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Author: Prof. Andrew Erickson
Naval War College, United States, andrew.sven.erickson@gmail.com

WHAT EXPLAINS CHINA'S COMPREHENSIVE BUT UNEVEN AEROSPACE DEVELOPMENT?

Abstract

China's post-1949 evolution suggests that political decisions best explain its successful development of rockets and satellites and also its failure thus far to mass produce commercial aircraft. These political decisions have taken the form of great national financial and human capital commitments since the 1950s. They did not occur in a vacuum, but were rather shaped by such idiosyncratic factors as leadership preferences and geopolitics. It is thus necessary to examine closely the history of China's aerospace development and its larger context to understand the reason for its trajectory.

Initially China devoted much of its limited technical resources to producing nuclear weapons and missiles to deliver them. Satellites were also prioritized for military reasons and because they could not be purchased from abroad following the Sino-Soviet split. Beijing's relative prioritization of rockets, satellites, and aircraft was revealed in even starker relief during the 'Great Leap Forward' and the 'Cultural Revolution,' which harmed development and exacerbated resource competition. The military importance of aircraft was recognized in theory, but the miniscule resources available and unrealistic goals that further dispersed them, both organizationally and geographically, devastated actual production. Consequently, the aircraft industry's organization, and the quality of its products, remained poor. As one of China's defense industry's few early 'pockets of adequacy,' by contrast, China's missile production became relatively well organized and capable.

Satellite launch capabilities, a spin-off from Chinese ICBM development, have since captured ten percent of global market share. Missile sales and satellite production have similarly succeeded. China's high demand for all types of aircraft offers opportunities to begin indigenous production at a relatively low level of expertise. Yet despite possessing a quarter of the world's commercial airline fleet and the third largest civilian aircraft market, normally self-reliant China failed in its first two attempts to enter its own domestic passenger aircraft market. This is in part because aircraft manufacturing has been subordinated to the higher priorities of missile and satellite development, and has thus received inadequate resources and organizational prioritization. Given increased funding, consolidation of inefficiently dispersed production facilities, and appropriate organizational reforms, Chinese aircraft development may yet succeed. The ARJ21 regional airliner, which is currently being flight-tested, already shows promise that its predecessors lacked.

China's emphasis on, and partial success in, aerospace development are in keeping with its substantial, rising comprehensive national power. Technological development in general, and aerospace development in particular, is shaped not only by aggregate national resources available but also by the sociopolitical system in which the development occurs. While China's capabilities in this area already seem able to support aerospace achievement in keeping with its position in the great power hierarchy, its rate of future progress is uncertain. Some elements of China's sociopolitical system approach advanced world levels in their scope and quality, but others remain mired in problems stemming from low per capita income and organizational inefficiencies. It is these domestic factors that will govern China's potential for future aerospace technology development.