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

Şevkat Özgür, Franz Wirl

Faculty of Business, Economics and Statistics

The (former) Chair of Industry, Energy and Environment

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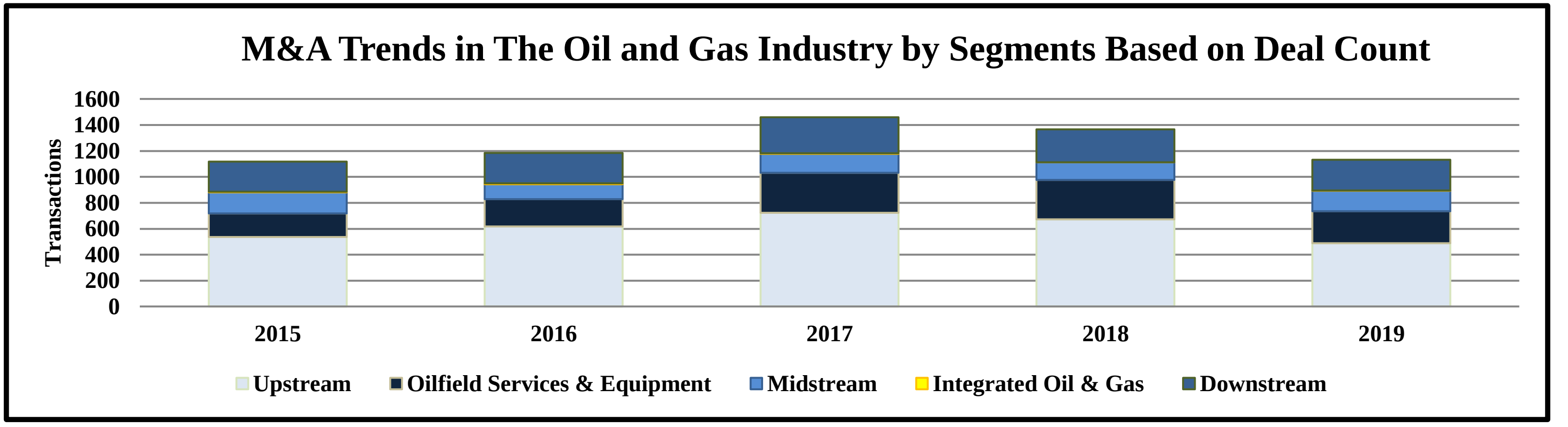
Outline

- Oil and gas industry and its investments have an essential impact on the global economy.
- To a firm in the oil and gas industry, upstream investment is crucial, since the replacement of reserves, field recovery are considered as key factors for future growth.
- Attempts to explain oil and gas investments, its underlying motivation and drivers face a challenge due to the complexity of the oil and gas industry and interaction of various factors.
- Previous literature: Interdisciplinary research of mergers and acquisitions. However, academic studies of extracting and oil and gas industry is scarce and the results are not conclusive yet (Hsu et al., 2017).
- **Motivation:** To provide broader view on upstream M&A transactions and its motivating facts by adding theoretical and industry-specific perspectives. The case of the U.S O&G M&A and its domestic transactions.

Status quo – Upstream transactions are increasing in oil and gas M&A market



Source: IHS Markit, Transactions Analysis Database, 2019.

- The challenges of reserve replacement, pursuit of cost efficiencies, higher cost of debt, pressure for capital discipline by investors, the changing market conditions and technological advancements trigger M&A activity in upstream industry (IHS Markit, 2019).
- The U.S is in the epicenter of global O&G M&A market. For instance, increasing domestic M&A transactions in recent years.
- What drives oil and gas M&A transactions in general?
- **Which factors motivates upstream oil and gas M&A transactions in the U.S?**

Background

- M&A transactions in general are impacted by technological, regulatory, economical, and industrial changes or other shocks (Harford, 2005)
- The motives and underlying facts of M&A can vary across industries (Kang and Johannsonn, 2000; Hsu et al., 2017)
- A distribution of the geographical risks, the command of several skills, costs for operation units, rising stock prices, commodity prices, technological advancements, changes of industry-specific indicators make M&A strategy essential for oil and gas companies (Corlay and Hubby, 2012).
- The oil and gas M&A transactions are mainly driven by industry-specific indicators, sectoral changes, political events (Berntsen et al., 2018; Hsu et al., 2017; Ng and Donker, 2013).

- Inconclusive and heteregoneous findings of M&A in general.
- Industry-specific M&A studies and empirical evidence is rare.
- Recent studies encourage further empirical demonstration in the oil and gas M&A.

Literature & Intended Contribution

Study	Key Findings
Hsu et al. (2017)	✓ The relationship between M&A deal counts between 2004 and 2013 in the U.S and industry-specific and macroeconomic indicators. ✓ The most significant impacts on M&A deal counts are the O&G production growth and oil price. ✓ Capital market and stock market performance show no significant impact on M&A deal counts.
Ng and Donker (2013)	✓ Canadian O&G transactions between 1990 and 2008. ✓ Reserves are negatively associated with takeover value: low reserve measures are associated with high takeover value. ✓ Oil price is shown to cause takeover activity. At the same time, takeovers shown to cause changes of natural gas prices.
Cox and Ng (2016)	✓ Takeover activities in the U.S between 1990 and 2018. ✓ Impact of energy reserves and oil and gas prices on takeover value and volume, and the impact of the takeover announcement. ✓ Positive association between oil reserves, oil price and takeover value ✓ Negative association on company's return after the announcement.

Contribution by empirical research: I) Assessing the association between the U.S upstream M&A transactions in terms of deal counts and value from the sector-specific, macroeconomics, political and technological changes perspectives. **II)** Sub-analysis for various patterns of upstream transactions (For instance; asset versus corporate deals, conventional and unconventional deals).

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Methodology and Data

- **Data:** Upstream oil and gas M&A transactions in the U.S (IHS Markit, Transactions Database, https://connect.ihs.com/home)
- **Period:** 2000 – 2019
- **Deal Types:** Acquisitions, mergers, acquisition/farm-in, acquisition/joint venture
- **Sample:** Domestic upstream transactions across 11 regions in the U.S (N= 4132 deals)
- **Model:** 1) Poisson regression for analysis based on M&A deal counts (fixed effects regression)

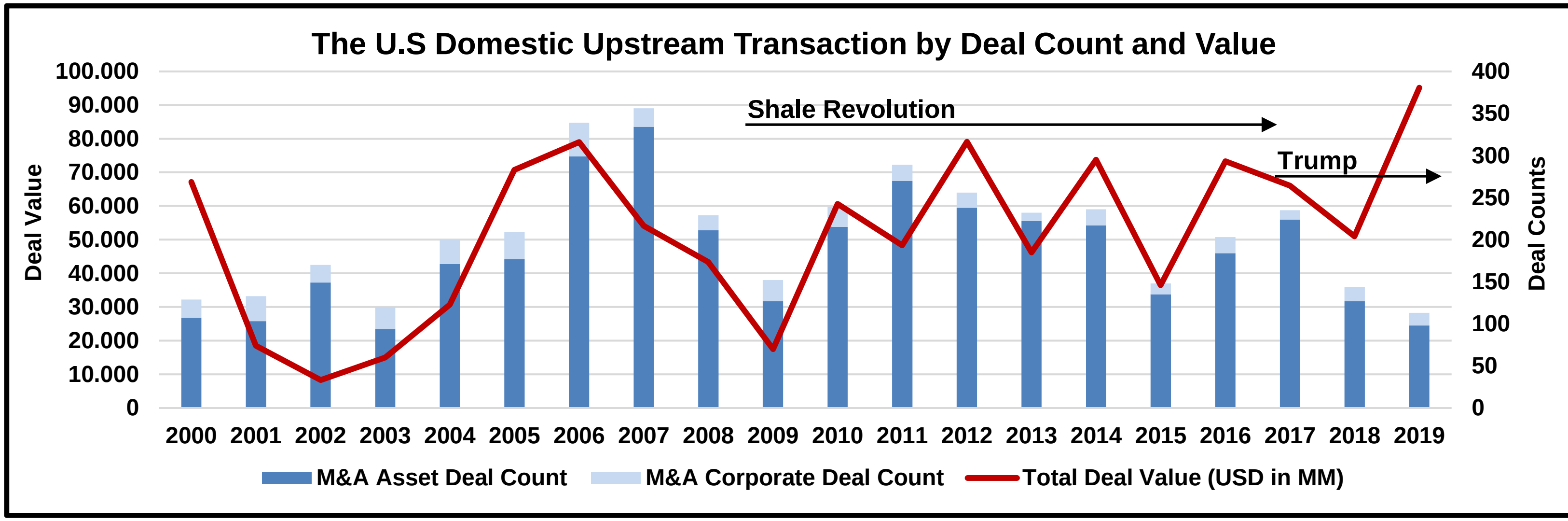
1) $$LN(Y_{it}) = \beta_0 + \boxed{\beta_1} X_{it} + \cdots + \beta_j X_{jt} + \gamma_i + \varepsilon_{it}$$

- **Dependent variable:** M&A Deal Counts per aggregated region level per year

- **Independent variables:** O&G production growth, oil and natural gas price, S&P 500 index price, interest rate spread (FRED CPFF)
- **Dummy variables:** Shale revolution, Trump's election and administration

- We add sub-analysis - how upstream M&A activity reacts to the changes of the independent variables: order on the timing, time lagged by 1-year.

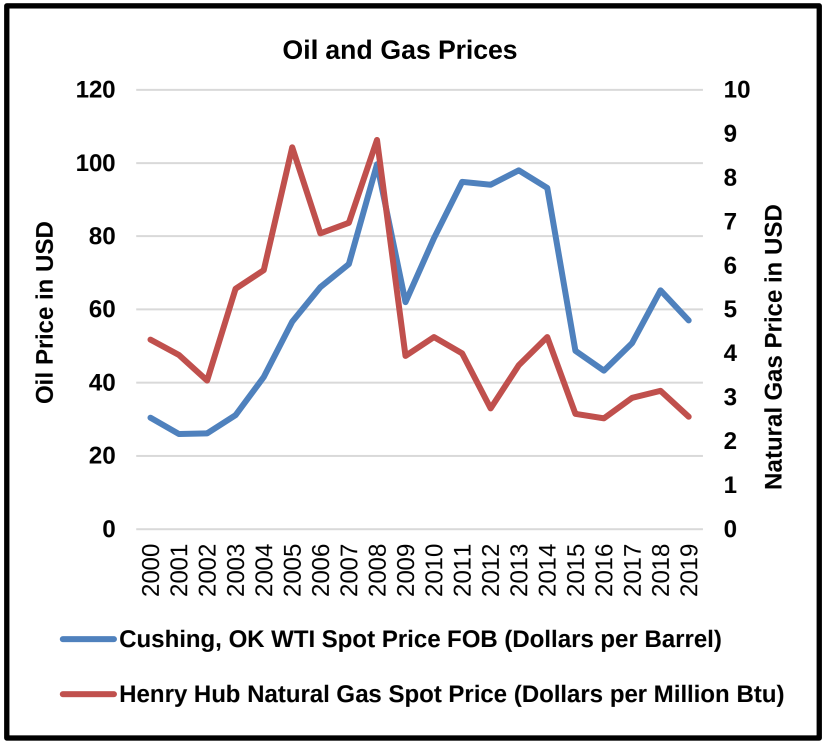
Results I: Upstream Transactions

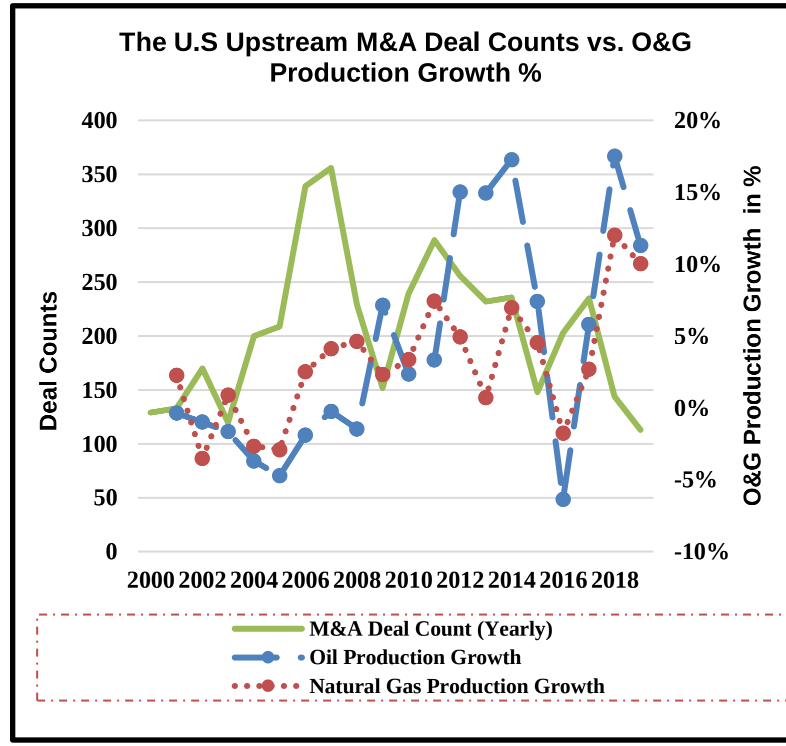


Source: Own depiction based on IHS Markit, (Connect).

- The recent trends show signs for concerns on **gaining asset ownership, asset reallocation and combination.**
- **Challenge of Upstream →** high financial risk with high return, regulated industry, impacted by global politics and high technology intensive industry, new drilling techniques in the U.S.
- **Organic growth** is more expensive than M&A transactions.
- Can we see the impact of Shale revolution or Trump's administration?

Results II: Oil and Gas

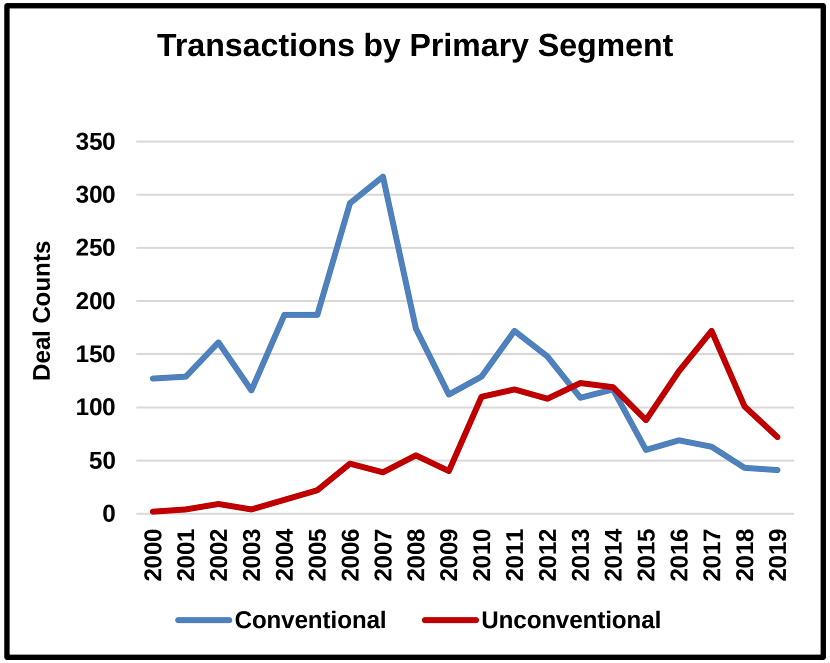


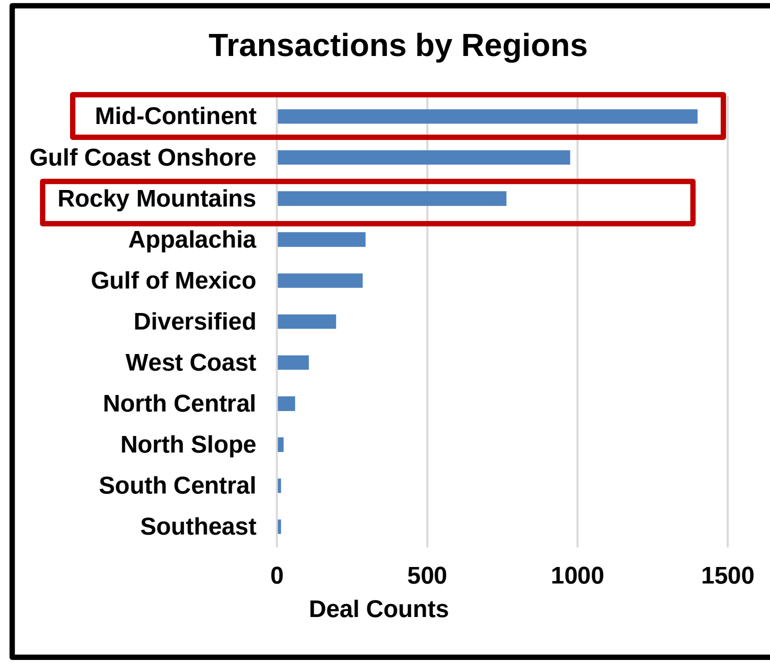


Source: Own depiction based on data from the U.S IEA.

- **Rapid increase of oil & gas prices** at the first decade, similar patterns with M&A activity.
- Negative oil ang gas production growth for the first decade, strong change after 2009.

Results III: Patterns





Source: Own depiction based on IHS Markit, M&A Transactions Data Sample.

- Shale oil and gas revolution show no strong impact on overall M&A transactions yet
- Mid-Continent, Rocky Mountains and North regions have increasing unconventional investments

Result IV: Summary of Empirical Evidence

Analyses	Key Findings
Dependent variable: M&A Deal Counts	✓ Negative and statistically significant association with interest rate spreads and O&G production growth ✓ Positive and statistically significant association with oil price but no significant impact of natural gas prices ✓ No significant impact of S&P 500 Index. ✓ No significant impact of Shale revolution and Trump's administration, only in the case of 1-y lagged.
Dependent variable: M&A Deal Counts per Asset vs. Corporate Deals	**Asset deals:** ✓ Similar results with the overall M&A deal counts **Corporate deals:** ✓ No significant association between M&A deal counts and independent variables, except the negative impact of the Trump's administration
Dependent variable: M&A Deal Counts per Unconventional vs. Conventional	**Conventional deals:** ✓ Negative and significant association with interest rate spreads, oil production growth and shale revolution ✓ Positive and significant impact of O&G prices **Unconventional deals:** ✓ Negative and significant association with O&G production growth ✓ Positive and significant impact of oil price, negative impact of natural gas price ✓ Trump's administration has a positive impact (Trump's incentives for unconventional O&G)

Dependent variable: M&A Deal Value – there is a limitation on the availability of the data, however the data-merge is in progress for further empirical application.

Conclusions

- Upstream M&A transactions requires broader perspectives, more than common traditional economic explanations.
- Study offers a specific sector-focus, unique contribution to the M&A literature.
- Extension of the study of Hsu et al. (2017)
- Timely research question for the future directions of the transactions in the O&G upstream.
- There is a stronger association between upstream oil and gas M&A activity and industry-specific indicators, macroeconomic indicator in the U.S.
- Overall politics, technological and industry-specific changes has a limited effect. For instance; Trump's election and administration. On the other hand, time frame is limited, and the real impact should be tested for conclusive arguments.
- Shale revolution has no significant impact, except for corporate and conventional deals.
- Upstream oil and gas industry M&A activities in the U.S respond more to oil and gas production declines than to hikes. (assymetric response to oil and gas production growth rate)

Critical reflection/Future Work

- Current results only give a first insight into various patterns and influencing factors without the claim to be complete.
- Further analysis and robustness check is required.
- Independent variables (e.g., upstream costs, drilling activity, other macroeconomic factors)
- Lagged-determinants (various time-lag)
- Structural break test – significant change before/after Shale revolution.
- Extension of the sample or collect/merge information on M&A deal value.
- Further research to check whether the conditions are driven by specific region.
- Further analysis of firm-level behaviours
- Paris Agreement, Trump vs. Biden’s administration and changes in future.
- Climate change, uncertainties, Post-Covid analysis

Discussion

Faculty of Business, Economics and Statistics
Oskar-Morgenstern-Platz 1, 1090 Vienna, Austria

Sevkat Özgür

T: +43-0-664-8385906
E-mails: sevkato25@univie.ac.at

https://www.univie.ac.at/

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