

UNIVERSIDAD ESAN



Oil and Gas Pipeline Concessions

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EXECUTIVE SUMMARY

Primary oil and gas pipelines are a critical supply chain link between the production areas and the refineries or fractioning plants, respectively. They require huge capital investments and expertise in design, construction, maintenance, and operation that are beyond the capabilities of many countries and are generally built and operated under concession by multi-national consortiums with huge financial resources and technical expertise on a Cost of Service (CoS) basis. They are the most economical means of land (and near coastal) transport. However, they also pose the threat of oil or gas spillage.

Although the frequency of spills is extremely low, the severity of the consequences can be extremely high if not controlled. There are several causes for oil and gas pipeline spills including geotechnical events, internal and/or external corrosion of the pipeline, failure of equipment, sabotage, internal expansion forces, materials defects, mechanical impact from excavation equipment due to lack of proper pipeline marking, etc.

Mechanisms for guaranteed payment are required from the upstream producers (ship or pay), as well as downstream refineries (take or pay) for the duration of the concession (typically 4-year construction plus 30-year operation). This often requires expert opinion, since few companies can sign 30 year contracts, and exploration for potential reserves is inherently high risk.

Large capital asset management and pension funds constantly search for long term investments with a high stable rate of return, where a US\$3 billion investment might represent only 1% of their portfolio. Oil and gas pipeline concessions on a Cost of Service (CoS) basis meets that criteria, but at what rate of return?

The purpose of this research was to develop a conceptual framework that focuses on the inherent internal and external risk factors and the expected rate of return for oil and gas pipeline concessions. The research employed a mix of qualitative and quantitative research methods for data collection and analysis. The data gathered for this research was through primary and secondary sources, and the model analysis was done using a combination of statistical analysis, scenario based analysis, scorecard, adjusted discount rate, and cost of capital techniques.

An integration of fuzzy synthetic evaluation (FSE) and fuzzy rule based (FRB) techniques can be used to evaluate the various dimensions of the risk associated with multi-dimensional risk situations. The fuzzy synthetic evaluation allows the identification of different attributes and based on the extent of information available, these attributes are then broken down into various sub-levels creating as many sub-criteria as possible. Each of the broken-down levels of the attribute is assigned a quantitative value per its importance and the collective value of the sub criteria provides a composite number defining quantitative value of the consequence for that risk type. The fuzzy rule base (FRB) technique integrates the chances of occurrence of oil or gas pipeline failure and the consequences of the same incident to determine the risk. CAPM is then suggested to be used to estimate the risks and return associated with the transmission of oil and gas through pipelines.

Although the basic risk factors can be easily calculated and insured against, the social and political factors are not easily determined, and must be carefully considered in a concession contract.

Corporate governance, transparency, and strong community relations are also seen as critical components of successful oil and gas pipeline concession agreements.