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

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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

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 heterogoneous 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

<table>
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<tr>
<th>Study</th>
<th>Key Findings</th>
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                       ✓ 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.                                                |
                       ✓ 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.                     |
                       ✓ 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).
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)

\[
LN(Y_{it}) = \beta_0 + \beta_1 X_{it} + \ldots + \beta_j X_{jt} + \gamma_i + \varepsilon_{it}
\]

- **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

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

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

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

- 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

Source: Own depiction based on IHS Markit, M&A Transactions Data Sample.
# Result IV: Summary of Empirical Evidence

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

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