THE MECHANISMS AND VALUE OF COMPETITION

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The Problem

The incentives created by a competitive environment for acquisition of large, complex DoD systems present challenges for acquisition professionals.

Competition is a cornerstone of the federal government's acquisition processes. In an open marketplace, one would expect that effective competition would drive down the price of goods and services. However, Major Defense Acquisition Programs (MDAPs) are large, complex, and normally built to specific Department of Defense (DoD) requirements. Do competitions for MDAPs yield significant benefits? If so, what are those benefits? Drawing on previous conceptual and empirical analyses of competition, IDA examined how competition operates for MDAPs in an effort to aid acquisition professionals in understanding the incentives created by a competitive environment and the benefits the government can be expected to obtain.

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Competition for a Weapon System Franchise

Most of DoD's MDAPs are awarded under competitive conditions. Many of these are of the general nature of a franchise: DoD awards a contract to a firm for engineering and manufacturing development (EMD) of a system, and, upon successful completion of EMD, awards the firm a series of fixed-price contracts for serial production. In a pure form, then, a firm needs to win only one competition in order to lock in work that can extend years or even decades into the future.

But is this method of competition effective? After all, normally, most of the cost of acquiring a weapon system is in the production phase; those production costs are imperfectly known at the start of the EMD phase, and the competition occurs sometimes years before the first production lots are priced. There is no direct evidence that such competitions drive the price of the system down to cost (where cost includes a fair return on the contractor's capital). However, competitions for MDAPs do appear to provide a significant value to the government.

The mechanism by which this value is obtained is described in a seminal paper by William Rogerson.[1] Fixed-price production contracts incentivize the contractor to invest in cost savings methods in order to drive its cost below the price negotiated

[1] William P. Rogerson, "Profit Regulation of Defense Contractors and Prizes for Innovation," *Journal of Political Economy* 97, no. 6 (December 1989): 1284–1305.

in the contract. Although the government will eventually discover these cost savings and reduce its price offer on later contracts, the serial nature of the contracting process introduces a "regulatory lag"—subsequent contracts are negotiated before actual costs are known on predecessor contracts. Therefore, the contractor is able to retain the savings generated by its cost reduction efforts. This allows the firm to obtain prices high enough during the production phase to allow it to earn a return on invested capital greater than it could obtain in a similarly risky alternative employment; in economic terms, the supplier earns "rents."

Rogerson views these production-phase rents as "prizes" for firms to provide innovative solutions to DoD requirements. These "prizes" of potential returns above the competitive level in the production phase provide a strong incentive for competitors to propose innovative solutions in the EMD competition and then deliver the solution that DoD wants. Thus, the incentives help reduce (but not eliminate) the enormous governance problems associated with managing the development and production of complex weapon systems: the contractor has a strong profit incentive to see that the government receives a product that meets its definition of success.

In order to maintain the effectiveness of this incentive, however, the government must retain some ability to put the potential stream of rents at risk. The prize is not awarded when the EMD contract is signed, but rather earned lot by lot during the production phase; the last of the prize is not awarded until the last unit has been delivered and fully paid for. If the contractor is not able to design a system that meets the government's requirements in terms of cost, capability, and performance, the program is subject to termination prior to production. If cost, quality, and/or schedule cannot be maintained in production, the government has the option to terminate the program early or reduce quantities, thus limiting the opportunity to earn rents. The government also has other tools to place potential rents at risk, such as reintroducing competition through mechanisms such as dual sourcing production.

Competition for a Single Design-Build System

DoD may also develop and procure a system under a single contract, a method we term a "single development-build" program. Under this method, firms compete for a single contract to both develop and build a weapon system. This structure is normally utilized when the production phase involves only a limited number of systems, such as satellites.

The benefits of competition for single development-build programs appear to be more limited than for competitions in franchise acquisitions because the incentives are different. Since there is only one contract award, it is more difficult to hold potential contractor rents at risk. This, in turn, reduces the incentives for the contractor to be responsive to the government's requirements, and to achieve program cost and schedule objectives. Thus, the government has to rely more heavily on other governance tools in order to attempt to achieve program success.

Conclusion

Competition for complex systems that require development and serial production offers an important tool to obtain the military capabilities that DoD requires. The potential rents available during the production phase provide a strong incentive for firms to remain in the defense market, to offer innovative solutions, and to remain responsive to the government's requirements during the (often extended) development and production period. However, the strength of this incentive effect is proportional to the ability to hold the production-phase rents at risk.

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