

UNCONVENTIONAL TRADE-OFFS: INSIGHTS FROM ARGENTINA'S VACA MUERTA AND THE BRAZILIAN PRE-SALT

ALEC WATERWORTH AND MICHAEL J. BRADSHAW

Introduction

The availability of shale gas and tight oil (i.e. unconventional oil and gas) in North America has played a major role in the recent decline in global oil and gas prices. This brings into question the economic feasibility of offshore oil and gas exploration and production of 'less conventional' reserves (e.g. offshore arctic oil and Brazilian pre-salt). Exploration for such reserves is looking increasingly risky given their cost and the potential that there will not be a market for any resources recovered (at an acceptable price). This in turn is leading International Oil Companies (IOCs) to consider as alternatives onshore unconventional reserves away from North America.

This case study looks at the opportunities for unconventional oil and gas exploration and development beyond North America and considers their impact on the future prospects of high cost production alternatives. This is explored through the oil and gas sectors of Argentina and Brazil. Both states are believed to have technically recoverable shale resources comparable to the US. The study assumes a trade-off exists between these sectors for investment from IOCs. Whilst production of Argentinian shale has been accelerating over the last several years, Brazil has largely been focussed on the hurried development of its sub-salt offshore oil fields: now a questionable proposition given the current oil price. A cross-case analysis draws on semi-structured interviews with governmental actors, IOCs, NOCs, industry bodies and academic experts, in addition to considerable documentary analysis, in addressing the following research questions:

1. What are the supporting and inhibiting mechanisms (domestic, market and environmental) at play in the development of Argentine shale and Brazilian pre-salt?
2. How can the cases of Argentine shale and Brazilian pre-salt inform Brazilian governmental bodies as they approach the development of their own shale reserves?
3. How would the growth of Brazilian shale alter the investment dynamics in the global petroleum industry?

Methodology

A cross-case analysis is carried out between the Brazilian pre-salt and Argentinian shale sectors across several characteristics, including those pertaining to the reserves themselves, the industry, and the broader national political and economic landscape. Semi-structured interviews were adopted as the primary data source, which provide a structure to the discussions whilst also offering the interview subject flexibility in their response and supports and the gathering of detailed contextual information. Interviewees were selected through 'non-probability sampling', whereby subjects are "deliberately selected to reflect particular features of, or groups within, the sampled population" (Ritchie et al. 2003), and were identified primarily through documentary research. Five groups of actors relevant to the research questions of the study were identified: IOCs; National Oil Companies (NOCs); academic experts (within energy economics and petroleum engineering); governmental bodies (regulatory and funding organisations); and non-government industry organisations. A total of eighteen interviews were conducted in Buenos Aires, Sao Paulo and Rio de Janeiro over two weeks in November 2016. In addition, documentary analysis is utilised as a complementary research technique to the interview data, providing more detail around the areas of discussion.

Expected results

Argentina is seemingly finding the securing of investment easier to come by (from industry leaders such as Chevron, Dow Chemical, Petronas, Total, Shell and ExxonMobil) than Brazil has in the pre-salt (significantly worsened recently by the Petrobras crisis and oil price crash). This may be attributable to the very different approaches to foreign investment that the respective governments have adopted, although other factors are also thought to play a role. Brazil has a history of protectionism in its core industries - most clearly evident in its adoption of Import Substitution Industrialisation (ISI) policies following the end of the Second World War - and has returned to a similar position with regards to the development of the pre-salt. This can be observed, for example, in the high levels of local content (a contractual obligation of operators to

utilise domestic suppliers), which is set at 37 per cent in the exploration phase and 55 per cent in the development phase, and is as high as 90 per cent in certain technical disciplines (Neuhaus, 2014). As with the previous dalliance with ISI, this has provided a significant impetus for the development of co-related domestic industries, such as the maritime sector (refer Folha de Sao Paulo, 2010). However, this raises serious concerns with regards to the innovative capacity and international competitiveness of these industries.

The Argentinian government, by comparison, has adopted a market-friendly approach to the country's shale development. In mid-2013, the 'Investment Promotion Regime' was established, which offered benefits to IOCs investing at least US\$1 billion in Argentinian oil and gas projects, such as tax-free exportation of up to 20% of the extracted hydrocarbons from the fifth year of a project. In October 2014, the 'Hydrocarbons Reform Law' was passed, which, along with updating and unifying the regulation, taxation, permitting and concession processes for Argentina petroleum, offered further incentives to boost national petroleum exploration and development activities and attract foreign investment, and lowers the limit at which IOCs can access the Investment Promotion Regime to US\$250 million.

Analysis of the interview data will elucidate the further factors behind the enhanced investment in Argentinian shale, and the extent to which a trade-off for investment exists between these neighbouring energy sources. It is expected that in a low cost environment, the shale business model is more appealing to IOCs, many of whom believe they can transport their existing business model from the United States. The crisis at Petrobras is also expected to be a factor in the current low levels of investment in Brazilian pre-salt, one solution to which would be to reduce the mandatory participation of Petrobras in the pre-salt (a measure currently in consideration by the Brazilian government). However, Argentina certainly does have shortcomings in need of addressing - primarily a lack of human resources and specialised equipment and inhibitive fiscal policies - which will equally be explored through the interview data.

Conclusions

Argentina has the potential to become a major player in global petroleum, although the extent to which and pace at which this is realised is dependent upon a number of factors, both within the country and the global market. An oil price recovery would enhance the levels of investment from IOCs, although this may equally raise competition from rival energy sources (such as Brazilian pre-salt). The lack of human resources and specialised equipment domestically requires the adoption of a flexible approach to imports, whilst in the long-term the country should look to foster a national expertise base and technology profile that is currently absent. The country's local infrastructure also requires considerable investment in order to support the production volumes anticipated for the coming decade.

Brazil must continue the very recent trend towards market liberalisation under President Michel Temer, but this should also be paired with a long-term strategy towards domestic industrialisation. Brazilian shale is still at the very early stages, yet this has not stopped the national industry's regulatory body, ANP, from declaring in 2013 that the country's shale reserves could be even greater than the pre-salt. However, the shale development is equally encumbered by Brazil's unattractive fiscal policies, including high local content, despite the country's lack of domestic expertise or a technology base pertinent to hydraulic fracturing. This has led to a lack of interest in early auctions for onshore gas blocks. As such, it is currently highly unlikely that Brazil will become a major gas producer in the foreseeable future without widespread policy reform.

References

- Folha de Sao Paulo (2010). Indústria naval pede investimentos em frota brasileira [Online]. Folha de Sao Paulo. Available: <http://www1.folha.uol.com.br/fsp/mercado/me0709201007.htm> [Accessed 24th December 2014].
- Ritchie, J., J. Lewis and G. Elam (2003). Designing and selecting samples. *Qualitative Research Practice: a guide for social science students and researchers*. J. Ritchie and J. Lewis. Thousand Oaks, CA, Sage Publishers: 77-108.