AD-A162 014 MINIMUM PROCUREMENT CYCLE QUANTITIES(U) ASSISTANT SECRETARY OF DEFENSE (ACQUISITION AND LOGISTICS) WASHINGTON DC B ARNOLD 20 SEP 85 1/1

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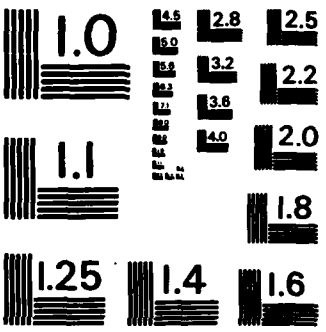

MICROCOPY RESOLUTION TEST CHART
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Minimum Procurement Cycle Quantities

by

Barbara Arnold
Office of Assistant Secretary of Defense
(Acquisition & Logistics)
Pentagon, Washington DC 20301

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Minimum Procurement Cycle Quantities

Barbara Arnold, OASD(A&L)

The Defense Department projects order quantities for consumable spare parts and some reparable parts by using a standard inventory model that minimizes the total variable cost of ordering and holding materiel, subject to a constraint on the number of requisitions short (backorders) for each item. The accounting technique of marginal analysis is used to find the quantity that is most economical to order by increasing that quantity until the marginal cost to order is equal to the marginal cost to hold materiel. This policy ~~was implemented in the early 1970s and~~ is being reexamined in light of current economic considerations and readiness objectives ~~of the Defense Department.~~

Performance goals that are item oriented do not necessarily provide the best materiel support for our ultimate objective of weapon system readiness. For example, a high supply availability rate does not necessarily equate to a high weapon system readiness rate because the lack of one critical part may prevent a weapon system from being ready to fulfill its mission. The total variable cost equation therefore should be redirected from an item orientation to a weapon system orientation. Rather than constraining the equation with a backorder or fill rate goal, the constraint should be a weapon system availability target.

There are also problems with other parameters in the current model. Costs we are using to project materiel requirements may not represent actual experience. We have assumed, for example, that the cost to store an item is equal to 1% of its acquisition cost. This may be too low an estimate, particularly for active inventory items. Total variable holding costs including this storage cost, plus investment cost, obsolescence cost, and inventory adjustments, are currently estimated at about 30% of an item's acquisition cost.

Ordering costs include labor and automated data processing costs for processing purchases at an inventory control point, administering contracts, indirect support costs, and labor benefit costs. Estimates of some or all of these costs now in use in the algorithm may also be too low. A recent study of Defense contract administration costs showed that for a small percentage of items, this portion of the cost to order is running about 50 times larger than estimates used ten years ago, and about 15 times larger than estimates currently used by some activities. The study indicated that more variability of cost factors among items should be considered when estimating these and other costs, depending upon the complexity of the administrative process. The Department has initiated a review of all segments of ordering costs used by the military Components as part of the overall review of order quantity policy.

Regulations require ordering costs to be updated at least every two years, but if these updates are not performed or updated factors still underestimate costs, economic order quantities (EOQs) produced by the requirements model will be inappropriate. The EOQ will be too large if the system assumes costs to store materiel are unrealistically low and too small if estimates of ordering costs are low.

The process of purchasing spares and repair parts should take into account not only costs to order and hold materiel but also additional economic aspects such as procurement leadtimes and price breaks for large quantity buys. In an attempt to consider procurement workload and price discounts, DoD Components have imposed minimum buys of twelve months' worth of stock for most items in their requirements computation systems. This policy increases the minimum buy for only a small number of items, but has a big impact on the dollar value of annual buys.

Although not specifically precluded by DoD Instructions, increasing buys to at least twelve months' worth of stock may not be a cost-effective policy because costs involved could negate savings. These costs include greater investment in inventories, higher storage costs, and increases in excess quantities of stock. Procurement workload and administrative leadtime could actually increase if the higher dollar value of each buy requires increased management attention. In addition, a price break may not result from arbitrarily increasing buy quantities or price reductions may be too small to offset the risk that future demands for the item may never materialize. We are requiring the Military Components to perform a quantitative analyses to assess the cost-effectiveness of the twelve-month minimum policy.

An alternative to arbitrarily increasing the minimum buy quantity after the EOQ has been computed is to include economic production quantity considerations within the EOQ formulas. In a September 1984 report, the House Appropriations Committee noted that substantial savings could be realized by incorporating these considerations into the Services' automated systems and directed the Army to become the lead Service for this effort. The Army has developed and tested a program that utilizes price discounts in the computation of stock fund procurement quantities and is in the process of implementing it. This approach to increasing buy quantities is more cost-effective than increasing quantities after the EOQ has been computed because it allows the system to reduce safety levels if price discounts yield larger buys and thus should help minimize some of the other costs involved as well.

Although a requirements computation system may not reduce an item's safety level if a larger buy quantity is indicated (lower prices may, in fact, produce a higher safety level), there is a potential short-term adverse impact if the safety level is reduced because the number of backorders may increase until the

larger buy quantities are delivered. At that point, the increased level of stock on-hand should reverse the effect, unless the level is surpressed by delivering quantities in phases.

We can also improve efficiency and economy through better interface between government and industry. Pratt and Whitney is attempting to improve customer visibility into quantity versus price relationships by identifying economic break quantities for active parts they expect to supply and by notifying the government of quantities ordered that are less than economic break quantities. Chart 1 displays the quantity versus price relationship. Note that ordering quantities greater than the economic break quantity does not necessarily result in lower prices. Multi-year savings may not be great enough to offset storage costs or the possibility of never needing that large a quantity of stock. Chart 2 displays an example of quantity versus price curves by generic part category that the company intends to provide the government. In this case, we have been ordering only about 60% of the cost-effective quantity of compressor blades.

Chart 3 shows that the Defense Department's inventories have increased dramatically over the last 5 years. Eleven percent of the growth or $3 billion is attributable to inapplicable assets - things we don't need. This trend can be expected to continue as assets are received under the 12-month minimum buy policy, unless alternatives can be found. We need more efficient ways of projecting requirements and managing our inventories in order to stem the growth of stock and minimize costs.

Improving the accuracy of item demand forecasts would help reduce inventories. Excess spare and repair parts tie up funds; inadequate stock has a deleterious impact on weapon system readiness. Improving forecasts, however, is easier said than done. Complicated methods may be more difficult to implement than the degree of improvement they provide. One possible approach we are exploring is to group items according to similar characteristics and use different forecasting techniques depending upon which work best for each group.

Reducing procurement leadtimes would improve the high error rate in demand forecasts by shortening the period over which the forecasts are made. Clearly, this would decrease the uncertainty in requirements forecasts. It would also decrease the amount of stock required to satisfy customer needs during the procurement period. Procurement leadtimes in the Defense Department are 5 to 6 times longer than those in the private sector. In fact, industry's leadtimes have decreased while DoD's have continued to increase. We may be able to implement some of private industry's practices to shorten our leadtimes and cut down on associated costs.

One way is to include production leadtime as well as price in contract negotiations. This would provide the vendor the incentive to deliver on schedule and would improve our planning process. Other potential methods are to negotiate transportation services or to phase deliveries and tie these deliveries more directly to need dates.

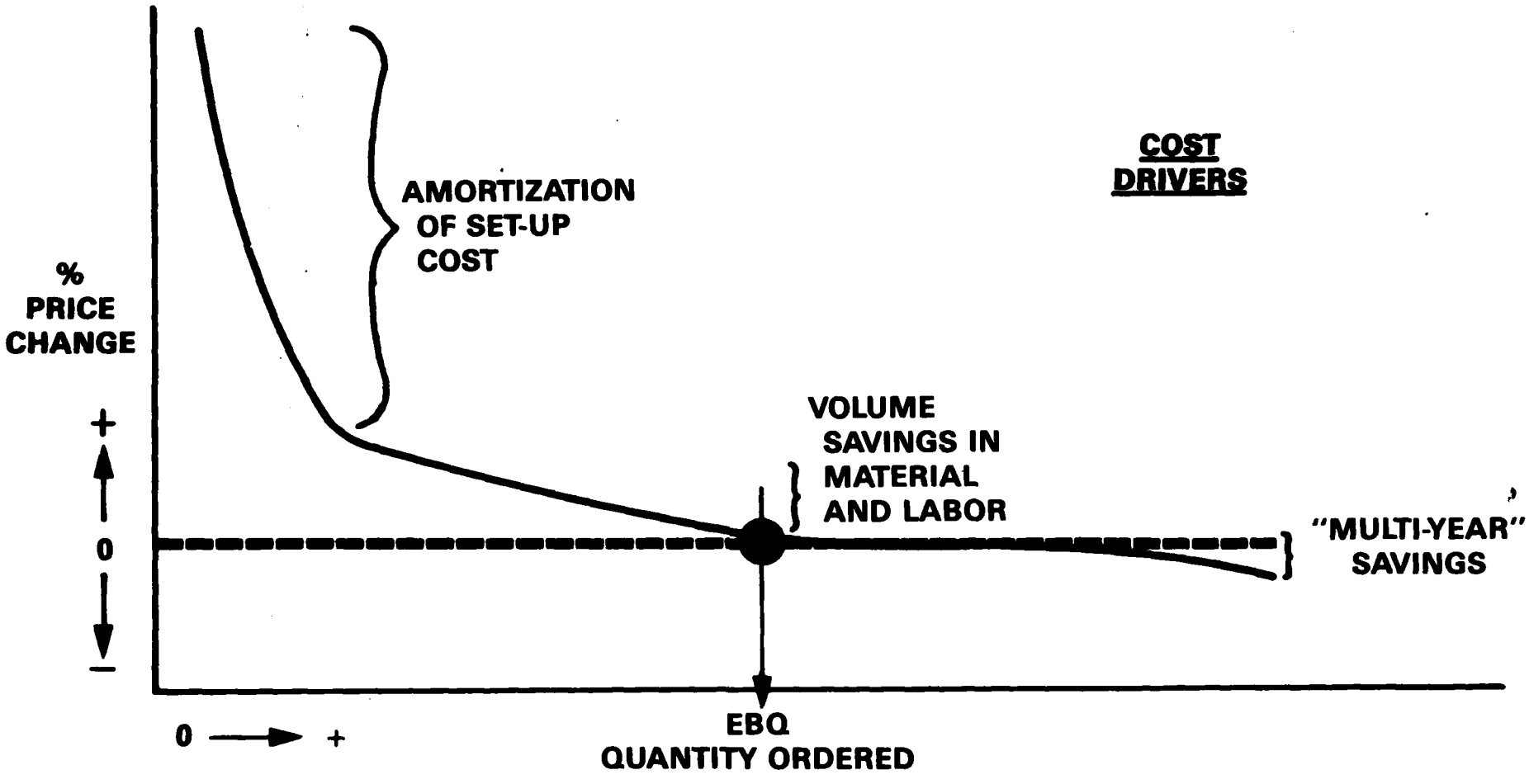
We could shorten administrative leadtime by performing the competition process initially among a wide range of potential contractors but awarding a contract for incremental deliveries tied to need dates over a longer period of time, thus going through the competitive process less frequently. These longer term arrangements have added advantages. By assuring a contractor of a stable order quantity over a longer period, he can plan production lines more efficiently and keep prices down because of less frequent start-up costs. Prices can also be negotiated based upon anticipated productivity improvements over a multi-year period.

Another way to reduce inventories and cut down on costs is to ship requisitioned quantities directly from the vendor. Under this contractual approach, no stock is maintained at government facilities. Transportation requirements are reduced by eliminating the necessity of shipping the stock from the vendor to the inventory control point for storage until a requisition is received from a user. Buy-back clauses are necessary with this type of contract, requiring the contractor to repurchase any unused spare parts when the contract expires. Savings can also be attained by pooling inventories of like items with industry, thus minimizing investment, storage, and distribution services; consigning inventories, where items with low failure rates are kept by the user who is billed only if an item is used; and maintaining a data bank listing of excess parts and equipment for sale that can be accessed before initiating a buy or used to locate hard-to-find materiel for older weapon systems.

Methods of computing operating levels and safety levels do not differ much between the Defense Department and private industry. The lesson we can learn from the private sector, however, is that the solutions to problems of support or limitations of the procurement process are not simply to buy more stock but to make improvements in other areas of the supply process. Increasing leadtimes cost the taxpayer in the form of larger safety levels, poorer demand forecasts, larger quantities of unneeded stock, and higher materiel costs.

The Defense Department's objective is to maximize operational readiness as opposed to industry's objective of maximizing profit. We can still, however, implement methods of improving efficiency and saving costs without degrading customer support, and must, if we are to restore credibility with Congress and the public. Lack of credibility has damaged the Defense Department's ability to defend its budgets and will continue to do so, unless we take immediate and positive action to improve management of the supply system.

VOLUME VS PRICE RELATIONSHIP



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VOLUME VS PRICE RELATIONSHIP

ENGINE	P/N	MANUFACTURER'S EBQ
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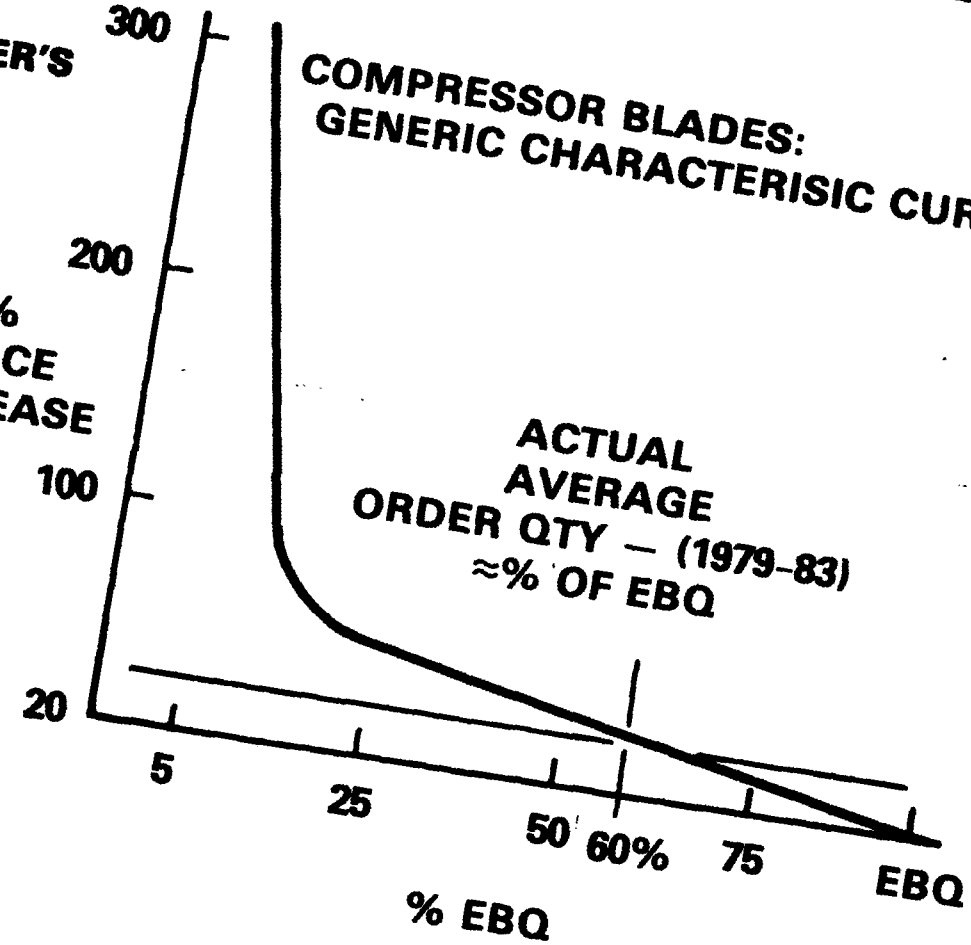
	710406	2000
	753116	3500
	4040806	3000
F100	4040809	3000
	4040810	3000



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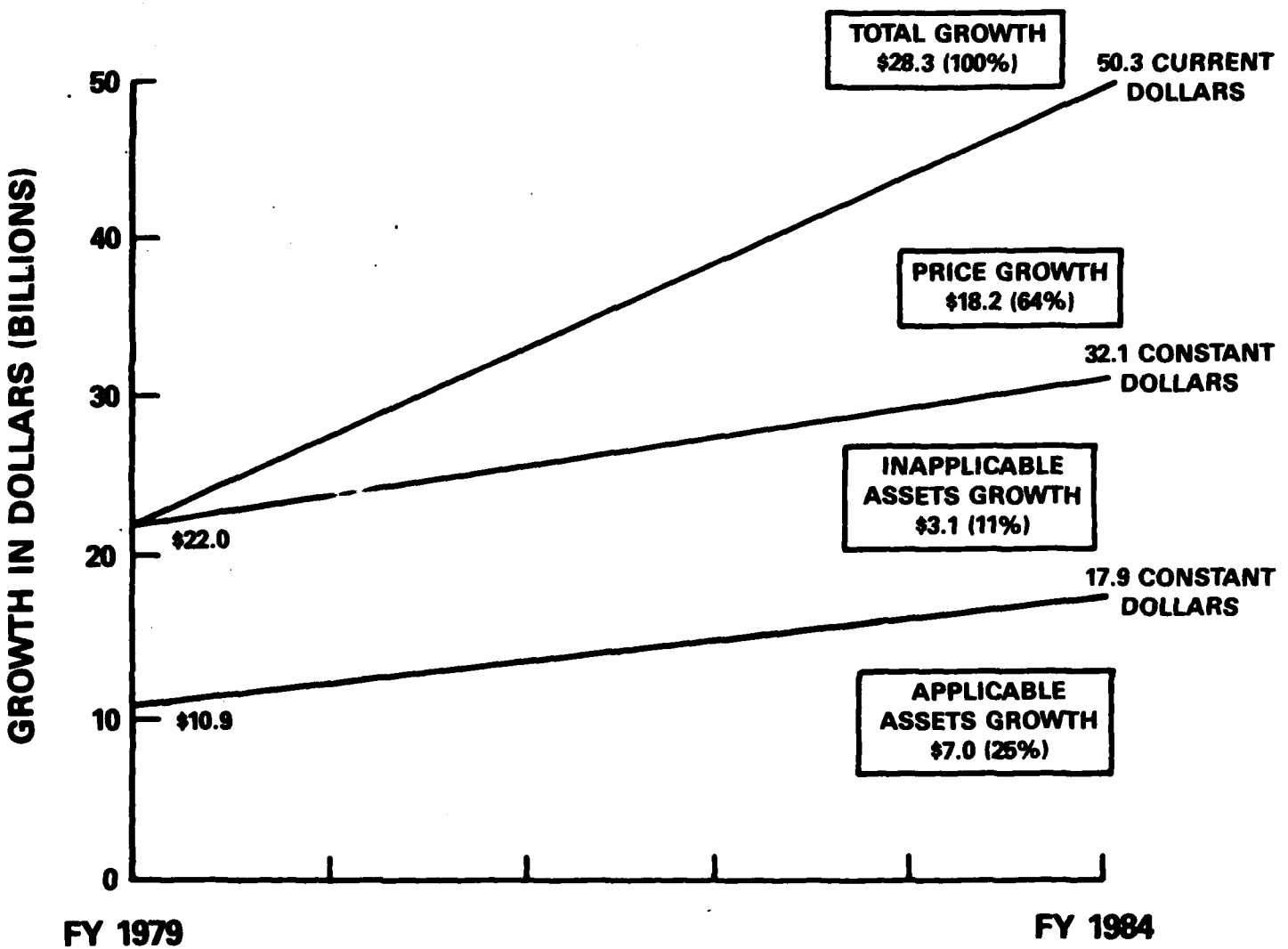
DOD CONSOLIDATED SECONDARY ITEMS PEACETIME INVENTORY — TOTAL GROWTH FY 79–FY 84



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