

Does the economic crisis affect firms' innovative behaviours?

Evidence from the oil and gas industry

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Extended abstract

The oil and gas industry has played a crucial role in shaping the contours of the world economy in recent years. Evidences suggest that the evolution of the sector has been intimately interconnected with business cycles. Fluctuations in oil prices seem to have accompanied most of the economic crises in recent decades. Understanding how the oil and gas industry has reacted to, and in particular how its innovative behaviour has been affected by, these periods of economic downturn is therefore crucial in the light of two main considerations. On the one hand the competitiveness of the industry is increasingly driven by the capability to keep climbing the innovation ladder. As natural resources become scarcer and harder to find and extract, technological development in terms of new technical solutions, new optimization processes and new products represent the only way to maintain the competitiveness of the overall industry. On the other hand, the sector has undergone a profound transformation in the last few years with an increasing role played by the upstream, midstream and downstream service contractors with respect to traditional national and international oil companies. The raise of these new actors has been concurrent and significantly correlated with the renewed focus on innovation since these players are responsible for most of the innovations developed and adopted in the industry in recent times.

This thesis investigates the innovative behaviour of the oil and gas service industry during the most recent economic crisis focusing on a representative subsample of contractors. The analysis adopts a mixed methods approach complementing the use of quantitative indicators of innovative outputs, based on patent records, with qualitative information recovered through in depth interviews with the management of Saipem, one of the leader service contractors in the industry. The possibility to complement quantitative and qualitative data allows to develop a deeper understanding of the dynamics at play and the possible future scenarios.

The analysis shows that the industry has experienced a positive innovative performance during the crisis with an increasing number of patented inventions developed in the last few years. This trend is however accompanied by a progressive refocusing of the corporate innovation strategies toward the strengthening of core competences. In other words in periods of resource scarcity each firm computed a strategic decision over the distribution of investments across a wide range of alternative technological classes favouring those considered as fundamental for the core business of the company. This implies a certain degree of heterogeneity in the innovative patterns and potential development trajectories of the main actors of the industry. This evidence, which has emerged from the analysis of the quantitative indicators, has been further confirmed in the qualitative section. The qualitative information recovered has also provided a number of additional insights. The positive innovative trend during the recent economic crisis has affected also typologies of innovations, other than product innovation, that can be potentially underestimated when looking at patent data only. New processes aimed at favouring production efficiency and new managerial practices, such as those stimulating a greater focus on innovation within the company as well as providing greater incentives for external partnerships, have emerged in the last few years.

Relevant implications are associated with the key findings of this analysis. First, the study contributes to the traditional debate on the link between innovation and economic fluctuations showing that in the case of the oil and gas industry the recent economic crisis has provided incentives to invest on innovative activities. This positive trend has emerged both with respect to product innovation (such as in the case of the development of green technologies) and to forms of innovation traditionally classified as process, organizational and managerial innovation and thus more difficult to capture through traditional indicators. Second, the crisis has also affected the nature of the innovative processes and play stimulating a stronger focus on corporate core competences. This strategic choice has generated a relevant heterogeneity in the scope of innovation across firms with different actors focusing on the development of different technologies, which in turn implies the potential for different growth trajectories in the near future. The implications associated to this latter evidence emerge in the qualitative section of this study. For instance, in the case of Saipem future opportunities and challenges are intimately connected to the strategic decisions made with respect to the technologies on which the bulk of investments has been redirected. The competitiveness of the Company depends on whether these strategic decisions will be able to match the future development of the industry in terms of core technological assets. The winners are those companies that have been able to predict effectively

the upcoming market scenarios and have therefore invested on those technologies that are expected to become predominant in the near future.

More research is needed in order to shed fresh light on the role played by innovation also in mature industries, such as the oil and gas sector. This implies understanding how they have restructured their value chain and who are the actors responsible for innovation development. The focus on firms and industries has to be accompanied also by a greater acknowledgement of the external context in which these innovations take place. Different contextual conditions, from time to location specific trends, may play a role in shaping the innovative behaviour of firms by redefining the innovative targets and the key determinants of the innovation process.