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## INFLATION AND FOREIGN MILITARY SALES PROGRAMS

By

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Understanding and interpreting the impact of inflation on military programs is difficult -- if not impossible. About the only thing most people will agree on is that it is a problem. In the June 1983 issue of Air Force Magazine, senior editor John T. Correll in an article entitled "The Costly Alternative to Controlling Cost" stated: "Inflation is a perpetual problem. It is bad enough by itself, but it feeds on cost growth like a loan shark's interest rates." Inflation, which may be defined as a rise in the general level of prices, impacts the majority of us personally, and many of us professionally. A more precise definition of inflation links a rise in the general level of prices with no rise in output (productivity). In foreign military sales (FMS) programs, inflation manifests itself in prices which move upward each year. Defense articles delivered last year cost more this year, and in most cases inflation is cited as the culprit.

The difficult question for countries purchasing military hardware through FMS is: why does inflation continue at a high rate in purchasing country programs, when U.S. newspapers indicate that inflation in the United States is under control? The answer is complex. Mr. Correll was right on target, however, when he related the impact of inflation on weapon system programs to that of a loan shark's interest rate.

In order to understand inflation, it is necessary to understand how it is measured. Inflation is described in terms of indexes which are statistical devices for measuring changes in groups of data. These changes are expressed in terms of index numbers which are ratios of values of subject items to the values of similar type items usually expressed as percentages. For example: A price index of an item is the ratio of its price at a given time to its price at some other time -- usually previously.[1]

According to the Inflation Handbook (8 March 1984), published by the Department of the Air Force, Aeronautical Systems Division (ASD), standard inflation indexes or rates have been in use in the U.S. government since 1977 when it was recognized that there were inconsistencies in the way federal agencies were computing inflation indexes. Uncertainty about the future makes predictions of inflation rates difficult. Standard inflation rates provide a standard base for analyzing program growth and make computer application of the rates easier.

The U.S. Office of Management and Budget (OMB) provides all federal agencies/departments with projected inflation rates. The Office of the Secretary of Defense, Program Analysis and Evaluation (OSD/PA&E) provides preparation instructions for the Program Objectives Memorandum (POM) which identify outlay profiles and inflation rates (both by appropriation) that have

been obtained from the Office of the Assistant Secretary of Defense (Comptroller) [OASD(C)], and which, in turn, are based on OMB rates. These rates are then used in the Department of Defense (DOD) Programming, Planning and Budgeting System (PPBS). For management decision making on the part of purchasers of U.S. military hardware, the weakness in these rates is that they are optimistically oriented to a downward trend in future year indexes. While recently there has been a downward trend in some areas, over time, static or upward trends have been the norm. The U.S. services have been directed to use these rates in their planning. However, exemptions have been granted based on unique, well-documented contractual arrangements between a program office and a prime contractor, or in instances of coproduction where foreign inflation rates differ from U.S. rates.

Additionally, there is a difference between published predictions of future inflation rates and actual experience. For example, in June 1978 OSD(C) directed the services to use a 5.5 percent inflation index for the 1981-1982 period for estimates of cost in the procurement of aircraft. In March 1979, the guidance for the 1981-1982 timeframe was to use 5.6 percent, and in December 1979, the guidance raised the inflation index for the same period to 8.5 percent. Actual experience in aircraft procurement for 1981-1982 reflected a cost increase of 9.6 percent. Another example of the difference between the predicted rate of inflation and actual inflation was cited in a 1982 House Armed Services Committee Report which compared OSD-approved price stabilization (inflation) rates and the actual inflation experienced in the procurement of spare parts. In 1982, the directed rate was 2.45 percent, whereas the actual rate was 12.4 percent.[2]

Economists have developed several measures of inflation. The most common are the Consumer Price Index, the Wholesale Price Index (which is currently referred to as the Producer Price Index), and the Gross National Product (GNP) deflator. Bernard A. Lietaer, in an article discussing these three measures in the Harvard Business Review, writes: "Each is better suited than the others for specific econometric purposes, but they have one aspect in common: They are all irrelevant for most managerial decisions." In discussing the irrelevancy of the Consumer Price Index, Mr. Lietaer writes:

We tend to forget that the Consumer Price Index we study so closely is merely the weighted average of the cost of about 400 goods and services most often purchased by the "average" American. It is often an irrelevant measurement of the inflation a specific person or corporation is experiencing. For example, a New York commuter who likes fish and eats out in restaurants has a higher "personal" inflation rate than the worker in Minneapolis who walks to work and dines at home on eggs and chicken.

Everyone in the United States has his own inflation rate, which depends on his consumer habits and preferences. So does every industrial group and every corporation. While the poultry business has actually experienced deflation over the last 10 years, for example, construction companies and hospitals have been living with inflation rates several times higher than the national average.[3]

In considering inflation in its decision making process and its financial planning, a country purchasing military systems from the U.S. must ask not only whose inflation rate is involved but also what particular form of inflation rate is being applied.

Mr. Lietaer went on to identify two indexes as "critical variables" in gauging the impact of rising prices on corporate management strategies: the change in the price index of inputs and the change in the price index of outputs, or products. He went on to write that, "When both indexes are equal the corporation's cash flow and profit margins are perfectly protected from inflation. If prices inflate faster than costs, the output index might well exceed the input one and profits would then rise."

This logic has application to arms transfers at the broad macro program level, and also applies to commercial, as well as FMS transactions. A purchasing country may wish to compare its rate of inflation to the U.S. rate of inflation in making management decisions ranging from the decision to buy, to financial planning for spares support, to determining total life cycle cost, and to laying out a financial plan to support that cost. In making these comparisons the next question involves determining what indexes must be used. The consumer price index is obviously one not to use. Unfortunately, this index is usually the most accessible and the one referred to most frequently by the casual observer. Comparisons of GNP appeals to some, but, without a deflator, has no real purpose, and again is based on statistics which have no bearing on arms transfers.

Relative currency values appeal to some, and certainly have merit in the short run. However, predictions of the relative value of currencies lack a high degree of confidence. Nevertheless, for long running programs, the day-to-day buying decision must consider currency values, and differences must be exploited whenever possible.

The Producer Price Index -- formerly known as the Wholesale Price Index -- is one of the oldest continuous statistical series published by the Bureau of Labor Statistics, as well as one of the oldest in the Federal Government. This index was established as a measure of price changes for goods sold in primary markets in the United States, and is based on over 18,000 price quotations received by the Bureau monthly. These quotations cover over 4,000 commodities. Civilian goods normally purchased by the U.S. government are in the sample, but military goods are not.[4]

Thus, this index has limited use in predicting inflation in defense industries. However, it can be used if done with care. Analysts may use price movements of those commodities contained in the sample which are incorporated into military hardware. The impact on the end item has to be measured in terms of the percent of the commodity it contains.

There are several Producer Price Indexes (PPI), each of which has a specific purpose. The Finished Goods Price Index, the major focus of the Bureau's news releases and economic analyses of the PPI since 1978, is one of the most widely cited indicators of inflation in the overall U.S. economy. Fluctuations in this Index often presage changes in the Consumer Price Index and the GNP deflator. Changes in the Intermediate Goods Price Index

frequently signal similar changes to come in the Finished Goods Price Index. The index for crude materials other than food and energy is quite sensitive to shifts in total demand and can be a leading indicator of the state of the economy. PPI data are also used in analyzing Government policies directed at specific industries, such as energy and steel. The Finished Goods Price Index can be used to measure changes in the purchasing power of the U.S. dollar in primary (but not retail) markets.

Added to the above are industry indexes. These follow general economic patterns of particular industries and are typically published in industry trade journals. The Industry Price Index has depended entirely upon price data primarily collected for the PPI. Thus, industry price indexes may have limited use in predicting price changes in arms transfers.

In 1978 the Bureau of Labor Statistics (BLS) began publication of the first, pilot group of indexes from the Producer Price Index Revision (PPIR). This revision is the first comprehensive overhaul of the entire theory, methods, and procedures used by BLS to construct indexes measuring price changes in nonretail markets. Indexes from the PPIR are industry-oriented instead of commodity-oriented. Imports are not priced in the PPIR.[5]

Having examined the various measures of inflation, what choices does a purchaser of U.S. arms have? The answer is, it depends on the purpose for which the measure is to be used. A typical FMS program involves several FMS cases for a variety of types of articles and services, some coming directly from stock, and some coming from procurements from defense contractors. If the inflation index is being used to predict a future price of a weapon system, it must be used carefully. Prices quoted in letters of offer have an inflation factor built in, and, in keeping with Department of Defense pricing policy, is to be a reasonable approximation of the final price to the purchaser. To inflate these prices again may disguise other cost growth (e.g., change of scope) problems. The best advice is that penned by Mr. Lietaer and referred to earlier: the "critical variables," i.e., the changes in input and output prices for a purchasing nation must be determined for their defense programs and used as the basis for financial planning. The U.S. indexes may form a backdrop for this but they are only a piece of a more serious analysis which must be accomplished in the preparation of these plans.

The following short list of terminology and procedures for calculating a raw inflation index are provided to give interested readers an insight into a very small portion of the study and use of inflation indexes. This information is from the Air Force handbook on inflation referred to earlier.

#### INFLATION TERMINOLOGY

- A constant-year dollar reflects the value or purchasing power of a dollar in any specific year and may or may not be the base year.
- A base year is a point of reference representing a fixed price level and usually is defined as the fiscal year (FY) in which a program was initially funded.

- A base-year dollar reflects the dollar's value at the time of a specific base year as if it was all expended in that year.
- An outlay profile is developed for every appropriation and reflects, in percentage terms, the rate at which dollars in each appropriation are expected to be expended based on historical experience.
- A then-year dollar is a constant or base-year dollar that has been either inflated or deflated using the appropriate inflation index to show the amount of money that will be needed when the goods and services expenditures will actually be made. All Programming, Planning, and Budgeting System documents use then-year dollars to properly reflect the Total Obligation Authority (TOA) that must be appropriated during a specific fiscal year if sufficient funds are to be available to pay for the goods and services when they are received.
- A raw inflation rate is a percentage (e.g., 5%, 7.5%, etc.) showing the change occurring from the mid-point of one year to the mid-point of the next year.
- Raw inflation indexes provide a means of compounding inflation rates from a base year which is assigned a raw inflation index of 1.00. Raw inflation indexes are used to convert constant dollars in one year to constant dollars in another year.

#### CALCULATING A RAW INFLATION INDEX

- Designate a base year and assign that year an index of  $i = 1.00$ .
- Obtain the current table of raw inflation rates and let  $r$  = inflation rate from one year to the following year.
- Compute the raw inflation index ( $R$ ) using the following formula where  $n$  = year of desired index. Therefore,

$$R_n = (i) \times (i + r_1) \times (i + r_2) \times \dots \times (i + r_n)$$

For example, suppose you had the following table of raw inflation rates for the Research, Development, Test, and Evaluation (RDT&E) appropriation.

Fiscal Year	Raw Inflation Rate, $r_n$ (percent)
78-79	6.2%
79-80	6.3%
80-81	5.8%
81-82	5.5%
82-83	5.5%
83-84	5.5%

Then, the following computations would be necessary to construct a table of raw inflation indexes where FY 78 is the base year and percentages are expressed as decimals.

<u>Fiscal Year</u>	<u>Formula</u>	<u>Raw Inflation Index</u>
78	1.000	1.000
79	$1.000 \times (1.00 + .062)$	1.062
80	$1.000 \times (1.00 + .062) \times (1.00 + .063)$	1.129
81		1.194
82		1.260
83		1.329
84	$1.000 \times (1.00 + .062) \times (1.00 + .063) \times (1.00 + .058) \times (1.00 + .055) \times (1.00 + .055)$	1.402

#### ENDNOTES

1. National Estimating Society. Dictionary of Estimating Terminology, Journal (Summer 1982), Special Edition.
2. Committee on Armed Services, House of Representatives, "Hearings on Military Posture and H.R. 5968 (DOD Authorization for Appropriations for FY 1983), Operations and Maintenance, Title III (Part 6 of 7 Parts)," March 1982, p. 623.
3. Bernard A. Lietaer. "Prepare Your Company for Inflation," Harvard Business Review, September-October 1970, Number 70506.
4. U.S. Department of Labor. Producer Prices, Handbook of Methods Bulletin 2134-1.

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