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The National Aeronautics and Space Act of 1958: An Analysis Using Process and Game Theory

The Space Race between the United States and the Soviet Union was an intense competition for spaceflight capability, rooted in the Cold War following the end of World War II. It began with the launches of satellites and robotic landers and culminated in the successful American moon landing of Apollo 11 in 1969. This period marked significant public investment and interest in space policy and programs. The American victory in the Space Race would not have been possible without the landmark policy decision in the Senate enacting the National Aeronautics and Space Act of 1958. This paper will analyze this policy through the lenses of the process model and game theory presented in the book "Understanding Public Policy" by Thomas Dye.

The process model analyzes policy decisions through "identifiable patterns of activities" (Dye 23) that influence policy outcomes. The standard outline for the process model includes identifying problems, formulating policy proposals, legitimizing policies, implementing policies, and evaluating policies. This outline will be utilized for the process model section of the analysis of the National Aeronautics and Space Act, referred to as the Space Act, in this paper.

Problem identification, in this instance, occurred through the evaluation of demands for government action. The demand for an organized and coordinated space program in the U.S. arose following the USSR's first successful launch of artificial satellites into space in 1957, known to the United States as the 'Sputnik Crisis' (“Landmark Legislation”). This demand resulted from a consensus among the public and governing elites that the U.S. military had failed to keep pace with competitors in developing spaceflight capabilities. Such a failure could leave the country vulnerable to breaches in national security, as one of the driving forces in the Space Race was the development of intercontinental ballistic missile capacity and satellite-based reconnaissance.

The formulation process began when President Dwight D. Eisenhower established the President's Scientific Advisory Committee (PSAC) to advise him on potential responses to the USSR's launches (Uri). In February 1958, PSAC recommended that a new civilian space agency be created. In response, the 85th Congress formed the Committee on Astronautics and Space Exploration, tasked with drafting the proposal for the Space Act and the National Aeronautics and Space Administration (“Committee History”). Legitimization proceedings commenced with Senate Majority Leader Lyndon B. Johnson, who began gathering support for a comprehensive space program as early as October 1957, following discussions with Eisenhower about the possibility of such a program. He enlisted the assistance of Senators Robert Kerr and Styles Bridges—members of the aforementioned space committee—as well as key entrepreneurs and businessmen (“Landmark Legislation”). By 1958, the final act of legitimization took place: it was passed by Congress and signed into law by President Eisenhower on July 29 (Uri).

In implementing NASA, Eilene Galloway, a Legislative Reference Service analyst and a key contributor to the program's development, successfully lobbied for NASA to be structured as an administration rather than an agency to "give it broader authority to coordinate with other government entities" (Uri). Congress also drafted various provisions related to the program's implementation into the Space Act. These include stipulations regarding the program's executive structure and salaries, as well as those related to the program's purposes, functions, reporting requirements, and committees (“National Aeronautics Space Act”). The Space Act and NASA can be evaluated based on their reported outputs and subsequent impacts. The creation of NASA resulted in many significant accomplishments in American space development, ultimately leading to American victory in the Space Race. The pinnacle of these achievements was landing the first man on the moon.

Game theory examines rational decision-making in competitive environments involving at least two participants. It is defined as "... the study of rational decisions in situations where two or more participants have choices to make, and the outcome depends on the choices made by each " (Dye 37). Participants must not only make decisions that achieve their desired outcomes, but they must do so in consideration of what the other players will do. Game theory is frequently utilized in defense policy analysis; however, it also applies effectively to the Space Race. To analyze the Space Act through the lens of game theory, it will be operationalized according to the following model: key players, potential strategies, possible payoffs, informational asymmetry, and outcomes.

The key players in this situation are clear: the game is being played between the United States and the Soviet Union. There were various potential strategies the U.S. could have employed. Game theory defines strategy as "rational decision-making in which a set of moves is designed to achieve the optimum payoff while considering all of the opponent's best plays" (Dye 38). The U.S. initially allocated most of the country's space research and design to the military; however, due to interservice competition, it could not do so efficiently (Uri). Instead of resolving the internal strife within the service, they opted to start anew by creating a civilian agency. Even after NASA was established and the best minds of the nation were employed, the USSR consistently outpaced them in spaceflight advancements, such as achieving the first manned orbit and having the first astronaut to spend an entire day in space (Uri). Rather than attempting to catch up gradually, the United States made a bold commitment: to put a man on the moon by the end of the decade (“Landmark Legislation).

The potential payoffs of this strategy were as follows: such an achievement would demonstrate extreme dominance in the space domain; it would stimulate increased funding and support from Congress; it would effectively conclude the Space Race. Information asymmetry played a crucial role in shaping the decisions of key players. In 1955, the U.S. and U.S.S.R. committed to collaborating on developing and launching an artificial scientific satellite to study the Earth and its environment. An article published by NASA states, “The two countries approached their pledges very differently. The Soviet Union operated in secrecy, formally approving a single program on Jan. 30, 1956” (Uri). While both nations concealed their efforts during the Space Race, the Soviet Union was significantly more deceptive and began covering its tracks much earlier. Lastly, the results align with those in the process model analysis. The eventual American victory serves as the definitive measure of the success of the policy and the resulting program.

When analyzing the National Aeronautics and Space Act through the process and game theoretical frameworks, we notice a clear connection between the elements of the models and their application to the policy. The models illustrate every key decision that policymakers made during its development and facilitate an evaluation of the implementation and outcomes. Thomas Dye’s presentation of the policy models provides an insightful framework for analysis.

Citations

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