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BUILDING TECHNOLOGICAL CAPABILITY WITHIN SATELLITE PROGRAMS IN DEVELOPING COUNTRIES

Abstract

This paper explores the process of building technological capability in new satellite programs within developing countries. Specifically, the article focuses on the strategy used by many developing countries to facilitate local technological learning via international collaboration. The research draws on examples from Asia and Africa in which developing country space agencies hire foreign firms to build a satellite and to train local engineers. Two important, global realities motivate the study. The first reality is that satellite services – remote sensing, communication and navigation – are increasingly crucial to address needs in developing countries. For example, remote sensing satellites can provide imagery and scientific data that is useful to manage disasters, monitor crops, facilitate urban planning, and spur industry. The second global reality is that a growing number of countries are moving from passive consumption of satellites services to active participation in space activities. New countries on every continent are creating or strengthening local satellite programs. Countries such as South Africa, Nigeria, Mexico, Malaysia, and the United Arab Emirates are joining more established countries such as India, China, Brazil, Argentina and South Korea. Previous research by the author considered the evolution of technological capabilities for 8 countries in Africa, Asia and Latin America. A key result from this past analysis is that many countries use foreign partnerships to gain new capability in satellite technology. The contribution of such foreign partnerships to local technological learning appears to be vital. At the same time, there are many inherent challenges in the foreign partnerships, including misaligned incentives among the partners; differences in culture and language; and imperfect information. This paper shows how literature on technology transfer, technological learning and project management provides insight into these collaborative satellite training projects. Ample work has been done in these bodies of literature to analyze capability building for technologies outside of the space context. Very little work has applied their ideas to satellite technologies. Here the concepts from the literature are applied to case studies of specific satellite training projects carried out by developing countries. The results are valuable to policy makers in countries throughout the world. For countries with young space programs, it provides a new lens through which to view the process of technological capability building. For countries, such as the United States, with more established space programs, the results provide insight about technology transfer policy and the potential of international cooperation with non-traditional partners.