Downfall in the Oil Price; Challenges and Opportunities for the Construction Industry

Abstract

The effects of declining oil and gas prices are being felt by economies around the world specifically oil-producing countries. The petroleum industry being the most important industry in Norway, not only contributes to the wealth in the country, but is also a very important driver for the innovation and technology development in other sectors especially the construction sector. Therefore, the current global economic situation and its impact on major oil and gas capital projects have made construction productivity improvement more and more important. Nevertheless, according to the Ansoff's theory of weak signals, strategic surprises, such as downturn in oil prices, do not appear out of the blue; rather they may be detected with the aid of pre-emptive signs, which may be referred to as early warning signs. The purpose of this study is to investigate whether an early warning system could have predicted the extent to which the oil crisis would affect the construction industry in Norway, allowing the industrial actors to react strategically ahead of time in order to exploit the opportunities created due to this situation and maintain and improve productivity under these circumstances. This is done through identifying the possible key leading indicators which could be measured in early phase of the downturn in oil capital, in order to discover these early warning signs. The next step is to verify how early a potential disruption could be predicted based on these indicators and how the industrial actors could accordingly react to this situation. This research is based on literature study including scientific publications, newsletters, white papers and available data obtained from selected news volume. The research results contribute to better understanding of the benefits of early warning systems in order for the main actors within the construction industry to effectively manage disruptions in the related industries.

Keywords: construction industry, Downturn in oil prices, Early warning system, Opportunities

# Introduction

# Norway is a small open economy, but according to the Ministry of Petroleum and Energy, it is today the 7th largest producer of oil and the 3rd largest producer of gas in the world. The petroleum sector accounts for 21.5% of its Gross Domestic Product (GDP), and almost half (48.9%) of total exports. In 2013 Norway was ranked the 15th largest oil producer, and the 11th largest oil exporter in the world. It is also the biggest oil producer in Western Europe (Buvarp, 2015). This leads to the country being vulnerable to the volatility in the oil pricing. Just to illustrate, in the course of the last two years nearly 30,000 people have lost their jobs in oil and gas as a consequence of falling oil prices and a delay in investing in productivity growth in the sector (Mohsin and Holter, 2016).

# The construction industry is one of the industries which has been strongly influenced by the fluctuations in the oil price. This is due the fact that the building and construction industry is sensitive to fluctuations in the market, and is often the industry that registers the first signs of major changes in the economy (Ministry of Trade, Industry and Fisheries, Norway, 2001). The falling oil prices have posed a major challenge to the growth of the construction sector in a number of oil-producing countries specifically the Gulf countries (Nagaraj, 2015). This article looks specifically to the effect of the oil price on the Norwegian construction sector from a proactive management perspective. This is done through early identification and response to the signs of major changes within the sector. These signs are referred to in the literature as "Early Warning Signs" (Nikander, 2002). Identification and reaction towards these signs leads to more successful proactive management of the situation created due to the major changes.

# The purpose of this article is to review selected data and information, extracted from various sources, in the early phase of the downturn in oil capital in Norway, in 2014, and investigate the potential value of an early warning system for construction project managers to proactively act on economic disruptions, such as down fall in the oil price, in order to exploit the possible opportunities lying under these situations. This will be done through introducing a list of key leading indicators which if measured and taken into account timely, can show indications of the future developments within the construction industry. The research questions covered in this article include: 1) What is the effect of downfall in the oil price on the construction industry and 2) What are the leading indicators which can give an indication of the potential effect on the construction industry, in the early phase of the development of the construction sector towards its current situation?

# Theoretical background

## The effect of the downfall in oil price on the construction industry

The significant fall in oil prices since mid-2014 has influenced the construction industry around the world in different ways. In this study, the construction sector is referred to as the sector which comprises the construction and maintenance of houses and commercial buildings, and the development of roads, airports and facilities related to defence, energy, oil, gas, railways and tramlines. According to the UK economic outlook, the construction sector in UK could gain significantly from a reduction in the oil price (Pwc Network, 2015). This is due to the rise of business investment following the rise in intermediate demand and consumer spending, thus the construction industry becoming the key beneficiary. The CECE Annual Economic Report (2015) also states that since 2014, growth has finally returned to the European construction sector. This should even accelerate further in 2015. One of the drivers of this growth is mentioned to be the purchasing power gain due to the decline in oil prices. Another overview of the European construction market also indicates that this market has started growing since 2014 and will continue the growth in the next 5 years. For example, the Norwegian construction sector output is forecasted to grow by 5.04% in 2020 which will double comparing to 2014 which is 46 Billion Euros (Buildingradar, 2015).

Although the construction sector is highly sensitive to fluctuations in the market, the downfall in oil price has not highly influenced it in a negative way, this could be due to the fact that only 25% of enterprises in the building and construction sector have petroleum related sales (Brander et al., 2013). There could be also other reasons such as lower construction costs which make it cheaper and easier to move supplies and other necessary materials to construction sites and transport of stones and waste (Construction Monitor, 2015). A third argument can be the weakening of krone due to the downfall in the oil price which according to the Norwegian finance minister *"even though a lower oil price represents a problem to the oil and gas industry, the krone now represents improved competitiveness for the rest of the Norwegian industry"*. In addition, while unemployment is rising nationwide, it is falling in those parts of Norway that aren’t dominated by the oil industry (Mohsin and Holter, 2016).

Nevertheless the information presented above are all published following the fall in the oil price in 2014. This study tends to investigate the potential value of an early warning system for construction project managers to proactively manage disruptions in order to exploit the opportunities and maintain productivity.

## Strategic Early Warning Systems (SEWS)

A central premise of this study is the theory of weak signals, first introduced by Ansoff (1975). Ansoff's idea was to seek an improvement to the strategic planning method, as it did not function satisfactorily when sudden changes or unanticipated discontinuities occurred in a business environment. Ansoff also uses the term "strategic surprise" to describe these discontinuities. A concrete example of this discontinuity is the oil crisis in the 1973 when the members of the Organization of Arab Petroleum Exporting Countries (OAPEC, consisting of the Arab members of OPEC plus Egypt and Syria) proclaimed an oil embargo. By the end of the embargo in March 1974, the price of oil had risen from $3 per barrel to nearly $12 globally; US prices were significantly higher. This had many short-term and long-term effects on global politics and the global economy (US department of state, office of the historian, 2013). In these cases according to Ansoff (1975), the usual approaches for trend monitoring and planning based on them was not sufficient. Ansoff indicates that strategic surprises do not appear overnight; there are always signals or symptoms of surprises to come. This theory has been strongly criticized by other researchers. Makridakis and Heau (1987) in Nikander (2002) stated that this theory has remained an academic idea. Webb (1987) in Nikander (2002) also indicated that it is crucial to investigate whether these signals actually exist. However there are also some other researchers that confirm the existence of these signals (Betts, 1982; Mintzberg, 1994).

This study is also based on the assumption that weak signals /early warning signs do exist and with hindsight it is often possible to point out the most likely factors leading to a future development, either of positive or negative nature. It is worth mentioning that the early warning phenomenon is closely linked to the risk management concept via the concept of "risk symptoms" (Nikander, 2002). However it is according to Niwa (1989), the information provided by an Early Warning (EW) about the time available before the risky event becomes real, is not the same thing as the probability of materialization of a risk. These two concepts do not substitute each other and are not opposite factors. Rather they supplement the total knowledge. Based on these definitions an EW sign is defined as following (Hajikazemi, 2015, p.12):

“*An EW sign is a specific element, happening or event which shows that the risk event will actually realize. The EW sign does not provide information on the exact time of the materialization of risk; neither does it reveal its expected magnitude. Rather it acts as an alarm which triggers action in order to either prevent the realization of the potential problem or possibly lessen the undesired consequences*.”

It is worth mentioning that by risk, the authors mean both upside and the downside of the risk. In fact a risk can be turned upside to ones advantage by the opportunities it provides.

Figure 1 presents the interconnectedness of the concepts; risk factor, potential risk, EW and response.

Information

Information

Information

Moment of Observation of early warning

Moment of Observation of early warning

Moment of Observation of early warning

Time

**Potential Risk**

Risk factor 2

Risk factor 1

Risk factor 3

Risk factor 4

Processing

Processing

Processing

Response/Action

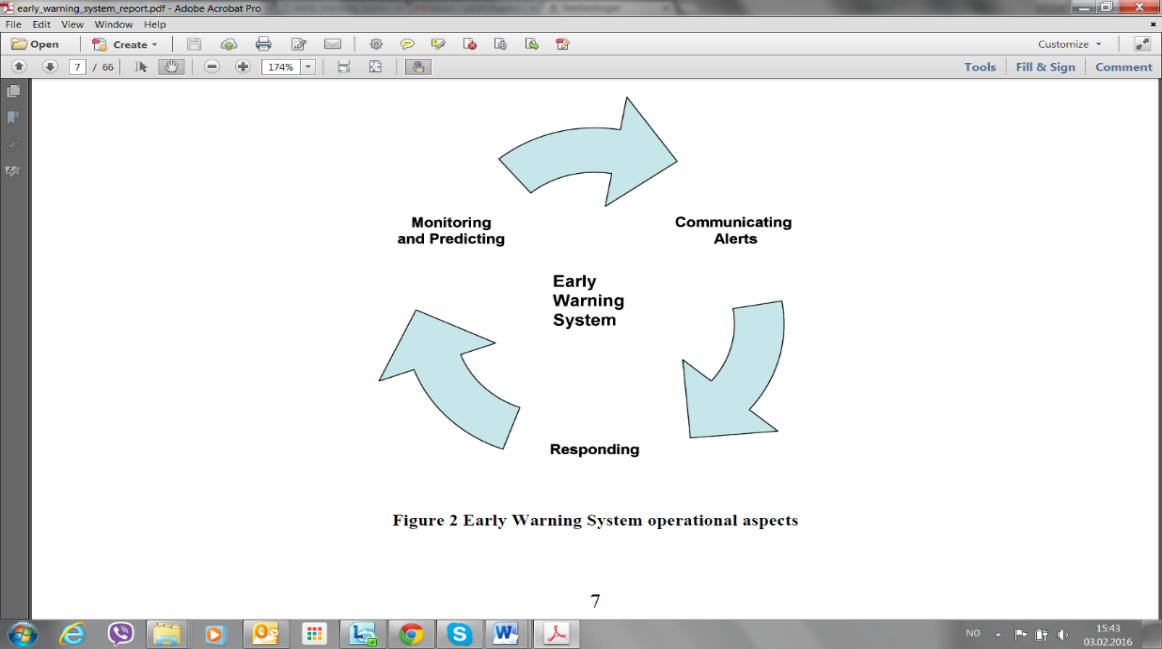
Response / Action

Figure 1. Interconnectedness of concepts (Hajikazemi, 2015)

Response / Action

In case of strategic discontinuities or surprises, a Strategic Early Warning System (SEWS) allows organizations to react strategically ahead of time by detecting EW signs which can be perceived as important discontinuities in an organizational environment. The EW information, at this point guides and empowers people to take actions when a crisis is close to happening. Effective early warning systems embrace all aspects of emergency management, such as: risk assessment analysis, which is one of early warning system’s design requirements; monitoring and predicting the intensity of the development about to happen; communicating alerts to authorities and to potentially affect; and responding to the situation (Grasso and Singh, 2011).The EW system's operational aspects are illustrated in figure 2. In this article, the main risk under study is the growth within the construction sector in Norway The aim is to investigate the contribution of a SEWS for more effective proactive management by the construction project managers.

The authors believe that the SEWS can be used as part of the strategic planning method that the project managers can use to make flexible long-term plans. This can be done through scenario planning. According to Ringland and Owen (2007) *"Scenarios do not predict the future, but they do illuminate the drivers of change: understanding them can only help managers to take greater control of their situation."*



Communicating allerts

Responding

Early Warning System

Monitoring and predicting

Figure 2. Early warning system operational aspects (Grasso and Singh, 2011)

# Research approach

The information which builds the foundations for this article has been gathered through studying published literature within scientific journals and conferences and also selected news volume which mainly focus on the downfall in the oil price and the effect on the construction industry worldwide. In addition, a number of Norwegian governmental documents which include the budgeting plans and records, have been studied. This has been followed by several structured discussion sessions where the authors, who have in total over 30 years of experience working in both the oil and gas and the construction sectors in Norway, have analysed and discussed the gathered information. The main focus of this research is to investigate if the signs of the development in the construction industry were identifiable in the early phases of the development process, which in our case is in mid-2014. The authors have endeavoured to combine the findings from the literature and their personal experiences in order to illustrate a case which is of interest for the actors within the construction industry. This has been done through development of two different scenarios regarding the possible influences of the oil price on the developments within the construction industry. The scenarios are validated by studying trends and other indications from the time prior to the realization of the upside risk, in order to illustrate that the identification of early indications of the current development within the construction industry would have been possible in advance.

The research approach applied in this study was inspired by Siggelkow (2007) who indicates that *"it is much harder to make a paper interesting whose findings or conclusions only address theory. A paper should allow a reader to see the world, and not just the literature, in a new way"* (p. 23).

# Early indications of the potential opportunities for the Norwegian construction industry

As earlier mentioned, the decline in the oil price has not had severe negative consequences for the construction industry in Norway. This sector has rather experienced a growth since 2014 when the downturn in oil price occurred. A clear example is the approximately 200% growth in the total turnover in Veidekke, a leading Scandinavian construction and property development company with about 6,400 employees, since 2014.

This can be due to different reasons which were partly described in section 2.1. In this section, two different scenarios will be presented as the reasoning for the growth within the construction sector, following the downfall of the oil price (Figure 3). The next step is to investigate if there are any indicators which if monitored prior to 2014, could show indications of the development of the construction industry towards the ending points of these scenarios.

Time

2014

Fall in oil price

Reduced investment in the oil and gas sector

Reduced activities within the oil and gas sector

Reduction in the workforce within the oil and gas sector

Potential productive workforce for the construction industry

Fall in oil price

Increased investment in the building and construction sector

Increased activity within the sector

More project possibilities and higher GDP

Figure 3. Two scenarios for effect of the oil price on the construction sector

*Scenario 1:* The fall in the oil price has resulted to reduced governmental investment in the oil and gas sector, thus reducing the activities and projects within this sector, leading to a high unemployment rate. The skilled resources will thus be available in the market, creating an opportunity for the construction sector to hire productive and skilled workforce.

*Scenario 2:* The fall in the oil price, although hurts the economy in every oil producing country, but is a testament for to the strength of the Norwegian construction industry that the country's GDP from construction not only hasn't declined since mid-2014, but has grown significantly. This is due to increased investment within the construction sector. Figure 4 shows the growth of Norway's GDP, from construction, alongside the growth of unemployment rate, in comparison with the changes in the oil price.

The question now is, was it possible for construction project managers to, by foresight, get an idea about what plausible futures would look like, prior to and in the early phases of the down fall in the oil price? Are there any leading indicators which in case monitored, could have given an indication of these scenarios becoming real?

Figure 4. Growth of Norway's GDP from construction and the unemployment rate within the past 5 years in comparison with the oil price (numbers drawn from [www.tradingeconomics.com](http://www.tradingeconomics.com) and [www.dn.no](http://www.dn.no))

*Scenario 1*

The decrease in petroleum investments in Norway, had already begun before the end of 2013 (Statistics Norway, 2016). This, in addition to the fact that the oil production in Norway was experiencing a constant decline since 2001, could appear as an early indicator for the potential developments within the construction industry due to these facts. However, it is worth mentioning that the decrease in the petroleum investment was not foreseen and stated by the authorities at that time. The "National budget report" published by the Norwegian finance department in 2014, stated that:

*"Petroleum investment growth will continue this year and next year, although the growth rate is expected to be somewhat more moderate in 2014 than in the preceding years."*

The National budget report in 2015, affirmed that there would be a decline in the petroleum investment. This was a rather new statement which was not foreseen and mentioned in the previously published reports. Today, it is predicted that there will be continued fall in investments in petroleum industry until end of 2018, thus the same situation remaining for the construction sector.

The number of unemployed engineers experienced a constant growth from early 2014 (See Figure 5). This number has grown by 1.48% up to this day (Andersen, 2016). This number was also an early indication for the potential opportunity of productive and skilled workforce which the construction sector could benefit from.

In 2014, the National budget report stated that the private sector had accounted for about 75% of the increase in employment in 2013. It also stated that the employment growth had been especially strong in the building and construction industry, in offshore-related parts of manufacturing industry, as well as in some service industries. Looking at the trend of unemployment growth in Norway, in general, and the growth of the workforce within the construction industry, could already demonstrate the potential which lies within the construction industry to benefit from the unemployed workforce within the oil and gas sector.

Figure 5. Number of unemployed workers within engineering and ICT fields from January 2014 to October 2016 (Andersen, 2016)

*Scenario 2*

Industries for which fuel is a direct and significant cost will see a positive effect from lower oil prices (Garrison, 2015). The companies within these industries , not only will benefit from declined costs associated with transporting materials , but will also benefit from broader economic gains from higher consumer consumption and healthier state and national budgets (Garrison, 2015).

The Norwegian government in early 2014 announced that it will invest 508 billion NOK (85.3 billion USD) on transport for the next 10 years, 311 billion NOK (52.2 billion USD) will be spent on roads, 168 billion NOK (28.2 billion USD) on railroads and the remaining on other transport facilities. Key projects under the New National Transport plan were the construction of a highway E39, the upgrade of Oslo's rail network, the construction of an underground railway tunnel through Oslo, and the construction of road between Kristiansand and Trondheim (Reportlinker, 2014). This could also be an early sign indicating the high potential for higher activities within the building and construction sector.

In the following section, the operational aspects of an EW system for identifying the potential opportunities under the conditions described above, will be discussed.

# Discussion

The purpose of this paper, is to investigate on possible early signals which provide indications of the development of the construction sector, as it is today, following the downfall in the oil price. Looking at Figure 1, the potential risk (in our case an upside risk) is the positive developments within the Norwegian construction industry and the risk factors are the elements which lead to these developments over time. The oil price dropped in mid-2014 and considering the development trends within the construction sector in Norway, any signal identified at (or around) that point of time, is regarded as an "early" indication.

The authors propose two scenarios for the possible effect of oil prices on the Norwegian construction industry. Evidences have been found within public documents and reports published in 2014, which verify these scenarios. The intention is however first and foremost, to select possible leading indicators which in case measured and monitored early, within the development process, can provide information to the construction project managers in order to better exploit possible upcoming opportunities. Secondly, this information should be employed in order to establish an early warning system (see figure 2) which will facilitate the systematic use of the gathered information in the favour of exploiting possible opportunities within the construction sector.

The operational aspects of the EW system suggested by Grasson and Singh (2011) include: Monitoring and predicting (the signals), communication the alerts and responding. According to the two scenarios proposed in the previous section, monitoring the following leading indicators, can provide indications of the possible development within the construction industry:

1. Investments in the oil and gas sector
2. Unemployment rate
3. Investments in the building and construction sector

The challenge lies in the source of information and, reliability of the data and the accuracy level of the predictions based on the gathered information. The successful proactive manager applies observation and monitoring in order to gather intelligence about these areas – the earlier, the better. The second step includes communication of the alerts between the strategic decision makers within the project and project organization. This is then followed by responding to these alerts, which is in fact the stage where the strategies will be developed based on the communicated signals. It is worth mentioning that according to the management information model developed by Ansoff (1984), these type of alerts and signals will pass several filters, such as mentality filter and power filter, before they are acted upon.

In strategic management, assumption surfacing has been used for quality assurance of strategies that are about to be developed (Mason and Mitroff, 1981). When a strategy draft has been established, the underlying assumptions that the strategy is based upon are made explicit and scrutinized. Based on the analysis, pivotal assumptions are identified. Finally, a thorough scrutiny is performed to investigate whether the management team still has confidence in the assumptions that the strategy is based on.

Having discussed the operational aspects of a possible EW system and the challenges, the authors will endeavor to answer the research questions outlined earlier in the article.

# *What is the effect of downfall in the oil price on the construction industry?*

The trends show a covariation between the oil price and the GDP from the construction industry in Norway. The GDP has grown as the oil price has gone down. Although it is not a proven causality that the downfall in the oil price has led to the positive developments within the construction industry, the authors believe that due to the two scenarios described in the previous section, there can be a true correlation between these two elements.

# *What are the leading indicators which can give an indication of the potential effect on the construction industry, in the early phase of the development of the construction sector towards its current situation?*

According to the scenarios mentioned, monitoring the investments in the oil and gas sector, the unemployment rate (especially among engineers and skilled workers within the oil and gas sector) and the investments in the building and construction sector can aid project managers and strategic decision makers for development of their strategies for the future. The follow-up of these indicators and certainly other possible leading indicators, at any point of time, can provide valuable information which can be the basis for strategy development within building and construction project organizations.

It is worth mentioning that in the short run, although the fall in oil prices has been problematic for Norway, but is has not led to a catastrophe. This might be is due to Norway's big advantage, which is the US$860bn (£565bn) Norwegian Government Pension Fund Global into which the oil money is deposited, which is a phenomenal economic strength for a country with a population just over 5 million (Buvarp, 2015). However, there is no guarantee that the oil price will go back to its unnatural high level again. Therefore, it is crucial for other sectors, and especially the building and construction sector to be proactive in developing their strategies according to the changes within the global oil market in order to maintain a sustainable business.

# Conclusion

The purpose of this paper was to study the impact of the downfall in the oil price on the Norwegian building and construction sector. The authors have investigated on possible early indications of the potential opportunities for the Norwegian construction industry, and proposed two scenarios based on which strategic decision makers within this sector can develop their future strategies.

This study indicates that establishing an EW system which contains three stages including, monitoring leading indicators of future developments, communicating the alerts and responding to them. This system can be applied as an effective tool for proactive management of disruptions.

Further studies that investigate more thoroughly the long-term effect of the fluctuations within the petroleum market on the building and construction sector, alongside real case studies within this sector, are likely to be of great interest in the near future.

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