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FOREIGN CURRENCY FLUCTUATION ALLOWANCES
IN DEPARTMENT OF DEFENSE ACQUISITION
APPROPRIATIONS

by

Charles S. Ellsworth

December, 1993

Thesis Advisor:

Richard D. Milligan

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Foreign Currency Fluctuation Allowances
In Department Of Defense Acquisition
Appropriations.

by

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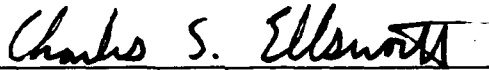
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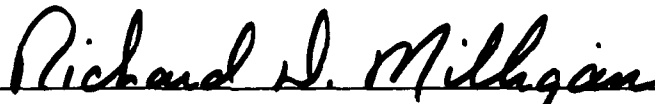
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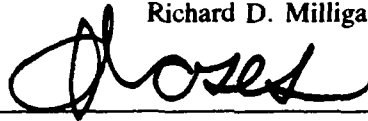


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ABSTRACT

This thesis examines the nature and significance of foreign currency exchange rate fluctuation problems experienced within Department of Defense procurement programs. It also examines the establishment of foreign exchange rates and the methods currently used within the Department of Defense to deal with losses resulting from exchange rate fluctuations. The current system for budgeting and covering losses incurred from exchange rate fluctuation contains several inefficiencies which place unnecessary administrative burdens and costs on financial planners and program managers. The avoidance of foreign exchange rate fluctuation is not realistic, however, the improvement of current budgeting and managing processes can reduce inefficiencies and management costs. Possible improvements to the current system include the use of a three year weighted moving average exchange rate for annual budgets involving foreign currencies. The inclusion of procurement programs in the Foreign Currency Fluctuations, Defense appropriation or the creation of a Foreign Currency Fluctuations, Defense Procurement appropriation would provide foreign exchange rate fluctuation coverage for procurement programs.

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I. INTRODUCTION

A. PURPOSE OF THE RESEARCH

Under the present climate of shrinking budgets, reduction of forces, and international competition for production materials and technology, the Department of Defense (DOD) is faced with a constant challenge to accurately and justifiably allocate available funds. One obstacle in the path of accurate budgeting is planning the procurement of goods or services from foreign countries as the value of the currencies of both the United States and the foreign supplier fluctuate significantly.

In 1979 the Foreign Currency Fluctuation, Defense appropriation was established for the Operations and Maintenance (O&M), Military Personnel (MP), and the Operation and Maintenance portion of the Family Housing Management appropriations. The purpose of that appropriation is to maintain the budgeted program in the event of gains or losses caused by fluctuations in the exchange rate throughout the annual expenditure cycle. In contrast, there is currently no foreign exchange rate fluctuation protection for acquisition programs which, through the purchase of components, materials, or technology from foreign countries, are subject to potential foreign exchange rate fluctuation gains or losses. Potential losses occur as a result of United States dollar devaluation

during the time lag between budget submission and the actual expenditure of funds.

This study will examine three current Navy acquisition programs with regards to their exposure to foreign exchange rate fluctuations. The three programs are the T-45TS Jet Flight Training System, the EX-44 Rolling Airframe Missile, and the AV-8B Harrier II. The purpose of the thesis will be to assess the significance of the foreign exchange rate fluctuation problems experienced by these programs, examine the current solutions utilized to make up fluctuation losses, and propose solution(s) which would prevent the issue of foreign exchange rate fluctuation from becoming a problem at the Program Manager level.

B. RESEARCH QUESTIONS

The following research questions will be addressed during this study.

1. Primary research question:

What is the nature and significance of foreign currency exchange rate fluctuation problems within current Navy acquisition programs?

2. Subsidiary research questions:

- What exchange rate is used in acquisition appropriations and what method is used to set the rate?
- How are foreign currency exchange rate fluctuation problems dealt with in affected acquisition programs?
- How could foreign currency exchange rate fluctuation problems best be dealt with?

C. RESEARCH METHODOLOGY

Information necessary to complete this study was gathered by conducting personal interviews and by reviewing available literature, applicable instructions and directives, letters, and memoranda detailing foreign exchange rate fluctuation problems and solutions. Interviews were conducted with the Program Managers of the acquisition programs involved and personnel from the Office of the Navy Comptroller. Information on the amount of appropriated funds within each program which are subject to foreign currency exchanges were obtained from appropriations, program budgets, program contracts, and interviews with Program Managers. Information on the amount of foreign exchange rate fluctuation gains or losses experienced by each program were obtained through comparison of budgeted exchange rates and actual exchange rates at the time of the actual expenditures.

The first step of the study was to review the procedures and methods used to set up and control the Foreign Currency Fluctuation, Defense account within the Department of Defense and within the Navy. Second, an examination of the susceptible expenditures and foreign exchange rate fluctuation difficulties encountered within the three Navy procurement programs listed previously was conducted to determine the significance of foreign exchange rate fluctuation issues within each program. Third, an examination was conducted of the methods used within each program to deal with foreign

exchange rate fluctuation losses, providing those losses were significant enough to warrant additional funding. Fourth, various options available to Program Managers and planners to avoid or protect the program from foreign exchange rate fluctuation exposure were identified. Lastly, an evaluation and summary of the information gathered and suggested solutions are provided.

II. BACKGROUND

A. INTRODUCTION

Although the procurement of weapons systems and defense technology in the United States has included purchases from foreign countries for many years, foreign participation will probably increase in the future. The breaking down of trade barriers between countries and the age of the global market may well result in increased foreign procurement and sales of defense technology. While the establishment and maintenance of a United States industrial base is often a consideration in the development of defense technology, the author assumes this ethos will include North Atlantic Treaty Organization and United Nation participants in a new global industrial base for defense technology in the future. Regardless of the truth of the assumption of widening United States defense industrial participation, the existence of current foreign participation in the defense procurement system will continue.

The three current Navy procurement programs which will be discussed later in this thesis constituted over \$300 million in foreign procurement in fiscal year (FY) 1992. For every foreign purchase there inevitably exists the potential for currency variance between the time of planning, programming, and budgeting for the purchase and the actual expenditure of funds. Options exist to minimize or eliminate the exposure to

exchange rate fluctuation, however, there will always be situations where direct United States currency to foreign currency exchanges are the preferred medium. The combined exposure to currency exchange rate fluctuation and the resulting fluctuation will create a loss for one party and a gain for the other.

The significance of considering foreign exchange rate fluctuation when preparing a budget influenced by foreign exchange rates can be compared to budgeting for inflationary movements. Although financial planners do not know the amount of inflation that prices will experience in a given year, it is a risk that is routinely factored into budgets. Granting that the trend of inflation can be more accurately anticipated than exchange rate movements, the analogy is useful in imparting the importance of allowing for the potential unanticipated and unavoidable losses or gains which exchange rate fluctuation can cause. For many years this risk has not been insured against or allowed for and procurement program financial planners have been left to their own methods to deal with losses from exchange rate fluctuation.

The primary focus of this thesis is on the significance of foreign exchange rate fluctuation in specific procurement programs and the possible creation of a fluctuation account to collect and distribute the inevitable gains and losses created from exchange rate fluctuation. This chapter will present a brief historical perspective of exchange rates, fluctuation,

and methods to minimize fluctuation exposure, along with an overview of the history and management of the Foreign Currency Fluctuation, Defense account. Also discussed in this chapter will be the establishment of exchange rates in the Department of Defense and which exchange rates are used in procurement program budgets.

B. HISTORICAL PERSPECTIVE

Currency exchange rates are necessary to conduct international trade and a fundamental understanding of the causes of exchange rate fluctuation is necessary to best deal with the issue. Exchange rates vary for several reasons. The main factors include inflation, deflation, domestic interest rates, trade balances, taxation policies, and central monetary policy [Ref.1:p.45]. Each of these factors and many others affect exchange rates daily and are as impossible to predict consistently as is the weather or the stock market. However, in order to effectively conduct international trade there must be mutual trust or confidence and a reasonably stable exchange rate between currencies. The establishment of mutual confidence is normally found in the backing of the currency, the strength or size of the economy represented, and occasionally agreements between the countries to limit the fluctuation of their currencies.

In response to the number of currencies found in Europe and the wide fluctuation of those currencies, many western

European countries have attempted several times to stabilize their exchange rates. The most recent attempt was the establishment of the Exchange Rate Mechanism (ERM) of the European Monetary System (EMS) in 1989. The ERM is a cooperative agreement among the participating Western European countries to limit the fluctuation of their currencies through their central banks and monetary policies. The ERM was established by "pegging" a rate to the German mark, which is traditionally the most stable of the European currencies [Ref.2:p.6]. Recently, countries such as France and Great Britain have experienced inflationary pressures related to the German mark and have subsequently opted out of the ERM. The traditional reaction of the German Central Bank has been to resist requests to weaken the mark through lower German interest rates.

1. Minimizing exchange rate exposure

The necessity to have currency exchange rates and the inevitable fluctuation of those rates lead to the identification of methods used by international traders in goods and services to avoid or minimize exposure to exchange rate fluctuation. Some of the more common methods used are:

a. Diversify transactions over several currencies. Although this option does not exist for all trades, by spreading foreign transactions equally over several currencies a trader can reduce the impact of a single exchange rate fluctuation. This diversification or hedging technique is used by many large international corporations through the development of factories or business bases in several countries.

b. Buy foreign currency in advance. By buying an amount of currency at the time a transaction is budgeted for and a price is set, the transaction can be conducted in the foreign currency without loss to either party. This method requires the commitment of capital in advance of the expenditure. However, if the capital is available the foreign currency can collect money market interest rates while awaiting expenditure.

c. Set an exchange rate in advance. This method removes the risk from the buying or paying party. The risk is simply transferred to the selling party who is receiving a fixed amount of foreign currency at some previously set rate which will have changed in value over time.

d. Contract through a domestic firm at a fixed price for foreign goods. This method effectively removes the risk of foreign currency fluctuation from the buyer, however, again the risk is simply transferred to a middle man and will be absorbed by the buyer eventually through higher costs.

The Department of Defense, prior to 1979, was forced to find creative ways to deal with foreign exchange rate fluctuation in the annual appropriations. Operations affected by foreign exchange rate fluctuation are primarily overseas bases which receive services and goods from host countries and pay them at the appropriate exchange rate at the time of the transaction. In 1979 Congress passed legislation establishing a new appropriation, "Foreign Currency Fluctuations, Defense" (FCF,D) [Ref.3]. It was established as a "no-year" account in the amount of \$500 million in order to provide a source of funds to cover losses experienced from unfavorable currency exchange rate fluctuation. Gains from favorable exchange rate fluctuation are returned to the account. The annual appropriations affected are (a) Operation and Maintenance, (b)

Military Personnel, and (c) the Operation and Maintenance portion of the Family Housing Management account [Ref.3].

**C. THE MANAGEMENT OF THE FOREIGN CURRENCY FLUCTUATION,
DEFENSE APPROPRIATION**

The management of the FCF,D account is provided by the Office of the Assistant Secretary of Defense, Office of the Comptroller. Portions of the account are allocated to the Military Departments and Defense Agencies through Centrally Managed Allotments (CMAs) for each currency. The FCF,D appropriation, which originally established coverage for eleven currencies, has since been expanded to the fifteen listed in TABLE 1 [Ref.6].

1. Obligations and expenditures

Obligations within each annual appropriation are recorded at the exchange rate established either in the President's budget or issued by the Office of the Secretary of Defense (OSD) and the Navy Comptroller (NAVCOMPT). Only obligations which are payable in a foreign currency or payable in dollars at an exchange rate are recorded in the CMAs. When payments are made, the disbursing officer charges or credits the variance between the OSD budgeted exchange rate and the current exchange rate directly to the appropriate CMA. Monthly reports of obligations within each CMA are submitted to OSD for FCF,D accounting records. The actual expenditure of FCF,D funds is accomplished through the CMAs which are

managed at Headquarter or regional level (i.e., foreign base commander's or overseas Commander In Chief's) [Ref.3, Ref.4:p.2]. Both gains and losses are managed through the CMAs and subsequently the FCF,D account. If a CMA is depleted due to exchange rate fluctuation losses, a request to OSD is made for fund replenishment. OSD manages overall CMA levels in accordance with current defense needs and priorities.

At the end of each fiscal year the components and agencies recording CMA transactions fully fund all unliquidated obligations and transfer unused obligations and net gains from

TABLE 1. COUNTRIES AND CURRENCIES INCLUDED IN THE FCF,D ACCOUNT.

	<u>Country</u>	<u>Currency</u>		<u>Country</u>	<u>Currency</u>
1	Belgium	Franc	9	Netherlands	Guilder
2	Canada	Dollar	10	Norway	Krone
3	Denmark	Krone	11	Portugal	Escudo
4	France	Franc	12	South Korea	Won
5	Germany	Deutsche Mark	13	Spain	Peseta
6	Greece	Drachma	14	Turkey	Lira
7	Italy	Lira	15	United Kingdom	Pound
8	Japan	Yen			

currency exchange rate fluctuation back to the FCF,D appropriation. Outstanding obligations are liquidated by converting them from the budgeted rate to the current rate as of 30 September. Each CMA is effectively zeroed out and closed as of 30 September. Losses incurred through the outstanding obligations after the account is zeroed are absorbed by the affected appropriation. The CMAs are replenished by OSD each year to cover current obligations [Ref.3, Ref.4:p.4].

2. Fund balance

Since the initial appropriation of \$500 million, the balance of the FCF,D account has varied slightly from year to year, but has remained near \$500 million since inception [Ref.5:p.37]. The level balance through the last 13 years is curious in that it has not received any increases for inflation. Obligations and actual transfers are shown in Figure 1 and reveal a decline from the 1987 obligations incurred of \$78 million to the 1992 level of \$32 million [Ref.6]. This decline can be attributed both to an unfavorable exchange rate variance between the OSD promulgated exchange rate and the actual exchange rates resulting from the general devaluation of the United States dollar in this period and also due to a significant United States withdrawal from Eastern Europe. As displayed in Figure 1, payments were actually made into the FCF,D account by the Navy in both fiscal years 1989 and 1992 due to the stronger than expected

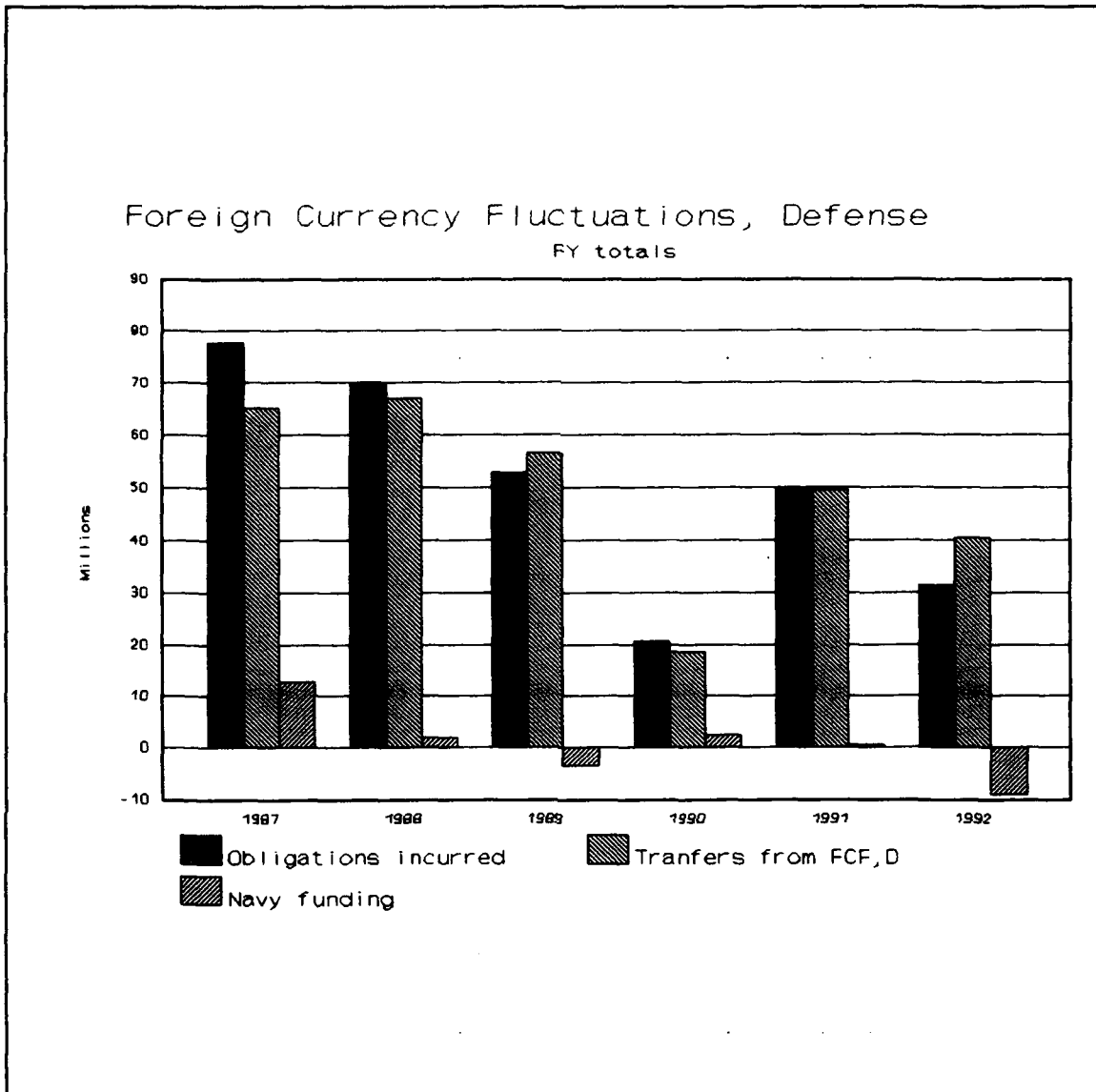


Figure 1. Foreign Currency Fluctuations, Defense

United States dollar against the Japanese yen. The Navy's presence in Japan is provided foreign exchange rate fluctuation coverage through the FCF,D for the operational accounts covered. Congress has recently proposed a net reduction to total O&M appropriations in the fiscal year 1994 budget due to exchange rate fluctuations. The 1994 proposal

includes an increase in Navy O&M appropriations due to the strengthening of the Japanese yen versus the dollar and a reduction in the Army and Air Force O&M budgets due to the weakening of the German mark versus the dollar [Ref.7].

3. The accuracy of budgeted exchange rates

The flow of funds within the FCF,D account are directly proportional to the gap between the OSD budgeted exchange rate and the actual exchange rate at the time of a given disbursement. The greater disparity between the two, the greater the funds flowing out of the FCF,D account. Figures 2 and 3 display actual exchange rate movements against the OSD budgeted exchange rates for the British pound and the German mark from 1987 through 1993 respectively [Ref.8]. For both currencies, the budgeted rate missed the actual rate significantly between 1987 and 1989, a period when the dollar devalued and exchange rate fluctuation losses were significant. Although 1986 is not shown in Figure 3, the budgeted rate was \$3.73 as compared to the actual average rate in 1986 of \$2.25 [Ref.6]. The large disparity between the actual rates experienced during a given fiscal year and the execution rate established by OSD can be best understood through an understanding of the techniques used to set the annual budgeted exchange rates.

4. Setting budgeted exchange rates

Although the framework for the FCF,D account suggests that Defense Component budget submissions involving foreign

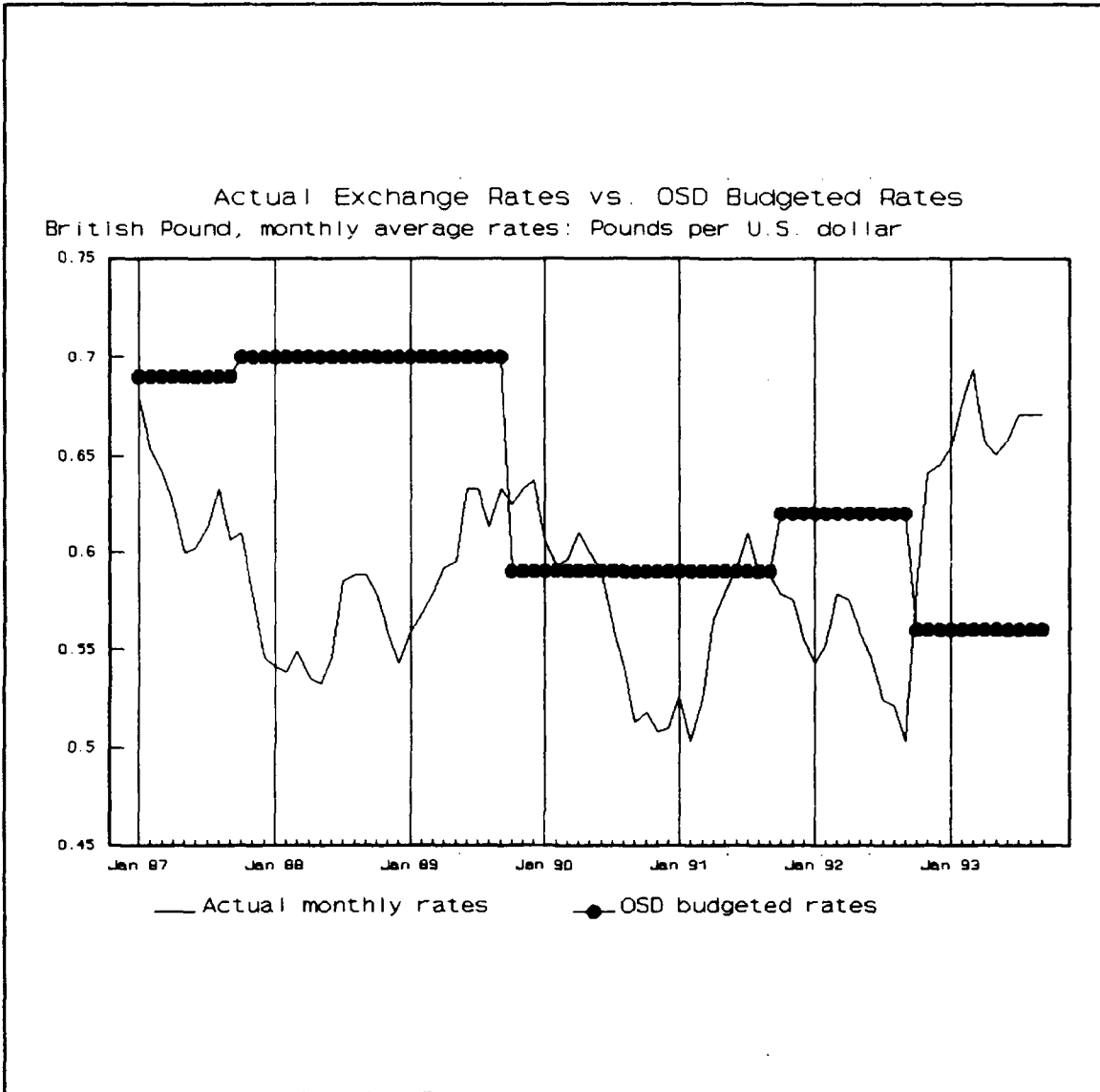


Figure 2. British Pound, actual rates vs. OSD budgeted rates

currency obligations should use the exchange rate at which the President's budget is submitted, the budgeted rate appears to be set by OSD far in advance to OMB's involvement in the Defense budget submission [Ref.3]. The budgeted rates are set by OSD not through complex formulas, averaging, or even statistical analysis, they are set by recording what the

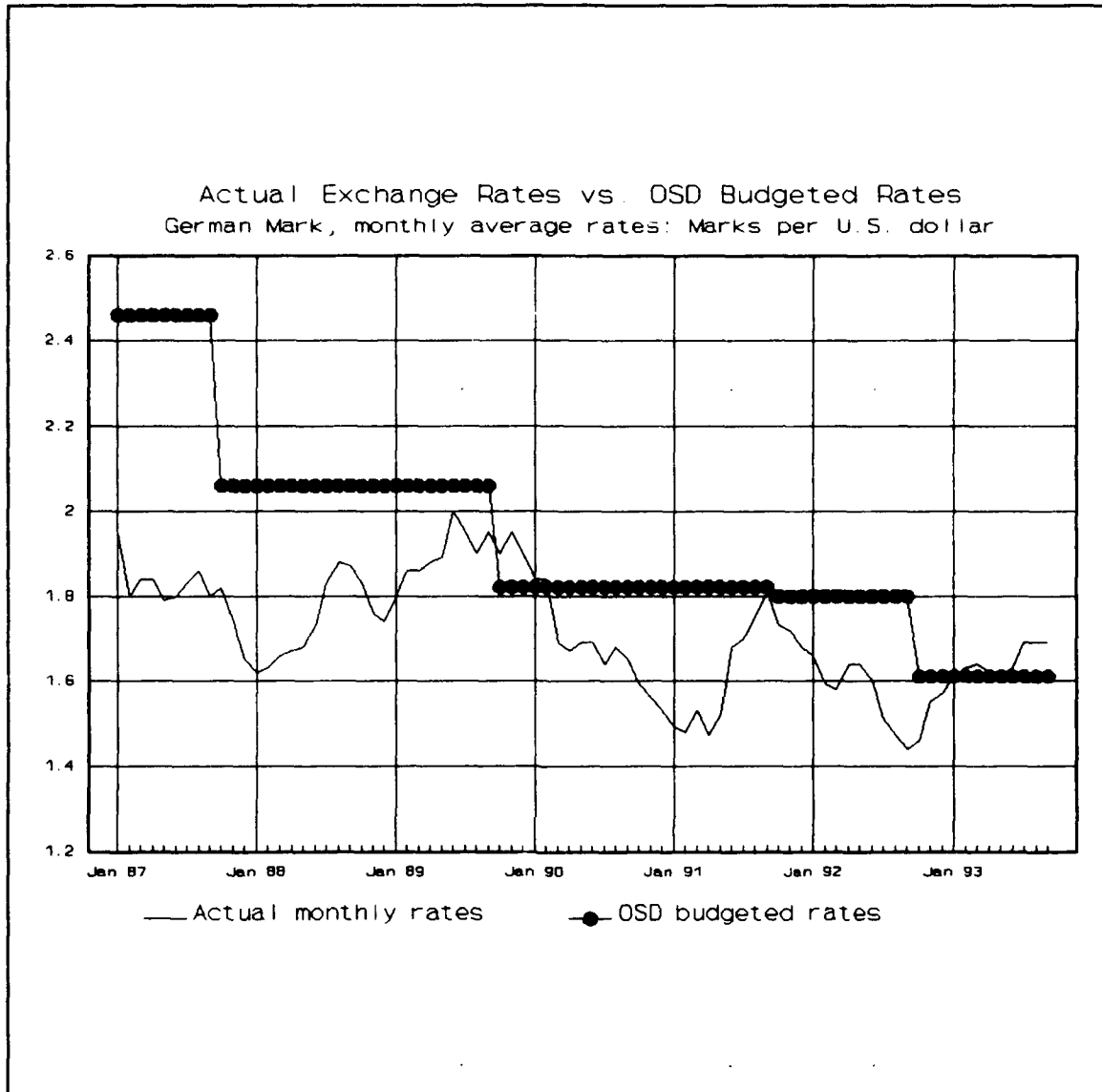


Figure 3. German Mark, actual rates vs. OSD budgeted rates

actual exchange rates are at a point in time during the budget formulation process [Ref.9]. That point is initially in the January through March time frame, one and one half years prior to commencement of the execution of the budget. For example, the fiscal year 1992 exchange rate established by OSD was initially selected during the establishment of the individual

service budgets for that year, roughly February 1990. This period equates to the Program Objective Memorandum development period for the Navy budget. Once the initial OSD budgeted exchange rates are provided to services and agencies, budgets are prepared and submitted to OSD.

As the budget process proceeds, the budgeted rates can be altered through official service or agency declaration and, after submission to OSD, by Program Budget Decisions (PBD's). PBD's are the Department of Defense's adjustments to the budget in order to achieve the most up-to-date exchange rates prior to submitting the President's budget to the Congress. PBD's may be promulgated throughout the budgeting process as events dictate and can be submitted up to the final submission of the President's budget to Congress [Ref.9].

Compounding the time lapse between selection of budgeted exchange rates and the execution of the budget for procurement programs is the issue of outlay rates. The annual appropriations covered by the FCF,D account are relatively fast spending appropriations, where most funds are expended in the first year. For procurement programs, expenditure of funds can take as long as six years, placing the budgeted exchange rate into the distant past. Procurement programs could conceivably find themselves expending funds at a budgeted exchange rate seven years old. Many significant changes can occur in the economies of two countries in seven

years to significantly alter the exchange rate between the two.

Although there is no acceptable model for predicting exchange rate fluctuation for various currencies, the current method fails to recognize potential fluctuations during the period of budget preparation, review, and Congressional approval. Even a nine month time lag between budget preparation and expenditure of funds can result in significant variance between even the relatively stable currencies of the United States, Germany, and Great Britain, as observed in Figures 2 and 3.

D. EXCHANGE RATES USED IN PROCUREMENT PROGRAM BUDGETS

Procurement programs predominately use the OSD promulgated exchange rates in their budget submissions [Refs.10, 11, 12]. Although procurement programs inevitably involve budgets projected over longer periods than one year, the overwhelming selection of procurement Program Managers are the exchange rates promulgated by OSD. The option does exist for Program Managers to formulate a different exchange rate for use in a procurement contract than the most current OSD promulgated rate. This option is provided because a procurement program budget faces a substantially different budget horizon than the one-year appropriations affected by the FCF,D account.

Another reason for allowing procurement accounts to use different exchange rates than those appropriations protected

by the FCF,D account is the OSD full funding policy for procurement programs. This full funding policy forces the military departments to fully fund the budgeted quantity in the year funding authorization is requested. To accurately price out a six year procurement program not only requires good planning, but also a crystal ball. No one can possibly predict what exchange rates will do over the next six years, therefore, it is understood that the fully funded budget will be submitted and subsequently repriced, usually annually, throughout the period of execution in order to adjust to the changing variables.

In order to propose a contractual exchange rate different from the OSD rate for a specific currency the Program Manager would have to provide a justification for the deviation and be subject to scrutiny by the individual service or the OSD Comptroller. Such a justification would have to be backed up with appropriate reasons for a suspected movement of the currency exchange rate in the longer term than is allowed for in the one-year projection budgeted by OSD. The potential problem resulting from such a proposal might, however, be the exposure of the Program Manager to the risk of losing more resources from exchange rate fluctuation than would have been lost using the OSD promulgated rate. This could be professionally damaging to a Program Manager and economically damaging to the program. This method is simply not wise from a managers perspective because a lower exchange rate (less

foreign currency per United States dollar) would only mean a lower budget, and a higher exchange rate could only be justified through set contractual exchange rates which would likely not be set until after the budgeting and appropriation process. Contractual exchange rates in procurement programs are generally not utilized because they shift the exchange rate risk to the contractor which is not a wise business decision for the contractor.

The risk involved in foreign currency exchange rate fluctuation is always born by the procurer. Procurement contracts dealing with foreign countries often involve a fixed price in the foreign currency at a budgeted exchange rate. In these types of contracts there is commonly an "H" clause which defines the method with which exchange rate fluctuation will be dealt. The "H" clause is designed to provide a method for adjusting the contract price to meet changing exchange rates without any of the parties involved realizing economic benefit or incurring economic loss [Ref.13, Schedule H-15]. The "H" clause does not fix the exchange rate for the contractor, it merely provides some assurance that exchange rate fluctuations will not unfairly hurt or benefit either party.

The "H" clause calculates the contract price change resulting from foreign exchange rate fluctuation through a series of simple calculations. First, add up the invoices paid throughout a given year in United States dollars, then divide that sum by the total paid in foreign currency to

achieve the Average Actual Foreign Exchange Rate for that year. Next, subtract the budgeted OSD exchange rate from the Average Actual Foreign Exchange Rate and divide the difference by the projected exchange rate. Then multiply the result by the sum of invoices paid out in foreign currency and multiply the result again by the projected exchange rate. This result is then multiplied by a fixed multiplier and the result is the amount of adjustment that will be applied to the contract price [Ref.13, Schedule H-15].

Working through this formula, using various fluctuation amounts and directions, reveals it's purposes which are simply to determine the gain or loss to the United States in United States dollars from exchange rate fluctuation, to add a fixed percentage for profit, and to retroactively increase the contract price in United States dollars. The fixed price is established in the contractors currency and the United States price is adjusted at the end of the year to reflect exchange rate fluctuations. Contractors are virtually unaffected by exchange rate fluctuations in a fixed price contract with an "H" clause since they will be paid in their own domestic currency. Again, the budgeted OSD exchange rate is predominately used in these types of contracts and therefore reflect exchange rates which are outdated by as much as six years.

E. SUMMARY

This chapter has discussed the requirement to purchase foreign defense systems and technology and the inevitable currency exchanges that will result from these transactions. The need and driving forces behind currency exchange rates was discussed as well as the impossibility of predicting exchange rate fluctuations. Methods used to minimize exposure to exchange rate fluctuations as well as the establishment and management of the Foreign Currency Fluctuations, Defense (FCF,D) appropriation by Congress were addressed. The chapter concluded with an examination of the exchange rates used in procurement budgets and contracts.

The next chapter will discuss the significance and nature of foreign currency exchange rate fluctuation in three current Navy procurement programs, the methods used by Program Managers to deal with fluctuation losses and the possible use of the FCF,D account or the creation of a separate Foreign Currency Fluctuation account to cover losses incurred from exchange rate fluctuations in procurement programs.

III. FINDINGS

A. INTRODUCTION

Having established some of the principles and theories behind exchange rates and the management and establishment of budgeted exchange rates in the DOD it is now useful to attempt to assess the significance of exchange rate fluctuations in three selected Navy procurement programs. The three programs selected, the AV-8B Harrier II, the EX-44 Rolling Airframe Missile, and the T-45TS Jet Flight Training System, each have significant portions of their systems being procured from foreign countries. Precise figures of foreign exchange rate fluctuation losses or gains are not maintained either by the individual program offices, the Navy Comptroller, or the DOD. Many of the foreign exchange rate fluctuation figures presented in this Findings Chapter were estimated from available budget figures, actual exchange rates, and portions of program total expenditures involving foreign procurement. When estimates were made, conservative losses were projected to prevent any possible exaggeration of the foreign exchange rate fluctuation issue.

This chapter will break out the three procurement programs individually, discuss the scope and nature of each program's foreign procurement, the overall affect of exchange rate fluctuation on each program in the past, and the potential for

future susceptibility to exchange rate fluctuations. For the purposes of this analysis, one percent of the total program budget will be labeled as a significant amount for each program. This assumption will help to assess the significance of foreign exchange rate fluctuation losses within each program. This chapter will also address the procedure currently used by Program Managers to deal with losses from unfavorable exchange rate fluctuations. The chapter will conclude with a discussion of the possible solutions to cover foreign exchange rate fluctuation in procurement appropriations.

B. FOREIGN CURRENCY EXCHANGE RATE FLUCTUATION IN THREE CURRENT NAVY PROCUREMENT PROGRAMS

1. EX-44 Rolling Airframe Missile (RAM)

The RAM program is a United States and German cooperative effort designed to provide naval vessels close-in defense against anti-ship cruise missiles. The program was initiated in 1976 under a memorandum of understanding for both countries to share development costs and divide production contracts between German and United States contractors. The program was initially expected to take four to five years to reach full scale production and has instead taken over 14 years to reach that milestone. The program has undergone long delays, many technological modifications to meet the changing

world threats, and many budget cuts through it's long developmental period.

The joint effort to produce the RAM basically consists of joint development, followed by dual-source production both to establish competition between industry in both countries and to ensure a qualified industrial base is established to produce the missile in each country during the low-rate initial production phase. During the full-scale production phase, the production contracts would be awarded competitively. Developmental and procurement costs for 7000 missiles were estimated at \$2.5 billion. This overall program estimate has actually been somewhat reduced due to a decrease in the total number of missiles that will ultimately be procured [Ref.14]. The exposure to foreign exchange rate fluctuation for the United States within this program consists of payments made directly to German contractors for Research, Development, Test, and Evaluation (RDT&E) costs, Government Furnished Equipment (GFE) purchased directly from German contractors, and German produced equipment purchased by United States contractors. The portion of RAM systems produced by German contractors is approximately 75 percent [Ref.10]. The prime United States contractor is General Dynamics and although precise figures are unavailable, significant budgeting shortfalls have been experienced by the Program Manager as a result of exchange rate fluctuations from General Dynamic subcontracts with German firms.

Data gathered in the form of invoices paid by the United States, scheduled or budgeted procurement figures, and budgeted versus actual exchange rates reveals several periods of significant losses due to exchange rate fluctuation. TABLE 2 shows foreign currency exchange rate fluctuation losses from the beginning of the program through fiscal year 1992 and also displays the losses as a percentage of total expenditures. The foreign exchange rate fluctuation losses for each fiscal year shown in TABLE 2, except October 1989 through September 1990 and October 1990 through September 1992, were provided through the RAM program office [Ref.15]. The periods not

TABLE 2. EXCHANGE RATE LOSSES EXPERIENCED IN RAM PROGRAM
(IN U.S. DOLLARS)

<u>Period</u>	<u>Total Expenditure</u>	<u>Ex rate(ER) Losses</u>	<u>ER as a % of Expenditures</u>
Prior to 10/87	271,500,000	(3,480,742)	(1.6%)
10/87 - 9/88	73,400,000	(1,728,939)	(2.3%)
10/88 - 9/89	91,100,000	(2,545,323)	(2.7%)
10/89 - 9/90	141,900,000	(1,800,000)*	(1.3%)
10/90 - 9/92	286,500,000	(5,700,000)*	(2.0%)
Total	810,400,000	(15,255,004)	(1.9%)

* Estimated

provided by the RAM program office were estimated by calculating the portion of total expenditures used to pay German contractors, then multiplying that amount by the average percentage difference between the budgeted exchange rate and the average actual exchange rate. This amount was then reduced by one half to remove the possibility of overestimating the foreign exchange rate fluctuation loss. The total expenditure data were also provided from the RAM program office and include RDT&E and procurement costs.

The total losses incurred as a result of foreign exchange rate fluctuation as displayed in TABLE 2 were 1.9 percent of total expenditures over the history of the program which, by the criteria established at the beginning of this chapter, signify a significant portion of expenditures for the RAM program. Losses have totalled \$15 million, a significant amount not only in terms of RAM appropriations but also in terms of the Navy budget. An ongoing battle, consuming several years of legal and financial expertise involving the effort by Commander, Naval Sea Systems Command to utilize fiscal year 1987 expired funds to liquidate the \$3,480,742 of foreign exchange rate fluctuation losses incurred prior to October 1987, demonstrates the difficulty the procurement programs are up against in funding foreign exchange rate fluctuation losses [Refs.16 and 17]. Each year the OSD budgeted exchange rate has overestimated the value of the United States dollar. Subsequently, foreign exchange rate

fluctuation losses have been incurred and resources have been expended to locate funds to cover the losses.

The RAM program is projected to continue through at least 1998 and may very well go on into the next century. The cooperative agreement between the German government and the United States government will assure that roughly even portions of the program will be produced in each country. This arrangement insures continued foreign procurement of significant portions of the system and continued significant exposure to foreign exchange rate fluctuation in the RAM program.

2. T-45TS Jet Flight Training System

The T-45 Training System is designed to provide jet pilot training for Navy and Marine Corps aviators. The Navy is procuring the \$5.9 billion system from McDonnell Douglas Corporation. The system includes 300 aircraft, 32 flight simulators, instructional materials and equipment, training integration systems, and logistics support. The major foreign contractors for production of the aircraft element are British Aerospace which produces the airframe and Rolls Royce which produces the engine [Ref.18]. The procurement of the airframe, engine, and other components from sub-contractors is conducted by McDonnell Douglas, however, the costs of procurement, including exchange rate losses, are born by the government. As a rough guideline the scope of the T-45

foreign procurement is approximately 41 percent of the total procurement costs per aircraft [Ref.19].

TABLE 3 shows foreign exchange rate fluctuation losses from fiscal year 1987 through fiscal year 1992 and also displays the losses as a percentage of total expenditures. The foreign exchange rate fluctuation losses for each fiscal year shown in TABLE 3, except 1989 through 1992, were provided through the T-45 program office. The periods not provided by the T-45 program office were estimated using the same procedure as was used to estimate the RAM foreign exchange

TABLE 3. EXCHANGE RATE LOSSES EXPERIENCED IN T-45 PROGRAM
(IN U.S. DOLLARS)

<u>Period</u>	<u>Total Expenditure</u>	<u>Exch rate(ER) Losses</u>	<u>ER as % of Expenditures</u>
10/86 - 9/87	207,500,000	(3,400,000)	(1.6%)
10/87 - 9/88	509,300,000	(16,500,000)	(3.2%)
10/88 - 9/89	357,200,000	(11,400,000) *	(3.2%)
10/89 - 9/90	100,000,000	(250,000) *	(0.3%)
10/90 - 9/92	76,900,000	(900,000) *	(1.2%)
Total	1,509,000,000	(32,450,000)	(2.1%)

* Estimated

rate fluctuation losses. The results were obviously proportionally different due to the different foreign currency (British pound vice German mark) and different portion of foreign procurement in the T-45 program. The total expenditure data were provided from Selected Acquisition Reports for the periods listed and include RDT&E, procurement, and military construction costs.

The total losses incurred as a result of foreign exchange rate fluctuation as displayed in TABLE 3 were 2.1 percent of total expenditures from fiscal year 1987 through fiscal year 1992. This percentage also meets the criteria established at the beginning of this chapter as a significant loss. The T-45 program has been another long, drawn-out procurement program which began in the late 1970's and awarded the first production contract to McDonnell Douglas Corporation in 1984. The program has experienced foreign exchange rate fluctuation losses virtually every year of it's existence. As with the RAM program there are examples of legal and financial battles going on in the Pentagon to find ways to pay foreign exchange rate fluctuation losses which cannot be absorbed by the program. One specific action carried out by the T-45 Program Manager was a request and eventual approval for reprogramming \$4.8 million in the fiscal year 1989 RDT&E budget to cover losses incurred from the dollar to pound exchange rate fluctuation. The reprogramming added \$4.8 million to the T-45 RDT&E budget in fiscal year 1989 and removed the same amount

from the A-6G RDT&E budget. This type of reprogramming action is sometimes difficult to achieve but is required for an increase in excess of \$4.0 million to a program element [Ref.20]. This instance is also the only successful reprogramming that was discovered by the author exclusively for the purpose of replenishing losses incurred from foreign exchange rate fluctuation.

The T-45 program is projected and budgeted to continue through at least 2002 with total expenditures of \$5.6 billion [Ref.21]. Even if foreign exchange rate fluctuation losses are reduced to a fraction of a percentage of total expenditures they will amount to millions of dollars which will not be allowed in an accurately priced budget. The production of the T-45 will continue to involve leading British contractors, British Aerospace and Rolls-Royce, therefore, significant exposure to exchange rate fluctuation can be expected to continue throughout the life of the T-45 program.

3. AV-8B Harrier II

The AV-8B Harrier II is a vertical and short takeoff and land (V/STOL) aircraft for use by the Marine Corps. It is an updated and improved version of the original AV-8A used by the Royal Air Force and later procured by the United States Marine Corps. Procurement includes 300 AV-8B aircraft, 28 TAV-8B training aircraft, and 6 developmental aircraft [Ref.22]. Total procurement is estimated at \$17.1 billion

from the initial Flight Demonstration Program contract in fiscal year 1976 through the final aircraft in approximately fiscal year 1998 or 2000.

The industrial base for the AV-8B technology resides both within the United States and the United Kingdom. Foreign contractor participation includes British Aerospace which produces the majority of the airframe and Rolls Royce which produces the Pegasus engine. The engine is procured by the United States as Government Furnished Equipment under a Firm Fixed Price contract. The airframe is subcontracted through the prime United States contractor, McDonnell Douglas Corporation. Exposure to foreign exchange rate fluctuation exists both in the Government Furnished Equipment procurement of the engine and through the subcontract for the airframe. The procurement of the engine and the airframe amount to approximately 55 percent of the total cost per aircraft. TABLE 4 shows foreign exchange rate fluctuation losses from fiscal year 1987 through fiscal year 1992 and also displays the losses as a percentage of total expenditures [Ref.12].

The foreign exchange rate fluctuation losses for each fiscal year shown in TABLE 4 except 1987 through 1989 were provided through the AV-8B program office [Ref.23]. The periods not provided by the AV-8B program office were estimated using the same procedure as was used to estimate RAM and T-45 foreign exchange rate fluctuation losses. This procedure was combined with known exchange rate losses

experienced from the RDT&E portion of the program. The results observed from examining foreign exchange rate fluctuation losses in the AV-8B program were, not surprisingly, very similar to those observed in the T-45 program. The portion of British procurement is very similar to the T-45 program and the contractors are identical. The total expenditure data were provided from Selected Acquisition Reports for all of the periods listed and include RDT&E, production, military construction, and operating and support

TABLE 4. EXCHANGE RATE LOSSES EXPERIENCED IN AV-8B PROGRAM
(IN U.S. DOLLARS)

<u>Period</u>	<u>Total Expenditure</u>	<u>Exch rate(ER) Losses</u>	<u>ER as % of Expenditures</u>
10/86 - 9/87	741,500,000	(18,530,000)*	(2.5%)
10/87 - 9/88	647,400,000	(16,300,000)*	(2.5%)
10/88 - 9/89	626,300,000	(12,600,000)*	(2.0%)
10/89 - 9/90	576,800,000	(7,200,000)	(1.2%)
10/90 - 9/91	571,600,000	(5,000,000)	(0.9%)
10/91 - 9/92	289,500,000	(6,900,000)	(2.3%)
Total	3,453,100,000	(66,530,000)	(1.9%)

* Estimated

costs.

The total losses incurred as a result of foreign exchange rate fluctuation, as displayed in TABLE 4, were 1.9 percent of total expenditures from fiscal year 1987 through fiscal year 1992. As with the RAM and T-45 programs, this percentage meets the 1.0 percent percentage criteria defining a significant portion of total expenditures. Also not surprisingly, the AV-8B program has documented similar difficulties in raising funds to cover some of it's exchange rate fluctuation losses incurred after the elimination of the "M" account in 1990.

The AV-8B program is projected to continue through at least 1998 and will likely proceed through the turn of the century [Ref.23]. The use of the British contractors and subsequent exposure to foreign exchange rate fluctuation may change sometime in the future with such developments as United States firms bidding for production of the Pegasus engine and Rolls Royce exploring the establishment of a commercial and military assembly and support facility in the United States. The current situation, however, is that approximately 55 percent of production costs are incurred through foreign contractors, perhaps continuing throughout the life of the AV-8B program.

Each of the three procurement programs discussed in this section contained a significant portion of it's total expenditure as foreign procurement and each suffered foreign

exchange rate fluctuation losses over the periods examined. The exposure to foreign exchange rate fluctuation risks will likely continue for each program and, it can safely be assumed, for future programs procuring foreign goods. These losses create a significant burden to the Program Manager, create inefficiencies in terms of planning, location of funds to cover losses, time lost, and administrative and legal costs associated with the reallocation of funds. The administrative, legal, and time (management and labor) costs are not only experienced at the program level. The costs associated with reprogramming or reallocating funds are felt at the service, DOD, and Congressional level.

C. METHODS FORMERLY USED AND METHODS CURRENTLY AVAILABLE TO DEAL WITH FOREIGN EXCHANGE RATE FLUCTUATION

Prior to the spring of 1990 the universal source of money utilized for such unforeseen funding shortfalls as foreign exchange rate fluctuation losses was the Merged Account or "M" account for the appropriation involved. "M" accounts were used to pool expired obligated funds for individual appropriations, to be available for eventual expenditure. The use of these funds were largely uncontrolled and gradually they became creatively used for other than their originally intended purpose. Suspected abuses of "M" account funds prompted a Congressionally mandated investigation of all DOD "M" accounts and the report, which was issued on March 22,

1990, eliminated the process of collecting expired obligated funds within "M" accounts [Ref.24]. With the expiration of the "M" accounts went the ease with which funding shortfalls could be covered.

In the arena of procurement, the "M" account served as the perfect source of funds for exchange rate losses. Prior to the 1990 investigation, the "M" accounts were used by all programs with foreign exchange rate fluctuation shortfalls. The significant amount of funds pooled in the "M" accounts, \$1.5 billion in Aircraft Procurement, Navy in 1990, and the revolving nature of the accounts allowed them to fund not only the expired obligations they were developed to serve, but also such unauthorized uses as foreign exchange rate fluctuation losses or non-discretionary program cost increases [Ref.24]. This practice ceased in 1990 and Program Managers have been left since then facing few if any sources of funds for foreign exchange rate losses.

Currently, Program Managers faced with foreign exchange rate losses have to seek resources from either same-year funds available within their program, same-year funds available from within their own appropriation, or same-year funds available from within the Department of the Navy (DON) through reprogramming. For example, the T-45 Program Manager will first look to his/her own budget for any possible spare money, if none is available he/she will then ask the Aircraft Procurement, Navy sponsor for additional funding to be removed

from some other aircraft procurement program and added to the T-45 program, and if that is unsuccessful, they must request reprogramming from NAVCOMPT to come from anywhere in the Navy. As mentioned earlier, reprogramming was approved in fiscal year 1989 for \$4.8 million in order to cover foreign exchange rate fluctuation losses experienced in the T-45 RDT&E budget. This is the only example discovered by the author of successful reprogramming exclusively for exchange rate fluctuation, suggesting that it is not a common or easy solution to the foreign exchange rate fluctuation problem.

In spite of the repeated occurrence of foreign exchange rate losses throughout the last decade, there is as yet no coordinated, efficient, pre-planned response to a loss experienced from an unfavorable fluctuation of an exchange rate. Reprogramming, as the final option available, is available only for funding from the same fiscal year and can require approval by Congressional Committees. As shown in section B of this chapter, foreign exchange rate losses have historically been significant in nature and not easily covered, even at the DON level. The costs of requesting and locating available funds is very heavy both in terms of the administrative burden placed on Program Managers, and in terms of the impact on the source of funds that are inevitably reduced to meet the funding shortfall.

**D. POSSIBLE SOLUTIONS TO COVER FOREIGN EXCHANGE RATE
FLUCTUATIONS IN ACQUISITION APPROPRIATIONS**

Thus far in this thesis it has been determined that the foreign exchange rate fluctuation problem is significant for the three current Navy procurement programs studied, is not being efficiently planned for or dealt with, and is likely to continue indefinitely. The issue of foreign exchange rate fluctuation cannot be eliminated as long as goods and services are procured from other countries, in foreign currencies. There is no simple solution to the budgeting dilemma. There are some processes in the budgeting and managing of funds to cover exchange rate fluctuation that could possibly be improved. Specifically, the selection of exchange rates for use in the budgeting process, in terms of the technique used to select the exchange rate and the timely selection of the rate, and the process which procurement Program Managers use to pay losses incurred from exchange rate fluctuation, can be improved.

**1. Adding acquisition appropriations to the Foreign
Currency Fluctuations, Defense account coverage**

The method used to cover exchange rate fluctuation in the annual appropriations is the FCF,D account as discussed in Chapter II. This method of providing insurance against unexpected losses and gains from foreign exchange rate fluctuation has proven successful and has avoided controversy and scandal for some fourteen years. The success or at least

the absence of significant problems in the use of the FCF,D account suggests this coverage to foreign exchange rate fluctuation may be duplicated in other appropriations.

The possibility exists to add procurement programs to the FCF,D account coverage, however, some of the possible difficulties with this solution should be addressed. Contrasting annual appropriations to procurement appropriations, several important differences should be noted which may contribute to the success of the FCF,D account and avoid potential difficulties in covering procurement appropriations under the same account. The first difference is outlay rates. Annual appropriations covered by the FCF,D account are all at least 95 percent expended within two years of the appropriation, which exposes them to the budgeted exchange rate for less time than the slower spending procurement appropriations. Procurement appropriations such as Aircraft Procurement, Navy and Other Procurement, Navy expend funds over a six year schedule. Annual appropriations are also more predictable and stable than procurement appropriations. Procurement programs vary in overall size and in scope of foreign involvement as economic, technological, and defense needs dictate. Annual accounts also vary. However, the degree of variation is much less and can be more easily anticipated and budgeted for in both the short and long term. Managing procurement program foreign exchange rate fluctuation issues under the rules of the FCF,D account might

create difficulties managing the CMAs. Since each CMA is zeroed out and outstanding obligations are liquidated at the end of each fiscal year, the slower spending appropriations would have significant portions of their obligations unexpended. These outstanding obligations would then be unprotected by the FCF,D account for as many as five years. The one-year protection effectively received by the procurement programs under such an arrangement would only cover roughly 10 percent to 15 percent of each annual appropriation.

The addition of procurement programs to the FCF,D account might be beneficial if two important alterations were made to the current FCF,D account. First, the rules governing the annual zeroing of the CMAs would have to be lengthened for the participating procurement programs. Zeroing procurement CMAs could occur with relatively small amounts of outstanding obligations at the four year point of a procurement appropriation. Thus each program would have to maintain a separate CMA for each fiscal year appropriation and for each foreign currency involved in that appropriation for four years. This could prove somewhat time consuming administratively. However, the insurance received from such an arrangement would outweigh the additional work. Secondly, the balance of the FCF,D account may have to be increased and maintained at a floating level proportional to the additional load of the outstanding procurement accounts. Any addition to

the level of the FCF,D account and added fluctuation of it's balance would make it an increasing target for Congressional scrutiny and scavenging.

2. Creating a Foreign Currency Fluctuation, Defense Procurement account

Another possibility to cover the unplanned losses or gains experienced through foreign exchange rate fluctuation is the creation of a Foreign Currency Fluctuation, Defense Procurement account. The advantage of separating this account from the FCF,D account would be to create the additional length of time between the zeroing of CMAs and to legislate a floating balance policy in the rules of the management of the account. As suggested earlier in this section, a four year period is sufficient to allow for approximately a 95 percent outlay of a given procurement appropriation to occur. The floating balance would be necessary for the reasons stated earlier and could be managed separately from the FCF,D account. The same type of annual assessment of the balance of the account as is used for the FCF,D account could be utilized to determine whether to appropriate additional fund or to remove funds from the account balance at the end of each fiscal year.

3. Using a three year weighted moving average as the annual budgeted exchange rate

The process of exchange rate selection and use in the budgeting system within the DOD, discussed in Chapter II,

tends to result in, on the average, significant variation between the budgeted rate and the actual rate between the time of selecting the budgeted rate and the expenditure of funds. Given the unpredictability of exchange rates, complex formulas and methods for deriving an anticipated exchange rate might prove to make the process more difficult and could even be less effective than simply selecting the most current exchange rate and using it as the projected rate. However, alternatives to the current process should be explored.

Examining the results of using a three year weighted moving average at the time of commencing budget execution could result in much more accurate budgeted rates. If the three year weighted moving average rate had been set each year on October first from fiscal year 1989 through fiscal year 1993, significant foreign exchange rate losses would have been avoided for both the German mark and the British pound. Figures 4 and 5 display OSD budgeted exchange rates, actual monthly rates, and a three year weighted moving average of actual rates from fiscal year 1989 through fiscal year 1993 for the British pound and the German mark versus the United States dollar respectively [Ref.6]. One can observe that the moving average rates more closely approximate, or divide, the fluctuations of the actual rates for both currencies. Unusual highs or lows in the exchange rates will tend to throw the current system off. The selection of the most current rate does not take into account that it may be a temporary anomaly,

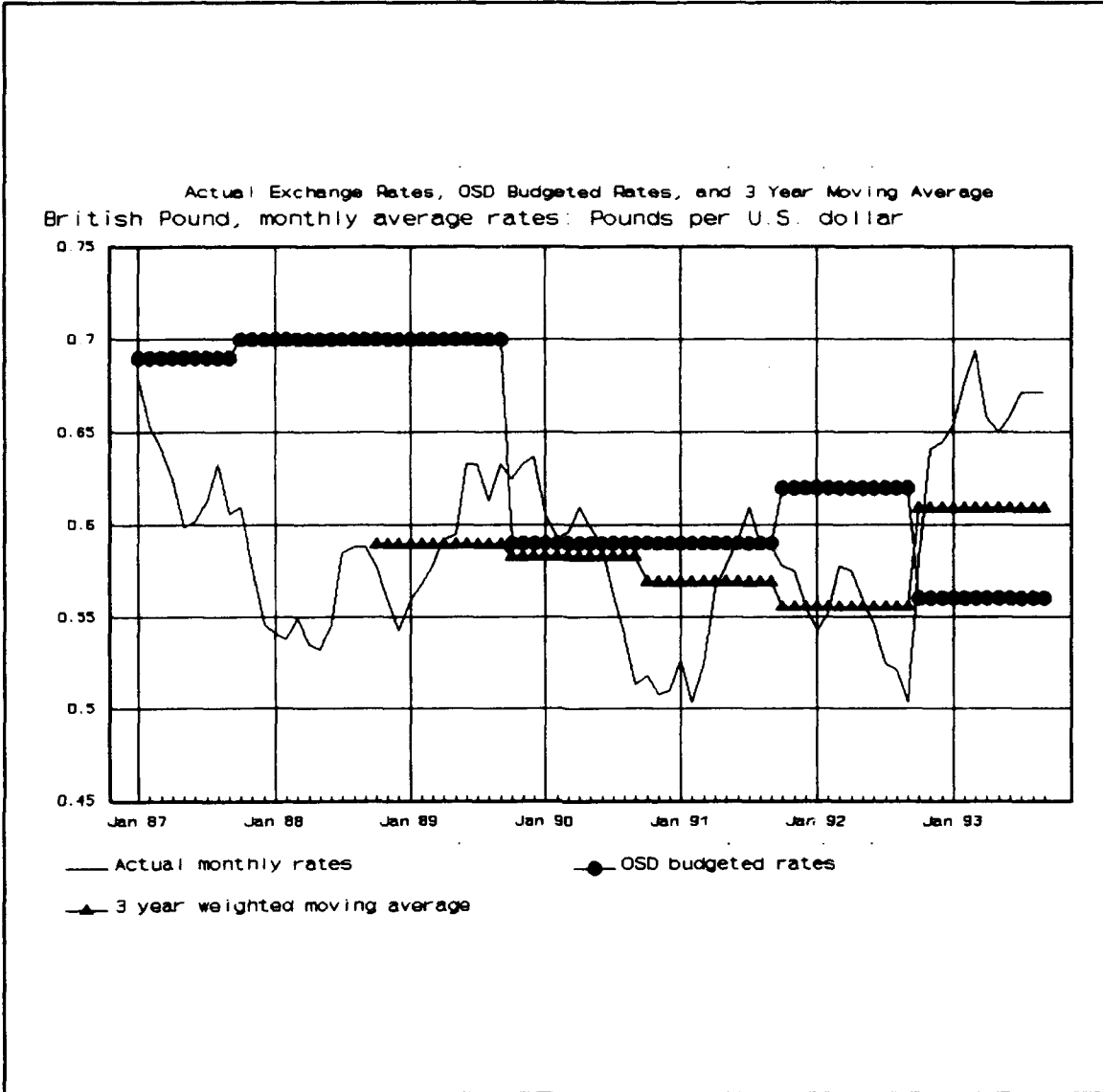


Figure 4. Three year weighted moving average, British Pound

whereas the weighted moving average system would keep the budgeted rates more stable. The weighted moving average system would tend to deter the temptation of budget officials to see a spike or movement in the exchange rate and pick the outlier rate vice the long term average it will likely settle at. The weighted moving average would be more effective than

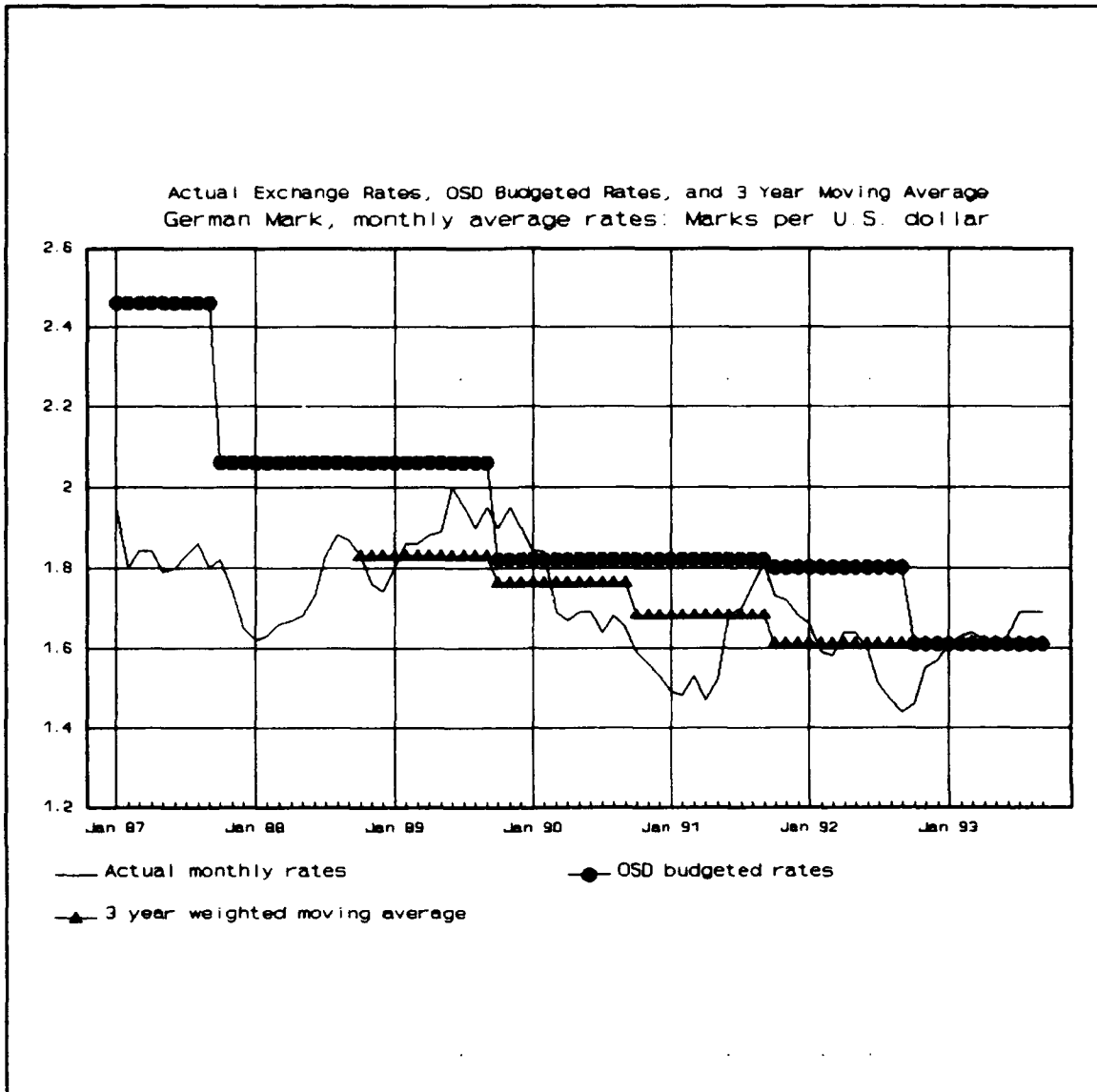


Figure 5. Three year weighted moving average, German Mark

a simple moving average because the weighted moving average place a higher relative value on more recent exchange rates.

A further improvement of the exchange rate budgeting system currently in use would be the automatic updating of the moving average budgeted rates each quarter during the budget process, through final approval by Congress. This automatic

update and recalculation of the weighted moving average could be accomplished without drastic alterations of the budgeted exchange rates. The minor alterations resulting from the updated exchange rates could be automatically factored into the affected portions of the DOD budget with the understanding by Congress that the alterations are the result of the automatic updating of the foreign exchange rate weighted moving average. A proposal made by the Program Executive Officer for Air ASW, Assault and Special Mission Programs in 1992 suggested establishing budgeted rates as a simple average over the last five years plus one standard deviation of the distribution of rates over the five year period [Ref.25]. The addition of the standard deviation effectively benefits the managers of the budgets by decreasing the probability by approximately 30 percent that the exchange rates will fluctuate negatively beyond the budgeted rate. Unfortunately, in the current environment of budgetary tightening, it would be difficult to justify factoring in such convenient allowance for foreign exchange rate fluctuation in each procurement appropriation.

The difficulties created from the unexpected losses from foreign exchange rate fluctuation can cause significant problems for the Program Manager. Programs are forced to reprice several times through an expenditure cycle (six years) and great time and effort are expended when losses occur. The need to improve the current exchange rate budgeting system for

the procurement programs is real and the solutions suggested may very well provide relief for this continuous problem.

E. SUMMARY

This chapter has identified the significance of foreign exchange rate fluctuation in three current Navy procurement programs. In each of the three programs it was discovered that the foreign exchange rate fluctuation losses experienced between 1987 and 1992 were over one percent of the total expenditures of each program. Although one percent does not initially sound too bad, the losses totalled over \$60 million for the three programs during the periods analyzed. It was also noted that each of the programs will continue through the next century and their foreign procurement will continue in a similar manner and proportion. Former and current methods used by procurement Program Managers to deal with foreign exchange rate fluctuation were then discussed. With the demise of the "M" accounts in 1990 the Program Managers are faced with locating same-year funds either within their own program, within their parent appropriation, or through reprogramming requiring Congressional Committee approval. Solutions to the foreign exchange rate fluctuation problem were then proposed. First is the possibility of including procurement programs in the coverage provided by the FCF,D account. Second is the possibility of creating a Foreign Currency Fluctuation, Defense Procurement account specially to

cover the unique requirements of the various procurement programs. Finally the improvement of exchange rate selection and update process was discussed. The use of a three year weighted moving average rate in the budget would improve the accuracy of the budgeted exchange rates over the long run. Also the automatic updating of the weighted moving average every quarter up to final approval of the budget would provide the most accurate budget given the difficulty surrounding the budgeting of funds for foreign procurement.

IV. SUMMARY AND ANSWERS TO RESEARCH QUESTIONS

A. SUMMARY

This thesis has examined the process of foreign currency exchange rate selection and use in the budgeting process. The process has been shown to be less than optimal in terms of both establishing budgeted exchange rates and recouping losses incurred from unfavorable exchange rate variances in procurement programs. Since the avoidance of exposure to foreign exchange rate fluctuation can only be accomplished by ceasing to buy goods and services from other countries, it is safe to assume that the risks and difficulties currently experienced by procurement Program Managers with respect to foreign exchange rate fluctuation, will continue indefinitely.

The acceptance and acknowledgement of the existence of the risks surrounding foreign procurement and the analysis of the current system used to deal with those risks, leads to the conclusion that improvements could be made in the budgeting and management of foreign exchange rate fluctuation. This thesis has examined the processes used in both procurement appropriations and in annual appropriations to cover losses and account for gains from exchange rate fluctuations. In many ways the two types of appropriations are similar and could be managed in similar fashions, however, in terms of outlay rates and stability they differ significantly.

Suggested solutions or improvements to the current system are made only to improve the efficiency with which funds are managed, not to avoid the risks associated with foreign exchange rate fluctuation.

B. RESEARCH QUESTIONS ANSWERED

The primary and subsidiary research questions are restated below.

- What is the nature and significance of foreign currency exchange rate fluctuation problems within current Navy acquisition programs?
- What exchange rate is used in acquisition appropriations and what method is used to set the rate?
- How are foreign currency exchange rate fluctuation problems dealt with in affected acquisition programs?
- How could foreign currency exchange rate fluctuation problems best be dealt with?

1. The nature and significance of the problem

Foreign exchange rate fluctuation is a risk taken on when purchasing goods or services from foreign countries. It is always borne by the purchasing agent and becomes a problem for the purchasing agent only when the budgeted exchange rate assumes greater value for the domestic currency than is actually realized when the currency is exchanged. No difficulties are experienced when the budgeted rate reflects a lower value for the domestic currency than is experienced in the exchange, in fact, the spending power of the purchasing agent is higher. This suggests that budgets involving foreign purchases could simply budget utilizing exchange rates which

undervalue the domestic currency intentionally to avoid funding shortfalls during execution. The drawbacks to that approach would be that more funds would be reserved for foreign procurement accounts thus reducing available funds for other DOD accounts.

Although both the exposure and subsequent risk associated with foreign exchange rate fluctuation cannot realistically be eliminated, the process of budgeting and covering losses from it can be examined and managed. The methods used to select exchange rates in current procurement program budgets, and the methods used to recoup losses incurred from unfavorable exchange rate variations, are less than optimal and allow many inefficiencies in managing the foreign exchange rate fluctuation problem. This thesis has shown that over the six year period from October 1986 to September 1992, the exchange rates for the German mark and the British pound have not consistently gone down with respect to the United States dollar, however, the budgeted exchange rates used for these currencies has consistently been above the actual exchange rate. In other words, the budgeted rate used by OSD has consistently selected a more favorable value for the United States dollar than was actually experienced. Figures 3 and 4 displayed this pattern.

Although the FCF,D account has been created and used to protect annual appropriations, no such protection exists for procurement programs. The inefficiencies in the current

system create unnecessary costs within the fiscal management system from Program Managers through Congressional appropriation committees. The avoidable costs incurred within the current system include administrative and legal fees associated with:

- Reprogramming.
- Repricing contracts.
- Reallocation of resources within appropriations.

These costs are generated by the only solutions currently available to cover foreign exchange rate fluctuation losses. The losses experience by the RAM, T-45, and AV-8B programs in the last six years due to exchange rate fluctuation, amount to one to two percent of the total expenditures of each program's annual budget. The total annual expenditures for the three programs combined averaged \$895 million, with annual total losses experienced from exchange rate fluctuation amounting to an average of \$18.6 million. Again, this is an average of two percent of the total expenditures and demonstrates the significance of exchange rate fluctuation in the procurement programs examined. These losses are not easily made up for when experienced. It should also be added that these are only three programs selected from current acquisition programs in the Department of the Navy, there are many others currently active in the Army and Air Force which involve the procurement of foreign parts and services.

2. The selection of exchange rates

Procurement programs commonly use the exchange rates promulgated by OSD in their budgets and contracts. These are the same rates used throughout the DOD budget and Presidential budget. The option exists for the Program Manager to formulate or select a different rate from the OSD rate due to the substantially longer budget horizon faced by procurement programs, however, this is rarely done due to the risk-reward tradeoff of making a bad choice. Another reason the procurement programs are given the freedom to deviate from the OSD promulgated exchange rates is the policy of fully funding procurement programs each year. This policy further exacerbates the longer budget horizon faced by Program Managers.

The process used by OSD to select the exchange rates and periodically update them throughout the budget process in the form of PBD's, is simply to use the most current rate available. It is often done by looking at the morning paper, taking the previous days exchange rates, and making them the budgeted rates for the next fiscal year. This process is not totally irrational in that it can be argued that the seemingly random movement of exchange rates over time cannot be forecasted. Thus, they should simply be set at rates as current as possible and fluctuations dealt with accordingly.

The problem with the current method of exchange rate selection is that rates may be selected that are anomalies.

They may happen to be the result of a temporary high or low. Selecting a rate at the peak or trough of a period will result in a significant disparity between the budgeted rate and the actual rate experienced later in the year.

A simple method to improve upon the current method of selecting current rates from the morning paper would be to use a weighted moving average over the last three years. This method would smooth out the peaks and valleys experienced in the short term providing a stable figure from which to develop annual budgets. Figures 4 and 5 demonstrated the effectiveness of this method. The weighted moving average technique would have consistently been more effective at anticipating the exchange rates over the five years sampled than the current system.

3. Past and current methods of dealing with problems

Prior to 1990, foreign exchange rate fluctuation losses were conveniently covered by the appropriate Merged Account or "M" account. The dissolution of these accounts in 1990 due to abuses left the Program Managers to look elsewhere for funds when unexpected losses were incurred from unfavorable exchange rates. Currently, the Program Manager is faced with three main options to locate funds to cover foreign exchange rate fluctuation losses:

- Same-year funds within the same program.
- Same-year funds within the same appropriation (i.e. APN)

- Same-year funds within their branch of service through reprogramming. Reprogramming usually requires Congressional committee approval.

These methods of recouping exchange rate fluctuation losses are time consuming and often involve long, uncertain battles for scarce resources. Putting the Program Manager in the position of seeking funds for an unavoidable shortfall such as currency devaluation not only creates the administrative costs mentioned earlier, but can also give the foreign countries and foreign contractors an uncertain impression of the commitment of the United States government toward it's business partners.

The risks involving foreign exchange rate fluctuation are also dealt with in the procurement contract in the form of an "H" clause. The "H" clause is designed to make certain the risks from exchange rate fluctuation are borne by the purchasing agent and economic benefits or losses are not unfairly realized by either party. The "H" clause adjusts the price of the contract, in United States dollars, to changing exchange rates throughout the life of the contract. The contractor is effectively guaranteed a firm fixed price in their own domestic currency.

4. Suggested solutions

Improvements to the current methods of dealing with foreign exchange rate fluctuation problems could begin with the process of exchange rate selection suggested earlier. The use of the weighted moving average and ensuring the average is

updated throughout the budgeting process would smooth out the anomalous budget rates which have been selected in past years. Other possible improvements to the system could be made in the process of recouping foreign exchange rate fluctuation losses.

The comparative success of the FCF,D account leads to the suggestion of adding procurement programs to the coverage provided by the FCF,D. Some difficulties might arise from this combination and should be addressed. First, the disparity between the short term outlay rates currently covered within the FCF,D appropriation and the long term outlay rates associated with the procurement appropriations would add a significant amount of uncertainty and risk to the FCF,D account. Second, annual appropriations are more predictable and stable than procurement appropriations. Procurement programs, although carefully planned and executed, are much more difficult to project over the long term than the comparatively flexible annual appropriation budget. Finally, the annual zeroing of the Centrally Managed Allotments (CMAs) within the FCF,D account would leave large amounts of the procurement programs unexpended. This would leave them exposed to uncovered foreign exchange rate fluctuation risks, and subsequent shortfalls. If the rules governing the annual zeroing of the CMAs were altered to accommodate the longer spending procurement programs and if the FCF,D balance were increased proportionally to the additional appropriations covered, the FCF,D might be able to provide foreign exchange

rate fluctuation coverage to procurement appropriations. The drawback to these proposed alterations of the FCF,D account would make it a much less stable and predictable account and subsequently, an easier target for Congressional criticism and cutting.

Another possibility to deal with foreign exchange rate fluctuation losses would be to create a Foreign Currency Fluctuation, Defense Procurement (FCF,DP) account. Using this solution, the difficulties resulting from mixing procurement and annual appropriations in the FCF,D account could be avoided. By altering the procedure used to close out the CMAs to a four year time period and maintaining a floating balance proportional to the foreign procurement expected each year, the FCF,DP account could stand on it's own and resolve the foreign exchange rate fluctuation risks procurement budgets currently face.

The author recommends the establishment of the weighted moving average technique to set annual exchange rates and the development of an FCF,DP account. These two actions would, in the long term, decrease the inefficiencies currently found in the exchange rate selection process and decrease the fiscal administrative burden of procurement Program Managers. With an FCF,DP account, the unavoidable fluctuations in foreign currency exchange rates would be covered and the burdensome administrative and legal processes currently used to

reallocate funds for procurement account exchange rate losses would be eliminated.

These solutions and suggestions do not change the fact that the risks inherent with foreign exchange rate fluctuation will continue regardless of the improvements made to the budgeting and spending process. Money exposed to such unpredictable fluctuations as foreign exchange rates will continue to loose or gain value and the author has no suggestion for the prediction of such forces, however, the results and suggestions made in this thesis do provide alternatives to the current frustration and uncertainties faced by the financial planners and managers within the DOD procurement system.

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