Upstream Oil and Gas Mergers and Acquisitions: Domestic Transactions in the U.S

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Overview

The oil and gas (O&G) industry is one of the largest, exclusive, and complex industries due to its dynamic nature (Inkpen and Moffett, 2011). Attempts to explain patterns of this industry and of its drivers of investments are challenging due to complex and rapid changes. This complexity is a result of the interaction of elements such as resource availability, geographical characteristics, institutional and political factors, technological advancements and innovations, sluggish supply and demand, financial markets, uncertainty, international competition, and other external factors. Above all, the industry continuously struggles to deal with a turbulent environment caused by commodity and energy prices, especially oil price volatility and rapid changes driven by industry-specific developments and industry instabilities. For example, significant external shocks, e.g., unexpected forces of nature such as hurricanes (Hurricane Katharina and Rita in 2005, Hurricane Harvey in 2017), discovery of new oil and gas fields and resources, cartel activities such as the Organization of the Petroleum Exporting Countries, (OPEC) (Weston et al., 1999; Asa, 2016). There is a link between all these factors and development of the oil and gas industry, investment strategies, particularly, oil and gas mergers and acquisitions (M&A) (Mohn and Misund, 2009; Hsu et al., 2017; Berntsen et al., 2018). Thus, all these factors lead to new perspectives both on cross-border and domestic investment landscape over time.

Over the past decades, parallel to the development of new technologies, new resources in the oil and gas industry, activities have gained speed which have led economic responses and various perspectives on the investments (Hsu et al., 2017). M&A transactions, particularly the upstream oil and gas M&A transactions showed changing patterns. Based on given figures in IHS Markit Transaction Analysis database (2019), the numbers of transactions in the upstream oil and gas industry have increased in recent years. Major triggers of the M&A market in the upstream oil and gas industry are organic reserve replacement challenges, pursuit of cost efficiencies, higher cost of debt, volatility of oil price, pressure for capital discipline by investors and challenging global market conditions.

For instance, the U.S has been the epicenter of M&A investments over decades (and over more than a century, expert in drilling) and remains as a major player in the oil and gas industry. This special case of oil and gas industry and investments in the U.S is that O&G industry has undergone remarkable changes such as growing domestic E&P activities, a recent shift from an oil importer to an exporter nation particularly during the last decade. All these changes are partially led by a transformation towards new technologies in drilling and new arising oil and gas resources, i.e., shale/tight oil and gas revolution, unconventional O&G production and changing trends in natural gas production growth and liquified natural gas (LNG) production and distribution (Cox and Ng, 2016; Hsu et al., 2017).

In this study, we investigate the U.S O&G market for M&A investments and its motivating facts in the upstream industry. Although M&A have been a topic of considerable interest in various disciplines and there is a well-established literature, research focuses on petroleum and oil and gas M&A is still growing and empirical evidence is rather mixed and not conclusive yet (Ng and Donker, 2013; Hsu et al., 2017). Thus, the motivating factors of O&G M&A transactions can show similarities with common inferences but also vary from usual economic explanations (Özgür and Wirl, 2020; Weston et al., 1999; Ng and Donker, 2013). We offer a comprehensive explanation to the drivers of O&G M&A from a specific industry view. Our study fills this void in the literature by focusing on a specific case and domestic M&A levels. Thus, a closer look to the U.S upstream oil and gas industry development, which experiences its unique expansion in terms of production, domestic investments in the oil and gas industry longer than a decade now (Cox and Ng, 2016, Hsu et al., 2017).

Different than M&A studies in general, this study conducts a unique sector-specific analysis of M&A transactions. Concurrently, our research complements to the recent study of Hsu et al., (2017). Their study proposes that between 2004 and 2013, upstream oil and gas M&A activity in terms of number of deals in the U.S is mostly influenced by

industry-specific factors (e.g., oil production growth, oil price) and general economic conditions and financial market have less impact on the deals and no significant impact on M&A flows.

The goal of our paper is to shed further light on what factors explain upstream M&A activity. We analyze upstream transactions in the U.S, and its drivers based on economic, financial, political, and sectoral levels, and explore whether there are other unique factors explaining upstream M&A activity. Our analysis is based on a rich and extended data set of upstream M&A transactions from IHS Markit covering U.S oil and gas industry in the last two decades, between 2000 and 2019. (IHS Markit Transaction Database, 2019). We estimate the impact of the following determinants on M&A activity: oil and gas production growth, oil and gas prices, S&P 500 index, interest rate spreads, Shale Revolution, and the Trump administration. Furthermore, we conduct sub-analyses for underlying drivers of various deal forms such as asset and corporate deals and unconventional and conventional deals in the U.S. This study answers a call for further research on the question what motivates upstream oil and gas transactions, what are the determinants of the U.S upstream M&A transactions and what are the differences on the underlying drivers of upstream O&G M&A based on various transaction forms (Hsu et al., 2017).

The study empirically validates upstream O&G M&A transactions in the U.S, shows some variations from prior literature and discusses the underlying reasons of those. The findings provide comprehensive view to the scholars, investors and policymakers, the motivations and drivers of upstream oil and gas transactions from a well-functioning O&G M&A market. Although the study period does not cover the covid-19 pandemic yet, but during booms and busts alike, it is expected that oil and gas M&A markets, as well as the U.S oil and gas M&A transactions will be affected. For instance, some of the economic consequences of this pandemic crisis are yet to be seen. This research paper offers a unique contribution to the investment and M&A literature, energy economics and policy, oil and gas industry and future directions by presenting empirical evidence and it motivates for further research in this field.

Methods

The upstream oil and gas M&A transaction data is obtained from IHS Markit, Connect database. The sample contains all mergers and acquisitions announced between 01/01/2000 and 31/12/2019, which includes both domestic and cross-border transactions in the upstream oil and gas industry. It lists 25,461 transactions over this period.

This study focuses only on the domestic U.S M&A transactions, particularly, focuses on the upstream oil and gas deals (i.e., 4,132 domestic upstream oil and gas deals). To analyse the drivers of cross-border oil and gas M&A transactions in the upstream industry, we applied empirical model, regression analysis.

We examine one dimension of mergers and acquisitions activity: M&A deal count. First, we follow a similar approach in the literature (Hsu et al., 2017; Dowling and Wanwallegem, 2018) and use a simple count data model of Poisson regression. The distribution of counts is discrete, not continuous, and is limited to non-negative values. The Poisson regression model seeks to maintain and exploit the nonnegative and integer-valued aspect of the outcome which is commonly used in the literature as an alternative to linear regression models (Gardner et. al., 1995 and Cameron and Trivedi, 2013). We model the natural log of the response variable, i.e., ln (Y) which is M&A deal counts, as a function of the coefficients.

I) Poisson Fixed Effects Regression for M&A Deal Count

$$LN(Y_{it}) = \beta_0 + \beta_1 X_{it} + \cdots + \beta_j X_{jt} + \gamma_i + \varepsilon_{it}$$

For each analysis where we regress the dependent variable, Y_{it} = the deal count in region i in year t, against independent variables X_{it} controlling for Annual FRED CPFF, S&P 500 Index Price, Henry Hub N. Gas Spot Price etc. and dummies for the shale revolution and the Trump administration. γ_i captures region fixed effects, e.g., culture, history, response behavior, and formal institutions that are expected to be unchanged over time.

To corroborate our findings and to differentiate we first add sub-regressions using as dependent variables again M&A deal count but based on corporate and asset deals, and conventional and unconventional deals. Second, we are interested in how upstream M&A activity reacts to the changes of independent variables over time. To accomplish this, we impose an order on the timing, the independent determinants (interest rate spreads, S&P 500 index, O&G prices, and O&G production growth) are time lagged (by one year), except for the dummy variables. This captures the delay of M&A deals to drivers. We choose 1-year lag and follow a similar approach as Hsu et al., (2017).

Preliminary Results

The major finding supports to the argument that drivers of M&A in general and M&A across various industries can vary and can be influenced by industry-specific stylized facts (Kang and Johansonn, 2000). Based on our large data set, our results show that industry-specific variables and capital market performance has a strong significant

impact on the M&A flows in terms of numbers of the deals. However, stock market performance, technology-specific factors or politics do not show any significant impact on M&A activity in the U.S. The results show similar patterns to Hsu et al., (2017) but also show differences which are caused by Shale revolution, extended time frame in our analysis which covers two decades and the independent variables show changing pattern between the first decade and second decade. For instance, the U.S oil and gas production growth are in negative levels for the first half of the analysis period which turns to positive for the last decade. Furthermore, various patterns of the deals are driven by different underlying motives. These all leads changes on the results.

Conclusions

Investment in the upstream oil and gas industry is an important activity both at the national and corporate level, as it directly affects the future oil and gas production and replacement of reserves which in turn also affects economic activities and continuous growth of oil and gas companies. Our particular focus deals with the question what are the proposed drivers of upstream oil and gas deals, what other factors might drive the upstream oil and gas M&A deals and if potentially, those factors has an impact on certain patterns/trends of the deals.

The upstream industry is very technology and capital-intensiv and carries high risks, affected by global politics and strict environment regulations which causes more difficulties for investment activities. In that line, merger and acquisition transactions offer growth opportunities, and strategy is applied by resource seekers, capital or technology seekers or strategic access seekers. Also in the future, acquisitions will remain a part of companies' strategic options because organic growth continues to be a challenge and has been more expensive than M&A transactions.

In this regard, the study makes a contribution for participants of M&A markets in the oil and gas industry. Moreover, it contributes to literature by complementing the study of Hsu et al. (2017), Ng and Donker (2013) and Dowling and Vanwalleghem (2018), which use a sample of Canadian oil and gas transactions, the U.S oil and gas transactions and Gulf Cooperation Council oil and gas transactions. It clearly acknowledges that investment in the upstream industry is crucial for future energy supply and mergers and acquisitions will remain a part of oil and gas companies' strategic options because organic growth in this field continues to be a challenge and has been more expensive than M&A transactions. Our outcome shows broader than fundamental firm or macroeconomic factors, how various other factors affect upstream M&A transactions. In this case, our study confirms that O&G M&A patterns and drivers are consistent with various theories.

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