

La trayectoria tecnológica de Petrobras en Offshore

Andre T. Furtado
UNICAMP, Brasil

Los países periféricos acostumbran asimilar, de fuentes externas, la mayor parte de la tecnología que usan, sobre todo cuando es de punta y requiere un cierto grado *performance*. Sin embargo, un grupo significativo de empresas de esos países, medianas y grandes, hacen un cierto esfuerzo tecnológico dirigido hacia la adaptación y la introducción de mejoras en procesos o productos del cual resultan innovaciones incrementales. Esas innovaciones son introducidas de preferencia en bases tecnológicas maduras, formando trayectorias tecnológicas que son

trajectory of innovative firms, supported by incremental innovations, can take a competitive commercial position, but it is very difficult for the same to occur with innovation, especially frontier innovation.

This paper is an attempt to show, from a specific case study of the offshore production of petroleum and gas, that an important enterprise in a country of the periphery can gain a place on the technological frontier even though it follows a trajectory based on incremental innovations. It must be borne in mind that this is more likely to happen within certain technologically mature sectors and this indeed confirms certain suppositions about the possibility of countries of the periphery catching up.

Indeed, Petrobras (the Brazilian state petroleum enterprise) reached an avant garde position in the deep water production of petroleum and gas as the result of a technological trajectory centered on a sequence of incremental innovations. When it was necessary to exploit the reserves in the Bacia de Campos at great depths, Petrobras resorted to fluctuating production systems, a technology that was already known but had not been adapted nor considered adequate for operations under these conditions. In contrast, the operators and leading capital goods and engineering firms in this field from the United States, France, United Kingdom and Norway decided to use completely new production systems that were still being developed as a solution to this challenge. The environment for selecting technologies and trajectories in the petroleum industry was greatly affected by the fall in prices brought about by the 1986 crisis. This meant that cost saving solutions were chosen. The new dominant trajectory in the industry finally converged with the essentially incrementalist trajectory Petrobras had pioneered.

This paper is an attempt to answer the following questions that arose from this case study:

1. What type of technological trajectory was adopted by Petrobras?
2. To what extent does this trajectory differ from that of the developed countries?
3. What were the determining factors for this firm to reach an international leadership position?
4. What repercussions did catching up have on the Brazilian firm's competitiveness abroad?
5. What lessons does this case study have for the study of technology change in the countries of the periphery?