstream output, thus it had a weaker power-ratio assumption. The game Lukoil played with its refineries unit is of *paternalistic-solidary type*. Also, Litasco was a weaker subsidiary in comparison to the upstream operations, such that it had a weaker power-ratio assumption. The game between Lukoil and Litasco was also of *paternalistic-solidary type*. Indirect customers, that bought crude oil through Litasco, and direct customer, Sibur, were relatively large and had a balanced power-ratio assumption. The competitive posture between each of the customers, China National United Oil Corporation, Orlen or Sibur, and Lukoil was individualistic. Consequently, the games played represented *competitive type games* with the Nash equilibrium strategy.

5.3.2 Suppliers

In 2012–2015 Honeywell, a technology and manufacturing company, supplied technology, equipment and facilities to Lukoil. In late 2012, Lukoil chose UOP Honeywell chemicals as the supplier of process technology, catalysts, adsorbents and process plants. We also found that Rolls Royce won a gas turbine contract to support Lukoil's production expansion. Another supplier of software development and further support was Oracle. The competitive posture with each of these suppliers was individualistic. Honeywell, Rolls Royce and Oracle were international manufacturer with large client and product portfolios. This implies relatively limited dependence on one single client, such as Lukoil. Consequently, the power-ratio assumptions between Lukoil and each of these suppliers were balanced. It follows that the games were of *competitive type* with the Nash equilibrium strategy.

Finally, a large number of construction, drilling and service companies, such as Neftegasmontazh and Stroyindustry, provided their services as subcontractor companies for various Lukoil's projects. Although supporting Lukoil's business by providing service works, these companies were preoccupied with their own interests. Thus, competitive posture was individualistic. As for power-ratio assumptions, Lukoil was a significant client and can impose its interest on these companies. As such it is assumed that Lukoil had a stronger power-ratio. The games between Lukoil and each subcontractor were *leader/follower type games* with the Stackelberg equilibrium strategies.

5.3.3 Competitors

Domestic market competitors were constituted by two large integrated state-owned companies: Gazprom Neft and Rosneft, with a large number of their subsidiaries operating in E&P. BP, Shell, Chevron were main competitors in the international arena. The power-ratio between Lukoil and each of the competitors was balanced. Competitive postures between Lukoil and its competitors were rivalrous. It is to conclude, that Lukoil played *retaliatory type games* with the Minimax strategies.

5.3.4 Complementors

One of the significant complementors supporting and adding value to Lukoil's production was Lukoil Drilling, which performed drilling operations for Lukoil's exploration and production. Petrocommerce Bank supported Lukoil and its business with financial operations in rubles, while VneshtorgBank did so in foreign currencies. The large number of joint upstream projects with different stakes brought value to Lukoil and its production (Lukoil-Reserve-Invest, n.d.). General Maritime was one of the complementors, that provided sea transport for Lukoil's oil distribution.

With each complementor, Lukoil held an associative competitive posture as all of them were interested in the growth of mutual business. However, complementors differed in their power-ratio assumptions. Lukoil was one of the biggest clients for both, Petrocommerce and VneshtorgBank. A loss of a client such as Lukoil would have hurt banks more while in turn Lukoil could have found a substitution for them without significant disadvantages. Although the Russian banking sector is concentrated, there are more than 600 small and regionally-important banks (Angel, Alvarez & Makunin, 2016). The same applied to Lukoil's own subsidiary, Lukoil Drilling, and to General Maritime company. Lukoil was in the stronger power position. Thus, the games between the company and each of its complementors were *paternalistic-solidary type games*.

5.4 Political instability and its effect on Lukoil

To set the responses in context, we need to consider the political instability connected to Russia and Ukraine. As of 2014, Russia's annexation of Crimea caused political criticism of this action. For example, the U.S. imposed sanctions on Russian companies ("How Far Do

EU-US Sanctions", 2014). Russian energy companies were subject to sanctions with respect to arctic offshore, deepwater and shale oil operations (U.S. Department of State, n.d.). However, Lukoil did not recognize the immediate effects on its development as the company had no major projects that were subject to these sanctions ("Lukoil: Opportunities Still Rife", 2015). Specifically, Lukoil had neither operations in the Arctic region, nor deepwater production that were subject to international demand. Only a small percentage of projects were related to shale oil. Therefore, we exclude considerations of the effect of sanctions from our analysis.

5.5 Responses

In the following section, we identify the responses of Lukoil to the dropping oil price. We start by examining the investment responses, thereafter the divestment responses and conclude with production responses. The information is retrieved from Lukoil's annual reports and analyst databook of the respective years (PJSC Lukoil, 2014a, 2014b, 2015a, 2015b), if not otherwise stated.

5.5.1 Investments

Although the ruble-equivalent CapEx in upstream operations increased during the analyzed period, the dollar-equivalent demonstrated a decrease due to the weak Russian currency position (APPENDIX B, Table B3). The main E&P activities in Russia were concentrated in Western Siberia, where in 2014 and 2015 the company brought 14 and then an additional 17 new fields into production. The depletion of Western Siberian fields was offset by new discoveries and continuous launches of completed wells. Another prioritized area was the Caspian offshore region due to a favorable tax environment. Finally, in the end of 2015 the company obtained its first license in Eastern Siberia adding to its hydrocarbon reserves and started with exploration activities in the region.

As for the international region, production doubled in 2014 in comparison with the previous year. Lukoil explained this increase with the launch of production in West Qurna-2 in Iraq. The company also invested in development and exploitation of projects in Iraq and Uzbekistan, as one of the key areas of business operations. In 2014, Lukoil also appropriated 37.5% in the offshore project of Cameroon. In 2015, the proportion between CapEx in Russian and international projects had balanced even further, showing an almost equivalent

allocation of expenditures. While continuing with the existing projects in Russia, Lukoil extended its exploration in West Africa and Mexico. The company acquired 38% in a deepwater project in Ghana, 45% in a crude oil E&P project in Nigeria and 50% in a Mexican service project. The increase in international production was due to Iraqi and Uzbek projects' continuous exploitation.

In the renewable energy sector Lukoil increased its share in a land power wind farm to 100% and commissioned a solar power plant in Romania.

The actual science and technology program expenditures amounted to $154 million, with R&D spending equal to $12.3 million in 2014. Investment in R&D in 2015 plunged down to $0.08 million. However, in 2014–2015 Lukoil continued further technology developments and testing.

5.5.2 Divestments

In 2014, Lukoil sold its 50% interest in Caspian Investment Resource Ltd to Chinese Sinopec. Further in 2015, the company sold out a number of its downstream assets – 100% of Lukoil Ukraine, Lukoil Slovakia, Lukoil Hungary and Lukoil Czech Republic. The same year the company also exited from the Cameroon project development. Furthermore, Lukoil sold its 20% share in the National Oil consortium established by Russian oil companies as a part of economic development between Russia and Venezuela. Lastly, Lukoil decreased its employees number by 3.8% in 2015 (APPENDIX B, Table B5).

5.5.3 Production

The depletion of the Russian oil and gas fields resulted in reduced increments in production. However, during the period 2014–2015 production outputs modestly increased, which was associated with the production increase from foreign assets (APPENDIX B, Table B2). Total crude oil production increased by 1% in 2014–2015 in comparison to the pre-crisis period. We also observe that in 2014 Lukoil lowered its crude oil exports in favor of the more lucrative domestic market.

5.6 Analysis

In the successive section we proceed with the analysis of the strategic responses and link them to the identified pre-crisis resources, dynamic capabilities and games Lukoil played.

Lukoil raised its capital expenditure and increased international presence. Considering the pre-crisis resource set and the shift that was noticeable towards a more diversified portfolio in terms of geography, the increased international investments can be attributed to the further strengthening of the company's diversified *resource base*. However, a number of favorable conditions in Lukoil's environment must be considered. We identify that the disruption in *the games* Lukoil played influenced the general investment behavior. Based on an interview with A. Gaidamaka, the Vice president of Investor Relations, the oil price shock caused domestic currency depreciation, which led to reduced ruble-nominated expenditures and liabilities expressed in U.S. dollars ("Lukoil: Opportunities Still Rife", 2015). Moreover, the competitive games with complementors, primarily, subcontractor companies, favored Lukoil in order to appropriate cheaper services. This was possible due to increased competition between service providers as the consequence of the oil price drop and the limited number of available projects. Following the reasoning developed by A. Gaidamaka, another influence on the strong investment performance of Lukoil was the relatively strong customer demand for petroleum products in the domestic market. The games with customers were paternalistic-solidary type games, that resulted in mutual benefits from the growing business. All three aspects, as outlined during the interview, the weak domestic currency and games with suppliers and customers, added to a stronger position of Lukoil relatively to its international competitors ("Russian Oil Producers Outperform", 2015; Katakey & Bierman, 2015). Under those circumstances, Lukoil gained an advantage in the retaliatory games, which led to the extension in its international portfolio in times when competitors cut on their capital expenditures.

New investments in the Eastern Siberia licensed area were also a consequence of Lukoil's *game* with Rosneft, and the failure of the latter to cope with low oil price environment. Rosneft was considered to be a priority company in the distribution of new E&P licenses. However, stroked with sanctions and overburdened with significant loans due to prior acquisitions of domestic competitors, Rosneft began to demonstrate its inability to deliver satisfying results. Rosneft sold 10% of its interests in the second-largest Eastern Siberia

projects to China National Petroleum (Mazneva, 2015). The oil price shock led to a disposition in the retaliatory game between Lukoil and Rosneft. Lukoil gained an advantage and used its opportunity to take possession of the licensing area, which led to associating investments.

In 2014–2015 Lukoil demonstrated ongoing E&P activities in Russian and international projects. To keep and raise production levels, Lukoil used new technological approaches for crude oil extraction. The ability to develop and utilize technology in order to increase and improve production is evidence of Lukoil's possession of dynamic capability to sustain and improve its core capabilities. Thus, we attribute the ability to increase production during the crisis to the company's *dynamic capabilities*.

Further, the expenses in R&D decreased significantly in 2015. This fact illustrates the idea that, although Lukoil continued to support and develop its *dynamic capabilities* in the form of continuous research and development in oil and gas technologies, the level of its commitment was compromised due to unfavorable economic conditions.

Divestments in form of employee layoffs was explained by Lukoil as the consequence of a reconfiguration of management processes and business structure that aimed for better efficiency levels. Besides, the decrease in employees number occurred due to asset divestments in the Eastern Europe. The reasoning for these responses are beyond economic considerations and as such are out of the scope of this work.

5.7 Conclusion

We conclude that Lukoil's responses were shaped by the resources it possessed, its dynamic capabilities and the games it played. Even though all three factors played important roles, the major investment responses were mostly shaped by the disrupted equilibria of Lukoil's games, which resulted in a new beneficial positioning for Lukoil.

6. Case 3 – Chevron

Chevron Corporation is an American integrated oil and gas company. Established as the Pacific Coast Oil Co., the company overcame the major reorganizational change and appropriated its modern name in 1977. Chevron's headquarters are situated in San Ramon, U.S.A. Chevron is listed on the New York stock exchange.

6.1 Resource identification

In this section we identify the specific resources that Chevron possessed prior to the crisis. The hereafter presented analysis of the specific resources leads to the general statement that Chevron's resource base was strongly *diversified* in terms of fossil fuel types and geography. The *integrated* model constituted important value to Chevron. Further, Chevron was *diversified* into the alternative energy sector. If not otherwise stated, the following information is retrieved from Chevron's annual reports and supplements to the annual reports of the respective years – Chevron Corporation (2012a, 2012b, 20131, 2013b, 2014a, 2014b).

6.1.1 Physical resources

In the pre-crisis years Chevron engaged in different operations including crude oil, synthetic oil, condensate and liquefied natural gas. Chevron's competence laid in the execution of complex and technologically challenging projects pertained to conventional and unconventional oil and gas. Chevron performed its upstream operations on all major continents, with long lasting activities established in Nigeria, Australia, Kazakhstan and Angola. Few operations were carried out in the Middle East, where the main operating site was situated in the Partitioned Zone between Saudi Arabia and Kuwait. Approximately 80% of earnings were generated outside the United States, with the largest impact attributed to Asian region.

Approximately three fourth of Chevron's total reserves belonged to consolidated companies. Hydrocarbon reserves were evenly distributed over the geographic regions of Chevron's E&P activities. In both years, 2012 and 2013, natural gas reserves made up approximately 43% of the whole reserve base (APPENDIX C, Table C1). In the same period, 33% of the total production output was associated with natural gas (APPENDIX C, Table C2).

Chevron was vertically integrated with large refining operations as well as chemical companies. Refineries and chemical companies were situated internationally. Net production, generated from upstream operations, resulted in 1,764 tbpd and 1,731 tbpd in 2012 and 2013, respectively. Downstream throughputs accounted for 1,702 tbpd and 1,638 tbpd in the same years. The capacity of downstream operations was thus comparable with upstream production, and roughly covered all volume of produced oil and gas. An analysis of CapEx in upstream and downstream business activities showed that only 9.3% and 7.6% of capital expenditures was allocated to the national and international downstream operations in 2012 and 2013, respectively (APPENDIX C, Table C3).

Chevron was active in geothermal energy production and considered itself as "one of the world's leading producers*"* (Chevron Corporation, 2013a, p. 7) in the field. The geothermal assets were located in Indonesia and the Philippines. The company was further involved in the production of other types of renewable energy such as solar and biomass. Renewable energy production though had no significant impact on the revenue stream of Chevron.

6.1.2 Human resources

We observe an increase in number of Chevron's workforce in the pre-crisis period by approximately 3,000 employees, which constituted 5.2% of the total workforce (APPENDIX C, Table C5).

6.2 Dynamic capabilities identification

We identify that Chevron possessed the dynamic capability of managing its upstream business ecosystem. We develop on argument in terms of the company's development and deployment of new technologies. The information is retrieved from the respective annual reports and supplements to the annual reports (Chevron Corporation, 2012a, 2012b, 2013a, 2013b, 2014a, 2014b), if not otherwise stated.

6.2.1 Management of the upstream business ecosystem

Development and deployment of new technologies

Chevron owned three spin-off companies, which were solely specialized in technology development within different business functions: energy technology, technology ventures

and information technology, with $1 billion investment projected for 2014. The focus on energy technology revolved around conventional exploration, deepwater, shale oil extraction and liquefied natural gas. Chevron placed technological advancements and innovations at the core of its business to differentiate and achieve efficient operational performance (Chevron Corporation, n.d.). For example, for the Australian Gorgon gas project a design model was developed and studied, depicting specific needs of the project. The important characteristic of the Gorgon project was that the gas gathering and production occurred under the sea level, which required prior intensive research. Moreover, the subsea system was required to shut down safely without impacting adjacent production, as it was linked to an underwater pipeline web. The innovative approach implemented in the Gorgon project required ten years of studies, planning and construction, and resulted in the unique deepwater solution for gas extraction and production. The research and development processes, which evolved alongside and enhanced Chevron's core capabilities, were established dynamic capabilities in accordance with Shuen et al. (2014).

6.3 Game identification

In this section, we present opposing players in the group of customers, competitors, suppliers and complementors of Chevron as identified by the Demandbase screening. By evaluating the competitive posture and power-ratio assumption, we identify that Chevron played cooperative type games with its customers. The games with competitors were generally hegemonic-marginal games as well as retaliatory type games. Further, Chevron played leader/follower type games with its suppliers and paternalistic-solidary type games with its complementors. We elaborate on the specific players and games in the following subsections and present the findings in Figure 6.

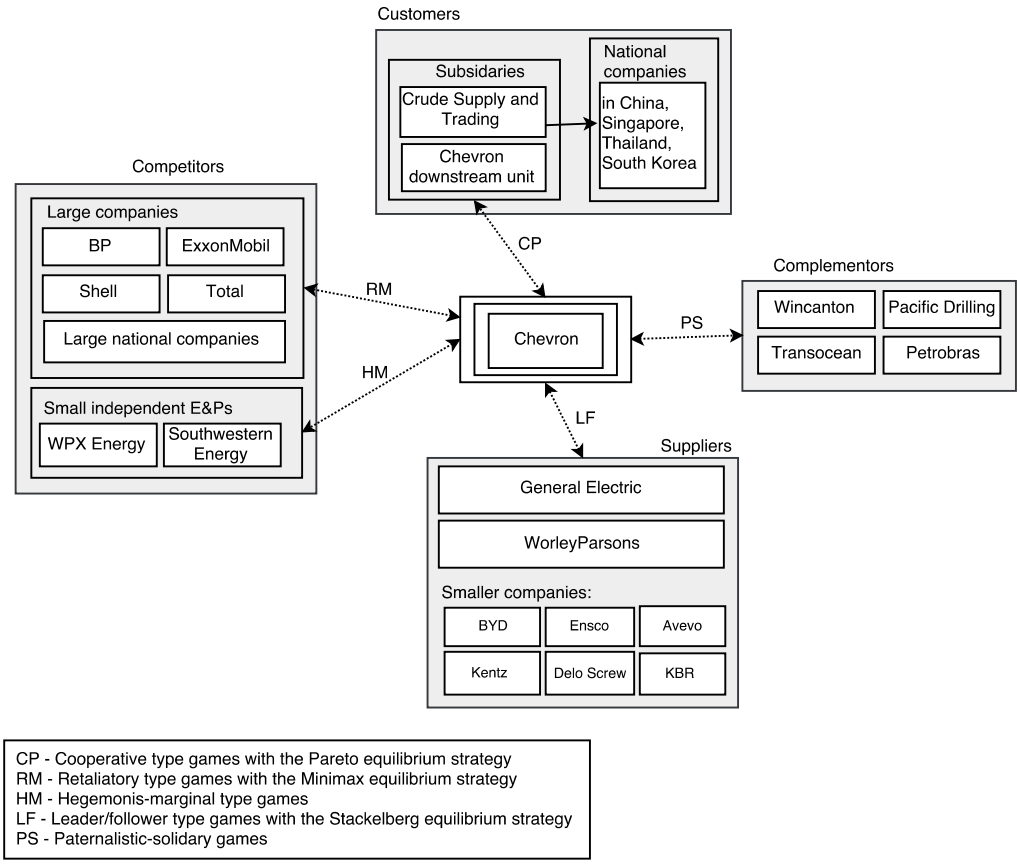

Figure 6. SGM Analysis of the Chevron case strategic games.

6.3.1 Customers

Chevron's own downstream business utilized the produced crude oil for its refining operations and served as the biggest appropriator of upstream production output. Besides, various national companies were also interested in crude oil purchases. The biggest customers were located in Singapore, Thailand, South Korea, and a significant part of crude and shale oil was supplied to China (Mushalik, 2012). The trading operations were conducted by Crude Supply and Trading company of Chevron.

Chevron's downstream unit was equal-sized in operations, and so were the national companies that purchased crude oil. As such, the power-ratio between Lukoil and each its customer was balanced. Considering that all parties were interested in conducting the business operations jointly and recognized the value from such collaboration, the competitive posture was associative. Thus, the strategic games played between Chevron and each of its customers were *cooperative type games* with the Pareto equilibrium strategy.

6.3.2 Suppliers

As Chevron carried out its upstream operations in various world regions, there were multiple different service and manufacturing firms among its suppliers. Among the most significant ones was General Electric, which supplied Chevron with subsea and production equipment. WorleyParsons was mentioned in several media sources, that informed about WorleyParsons' engineering and design services to Chevron. We also identify smaller suppliers, such as BYD, Ensco, KBR, Delo Screw, Kentz and Avevo. These organizations provided construction services, engineering solutions, software development and support. For each of the suppliers, Chevron, as the international behemoth, was a valuable customer. Thus, Chevron was a stronger player in comparison with its relatively weaker suppliers, and each of them held an individualistic competitive posture. Hence, games are distinguished as *leader/follower type games* with the Stackelberg equilibrium strategy.

6.3.3 Competitors

Chevron competed with major integrated petroleum companies, as well as independent E&P producers for the acquisition of natural reserve leases and other assets, and for equipment and human resources required to develop and operate on projects.

As was mentioned in the annual reports (Chevron Corporation, 2012a, 2013b), the peer-group for the U.S. market consisted of BP, ExxonMobil, Shell, Total. The revenue-based power-ratio assumptions were balanced for Chevron and each of these competitors. At the same time, Chevron competed with smaller players, independent E&P oil companies, on its domestic market, such as WPX Energy and Southwestern Energy. As integrated company, Chevron was better leveraged, and therefore, its power-ratio assumption was stronger in comparison with smaller independents. As for competitive posture, the U.S. market was characterized by rivalry for resources, hydrocarbon deposits and licenses, which implied rivalrous competitive postures between Chevron and its competitors. Games played with large competitors were *retaliatory type games* with the Minimax strategy, while games played with relatively weaker independent oil companies were *hegemonic-marginal type games*.

In the international arena, Chevron also competed with various integrated major companies such as BP, Shell, Total, as well as national companies. A significant part of national

competitors was situated in the Middle East. Power-ratios were balanced with rivalrous competitive postures, which implied *retaliatory type games* with the Minimax strategies.

6.3.4 Complementors

Chevron sustained a number of partnerships with complementing companies to add on its activities and operations. The most interesting complementor was Wincanton. Wincanton is a U.K. based logistic company, that had been partnering with Chevron for more than two decades by providing crude oil and oil products transport services. Another complementor was Pacific Drilling, which had established business relationships with Chevron ("Chevron Spends USD", 2012; "Pacific Sharav' Begins", 2014) and generated 86% of its revenue from the operations performed for Chevron in the period of 2011–2014 ("Pacific Drilling", 2015). Transocean is an American drilling service provider, and was one of the long-lasting partners of Chevron. Furthermore, in 2012 Chevron cooperated with Petrobras in Brazil for the Frade field explorations and development.

Some of the service companies that we distinguish as complementors can be viewed as suppliers of services at the same time. However, we sort them as complementors due to their long-term dedicated cooperation with Chevron, which brought value to the whole chain of operations. The competitive posture was associative, and the complementing companies were the weaker players in the games. Thus, the games were *paternalistic-solidary type games* in which all parties sought to develop the common business.

6.4 Responses

In the following section we identify the responses of Chevron to the dropping oil price. We start by examining the investment responses, thereafter the divestment responses and conclude with production responses. If not otherwise stated, the information is retrieved from Chevron's annual reports and supplements to the annual reports (Chevron Corporation, 2014a, 2014b, 2015a, 2015b) of the respective years.

6.4.1 Investments

In 2014 Chevron started to decrease its investment spending. The company's overall CapEx decreased by 3.7% (APPENDIX C, Table C3). Chevron kept its previous balance between

upstream and downstream expenditure as approximately 90% and 6% of total CapEx, respectively, and between national and international expenditures as 30% and 70% of total CapEx, respectively. The decrease in investments in 2014 was evenly distributed between upstream and downstream units, and this trend continued in 2015 with a total decrease of 15.7%.

In 2014, Chevron's investments went into the purchase of new interests in Mauritania, Myanmar and New Zealand. Chevron also invested in ramp-ups of existing fields. In 2014 no entirely new projects were sanctioned. However, some ongoing projects achieved first production. In the following year, 2015, Chevron did not invest in any new projects or purchase of interests. Old production fields, especially in the U.S. Gulf of Mexico, were ramped up, and Chevron achieved progress in its major LNG projects. As follows, Chevron's focus in investments was its key megaprojects – the Australian LNG projects at Gorgon and Wheatstone, and the U.S. Gulf of Mexico deepwater project Jack/St. Malo.

6.4.2 Divestments

In 2014, Chevron launched a three-year divestment program worth $10 billion. The company managed to divest $5.7 billion in 2014 already. The annual gains from the divestment program resulted in $1.8 billion. Chevron sold interest in Canada, Chad and Cameroon. The company also discontinued its shale gas exploration in Poland (Lowe, 2015). General divestments were achieved in both the domestic U.S. market as well as the international market. In the upstream sector, the focus for divestments was international asset sales, which equaled to $1.1 billion. Subsequently, divestments in 2015 were large enough such that the total actual divestments since the start of the divestment program exceeded the planned amount projected for three years. In this period, Chevron increased its asset sale to $6 billion. However, the gain from divestments made only $470 million as most of them have been offset by operational spending.

As for workforce numbers, Chevron was still able to increase the number of employees slightly in 2014, while the company had to lay-off 5.3% of its employees in 2015. Expressed in absolute numbers the decrease in 2015 equaled 3,278 lay-offs (APPENDIX C, Table C5**).** This change set Chevron back to an even lower workforce number than in 2012.

6.4.3 Production

In 2014, production decreased by 1% to 2.6 mboed (APPENDIX C, Table C2). Even though Chevron increased production in existing fields and added new production facilities, the company claimed that this was offset by natural field depletion mainly in international operations, as well as by international asset sales. In 2015, Chevron's international production levels stayed constant, although sources changed due to the reconfiguration of assets. The U.S. liquids production increased by 10% and stemmed mainly from production growth of shale and tight oil resources, and large project ramp-ups. However, the total increase in production was offset by asset sales and normal field declines, and resulted only in 2% growth (APPENDIX, Table C2).

6.5 Analysis

In this section we proceed with the analysis of responses and relate them to the identified pre-crisis characteristics of the resources, dynamic capabilities and games Chevron played.

After the oil price drop Chevron decreased investments in comparison to the pre-crisis period. Although reduced, Chevron showed the ability to invest and keep up with its current megaprojects. This was possible due to the profits earned via Chevron's downstream units (APPENDIX C, Table C4). Downstream profit almost doubled and resulted in $7.6 billion in 2015, which made earnings from the refining unit an internal hedge (Allen, 2015). This implies that Chevron was able to set its general investment plan due to its *integrative model*.

As discussed in the analysis of BP, in early 2015, Chevron appropriated leadership over the Gila and Tiber oil discoveries and Gibson exploration prospects in the U.S. Gulf of Mexico, which previously belonged to BP. As we identified, Chevron played *retaliatory games* with each of its competitor, including BP. News articles (Carroll, 2015; Macalister, 2015) underlined the fact of Chevron being the stronger operator in the region. In times of crisis, rivals yield opportunities to stronger operators to sell assets and raise cash. While BP was withdrawing from the region, Chevron enhanced its efforts in the U.S. Gulf of Mexico and took advantage of the disrupted equilibrium in the retaliatory type game.

We further see, that the focus on key projects was driven by Chevron's *dynamic capability* in terms of technological advancements. Chevron's long-lasting history of investments in R&D

provided opportunities to develop necessary technology to further implement the innovative deepwater gas project – the Australian LNG system in Gorgon. Chevron's technological advancements allowed to efficiently extract shale oil and allow for stable growth in production during 2014–2015. Thus, the dynamic capability of technology development and deployment enabled and drove the associated investments.

Chevron's key projects were expected to be the main drivers of growth with total hydrocarbon production to be raised from 2.6 to 3 mboed by 2017. Alongside with the increased investments in megaprojects, Chevron carried out divestments across the value chain mainly focussed on the international portfolio. The general divestment plan was established before the oil price drop in 2014 and, therefore, should not be reviewed as a response. However, the divestments in 2015 exceeded the actual plan, and we conclude that the oil price drop intensified the initial direction of divestments. Chevron did not divest sporadically from its international portfolio, but the company divested from the small-scale projects that could not provide a significant rapid production increase. Chevron divested non-core assets and projects to strengthen the focus on its megaprojects. To sum up, we observe that Chevron's divestment decisions were framed by Chevron's diversified *resource base* and the chosen focus strategies.

Notably, the decrease in employees number constituted the ad hoc problem solving. The biggest part of workforce reduction is attributed to Houston, Texas ("Chevron To Lay Off", 2015). To lay off personnel was the company's efforts to reduce operational costs internally and save cash.

6.6 Conclusion

We conclude that Chevron chose its investment direction in accordance with its integrative model and the dynamic capability of developing and implementing new technological solutions for new opportunities. The retaliatory games the company played opened the opportunity for the specific investments in the U.S. Gulf of Mexico. Divestment decisions have been shaped by Chevron's diversified resource portfolio and focus strategies the company implemented.

7. Case 4 – Suncor

Suncor Energy Inc. is a Canadian integrated oil and gas company established in 1979, headquartered in Calgary, Canada. Suncor is listed on the Toronto and New York stock exchanges.

7.1 Resource identification

In this section we elaborate on the specific resources that Suncor possessed prior to the crisis. The hereafter presented analysis of the specific resources leads to the general statement that the company's primary focus in the upstream sector resided within its operations in unconventional oil sources – exploration and production of Canadian oil sands, which underlines Suncor's *specialization*. Suncor was mostly focused on domestic production fields and demonstrated a decreasing participation in the international arena. Besides, Suncor drew considerable value from its *integrated model*. If not otherwise stated, the following information is retrieved from Suncor's annual reports of the respective years – Suncor Energy Inc. (2012, 2013, 2014).

7.1.1 Physical resources

Suncor's upstream focus laid on unconventional oil – oil sands exploration and production. The direct products were bitumen and the upgraded product synthetic crude oil (SCO), which together constituted the biggest reserve base (APPENDIX D, Table D1). Other fossil fuel reserves of Suncor, apart from bitumen and SCO, were light & medium oil, natural gas and natural gas liquids (NGL). The oil-related reserves accounted for 97.3% and 99.8% of the total reserve portfolio in 2012 and 2013, respectively.

Bitumen and SCO made up 65.4% and 70% of the total production in 2012 and 2013, respectively (APPENDIX D, Table D2). Although Suncor's operations included both, oil sands and conventional oil exploration and production, oil sands provided the highest contribution to earnings (APPENDIX D, Table D4). In 2012, natural gas constituted 49.4 mboed or 9% of Suncor's total production volume. In 2013, as a part of a general divestment program, Suncor sold its remaining part of the conventional natural gas business in Western Canada. The gas production volumes in the same year fell to 6% of the whole production portfolio. Natural gas was therefore not a focus of Suncor's business, and served mostly as

an internal energy source to support oil sands extraction and refining. There were two extraction technologies used by Suncor: mining and *in situ. In situ* is the method to extract deep deposited oil sands. In 2012, Suncor was the largest *in situ* producer in Canadian oil sands.

In 2012, Suncor's exploration and exploitation operations encompassed Canadian oil sands business and oil sands ventures together with operations related to onshore conventional crude oil assets in Western Canada. In the international arena, Suncor took part in joint projects in the North Sea, especially in exploration efforts offshore the U.K. and Norway. The company also took part in development and exploration of Libyan oilfields in Sirte Basin. In the same year, Suncor declared its withdrawal from Syria due to political unrest in the region. The production output from participation in international projects equaled to 89.5 and 76.4 mboed, which was 16.3% and 13.6% of the whole business portfolio in the period of 2012–2013. The core operations of Suncor's upstream business were built around oil sands development and production in the domestic market. This fact is also supported by Suncor's capital expenditure allocation. 69.2% and 62.6% of CapEx were used in the oil sands business in 2012 and 2013, respectively (APPENDIX D, Table D3).

Suncor was vertically integrated, with refineries spread within Canada and the northern part of the U.S. Although only 10.1% and 13.9% of the total CapEx were allocated to the downstream sector of the company, refineries accounted for 43% and 38% of total earnings in the pre-crisis years. A comparison of capacities between Suncor's upstream and downstream operations shows that oil and gas production exceeded refinery throughputs by 118 tboed and 102 tboed in 2012 and 2013, respectively. This implies that the downstream unit of Suncor was able to process approximately 80% of the upstream production output.

In 2012, Suncor proceeded with the wind projects Adelaide and Cedar Point, which added 55% to the already installed capacity of Suncor's wind projects across Canada. Suncor's renewable energy assets included also an ethanol plant in St. Clair. The firm's outlook for the renewables business remained unchanged in 2013.

7.1.2 Human resources

The total number of employees was stable over the period of 2012–2013 (APPENDIX D, Table D5). The distribution of employees shifted however. While the number of employees

increased in oil sands and refining operations, the number of employees decreased in the remaining exploration and production (by 33.4%) and the corporate business unit (by 3.3%).

7.2 Dynamic capabilities identification

We find evidence for ambidexterity and the ability to manage the upstream business ecosystem in form of development and deployment of new technologies. As following, we report on our findings. If not otherwise stated, the information is retrieved from the annual reports of the respective years (Suncor Energy Inc., 2012, 2013, 2014).

7.2.1 Ambidexterity

Suncor presented itself as an ambidextrous company, placing a focus on the ability to adapt to changing environments. Suncor tried to manage its knowledge transfer by transferring key leaders from one business sector to another. We perceive it as a measure against rigidity and business inertia as the transfer of key leaders brought new impact to processes, systems and cultures. These changes helped to embrace variations in business approaches, which, in accordance with Shuen et al. (2014), is what ambidexterity implies.

Another source of our judgement on the dynamics of change and the avoidance of inertia in the company is the opinion of Suncor's top managers. We examined testimonial videos available on the official web page of the company and tried to identify any factual arguments that may point to the ambidextrous nature of Suncor. We transcribed and analyzed the testimonial given in 2012 by one of the project managers from Fort McCarthur, Suncor's main project of oil sands operations (Appendix D). Assessing the given statement, we conclude that Suncor successfully maintained existing tailing processes while simultaneously and gradually introducing new technology. To emphasize, Suncor successfully managed the contemporary process of extraction while adapting the new processes. While addressing the needs for mature processes, Suncor drove innovation in its operations, which gives us reason to consider Suncor as an ambidextrous company.

7.2.2 Management of the upstream business ecosystem

Development and deployment of new technologies

Suncor claimed the pioneering position in oil sands development in Canada. Early investments helped to convert oil sands operations into commercially viable projects. An

analysis of the dynamics in Suncor's R&D underlines the company's commitment to open innovation principles. For example, in 2012, Suncor launched Canada's Oil Sands Innovation Alliance together with thirteen other oil companies. The alliance focussed on key environmental areas such as water, land, tailings and greenhouse gases. Another illustrative example is Suncor's participation in EVOK Innovations, which is a collaboration between three oil companies to accelerate early-stage innovative technology. Simultaneously, Suncor continuously monitored technology developments by third parties, kept close attention to findings, and made necessary investments in potentially important advancements. Suncor's investments in LanzaTech is an example of Suncor's interest in biofuels development (Suncor Energy Inc., 2017). In 2013, Suncor announced a target investment of $175 million in R&D for the year 2014, stressing its focus on incremental and game-changing technologies.

7.3 Game identification

In this section, we present opposing players in the group of customers, competitors, suppliers and complementors of Suncor. By evaluating the competitive postures and power-ratio assumptions, we identify that Suncor played cooperative type games with its customer. The games with competitors were leader/follower types as well as retaliatory types. Further, Suncor played leader/follower type games with its suppliers. With complementors Suncor played paternalistic-solidary, cooperative and leader/follower type games. We elaborate on the specific players and games in the following subsections and present the findings in Figure 7.

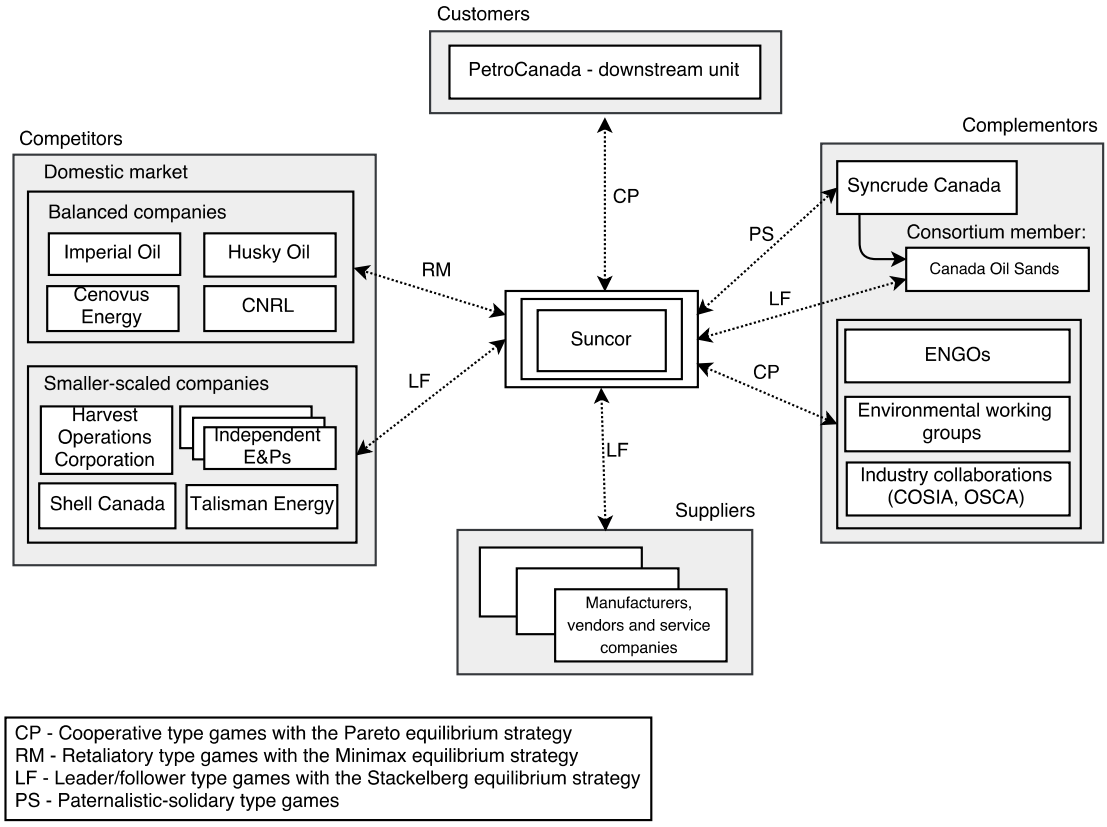

Figure 7. SGM Analysis of the Suncor case strategic games.

7.3.1 Customers

Analyzing the upstream environment of Suncor, we conclude that the main customer was Suncor's downstream department functioning under the name of Petro Canada (Suncor Energy Inc., 2012, 2013). The competitive posture is therefore associative. As one of the largest oil companies in the Canadian market, Suncor was one of three companies, which had more than one refining facility. Suncor's refining business included four refineries across the country with further distribution to various industrial, commercial and retail customers, including its own 1,500 gas stations. The downstream sector of Suncor was characterized by relatively large operations (see Resource identification), and we therefore view the power-ratio assumption as balanced. Suncor played a *cooperative type game* with the Pareto equilibrium strategy.

7.3.2 Suppliers

A number of small manufacturers, vendors and service providers acted as suppliers of various goods and services to support the business operations of Suncor (Suncor Energy Inc., 2012, 2013). Suncor held a stronger power-ratio assumption, while small manufacturers and service providers held weaker power-ratio assumptions. Meanwhile, we classify the competitive postures as individualistic, because each of the players was interested in the development of its own business, but adjusted their operations and market movements in accordance with the leading company, Suncor. With each of the suppliers, Suncor played *leader/follower type games* with the Stackelberg equilibrium strategy.

7.3.3 Competitors

Suncor's main focus was the domestic market. Among the main competitors there was Imperial Oil, the second biggest petroleum company in Canada with 70% of its shares in possession of ExxonMobil, and revenues of approximately $27 billion as for 2015 (Imperial Oil, 2015). Husky Energy, an integrated petroleum company, was another Suncor's competitor in the upstream market with revenues in 2015 equaled to $22.4 billion (Husky Energy Inc., 2015) and 70% of shares owned by Hong Kong tycoon Li Ka-shing (Associated Press, 2015). Another player, which participated in Canadian E&P competition, was Cenovus Energy. Focus of Cenovus Energy was the development of its integrative business by expanding downstream operations. Cenovus Energy's revenue value was around $20 billion in 2015 (Cenovus Energy Inc., 2015). Finally, Canadian Natural Resources (CNRL) was another distinguishable local competitor. CNRL is an independent company with sole E&P operations and revenue equaled to $17.9 billion in 2015 (Canadian Natural Resources Limited, 2015). All of the mentioned competitors of Suncor were not significantly different in the assumptions of power-ratio. All were characterized by equally-sized upstream operations and same-ranged revenue values. The competitive posture was rivalrous and a gain of one company would have caused a definite loss for the other. We identify these games as *retaliatory type games* with the Minimax equilibrium strategy.

Smaller Canadian competitors were represented by Talisman Energy, an independent E&P producer, and Harvest Operations Corporation, an oil and gas trust with upstream and downstream operations. Finally, the subsidiary of international Royal Dutch Shell – Shell Canada – an integrated player, concludes the list of significant competitors in Canada. There

was a number of even smaller E&P providers, that we do not analyze in details but account for their existence. The competitive interactions between Suncor and smaller competitors were of individualistic nature, and power-ratios were unbalanced with Suncor being a marginally more powerful player. Suncor played *leader/follower type games* with the Stackelberg equilibrium strategies.

7.3.4 Complementors

Syncrude Canada Ltd. (Syncrude) was one of the largest oil sands producers with E&P operations concentrated in Alberta, Canada. Syncrude was a consortium of seven major oil and gas companies, among which Suncor was the third significant shareholder with a 12% share in 2013 (Suncor Energy Inc., 2013). The main holder of interests in the consortium was Canadian Oil Sands Limited (COS) with a 36.7% share (Morgan, 2015).

The game between Suncor and Syncrude was twofold in its nature. First, the game between Suncor and the Syncrude consortium itself was a *paternalistic-solidary type game*, where Suncor had a stronger power position due to a larger operational scale, and the competitive posture was associative. Simultaneously, Suncor played games with each consortium member, where each had an individualistic competitive posture, but differed in its power-ratio due to proportional differences in their shares. For example, COS owned the biggest share in Syncrude, which means that COS and Suncor played a *leader/follower type game* with the Stackelberg equilibrium strategy.

A number of environmental non-government organizations (ENGOs) closely monitored petroleum companies active in oil sands operations. As Suncor was involved in partnerships with various institutions and independent firms – members of ENGOs – we account for them as complementors. Suncor was benefiting with valuable knowledge, insights and diverse perspectives from such partnerships (Suncor Energy Inc., n.d.). The list of complementors is extended to industry and environmental collaborations, including Canada's Oil Sands Innovation Alliance and Oil Sands Community Alliance. There was no rivalry surrounding Suncor's actions relatively to its business conduct, but complementarity was established by learning from each other. In this case, the competitive posture had an associative character and the power-ratio was balanced, which delineates *cooperative type games* with the Pareto equilibrium strategy.

7.4 Responses

In the following section, we identify the responses of Suncor to the dropping oil price. We start by examining the investment responses, thereafter the divestment responses and conclude with change in production levels. The information is retrieved from Suncor's annual reports (Suncor Energy Inc., 2014, 2015) of the respective years, if not otherwise stated.

7.4.1 Investments

Suncor decreased its overall capital and exploration expenditure by 4.7% in 2015, though in 2014 Suncor had an expenditure increase of 2.4%. It is noteworthy to mention, that in 2015 CapEx in conventional oil as well as refinery and marketing were subjects to greater decreases, by 21.4% and 19.7%, respectively (APPENDIX D, Table D3). At the same time, expenditures in oil sands, Suncor's main operations, increased by 9.6%. This pattern differed from the previous years, where capital expenditure was increased in both, conventional oil exploration and the downstream sector, and decreased in oil sands. This shift caused an increasing share of oil sands expenditure in the total CapEx, resulting in 62.4% in 2015.

Our analysis shows that Suncor did not cease its long-term key projects. In the beginning of 2015, Suncor announced its ambition to develop the giant mining project Fort Hills in northern Alberta, which was planned to be operated together with two other companies, Total and Teck Resources. CEO Steven Williams mentioned Fort Hills as one of the key strategic projects to boost capacity (Van Loon, 2015; Williams, 2017). In the fourth quarter of 2015, Suncor intensified its development activities in Fort Hills and invested in additional 10% interest in the project. This acquisition made Suncor to become the main investor and operator for the project with a total interest of 50.8%.

Suncor further acquired a main share of COS (84.2%) in the end of 2015 and claimed the intention of buying the remaining shares in 2016. The complete acquisition would increase Suncor's share in the Syncrude consortium to 48.7%.

Hebron East Coast offshore project was another capital consuming business focus of Suncor with continued investments for further development, in which the company had a 21% share. Hebron was viewed as a long-term growth project with high impact for the company's production capacity once it's launched ("Suncor Committed To Hebron", 2015).

7.4.2 Divestments

In the third quarter of 2015, Suncor carried out a non-cash asset exchange and lease with TransAlta Corporation. Suncor assumed operating control in the steam and power facility, Poplar Creek, while transferring shares of the wind power facilities, Wintering Hills and Kent Breeze. These reconfigurations were performed to better accommodate the oil sand operations, as steam and power facilities were used for Suncor's internal power demand.

Suncor also ceased the second phase of the MacKay River oil sand project and the White Rose Extension project offshore Newfoundland and Labrador (Van Loon, 2015).

The E&P business unit of Suncor - North America Offshore - sold its major project Wilson Creek in the third quarter of 2014 and was then subject to restructuring. North America Offshore and East Coast Canada were merged into E&P Canada in 2014.

The general reduction in the company's workforce equaled 515 employees in 2015 (APPENDIX D, Table D5). The highest reduction in workforce stemmed from the conventional exploration and production unit and the corporate department.

7.4.3 Production

In 2014, the average annual production was lower than expected due to a sharp drop in volumes in the second and third quarters. The decline in production was mainly caused by an outage due to extreme weather and planned maintenance. In the following year, Suncor's production increased by 8% from the 2014 level or 3% from the 2013 level (APPENDIX D, Table D2). The main increase in production can be attributed to an increase in oil sands output rather than conventional oil outputs. Notably, the increase in oil sands production volumes in 2015 was not attributed to an increase in the company's resource base, but to better utilization of the *in situ* facilities.

7.5 Analysis

In the following section, we proceed with an analysis of the responses and link them with the identified pre-crisis characteristics of the resources, dynamic capabilities and games Suncor played.

As discussed, capital expenditures decreased in the year of 2015. Suncor increased the spending of its budget in oil sands, and decreased its investments in other fossil fuel types, underlining the company's *specialization* in oil sands. While the oil price drop caused a decrease of revenue, thus limiting Suncor's internal financial resource, the company focused its operations in oil sands due to its expertise and existing *resource base,* and further strengthened its specialization.

Main investments in oil sands were the purchase of more shares in the project Fort Hills and the acquisition of main shares of COS, which in turn increased Suncor's share in the Syncrude consortium. At the same time however, the company did not carry out the planned extension process at MacKay River, which underlies limitations in Suncor's *financial resources* due to the crisis. Suncor needed to prioritize projects and allocate finances accordingly. Fort Hills was especially interesting for Suncor as it was an oil sands project with high quality in output and less uncertainties in development. It was 50% completed and was expected to bring first oil in 2017. Similarly, the company's effort to increase its share in the already operating Syncrude project ensured a higher production volume allocated to Suncor.

Regarding the acquisition of COS, Suncor and COS were competitors on the Canadian upstream oil and gas market, and at the same time complementors as Syncrude consortium members. Being a leader in the market, Suncor played a leader/follower type game with its smaller competitor, COS. However the companies played the same game with reversed roles in the Syncrude consortium, with Suncor being the follower as COS had a bigger share in the project. In June 2014, Suncor's CEO, Steven Williams, expressed his dissatisfaction with Syncrude's operations. The consortium's share production plunged down from 32,800 bpd to 24,300 bpd in the second quarter of 2014 (Hussain, 2014). In late 2015, Suncor placed an offer for appropriation of COS. This maneuver allowed Suncor to accumulate a majority of interests in Syncrude and set its own course (Morgan, 2015). The persistent nature of the low oil price paired with dissatisfied operational results of the consortium disrupted the

equilibrium and provoked Suncor, as the generally stronger player, to place the offer. Therefore, the acquisition of COS was a strategic action that was possible due to the nature of the *games* the companies played.

Suncor's sale of Wilson Creek in the third quarter of 2014 falls into the time of the oil price drop. However, the decision for this sale was made prior to the oil price drop. Nevertheless, it portrays that Suncor had been reassessing its assets continuously and was willing to divest from unprofitable or strategically non-fitting projects. This gives us further reason to argue that the divestments made in response to the oil price drop are not solely due to ad hoc problem solving, but can be viewed as a patterned process with respect to the *ambidextrous nature* of the company.

The non-cash asset exchange with TransAlta, which involved the divestment from wind power facilities and the acquisition of the steam and power facility, can be explained from the resource base perspective. As mentioned, the steam and power facility was supportive for Suncor's oil sands operations and covered Suncor's own power demand. The exchange of assets turned a non-strategic resource into an addition to the strategic resources of oil sands assets. Aligning the existing resources around its core resources and capabilities goes along with Suncor's *specialization.*

7.6 Conclusion

We can see the clear pattern that investment and divestment decisions of Suncor were shaped by its resources and competences as well as ambidexterity. Particularly, Suncor took investment decisions in accordance with its specialization in oil sands. Further, we identify games that influenced the decisions of Suncor's specific actions as illustrated in the example of the Syncrude consortium. We explain the general direction of Suncor's responses to the dropping oil price based on the resource-based view, while we observe that the specific investment decisions were shaped by the game-theoretic perspective.

8. Case 5 – ConocoPhillips

ConocoPhillips Company is an American independent E&P oil and gas company. The company was established in 2012 by spinning off its downstream operations. The company's headquarters are situated in Houston, Texas, U.S.A. ConocoPhillips is listed on the New York stock exchange.

8.1 Resource identification

In this section we elaborate the specific resources that ConocoPhillips possessed prior to the crisis. The hereafter presented analysis of the specific resources leads to the general statement that ConocoPhillips was *diversified within the industry* as its operational portfolio constituted both conventional and unconventional oil and gas projects, and the company demonstrated well established geographic diversification. At the same time, ConocoPhillips was not diversified outside its core industry, and, as an independent E&P company, was deficient in an integrated business model. If not otherwise stated, the following information is retrieved from ConocoPhillips' annual reports of the respective years – ConocoPhillips Company (2012, 2013, 2014b).

8.1.1 Physical resources

ConocoPhillips' worldwide portfolio included projects in the U.S.A., Canada, Europe and North Africa, Asia Pacific and the Middle East, and a number of other international destinations outside the global regional clusters. ConocoPhillips possessed a wide range of competences in conventional crude oil, shale oil, oil sands and deepwater offshore E&P operations. Natural gas reserves, including liquefied natural gas, constituted roughly the same amount as crude oil and bitumen reserves together (APPENDIX E, Table E1). In 2012 and 2013 natural gas and LNG accounted for 54.9% and 54.1% of the total daily production output, respectively (APPENDIX E, Table E2). ConocoPhillips also projected a five-year growth plan of 3% to 5% production increase per year through 2017. The company demonstrated a 4.8% production growth in 2013.

ConocoPhillips' domestic assets in the U.S.A. were clustered in the regional groups Lower 48 and Alaska. In the period of 2012–2013, the company kept CapEx attributed to its domestic projects above 40%. The remaining CapEx was distributed between various

international projects and assets (APPENDIX E, Table E3). As for 2012, ConocoPhillips established its operations and activities in 30 different countries. 36% and 30% of total earnings were generated by domestic projects in 2012 and 2013, respectively (APPENDIX E, Table E4).

According to an interview with Matt J. Fox, Executive Vice President of Exploration and Production, as for 2012 there were five focus areas for the company: the development of petroleum plays in the Lower 48, oil sands operations in Canada, major projects in Europe, deepwater exploration and development efforts in Malaysia, and an LNG venture in Australia. (ConocoPhillips Company, 2012, p. 6).

ConocoPhillips provided an extensive sustainability report (ConocoPhillips Company, 2014a), in which, alongside with discussions over the safety and interests of various stakeholders, the company underlined the importance of CO_2 emission reductions and demonstrated its climate change concerns. The company's portfolio, however, consisted of neither investments in renewable energy projects, nor did it reveal any plans or intentions of the company to address the issue in the foreseeable future.

8.1.2 Human resources

ConocoPhillips emphasized the importance of developing and retaining its workforce by technical learning, training, participation in development programs, collaborations and access to academic institutions and research partners. In the period of 2012–2013, the company increased its workforce by 1,500 new employees (APPENDIX E, Table E5).

8.2 Dynamic capabilities identification

We identify that ConocoPhillips possessed the dynamic capability of managing its upstream business ecosystem in terms of development and deployment of new technologies. We report on the finding in the following section. The information is retrieved from the company’s website (ConocoPhillips Company, n.d.).

8.2.1 Management of the upstream business ecosystem

Development and deployment of new technologies

ConocoPhillips' optimized cascade process was an innovative liquefaction process for LNG production. The first adaptation of the process, dated 1969, led to the development of ConocoPhillips' unique LNG technology and operations expertise which were continuously advanced since. The unique knowledge in liquefying natural gas allowed the company to license its technology and further built competence by improving cutting-edge solutions. Unique knowledge and experience in LNG though supported mainly company's core capabilities within the upstream business operations. The development and application of the company's LNG technology to the main production activities served as a higher-order capability and was enhancing the ordinary capabilities. As follows, we consider R&D activities in the development of LNG technology as dynamic capabilities in accordance with Shuen et al. (2014).

8.3 Game identification

In this section, we present opposing players in the groups of customers, competitors, suppliers and complementors of ConocoPhillips in accordance with the Demandbase screening. By evaluating the competitive postures and power-ratio assumptions, we identify that ConocoPhillips played competitive type games with its customers. The games with competitors were hegemonic-marginal as well as retaliatory types. Further, ConocoPhillips played leader/follower type and competitive type games with its suppliers. With complementors ConocoPhillips played cooperative games. We elaborate on the specific players and games in the following subsections and present the findings in Figure 8.

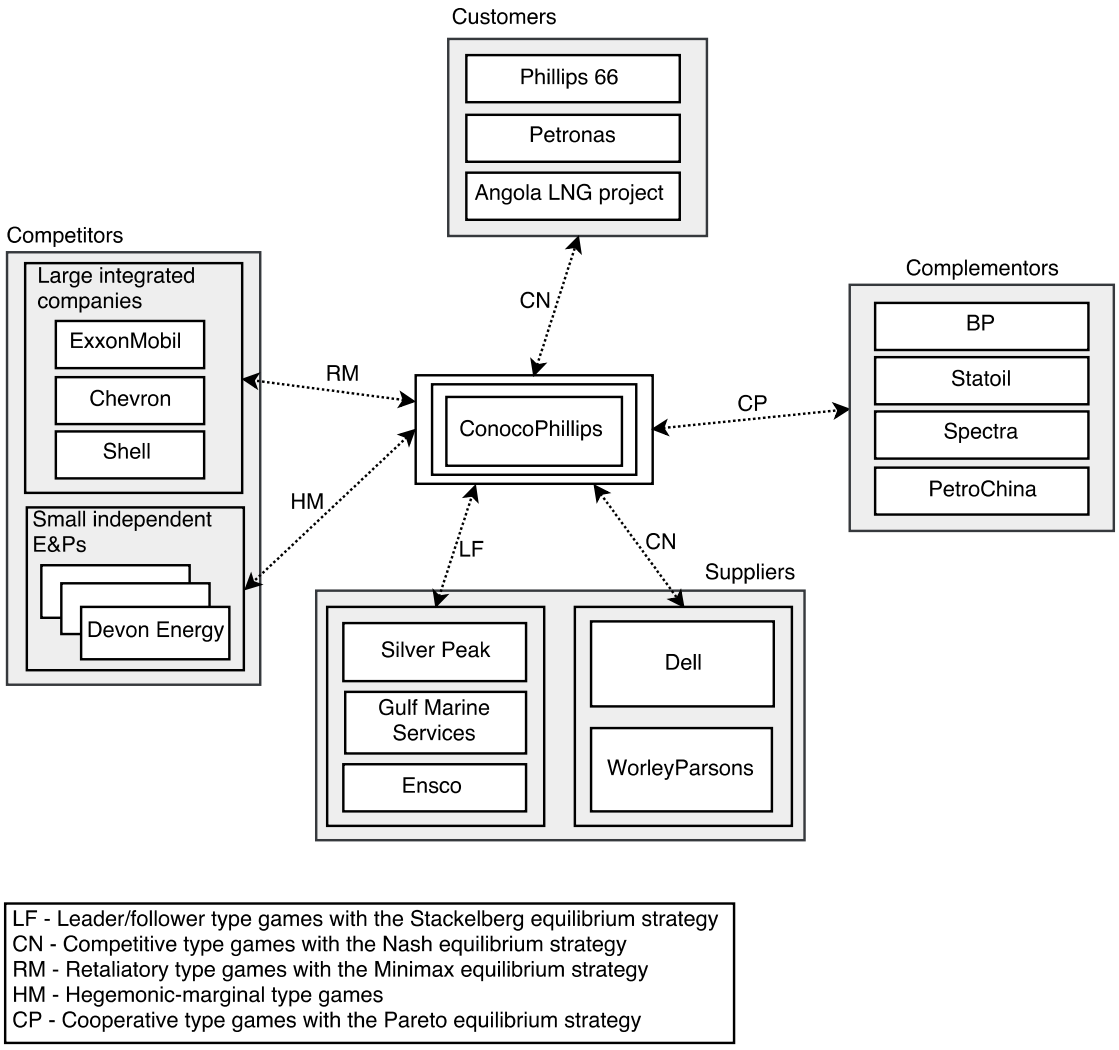

Figure 8. SGM Analysis of the ConocoPhillips case strategic games.

8.3.1 Customers

We find that Phillips 66, the downstream spin-off of ConocoPhillips, was the main customer and retained well established trading relationships with ConocoPhillips. Further, in 2012, ConocoPhillips signed a contract with Petronas, the Malaysian oil company, to appraise and develop the Kebabangan oil field. In addition, ConocoPhillips was a licensor of LNG technology. For example, Angola LNG, the liquefied natural gas joint project of Chevron, Sonangol, BP, Eni and Total adopted proprietary LNG technology from ConocoPhillips. All customers of the company were characterized by balanced power-ratios relatively to the ConocoPhillips itself. The customer companies were large business establishments that possessed equally strong strategic positions in the markets and were not dependent or significantly influenced by ConocoPhillips and its strategy. The competitive postures were

individualistic as each of the customers was interested in its own interests and benefits from the business relations. Thus, the games each of the customers played with ConocoPhillips are classified as *competitive type games* with the Nash equilibrium strategy.

8.3.2 Suppliers

Our analysis reveals a number of suppliers for various services and products. For example, Dell provided ConocoPhillips with point-of-sale systems and was the chosen supplier of ConocoPhillips' loyalty program in 2012. Silver Peak provided drilling and tracking services. WorleyParsons was one of the firms, which implemented front-end engineering design definitions and advanced procurement services. Support services on the sites and accommodations for workers on the projects in the Southern North Sea region were administrated by Gulf Marine Services Aberdeen. Ensco was a chosen drilling contractor for ConocoPhillips' deepwater exploration activities. The competitive posture between each of the suppliers and ConocoPhillips was individualistic as each player pursued its own interests in the business. Power-ratio assumptions varied between the companies. For suppliers with relatively weaker power-ratio assumptions, such as Silver Peak, Gulf Marine Service Aberdeen and Ensco, the contract with ConocoPhillips represented a significant and important business deal. Such companies played *leader/follower type games* with the Stackelberg equilibrium strategy. On the other hand, WorleyParsons and Dell were large and renown companies with established client bases. The power ratio between each of these players and ConocoPhillips was balanced, and the games played were *competitive type games* with the Nash equilibrium strategy.

8.3.3 Competitors

ConocoPhillips competed with large and prominent integrated oil companies as well as smaller independent E&P firms. Among large competitors there were ExxonMobil, Chevron and Shell. The games were characterized by rivalry competitive postures, while the power-ratio assumption of ConocoPhillips was weaker in comparison with the more leveraged integrated companies. However, E&P business operations of the integrated companies were comparable and balanced in their power ratio with ConocoPhillips. Thus, the power ratios of companies, considering solely upstream operations, were balanced. It follows that the games were *retaliatory type games* with the Minimax equilibrium strategy.

ConocoPhillips also competed with smaller independent E&P companies such as Devon Energy on its Lower 48 exploration territories. Smaller-scaled independent E&Ps, such as Devon Energy, had weaker power-ratio assumptions while the competitive postures between them and ConocoPhillips were rivalrous. Thus, ConocoPhillips played *hegemonic-marginal type games* with its weaker competitors.

8.3.4 Complementors

The study of complementors demonstrates that ConocoPhillips formed partnerships with BP and Statoil in the period of 2012–2014. Statoil and ConocoPhillips collaborated in the bidding for the development of two blocks east of Greenland and were chosen to work on one of them, while BP cooperated with ConocoPhillips in the deepwater projects of the U.S. Gulf of Mexico in 2014. The long lasting cooperations formed for different projects with BP and Statoil added value to the operations conducted by ConocoPhillips. This allows us to argue that BP and Statoil took the role of complementors to ConocoPhillips within the upstream operations. Moreover, in 2012, Spectra Energy and ConocoPhillips announced the formation of a joint venture – DCP Midstream – which gathered, processed and transported natural gas. Finally, in the beginning of 2013 it was announced that ConocoPhillips was entering joint study agreements with PetroChina to identify unconventional resource reserves in China's Sichuan Basin ("ConocoPhillips Signs 3 Agreements", 2013). All things considered, each of the complementors had an associative competitive posture as all of them were interested in mutual and beneficial development of their collaborative business operations. The power ratio between each of complementors and ConocoPhillips was balanced as all of them had comparable upstream operations. Thus, the games were of *cooperative type* with the Pareto equilibrium strategy.

8.4 Responses

In the following section, we identify the responses of ConocoPhillips to the dropping oil price. We start by examining the investment responses, thereafter the divestment responses and conclude with dynamics on production levels. The information is retrieved from ConocoPhillips' annual reports (ConocoPhillips Company, 2014b, 2015) of the respective years, if not otherwise stated.

8.4.1 Investments

In 2014, ConocoPhillips funded a $17 billion investment program and shifted towards high-value liquids and the support of expensive major projects. The highest spendings were allocated to the significant Australian Pacific LNG project, the Canadian oil sand megaproject Surmount 2 and the offshore oil development project Eldfisk II, which was situated in the Norwegian North Sea. As a result of production start from these projects, ConocoPhillips increased its annual production output by 3.2% in 2015, which implies that these projects were the main source of ConocoPhillips' production growth.

ConocoPhillips' portfolio was further focused on shale oil plays in the U.S. Lower 48 projects of Eagle Ford play and Bakken formation. ConocoPhillips operated both projects at lowest cost of supply compared to competitors. This implies that the company would have been able to increase production from these areas even with lower prices of oil than average in 2014–2015.

In 2015, ConocoPhillips demonstrated a decrease of capital spending by 41.2% (APPENDIX E, Table E3). The reduction of CapEx went alongside the general decrease in the asset base, as the company divested from international assets and withdrew its participation in a number of international projects and ventures (See Divestments). Thus, less investments have been performed due to a decreased asset base.

8.4.2 Divestments

As a response to the disadvantageous environment after the oil price drop of 2014, ConocoPhillips decided to focus on low cost-of-supply assets. A reduction of the deepwater exploration program caused the company to terminate deepwater drillship contracts with its service supplier Ensco. Furthermore, ConocoPhillips sold certain western Canadian

properties, production properties in North Louisiana, East and South Texas, pipeline and gathering assets in East Texas, and finally, a 50% stake in the Russian joint venture Polar Lights Company. ConocoPhillips further curtailed its shale gas exploration in Poland and withdrew all operations from the region (Pulsinelli, 2015a). The assets ConocoPhillips sold in western Canada amounted to around 20% of the total company's production portfolio in Canada (Pulsinelli, 2015b). Additionally, ConocoPhillips planned to market non-core assets aiming to generate up to $1 billion from these sales. Later in 2015, ConocoPhillips revised its Indonesian portfolio and considered to sell its stake in Natuna Sea block.

Notably, ConocoPhillips' disposal of assets had already begun prior to the crisis and was connected to the asset balancing after the spin-off of ConocoPhillips' downstream operations. The assets sold within the disposition program were the Kashagan field of the Caspian sea region, interests in Algeria, and the Nigerian business. Although Nigerian assets were sold in the third quarter of 2014, they are not viewed as a response to the oil price drop by ConocoPhillips itself.

ConocoPhillips also reduced its workforce from 19,100 to 15,900 employees in 2015. The biggest portion of all cuts was attributed to the headquarters in Houston. (APPENDIX E, Table E5).

8.4.3 Production

ConocoPhillips maintained a gradual increase in its oil and gas production, however, the most intensified accretion is noticed in Bitumen. Production of bitumen rose by 18.3% and 17.1% in 2014 and 2015, respectively (APPENDIX E, Table E2).

8.5 Analysis

In this section we proceed with the analysis of ConocoPhillips' responses and tie them to the identified pre-crisis characteristics of the resources, dynamic capabilities and games ConocoPhillips played.

ConocoPhillips decreased its capital expenditure and divested immensely in 2015. As an independent E&P firm, ConocoPhillips was not able to support its upstream operations by profitable downstream activities. The large divestment program must be considered with

respect to the limitations in financial resources and the *absence of* a lucrative *integrated model*. The divestments do not appear to follow a clear pattern in terms of geography or oil type. Divestments were made across the portfolio from non-profitable resources. By this, ConocoPhillips kept its internationally diversified set-up, but we attribute the divestment responses to mere ad hoc problem solving driven by the need of survival.

We observe, that ConocoPhillips pursued investments in major projects, such as the Australian LNG. Those projects were able to provide the company with an increased production volume for future periods. ConocoPhillips engaged in the major projects before the oil price drop occurred, and thus, we argue that these resources provided the company with the incentives to invest and ensure future growth. As the financial resource was limited due to the oil price drop, the strategies for investment and divestment decisions were focused on identification of the projects with promising production potential and less uncertainty. So to say, the existing physical resource configuration and absence of a tailored downstream unit underlay the prioritization decisions for investment and divestment responses.

8.6 Conclusion

We do not attribute ConocoPhillips' responses to specific games, nor to dynamic capabilities. ConocoPhillips acted upon the absence of a profitable refinery business, as has been noted, and responded to the dropping oil price under consideration of its limited financial resource but within the scope of its physical resource base.

9. Case 6 – OMV

OMV Aktiengesellschaft (OMV) is an international, integrated oil and gas firm headquartered in Vienna. OMV was founded in 1956 by the Austrian government. OMV is now a public company, listed on the Vienna stock exchange (Wiener Börse).

9.1 Resource identification

In this section we elaborate the specific resources that OMV possessed prior to the crisis. The hereafter presented analysis of the specific resources leads to the general statement that OMV was *diversified* in its operations, but *geographically focused* on Romania and Austria. OMV showed efforts to increase its geographic diversification due to declining natural reserves in its core regions. OMV drew value from its *integrated* model, but demonstrated a shift in its strategic focus towards the development of upstream operations. If not otherwise stated, the following information is retrieved from OMV's annual reports of the respective years – OMV Aktiengesellschaft (2012, 2013, 2014).

9.1.1 Physical resources

In the pre-crisis period OMV was active in crude oil, condensate and natural gas, where oil reserves accounted for 55% and 56.1% of the total reserves in 2012 and 2013, respectively (APPENDIX F, Table F1). OMV's main reserves were situated in Romania and Austria. The international portfolio included exploration and production in Asia, the Middle East and Africa as well as Australia. OMV's core assets were located in Romania and Austria with decreasing reserve replacement ratios of 60% in 2012 and 49% in 2013, while the international portfolio had increasing reserve replacement ratios of 122% in 2012 and 203% in 2013. A reserve replacement ratio portrays the ratio between the exploitation of existing reserve bases and the addition of new proved fields. OMV's ratios point out, that the company grew in its international market, but faced declining future supply from its core regions.

OMV's oil and gas production equaled 303 tboed in 2012 and 288 tboed in 2013 (APPENDIX F, Table F2). The decrease of 4.9% can be attributed to political unrest in Libya and to production issues in other operating countries. The core countries, Austria and Romania, remained stable in production during the analyzed period with evenly split

production output between crude oil and natural gas. OMV set its production target for 2016 to 400 tboed.

OMV's investment strategy was to spend in projects that would create long-term growth opportunities. Such projects were carried out in Sub-Saharan Africa and northern Europe. Especially, the North Sea had turned into a new focus area, where OMV planned on investing in E&P to increase its offshore and deepwater operational knowledge. For this, OMV made a large investment of $2.7 billion in 2013 and acquired assets from Statoil in Norway and the U.K. This investment related to a capital expenditure increase of 165.2% in exploration and production (APPENDIX F, Table F3). The acquisition was also consistent with a general strategy turn around such that OMV turned "from an integrated downstream-focused company to an integrated upstream-focused company." (OMV Aktiengesellschaft, 2013, p. 4). The target was to arrive at upstream asset base of 55% in 2021. In 2013, OMV already reached 51%. For this, 80% of capital expenditure was planned for investments in E&P until 2016. Consistent with this strategy, OMV divested from the downstream activities in Croatia and sold its 45% interest in Bayernoil refineries in Germany. The remaining three refineries were situated in Austria, Germany and Romania. Two of them were integrated petrochemical companies. Furthermore, the company owned gas-fired power plants in Turkey and Romania. The power plant in Turkey started production in 2013. The power business represented the downstream unit for OMV's own gas production as OMV supplied its powerplants with in-house produced gas.

OMV launched an initiative called 'Resourcefulness'. 'Eco-innovation' was one of three pillars of the initiative, and it favored projects that developed alternative energy sources and new business areas. One example was the investment in hydrogen mobility in Austria, where OMV was engaged with other partners, such as Daimler AG and Shell.

9.1.2 Human resources

Coherent with the strategy plan of refocusing towards upstream operations, OMV planned to hire 1,600 experts and technology graduates by 2016 to ensure further organizational growth. Even though OMV expanded its E&P activities and planned new hires, the overall number of employees dropped by 1,803 employees in 2012 and 2013 combined (APPENDIX F, Table F5).

9.2 Dynamic capabilities identification

Our analysis shows that OMV demonstrated the dynamic capability to manage the upstream business ecosystem in accordance with Shuen et al. (2014), as the company developed the higher-order capability to manage its joint ventures in a specific manner. The following information is retrieved from OMV's annual reports (OMV Aktiengesellschaft, 2012, 2013, 2014), if not otherwise stated.

9.2.1 Management of the upstream business ecosystem

Management of joint ventures

OMV had a long history of M&A. Most new exploration areas were entered by acquiring existing, well-established local companies. For example, the Romanian oil and gas fields were added by acquiring Petrom in 2004, the second biggest player in Romania at that time (OMV Aktiengesellschaft, n.d.). This pattern continued internationally over the years, for example, acquisition of shares in Madagascar, Norway and Iraq. In most countries OMV was further engaged in partnerships for exploration activities in the licensing fields. This was particularly important in the international arena, as the company was lacking strong positioning. While in Romania and Austria OMV acted mostly as the main shareholder in the joint ventures, the company was reliant on other partners in its international ventures. Examples of partnerships were the joint venture with ExxonMobil, that completed a first deepwater well in the Black Sea in 2012 (Liou, 2012), and the joint venture with Abu Dhabi National Oil Company to explore the region in East Abu Dhabi. The company sensed greater value and growth opportunities in new areas. With this motivation, OMV also sought for possibilities to engage in partnerships in the North Sea area.

9.3 Game identification

In this section, we present opposing players in the groups of customers, competitors, suppliers and complementors of OMV revealed by the Demandbase screening. By evaluating the competitive postures and power-ratio assumptions, we identify that OMV played cooperative type games with its customers. The games with competitors were hegemonic-marginal as well as retaliatory type games. Further, OMV played leader/follower type games with its suppliers and complementors. We elaborate on the specific players and games in the following subsections and present the findings in Figure 9.

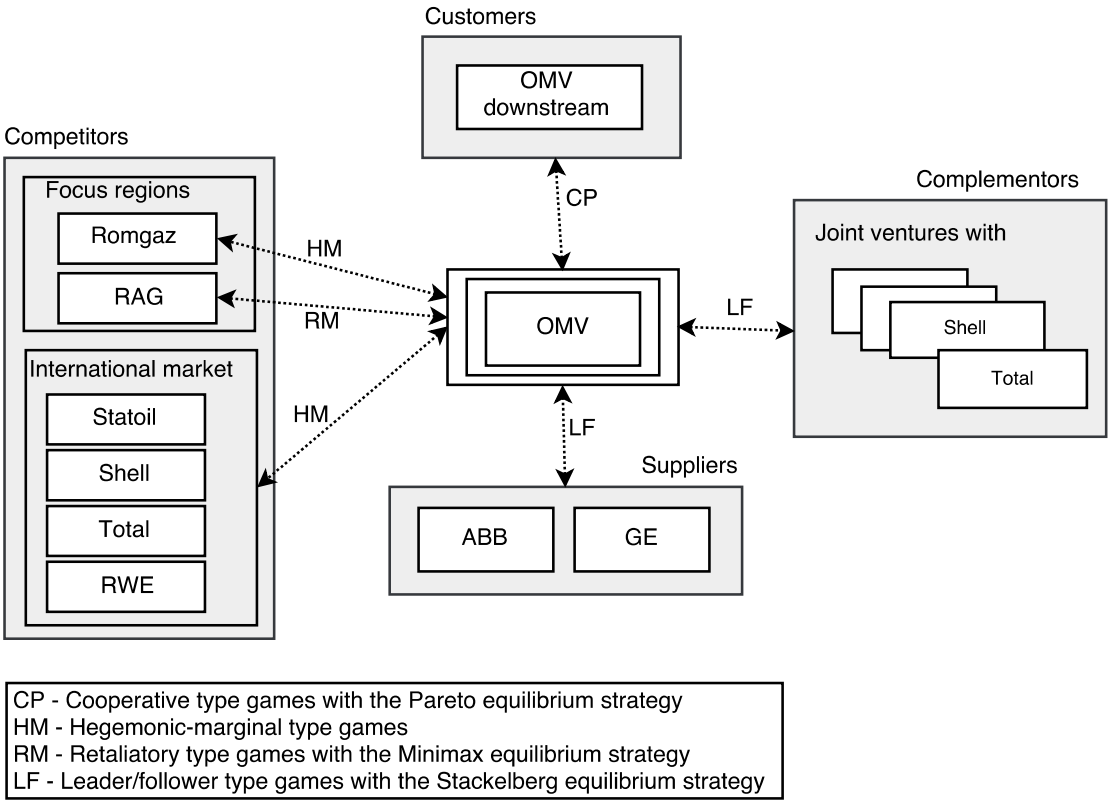

Figure 9. SGM Analysis of the OMV case strategic games.

9.3.1 Customers

OMV mainly distributed its production output within the OMV Group. Oil was sold to the refining and petrochemicals business units, while gas was used in the power business. Thus, the main customer was OMV's downstream unit. The competitive posture was associative as OMV was interested in the development and growth of both operational units. The power ratio between OMV's upstream and downstream units has altered in the period of 2012–2013. While the upstream business unit was previously minor and supportive to the downstream operations, the new strategy shifted this relationship, such that the upstream unit was becoming the stronger player. In the pre-crisis period the shift was however still ongoing. Therefore we argue that the power-ratio was in its transition phase and mostly characterized as balanced. The game played by the upstream and downstream business units was a *cooperative type game* with the Pareto equilibrium strategy.

9.3.2 Suppliers

Main suppliers to OMV were ABB, as a long term software provider, and General Electric, as a main manufacturer. Both companies were major global players in their fields, and their power position was relatively strong. OMV and each of the suppliers pursued their own business interests from the trading relationships, such that we characterize the competitive posture as individualistic. Thus, the game OMV played with each supplier was a *leader/follower type game* with the Stackelberg equilibrium strategy.

9.3.3 Competitors

In Romania as well as Austria competition was limited, and OMV was one of the leading petroleum companies. In Romania, OMV mainly competed with the state-owned petroleum company Romgaz, while in Austria, RAG was the main competitor. Compared to OMV, Romgaz was similar based on E&P operations, production output and revenue. This implies that OMV and Romgaz had a balanced power ratio. RAG was a weaker competitor with a smaller scope of operations. The competitive posture with both, Romgaz and RAG, was rivalrous. As follows, the game between OMV and RAG was a *hegemonic-marginal type game,* where OMV was the stronger player. The game between OMV and Romgaz was a *retaliatory type game* with the Minimax equilibrium strategy.

In the other international regions, the company competed with major oil companies for hydrocarbon resources: Statoil, Shell and Total. The competitive posture was characterized as rivalrous, while OMV had a weaker power-ratio assumption. Therefore, OMV played *hegemonic-marginal type games* with each of its stronger competitors.

9.3.4 Complementors

OMV engaged in partnerships for many of its international projects with major integrated companies, which complemented OMV's exploration effort. Joint ventures were for example established with Shell for exploration and development of the offshore gas field in New Zealand. Together with Total, OMV was awarded an exploration block in the offshore Bulgarian Black sea. The complementors had stronger power-ratio assumptions and pursued their own interests with individualistic competitive postures. The games OMV played with each of its large complementors were *leader/follower type games* with the Stackelberg equilibrium strategy, where OMV was a follower-company.

9.4 Responses

In the following section, we identify OMV responses to the drop in oil price. We start by examining the investment responses, thereafter the divestment responses and conclude with production levels. The information is retrieved from OMV's annual reports (OMV Aktiengesellschaft, 2014, 2015) of the respective years if not otherwise stated.

9.4.1 Investments

OMV's total capital expenditures dropped during the oil slump period (APPENDIX F, Table F3). CapEx in 2014 is contrastingly low in comparison to 2013, which saw significant spending in the North Sea region. Upstream CapEx was the focus during the oil price slump period and equaled to 77% of the total amount. The spending in gas and power, which incorporated the downstream business unit for gas operations, dropped immensely by 77.1% to $67.2 million in 2015. Also, the capital expenditure for OMV's oil downstream unit dropped by 19.3% in 2015. In the same period, OMV was actively engaged in new exploration and development, so that the company drilled 17 new wells. Most investments were made in the old core regions – Romania and the Black Sea. The new fields in Norway and the U.K. were further developed, and several wells started production in 2015.

Reserves declined in 2014 as well as in 2015. The reserve replacement ratio was only 64% and 44% in 2014 and 2015, respectively. Thus, the decline in reserves was not offset by new discoveries, which means that OMV's domestic reserves shrank. Regarding the international portfolio, excluding Austria and Romania, the reserves were replaced at a rate of 188% in 2014 and 155% in 2015. This constituted a decrease to the previous years and implied that OMV's growth in the international market was slowing down.

In 2015, OMV's employee pool shrank by 1,801 employees, which constituted a 7% decrease from 2014. Further, OMV hired a new CEO in July 2015.

9.4.2 Divestments

OMV did not divest from the upstream business unit. In 2015, OMV divested from Petrol Ofisi, its refinery business in Romania. Also, in the gas and power business divestments were planned to restructure the business, but no actions were taken in 2014 and 2015.

9.4.3 Production

Oil production increased in 2014 by 5.3% but decreased again in 2015 and remained slightly higher than in 2013 (APPENDIX F, Table F2). OMV explained the production decrease as due to periodic curtailment of operations in Libya and Yemen for security reasons. However, production in Norway increased due to the additions in wells. With a total daily production of 303 tboed OMV stayed still far behind its 2016 target of 400 tboed.

9.5 Analysis

In the following, we analyze OMV's responses and link them to the identified pre-crisis characteristics of the resources, dynamic capabilities and games OMV played. OMV increased its investments in the core region Romania after the oil price drop. Keeping in mind that OMV had been increasingly investing in resources in the North Sea and internationally, this appears inconsistent with OMV's strategy to expand outside its core regions. However, considering Romania and Austria were still the main *strategic areas*, the increased spending in the existing core resource portfolio is reasonable. In fact, OMV had been shifting focus away from the strategic resources in Romania, but, in the light of the crisis, went back to strengthen its operations in this important for the company country. The same response can be also explained from the position of *games* that OMV played. As we acknowledge, being a strong player in its core countries, OMV played hegemonic-marginal type games with the local competitors. It is less risky to develop business in a market where the company holds a dominant position. Contrastingly, in the international field OMV took a weaker position in the competition with more dominant players. Thus, the increased competition in the international regions, such as the North Sea, might have caused OMV to slow its development there and relocate investments to the more favorable core markets. We also acknowledge, that OMV was not able to draw value from their dynamic capability to manage the upstream business ecosystem. The previous pattern of acquiring new assets and engaging in strategic partnerships did not lead to further successfully collaborations during the period of oil price slump.

We observe that OMV increased CapEx for its downstream operations in 2014, but cut on it in 2015 by 19.3% (APPENDIX F, Table F3). In 2015, OMV also sold its Petrol Ofisi refinery. The increase in investments in 2014 was mainly attributed to upgrading operations.

As follows, we assert, that OMV kept investing in development of its *integrated model*, from which the company drove value, but stayed with the general trend of focusing on the upstream operations.

9.6 Conclusion

All in all, we recognize, that OMV responded to the dropping oil price by focusing on its resource base with expansion on upstream operations. OMV shifted its capital expenditure to less uncertain strategic assets in its core countries. We argue further that the game-theoretic position of OMV influenced its investment possibilities, but investment behavior differed in domestic and international markets. In general, OMV's investment responses were shaped by both, its resource base and games with competitors.

10. Discussion

Following Yin (2009), we create integrative tables to synthesize the data across cases (APPENDIX G, Tables G1–G4). We analyze resources, dynamic capabilities, games and responses during the period of 2012–2015 together with the conclusions drawn from each case previously debated. Further, we analyze whether some of the cases from our sample share similar characteristics and responses, and whether or not the cases are actually different based on the divided groupings. We then summarize how the internal and external firm factors influenced the responses, and answer our research question. Although our tables contain numeric data, the argument development relies strongly on our interpretation of information.

10.1 Upstream investments

We observe a general pattern of reduction in capital expenditures for all the cases analyzed for this research paper. We find that all companies invested in upstream operations and carried on with their major projects. However, the scale of investments decreased in comparison with the pre-crisis period. The oil price drop negatively affected the previously set investment courses, and investment patterns were guided by general strategies to assure future production growth and timely return on investments for most cases. The general trend was to reinforce operations in regions with less uncertainty, while Lukoil was able to strengthen its competitive position in the after-crisis period and expanded its international portfolio. Companies sought solutions shaped by both their available resource bases and competitive interactions with other players in the upstream sector. In some cases oil companies proceeded with certain projects that were possible to implement due to their developed dynamic capabilities, for example BP and Chevron.

10.2 Upstream divestments

We find that all companies from our sample were engaged in divestment strategies due to the oil slump that affected their financial resources. The companies divested from non-core assets, exited or decreased the stakes in capital intensive or uncertain projects and decreased their workforce numbers. The volume of divestments varied across the cases. ConocoPhillips and BP pursued with the most aggressive divestment strategies. In the case of

ConocoPhillips, the divestment responses can be explained by the company's inability to generate internal financial support from an integrated schema, or more precisely, the absence of a prolific downstream unit. BP, in turn, was affected by its previous large liabilities stemming from the Deepwater Horizon oil spill. In contrast, Lukoil was favored with opportunities due to beneficial circumstances in its domestic market and shifted equilibria in games with customers, suppliers and competitors. The oil price drop affected Lukoil's divestment strategy to a smaller extent.

10.3 Downstream investments

The downstream sectors showed increased earnings during 2015, which supported the operations of the integrated companies. For all cases, excluding ConocoPhillips and Lukoil, the downstream units represented the only profitable operations in the same year. At the same time, the companies from our sample did not increase capital expenditures in their downstream operations, some even kept divesting from the unit, for example OMV. We therefore do not detect a shift in focus from upstream to downstream operations for the oil companies in our sample.

10.4 Focus strategies

Our analysis has revealed that certain companies followed focus strategies, however those strategies varied from company to company. Relying on its integrative model, Chevron used its downstream profit to finance ongoing key projects in the upstream business unit to support tomorrow's growth. However, Chevron had to choose and kept investing in highly promising projects, while divesting from risky assets. Suncor strengthened its focus on oil sands assets in Canada due to its specialization and expertise in oil sands technology. ConocoPhillips sold its operations worldwide and focused on megaprojects that ensured certain growth. Even though the companies pursued focused strategies, we observe a difference in motivation between the companies: Suncor focused on one area of E&P operations due to its developed distinctive capabilities, while Chevron and ConocoPhillips focused on megaprojects to ensure a timely return and future growth.

10.5 Reactions in the large-scale group

The oil price slump affected the international presence of the oil companies in our large-scale group. For example, Lukoil used opportunities brought by the oil crisis and enlarged its global assets. Chevron and BP divested all around the world by carefully sorting out projects and assets, while keeping their diverse geographic portfolios. However, the motivation underlying the decisions differed. Lukoil gained stronger positioning in the disrupted games, which gave the company chances to strengthen its international presence. Chevron proceeded with its investment strategies largely based on ensuring the security of its resource base, while games and developed dynamic capabilities influenced decisions to a smaller extend. In the case of BP, the company went through a challenging history of consequences from the major oil spill and learned from it to seek hidden resource reserves. Although the period of low oil prices did not make it easier for BP, we observe a set of developed, distinctive capabilities, of higher-order, that the company possessed and used for its survival. Unique technical competences in upstream operations, the value of partnerships and management of joint ventures allowed BP to achieve positive earnings from operations in the year after the oil price drop, if we were to disregard the oil spill implications. Interestingly, we were able to distinguish responses based on particular games with surrounding players for each company from the large-scale group. In general, we observed a wide variety in strategic responses and motivations of the large-scale companies based on their extensive physical resource bases, well developed dynamic capabilities and games played.

10.6 Reactions in the small-scale group

We do not find evidence that would demonstrate a clear difference between our two groups of companies. The small-scale group was also characterized by a range of different strategic responses. For example, ConocoPhillips behaved similarly to Chevron, that we assigned to the large-scale group. ConocoPhillips divested its non-core assets and increased spending in key projects. Both companies had their corporate headquarters in the U.S.A. and increased their focus on domestic assets even though they differed in terms of whether or not they had an integrated model. In this sense, the geographic region of the assets together with the company's competences, influenced their strategic decisions. Further, for OMV we observe its struggle to pursue its expansion plans as the company was limited in its resource base and competences. The plans to progress with projects in the North Sea were impeded by the

crisis in 2014, opportunities were limited and the company refocused on its core assets in Romania and projects in the Black sea. Finally, Suncor strengthened its core competence and assets – oil sands. Clearly, Suncor quit any ambitions to pursue seizing opportunities elsewhere, divested uncertain projects and concentrated its attention to what it knew best. By the same token, the companies in our small-scale group differed in their responses and motives. The variation in resource bases and competences underlay the strategic reactions. Interestingly, we found that games influenced strategic responses in this group to a smaller extend.

10.7 Resources

Physical resources shaped general investments and divestments for all cases. Specialization areas were placed in focus, while widely diversified companies tried to find focus projects according to resources and competences they possessed. For example, BP focused on giant fields and deepwater unconventional productions, whereas Chevron focused on its key major projects. The oil crisis affected the strategies such that companies began to reconfigure their resource bases, utilized their competences and sought for new equilibria in disrupted games in accordance with redefined strategic priorities and resources in their possession. Although our analysis does not consider the impact of the oil crisis on the financial resources of the companies, we find that the responses were affected by limited finances. However, we do not reveal the extent the limited financial resources have on a company's responses.

10.8 Games

The investment and divestment decisions were mainly influenced by the games with competitors. Games were played once the situation of the company itself changed, or the competitor's position changed, such that the pre-crisis equilibria were disrupted. We are able to identify influential games, especially for large-scaled projects. The decisions influenced by games stayed within the general frame outlined by a company's resource base. The games then determined specific assets that were subject to divestment or investment within the scope of strategic responses. As mentioned above, we detect more occasions for games shaping specific responses among companies in the large-scale group. This can be explained by differences in opportunities. The large-scaled companies had larger resource bases with internationally spread portfolios of projects and capabilities. Thus, the probability to be

engaged in various and intricate ventures with more occasions for competitive interactions was higher. For example, ConocoPhillips divested largely with no detected occurrences for responses due to specific game situations, while all large-scaled companies had more resources and flexibility to be engaged into game interactions and solve the games based on their new competitive positions during the period of the oil price slump.

10.9 Other observations

We observe neither a shift in investments towards gas exploration and production, nor towards renewable energies. We also detect no immediate responses in 2014, but observe a time lag for concrete investment and divestment decisions of approximately six months. The main actions took place in 2015, once the drop in oil prices was perceived as longer lasting. In terms of production, all companies demonstrated increased production from existing fields. However, in the case of BP, production volumes decreased immensely due to their divestment plan. It is also important to say, that we find other reasons influencing the responses of the oil companies to the crisis. For example, in many cases the layoffs that occurred were made not only based on divestments of assets but also on ad hoc decisions to manage the crisis.

10.10 Answer to the main research question

We study strategic responses of the oil companies from our sample to the oil price drop of 2014 and distinguish a variety of investment reactions shaped by the concrete settings of each case.

The oil companies developed investment and divestment plans based on their physical resource portfolio, distinctive higher-order capabilities and games they played. The theoretical frameworks applied to the industry settings show that the two theory streams are not rivalrous, but complementary. Most importantly, we observe that the resource base and dynamic capabilities of the companies delineated the framework of targeted investment and divestment opportunities, while games determined the specifics and details of where, how much and when to invest or divest. With this in mind, we enhance our conceptual model and state that the game situations are derived from the company's resource and capability framework. As such, resources and capabilities are the defining factors for where and which

type of games a company may play and what possible solutions it may achieve. Based on the six analyzed cases in the upstream oil and gas sector, we find that in times of frame-breaking change internal firm factors dominate external factors, such as games companies play. Internal resources and capabilities therefore determine the games and anticipated outcomes. While the internal factors play a preeminent role, it is important to note that both firm factors - internal and external - shaped the strategic investment responses of oil and gas companies to oil price crisis of 2014. Our findings support the previous settings for the conceptual model, but suggest that the link between internal and external firm factors is not bidirectional, but instead points in one way. We adapt our model accordingly (Figure 10).

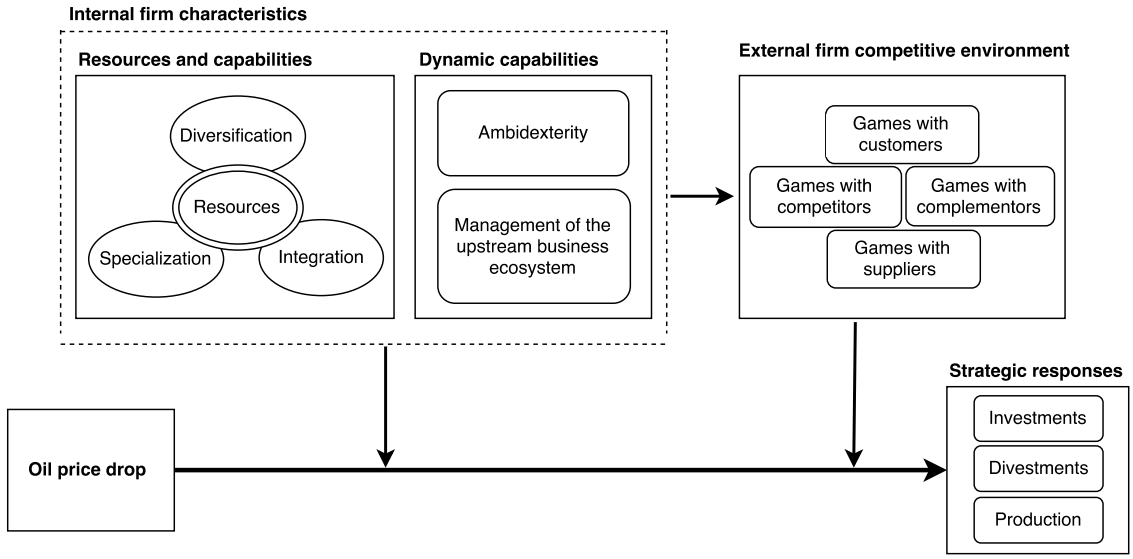

Figure 10. Enhanced model of influential factors shaping strategic responses of petroleum companies operating in the upstream oil and gas sector.

11. Conclusion

Anomalous events such as an economic crisis occur frequently in a modern economy (Grewal & Tansuhaj, 2001). Firms around the world must cope and manage through such adverse economic periods. In 2014, the oil industry experienced its strongest downturn since the 1990s due to an immense drop in oil prices (Krauss, 2017). Nowadays, many prominent, publicly traded oil and gas companies provide extensive, transparent data on their organization and performance, which gave us the opportunity to study their strategic behavior, focusing on investments and divestments. As follows, we were able to gain appropriate information on six international companies that operated in the upstream sector during the period of 2012–2015.

In our analysis, we adopted two distinctive approaches to study firms' characteristics and constrained our exploration to these specific theory streams. First, we employed a resource-based perspective to identify company's resources and capabilities with an enunciated accent on physical resources for the upstream sector of the oil and gas industry. We extended our analysis of internal factors to include firms' dynamic capabilities. Second, we adopted a game-theoretic approach to assess firms' external factors. Our work was focused on the identification of investment responses of oil and gas companies, and we further explored how these strategic responses were shaped by both internal and external factors.

We found that the petroleum companies reduced their total investments while strengthening their focus on spending in upstream operations. There was no increase in downstream capital expenditure for vertically integrated companies. In all cases we observed divestment behavior and reconfigurations of international assets, however intensities of divestments differed from company to company. We also did not detect a shift towards renewable energy sources as an alternative to oil. In like manner, there was no increase in interest in natural gas for our sample of petroleum companies. In all cases we further observed reductions in the number of employees, while production levels increased. The actions related to the reduction of workforce were made mainly in an ad hoc manner. Linking strategic responses to a firm's factors, we found that companies pursued their investment and divestment strategies on the basis of their distinct resources and dynamic capabilities. We also concluded that the games were inferior to internal factors, but shaped the specifics of investment and divestment actions.

11.1 Practical and theoretical implications

Our findings shed light on how strategic decisions are influenced by certain aspects of a firm's underlying characteristics and its external competitive environment. The resulting facts equip managers with a useful toolkit to understand company's response frames and influential factors.

The results of our research show how different resource configurations can influence different possibilities for responses. A diverse physical resource base enlarges the chances for competitive interactions and determines a framework for specific firm reactions. The competitive stand of a company is depended on its diversified portfolio, degree of flexibility due to existence or absence of an integrated model, and particular interests in each specific situation. In times of a steady economic environment, companies should therefore take advantage of opportunities and focus on strengthening their resource base and the development of dynamic capabilities. As follows, managers should have a clear understanding of available resources and capabilities before a crisis happens.

Managers should further understand the importance of certain dynamic capabilities for the industry the company operates in and how to support their development. As we determined, higher-order capabilities in terms of long term established research and development processes helped to improve core capabilities in oil and gas extraction and supported the operations in the time of crisis. Large-scaled projects, that were possible to carry out due to improvements in technology and technical methods, have shown to be the biggest source of future growth for petroleum companies.

Our findings imply, that it is also important to delineate the network of competitive interactions. Managers should understand the universe of all surrounding companies, including competitors, suppliers, customers and complementors. Economic distress may disrupt equilibria in competitive games and provoke new market conflicts, and actions should be taken to find new solutions to the games. Managers should be able to predict the outcomes of games more accurate, strengthen weak positions before an economic downturn happens and take advantage of situations when it is possible. Games can be exhausting, result in competitive wars, and may critically damage business and company's operational possibilities (Brandenburger & Nalebuff, 1996). Therefore, managers should clearly

understand where it is worth to fight and where the company should yield based on the settings of its resource base and developed dynamic capabilities.

Furthermore, with our work we attempt to answer a call to determine a firm's competitive success by examining its internal aspects and the external environment (Porter, 1991). We observed specific strategic behavior of the firms and assessed general similarities as well as differences between our cases. We found that some oil companies were more advantageously situated in terms of resources and dynamic capabilities, and thus had advantageous competitive positioning, while others struggled to cope with the crisis. As a matter of fact, Porter (1991) in his paper "Towards a dynamic theory of strategy" urged to conduct longitudinal detailed case studies to better understand these phenomena across wide range of industries and nations. Although with limited focus on the upstream sector of oil and gas industry, our work contributes to the development of the theory and proposes interesting directions for further research.

11.2 Future research

One possible direction of future research would be a detailed study of the connection between the external competitive environment and internal firm characteristics. Our study mainly focused on how different aspects of internal strength and external firm environment shape responses. We did not research the link between company's resources, capabilities and games per se. We suggest however, that the internal firm factors set the general scope, while the external firm factors delineate specifics of responses. It would be interesting to examine our finding more rigorously, understand how such interactions are established, and how one can observe general patterns across the cases to predict specifics of the interrelation between firm's internal factors and games. Thus, our model can be extended and approached differently.

Most games our sample companies played were concrete and specific. Rivalry and partnership relationships were quite manifold. Future research should take a more detailed look by focusing on one company to establish a greater in-depth analysis of the games. This could enhance the understanding of interactions between games and firm's resources.

We further suggest studying the linkage outside the particular industry crisis, but within a more general setting of a global economic crisis, such as the financial crisis of 2008.

Furthermore, to verify cross-industry transferability, it would be interesting to conduct similar research within another industry or sector. Additionally, future research could adopt a narrower approach by focusing on specific geographic regions or countries, and consider a sample of local oil companies.

Due to the relatively recent nature of the phenomenon and shortage in data availability, we were not able to extend our time horizon to 2016. Persistent low oil prices suggest however that responses may have been intensified. Future researchers will be able to gain access to more data points and follow the strategic behavior of firms over a longer period.

Finally, certain aspects of our findings can be further verified with the help of statistical methods based on quantitative data. Future studies can trace development and analyze trends across a larger sample of companies for example with the help of latent growth models. We found that vertical integration supported oil companies during the first year after crisis, while ConocoPhillips, as an independent E&P company, needed to divest non-core assets and heavily decreased its CapEx. Consequently, growth curve analyses of CapEx for independent E&P companies within the same economic environment and time settings could be of particular interest.

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APPENDIX A: The case of BP

Table A1

BP's proved reserves by fossil fuel type in 2012–2015

	Fossil fuel reserves				Change in reserves		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Liquids	10,050 *(59.1%)*	10,070 *(56%)*	4,809 *(44.4%)*	4,689 *(45.2%)*	+0.2%	-52.2%	-2.5%
Natural Gas	6,949.1 *(40.9%)*	7,926.7 *(44%)*	6,011.9 *(55.6%)*	5,694.5 *(54.8%)*	+14.1%	-24.2%	-5.3%
Total	16,999.1	17,996.7	10,820.9	10,383.5	+5.9%	-39.9%	-4%

Notes: Reserves are given in mboe. Share of total reserves is given in parentheses. Reserves in 2014 and 2015 exclude reserve share of Rosneft.

Table A2

BP's production volumes by fossil fuel type in 2012–2015

	Production volume				Change in volume		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Liquids	2,056 *(61.7%)*	2,013 *(62.3%)*	1,927 *(61.2%)*	1,232 *(54.6%)*	-2.1%	-4.3%	-36.1%
Natural Gas	1,274.7 *(38.3%)*	1,217.4 *(37.7%)*	1,224.1 *(38.8%)*	1.026 *(45.4%)*	-4.5%	-2.5%	-16.2%
Total	3,330.7	3,230.4	3,151.1	2,258	-3%	-2.5%	-28.3%

Notes: Volume of production output is given in tboed. Share of total production volume is given in parentheses. Production volumes of 2015 exclude production share from Rosneft.

Table A3

BP's capital expenditure by business unit in 2012–2015

	CapEx				Change in CapEx		
Business unit	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Upstream	18,520 *(73.5%)*	19,115 *(52.2%)*	19,772 *(83,1%)*	17,082 *(87,5%)*	+3.2%	+3.5%	-13.6%
Downstream	5,249 *(20.8%)*	4,506 *(12.3%)*	3,106 *(13,1%)*	2,109 *(10,8%)*	-14.2%	-31.1%	-32.1%
Rosneft	–	11,941 *(32,6%)*	–	–	–	–	–
Other & corporate	1,425 *(5.7%)*	1,050 *(2,9%)*	903 *(3,8%)*	340 *(1,7%)*	-26.3%	-14%	-63.3%
Total	25,204	35,612	23,781	19,531	+45.3%	-35%	-17.9%

Note: Capital expenditure is given in million US$.

Table A4

BP's operating income by business unit in 2012–2015

Business unit	2012	2013	2014	2015
Upstream	22,387	16,661	8,848	-967
Downstream	2,377	2,725	-2,362	5,248
Rosneft	–	2,053	1,076	1,314
TNK-BP	3,370	12,500	–	–
Other & corporate	-2,794	-2,319	-2,010	-1,768
Gulf of Mexico oil spill	-4,995	-430	-781	-11,709
Consolidation	-576	579	641	-36
Total	19,769	31,769	5,412	-7,918

Note: Operating income is given in million US$.

Table A5

BP's employees by business unit at year end of 2012–2015

	Employees				Change in employees		
Business unit	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Upstream	24,200	24,700	24,400	21,700	+2.1%	-1.2%	-11.1%
Downstream	51,800	48,000	48,000	44,800	-7.3%	0%	-6.7%
Other & corporate	10,300	11,100	12,100	13,300	+7.8%	+9%	+9.9%
Gulf Coast Restoration	100	100	–	–	+0%	-100%	–
Total	86,000	84,600	84,700	82,600	-1.6%	+0.1%	-2.5%

APPENDIX B: The case of Lukoil

Table B1

Lukoil's proved reserves by fossil fuel type in 2012–2015

	Fossil fuel reserves				Change in reserves		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Liquids	13,381 *(77.4%)*	13,461 *(77.4%)*	13,594 *(77.3%)*	12,585 *(76%)*	+0.6%	+1%	-7.4%
Natural Gas	3,915 *(22.6%)*	3,940 *(22.6%)*	3,991 *(22.7%)*	3,973 *(24%)*	+0.6%	+1.3%	-0.5%
Total	17,296	17,401	17,585	10,383.5	+0.6%	+1.1%	-5.8%

Notes: Reserves are given in mboe. Share of total reserves is given in parentheses.

Table B2

Lukoil's production volumes by fossil fuel type in 2012–2015

	Production volume				Change in volume		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Liquids	677 *(85,3%)*	684 *(85,1%)*	727 *(86,1%)*	749 *(86.3%)*	+1%	+6.3%	+3%
Natural Gas	117 *(14,7%)*	120 *(14,9%)*	117 *(13.9%)*	119 *(13,7%)*	+2.6%	-2.5%	+1.7%
Total	794	804	844	868	+1.3%	+5%	+2.8%

Notes: Volume of production output is given in tboed. Share of total production volume is given in parentheses.

Table B3

Lukoil's capital expenditure by business unit and region in 2012–2015

	CapEx				Change in CapEx		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
By business unit							
Upstream	9,195	14,205	11,628	10,153	+54.5%	-18.1%	-12.7%
	(72.2%)	*(78%)*	*(78.2%)*	*(86.6%)*			
Downstream	2,780	3,237	3,155	1,495	-16.4%	-2.5%	-52.6%
	(21.8%)	*(17.8%)*	*(21.2%)*	*(12.8%)*			
All Other	761	777	80	71	+2.1%	-89.7%	-11.9%
	(6%)	*(4.3%)*	*(5%)*	*(6%)*			
By region							
Russia	9,572	13,703	9,471	6,268	+43.2%	-30.9%	-33.8%
	(75.2%)	*(75.2%)*	*(63.7%)*	*(53.5%)*			
International	3,164	4,516	5,392	5,450	42.7%	+19.4%	+1.1%
	(24.8%)	*(24.8%)*	*(36.3%)*	*(46.5%)*			
Total	12,736	18,219	14,864	11,718	+43.1%	-18.4%	-21.2%

Note: Capital expenditure is given in million US$.

Table B4

Lukoil's operating income in 2012–2015

	Operating income				Change in operating income		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Total	14,070	10,247	7,239	6,390	-27.2%	-28.5%	-12.8%

Note: Operating income is given in million US$.

Table B5

Lukoil's employees by business unit at year end of 2012–2015

	Employees				Change in employees		
Region	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Russia	85,218	83,384	84,239	83,886	-2.2%	+1%	0.4%
International	26,796	26,242	26,094	22,301	-2.1%	-0.6%	-14.5%
Total	112,014	109,626	110,333	106,187	+2.1%	+0.6%	-3.8%

APPENDIX C: The case of Chevron

Table C1

Chevron's proved reserves by fossil fuel type in 2012–2015

	Reserves				Change in reserves		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Liquids	6,481 *(57.1%)*	6,345 *(56.6%)*	6,249 *(56.3%)*	6,262 *(56.1%)*	-2.1%	-1.5%	+0.2%
Natural Gas	4,865.8 *(42.9%)*	4,857.7 *(43.4%)*	4,852.7 *(43.7%)*	4,906.2 *(43.9%)*	-0.2%	-0.1%	+1.1%
Total	11,346.8	11,202.7	11,101.7	11,168.2	-1.3%	-0.9%	+0.6%

Notes: Reserves are given in mboe. Share of total reserves is given in parentheses.

Table C2

Chevron's production volumes by fossil fuel type and region in 2012–2015

	Production volume				Change in volume		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
by fossil fuel type							
Liquids	1,764 *(67,6%)*	1,731 *(66.7%)*	1,709 *(66.5%)*	1,744 *(66.5%)*	-1.9%	-1.3%	+2%
Natural Gas	845.7 *(32.4%)*	865.3 *(33.3%)*	861.2 *(33.5%)*	878.2 *(33.5%)*	+2.3%	-0.5%	+2%
by region							
U.S.	655.5 *(25.1%)*	656.7 *(25.3%)*	664.3 *(25.8%)*	719.3 *(27.4%)*	+0.2%	+1.2%	+8.3%
International	1,954.2 *(74.9%)*	1,939.7 *(74.7%)*	1,905.8 *(74.2%)*	1,902.8 *(72.6%)*	-0.7%	-1.7%	-0.2%
Total	2,698.7	2,596.3	2,570.2	2,622.2	-0.5%	-1%	+2%

Notes: Volume of production output is given in tboed. Share of total production volume is given in parentheses.

Table C3

Chevron's capital expenditure by business unit and region in 2012–2015

	CapEx				Change in CapEx		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
by business unit							
Upstream	30,444 *(88.9%)*	37,858 *(90.4%)*	37,115 *(92.1%)*	31,117 *(91.6%)*	+24.4%	-2%	-16.2%
Downstream	3,172 *(9.3%)*	3,175 *(7.6%)*	2,590 *(6.4%)*	2,436 *(7.2%)*	+0.1%	-18.4%	-5.9%
All Other	613 *(1.8%)*	844 *(2%)*	611 *(1.5%)*	426 *(1.3%)*	+37.7%	-27.6%	-30.3%
by region							
United States	11,046 *(32.3%)*	11,287 *(27%)*	11,032 *(27.4%)*	9,923 *(29.2%)*	+2.2%	-2.3%	-10.1%
International	23,183 *(67.7%)*	30,590 *(73%)*	29,284 *(72.6%)*	24,056 *(70.8%)*	+32%	-4.3%	-17.9%
Total	34,229	41,877	40,316	33,979	+22.3%	-3.7%	-15.7%

Note: Capital expenditure is given in million US$.

Table C4

Chevron's operating income by business unit in 2012–2015

Business Unit	2012	2013	2014	2015
Upstream	23,788	20,809	16,893	-1,961
Downstream	4,299	2,237	4,336	7,601
All Other	-1,908	-1,623	-1,988	-1,053
Total	26,179	21,423	19,241	4,587

Note: Operating income is given in million US$.

Table C5

Chevron's employees at year end of 2012–2015

	Employees				Change in employees		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Total	58,286	61,345	61,456	58,178	+5.2%	+0.2%	-5.3%

APPENDIX D: The case of Suncor

Table D1

Suncor's proved reserves by fossil type in 2012–2015

	Fossil fuel reserves				Change in reserves		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
SCO	2,623 *(64.6%)*	2,578 *(53.7%)*	2,491 *(53.2%)*	2,442 *(52.3%)*	-1.7 %	-3.4%	+0.2%
Bitumen	963.7 *(23.7%)*	1,887 *(39.9%)*	1,838 *(39.3%)*	1,917 *(41.2%)*	+95.8%	-2.6%	+4.3%
Light & Medium Oil	365.1 *(9%)*	329 *(6.8%)*	343 *(7.3%)*	283 *(6.1%)*	-9.9%	+4.3%	-17.5%
NGL	7.2 *(0.2%)*	1 *(0%)*	– –	– –	-86.1%	-100%	n.a.
Natural Gas	101 *(2.5%)*	9 *(0.2%)*	8.83 *(0.2%)*	6.3 *(0.1%)*	-91.1%	-1.9%	-28.3%
Total	4,060	4,804	534.9	477.8	+18.3%	-2.6%	-0.7%

Notes: Reserves are given in mboe. Share of total reserves is given in parentheses.

Table D2

Suncor's production volumes by fossil fuel type in 2012–2015

	Production volume				Change in volume		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Oil Sands	359.2 *(65.4%)*	392.5 *(70%)*	421.9 *(79%)*	463.4 *(80%)*	+9.3%	+7.5%	+9.8%
All Other	189.9 *(34.6%)*	169.9 *(30%)*	113 *(21%)*	114.4 *(20%)*	-10.5%	-33.5%	+1.2%
Total	549.1	562.4	534.9	477.8	+2.4%	-4.9%	+8%

Note: Volume of production output is given in tboed. Share of total production volume is given in parentheses.

Table D3

Suncor's capital expenditure by business unit in 2012–2015

	CapEx				Change in CapEx		
Business unit	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Oil Sands	4,407 *(69.2%)*	3,996 *(62.6%)*	3,541 *(54.2%)*	3,881 *(62.4%)*	-9.3%	-11.4%	+9.6%
Exploration & Production	1,227 *(19.3%)*	1,401 *(22%)*	1,685 *(25.8%)*	1,325 *(21.3%)*	+14.2%	+20.3%	-21.4%
Refining & Marketing	643 *(10.1%)*	890 *(13.9%)*	1,009 *(15.5%)*	810 *(13%)*	+38.4%	+13.4%	-19.7%
Corporate, Energy Trading & Renewables	95 *(1.5%)*	93 *(1.5%)*	295 *(4.5%)*	204 *(3.3%)*	-2.1%	+217.2%	-30.8%
Total	6,372	6,380	6,530	13,190	+0.1%	+2.4%	-4.7%

Notes: Capital expenditure is given in million US$. Share of total capital expenditure is given in parentheses.

Table D4

Suncor's operating income by business unit in 2012–2015

Business Unit	2012	2013	2014	2015
Oil Sands	2,015	2,098	2.771	-111
Exploration & Production	850	1,210	857	7
Refining & Marketing	2.144	2.022	1,692	2.234
Corporate, Energy Trading & Renewables	-119	-630	-700	-665
Total	4,890	4,700	4,620	1.465

Note: Operating income is given in million US$.

Table D5

Suncor's employees by business unit at year end of 2012–2015

	Employees				Change in employees		
Business unit	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Oil Sands	6,015 *(43.2%)*	6,310 *(45.2%)*	6,024 *(44%)*	6,008 *(45.5%)*	+4.9%	-4.5%	-0.3%
Exploration & Production	719 *(5.2%)*	479 *(3.4%)*	489 *(3.6%)*	360 *(2.7%)*	-33.4%	+2.1%	-26.4%
Refining & Marketing	3,175 *(22,8%)*	3,265 *(23.4%)*	3,460 *(25.2%)*	3,437 *(26.1%)*	+2.8%	+0.6%	-0.7%
Corporate, Energy Trading & Renewables	4,023 *(28.9%)*	3,892 *(27.9%)*	3,732 *(27.2%)*	3,385 *(25.7%)*	-3.3%	-4.1%	-9.3%
Total	13,932	13,946	13,705	13,190	+0.1%%	-1.7%	-3.8%

Note: Share of total workforce is given in parentheses.

Video testimonial transcription.

Kathi Brewer-Gouthro, Project manager, Major Projects – Fort McMurray.

Transcription of the video testimonial, published 9 March, 2012 (Suncor Energy Inc., 2012b)

"I have started working with Suncor in 1996 as a co-op student. I have graduated in April 1998, and started working in Suncor corporation and mine engineering and mine planning. The thing that was appealing to me about Suncor as a career opportunity was an integrating nature. It is mining, it is extraction, it is tailings, it is upgrading, it is off lots, it is utilities, it is marketing and logistics. So, it was a huge candy shop of opportunity. Oil sands mining and extraction is unique. There is only found one place in Canada and it is right here. So, all the technology behind it, the tailings technology, the great work that the company is doing with environment and sustainability initiatives - it is right here. I am personally very proud being able to be part of the group that is putting in the infrastructure to support the taro process that the business unit developed because the entire Suncor's tailing handling process

is changing. All the infrastructure is going to be in place. The new barges, the new pipelines, the new pump houses that is going to change the whole material handling process for Suncor, for tailing handling. Now, we get the opportunity to build the infrastructure and hand over the keys to the complex, so to speak, and to see it takes off. I have got this piece of the pie, and that is really what it is all about. You get ownership of it – it is really exciting. I try not to over moto when they talk what is Suncor's culture, what is Suncor's vision. It is just do your best, take it up a notch, and do the right thing."

Interpretative analysis of the testimonial.

The content analysis for the testimonial, given by the project manager in Fort McMurray, provides a better understanding on what and how processes happening from a managerial point of view. Even though there is a personal insight on a job position, we still are able to study the whole picture of the current situation and ability of Suncor to change. We underline phrases and sentences that represent particular important facts on how Suncor introduced changes while maintaining the established processes. The dynamics of change ascertained as the aspects of the whole tailing process alteration. The technology is unique for Canada, and Suncor successfully managed the contemporary process of extraction while introducing new technology and adapting the processes. The ability to successfully implement changes while managing previously established processes and activities implies that Suncor was ambidextrous across mature and emerging domains.

APPENDIX E: The case of ConocoPhillips

Table E1

ConocoPhillips' proved reserves by fossil fuel type in 2012–2015

	Fossil fuel reserves				Change in reserves		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Crude Oil	2,779 *(32.2%)*	2,749 *(30.8%)*	2,708 *(30.4%)*	2,363 *(28.9%)*	-1.1%	-1.5%	-12.7%
Natural Gas & NGL	3,963 *(45.9%)*	4.142 *(46.4%)*	4,132 *(46.4%)*	3,424 *(41.9%)*	+4.5%	-0.2%	-17.1%
Bitumen	1,900 *(22%)*	2,030 *(22.8%)*	2,066 *(23.2%)*	2,393 *(29.3%)*	+6.8%	+1.8%	+15.8%
Total	8,642	8,921	8,906	8.180	+3.2%	-0.2%	-8.2%

Notes: Reserves are given in mboe. Share of total reserves is given in parentheses.

Table E2

ConocoPhillips' production volumes by fossil fuel type in 2012–2015

	Production volume				Change in volume		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Crude Oil	618 *(39.2%)*	581 *(38.7%)*	595 *(38.6%)*	650 *(38.1%)*	-6%	+2.4%	+1.7%
NGL	160 *(10.1%)*	156 *(10.4%)*	159 *(10.3%)*	156 *(9.8%)*	-2.5%	+1.9%	-1.9%
Bitumen	93 *(5.9%)*	109 *(7.3%)*	129 *(8.4%)*	151 *(9.5%)*	+17.2%	+18.3%	+17.1%
Natural Gas	707 *(44.8%)*	656 *(43.7%)*	657 *(42.7%)*	677 *(42.6%)*	-7.2%	+0.2%	+0.3%
Total	1,578	1,502	1,540	1,589	-4.8%	+2.5%	+3.2%

Note: Volume of production output is given in tboed. Share of total production volume is given in parentheses.

Table E3

ConocoPhillips' capital expenditure by business unit in 2012–2015

	CapEx				Change in CapEx		
Business unit	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Alaska	828 *(5.8%)*	1,140 *(7.3%)*	1,564 *(9.2%)*	1,352 *(13.5%)*	+37.7%	+37.2%	-13.6%
Lower 48	5,251 *(37.1%)*	5,210 *(33.5%)*	6,054 *(35.4%)*	3,765 *(37.5%)*	-0.8%	+16.2%	-37.8%
Canada	2,184 *(15.4%)*	2,232 *(14.4%)*	2,340 *(13.7%)*	1,255 *(12.5%)*	+2.2%	+4.8%	-46.4%
Europe & North Africa	2,860 *(20.2%)*	3,126 *(20.1%)*	2,540 *(14.9%)*	1,573 *(15.7%)*	+9.3%	-18.7%	-38.1%
Asia Pacific & Middle East	2,430 *(17.1%)*	3,382 *(21.8%)*	3,877 *(22.7%)*	1,812 *(18%)*	+39.2%	+14.6%	-53.3%
Other International	415 *(2.9%)*	265 *(1.7%)*	520 *(3%)*	173 *(1.7%)*	-36.1%	+96.2%	-66.7%
Corporate & Other	204 *(1.4%)*	182 *(1.2%)*	190 *(1.1%)*	120 *(1.2%)*	-10.8%	+4.4%	-36.8%
Total	14,172	15,537	17,085	10,050	+9.6%	+10%	-41.2%

Notes: Capital expenditure is given in million US$. Share of total capital expenditure is given in parentheses.

Table E4

ConocoPhillips' operating income by business unit in 2012–2015

Business unit	2012	2013	2014	2015
Alaska	2,276	3,276	2,977	-166
Lower 48	1,029	1,449	1,052	-3,268
Canada	-684	746	1,154	-1,290
Europe & North Africa	1,498	4,278	2,022	-1,533
Asia Pacific & Middle East	3,996	4,630	3,793	-397
Other International	359	-31	95	2
Corporate & Other	993	1,410	1,199	–
Total	8,474	15,758	1,176.4	-6,652

Note: Operating income is given in million US$.

Table E5

ConocoPhillips' employees at year end of 2012–2015

	Employees				Change in employees		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Total	16,900	18,400	19,100	15,900	+8.9%	+3.8%	-16.8%

APPENDIX F: The case of OMV

Table F1

OMV's proved reserves by fossil fuel type and region in 2012–2015

	Reserves				Change in reserves		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
by type							
Oil & NGL	614.8 *(55%)*	634.3 *(56.1%)*	615.7 *(56.5%)*	n.a.	+3.2%	-2.9%	n.a.
Natural Gas	502.8 *(45%)*	496.5 *(43.9%)*	474.7 *(43.5%)*	n.a.	-1.3%	-4.4%	n.a.
by region							
Romania & Austria	855.4 *(76.5%)*	805.2 *(71,2%)*	763.3 *(70%)*	n.a.	-5.9%	-5.2%	n.a.
Rest	262.2 *(23.5%)*	325.6 *(28.8%)*	327.1 *(30%)*	n.a.	+24.2%	+0.5%	n.a.
Total	1,117.6	1,130.8	1,090.4	1.028	+3.2%	-0.2%	-8.2%

Notes: Reserves are given in mboe. Share of total reserves is given in parentheses.

Table F2

OMV's production volumes by fossil fuel type in 2012–2015

	Production volume				Change in volume		
Fossil fuel type	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Oil & NGL	162.5 *(53.4%)*	150.4 *(52.3%)*	158.4 *(51.2%)*	151.5 *(50%)*	-7.4%	+5.3%	-4.3%
Natural Gas	141.9 *(46.6%)*	137.3 *(47.7%)*	151 *(48.8%)*	151.2 *(50%)*	-3.3%	+10%	+0.2%
Total	304.4	287.7	309.3	302.7	-5.5%	+7.5%	-2.1%

Notes: Volume of production output is given in tboed. Share of total production volume is given in parentheses.

Table F3

OMVs' capital expenditure by business unit in 2012–2015

	CapEx				Change in CapEx		
Business unit	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Exploration & Production	2,203.6 *(65.9%)*	5,844.5 *(84.8%)*	3,582.5 *(77%)*	2,330.5 *(77.2%)*	+165.2%	-38.7%	-34.9%
Gas & Power	484 *(14.5%)*	356.1 *(5.2%)*	295 *(6.3%)*	67.5 *(2.2%)*	-26.4%	–17.2%	-77.1%
Refining & Marketing	599.9 *(17.9%)*	650.3 *(9.4%)*	736.9 *(15.8%)*	594.6 *(19.7%)*	+8.4%	+13.3%	-19.3%
Corporate & Other	57.9 *(1.7%)*	42.2 *(0.6%)*	37.6 *(0.8%)*	25.5 *(0.8%)*	-27.1%	-10.8%	-32.3%
Total	3,345.5	6,893.1	4,652	3,018.1	+106%	-32.5%	-35.1%

Notes: Capital expenditure is given in million US$. Share of total capital expenditure is given in parentheses.

Table F4

OMV's operating income by business unit in 2012–2015

Business unit	2012	2013	2014	2015
Exploration & Production	3,782.6	2,624.8	1,779.7	-2.582
Gas & Power	59.3	1.3	-242.8	-604.4
Refining & Marketing	575	1.018.3	-410.3	969.2
Corporate & Other	-91	-69.9	-76.5	-52.2
Consolidation	-45.5	9.2	126.3	86
Total	4,280.4	3,583.7	1,176.4	-2,184.4

Note: Operating income is given in million US$.

Table F5

OMV's employees at year end of 2012–2015

	Employees				Change in employees		
	2012	2013	2014	2015	Δ12-13	Δ13-14	Δ14-15
Total	29,147	27,344	26,618	24,817	-6.2%	-2.7%	-6.8%

APPENDIX G: Cross-case analysis

Table G1

Comparison of resources of sample companies prior to the oil price drop of 2014

Company	Fuel fuels	International dispersion	Integration	Renewables
BP	- conventional & unconventional - oil & gas	- domestic market: U.K. - worldwide operations - no focus area	- supportive value of downstream operations	- wind: largest producer in U.S. - biofuels
Lukoil	- focus on conventional oil - deepwater - shale oil	- domestic market: Russia - worldwide operations - focus on Russia	- claim supportive value of downstream operations	- supportive for main operations - wind - photo-electrical
Chevron	- conventional & unconventional - oil & gas	- domestic market: U.S. - worldwide operations - no focus area	- supportive value of downstream operations	- geothermal: world leader - solar - biomass
Suncor	- focus on oil sands - few conventional oil & gas operations	- domestic market: Canada - North Sea, Middle East - focus on Canadian operations	- great value of downstream operations	- multiple wind farms - investments in ethanol plant
ConocoPhillips	- conventional & unconventional - oil & gas	- domestic market: U.S. - worldwide operations - focus area: U.S.	- independent petroleum company	- none
OMV	- conventional oil & gas - unconventional oil	- domestic market: Austria - worldwide presence - focus on Austria and Romania - shift towards North Sea	- great value of downstream operations	- small investments

Table G2

Comparison of dynamic capabilities of sample companies prior to the oil price drop 2014

Company	Ambidexterity	Management of upstream business ecosystem
BP	- ambidextrous leadership	- management of joint ventures - development and deployment of new technologies
Lukoil	- no evidence	- strategy formation - development and deployment of new technologies
Chevron	- no evidence	- development and deployment of new technologies
Suncor	- ambidextrous leadership - ambidextrous interaction of operational processes	- development and deployment of new technologies
ConocoPhillips	- no evidence	- development and deployment of new technologies
OMV	- no evidence	- management of joint ventures

Table G3

Comparison of games of sample companies by opposing player groups prior to the oil price drop of 2014

Company	Games with Customers	Games with Competitors	Games with Suppliers	Games with Complementors
BP	- paternalistic-solidary - leader/follower	- leader/follower - retaliatory	- leader/follower	- leader/follower
Lukoil	- competitive - paternalistic-solidary	- retaliatory	- competitive - leader/follower	- paternalistic-solidary
Chevron	- cooperative	- retaliatory - hegemonic-marginal	- leader/follower	- paternalistic-solidary
Suncor	- cooperative	- leader/follower - retaliatory	- leader/follower	- leader/follower - paternalistic-solidary - cooperative
ConocoPhillips	- competitive	- retaliatory - hegemonic-marginal	- leader/follower - competitive	- cooperative
OMV	- cooperative	- retaliatory - hegemonic-marginal	- leader/follower	- leader/follower

Table G4

Comparison of investment and divestment responses of sample companies in 2014–2015

Company	Investments	Divestments
BP	- proceeding with ongoing major projects across the world - reduced investment in exploration	- decreased presence in U.S. Gulf of Mexico - U.K. North Sea
Lukoil	- Increasing investments in ruble - International expansion: Iran, Iraq, Usbekistan	- Eastern Europe - Venezuela
Chevron	- focus on ongoing major projects: Australian LNG, U.S. Gulf of Mexico	- non-core assets across the world
Suncor	- focus on oil sands operations - focus on domestic market	- offshore divestments - non-core assets across the world
ConocoPhillips	- focus on domestic market - focus on ongoing major projects: Australian LNG, North Sea, Canadian oil sands	- divestments across the world
OMV	- mainly Romania and Black Sea - proceeding in North Sea	- no divestment from upstream operations - divestments from downstream assets