The Economics of Defence Spending

An International Survey

Edited by

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London and New York

Chapter two

United States defence expenditures: trends and analysis[1]

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Introduction

Either by formal treaty, presidential declaration or executive agreement the US is committed to provide military support to more than 40 nations throughout the world. Probably no other barometer of US capabilities in fulfilling those commitments is so closely watched as the level of its spending on defence. This is true even though it is debatable whether measures of input are superior to measures of output, such as readiness or performance, in gauging a nation's broad defence capabilities. The importance of defence expenditures as an overall indicator of military capability is highlighted by events of the last decade. An apparent gap in spending between the USSR and the US in the 1960s and 1970s prompted a rapid acceleration of US military spending in the late 1970s and early 1980s.

The pattern of defence spending in the US since 1948 reveals a steady upward trend in real outlays. Real military purchases (in 1982 dollars) rose $2 billion per year on average between 1948 and 1986 (Higgs 1988: 16). However, this steady upward trend has been punctuated by three periods of rapid multi-year build-ups of real military outlays – 1950–3, 1965–8, and 1978–85. All of these mobilization periods have been followed by substantial reductions in real military outlays. For example, the congressional authorization of $300 billion for fiscal year 1989 represents 11 per cent less in real terms than spending in the peak year of 1985, and 1 per cent less than the previous year.[2]

As a result of the complexity of forces underlying the US budgetary process, single theories have not been particularly accurate in either accounting for past spending patterns, or in providing insights to future allocations. At least nine factors have been advanced at one time or another to account for defence spending patterns (Schneider 1988: 54):

1 international events
2 changing administrations
3 public opinion
4 congressional attitudes

domestic economic constraints
perceptions of the Soviet threat
arms control agreements
elections
inter-service rivalries

o this list we might add such factors as expenditures by allies, burden haring among alliance members, and macro-economic stabilization con-iderations. Clearly, several of these explanations overlap, and they are kely to have had varying strengths and operated in conjunction with issimilar sets of forces during the various sub-periods outlined above. In ddition, the feedback effects from economic performance to future levels f defence expenditures are complex and not well understood.

None the less, all of these threads – domestic budget and political onsiderations, relationships between allies and external threats – are /oven into the final decision on the amount of defence spending. The urpose of this chapter is to develop a model of the relationships between a ation's observed level of defence spending and its economic performance, omestic political status and external spillovers. The chapter starts by eviewing past economic performance of the US economy and how past efence choices have been influenced by economic and strategic con-itions. Second, it examines the current position of the economy, recent conomic policy developments and forecasts for future growth. Third, it ighlights trends in defence spending and discusses current defence policies nd trade-offs.

A secondary purpose of this chapter is to estimate a military expenditure emand function for the US using time series data. Accordingly, it assesses he importance of various factors that have been proposed as explanations f defence spending patterns, and then briefly reviews previous models of efence spending from the economics literature. Much of this literature has oncentrated primarily on examining the interactions between spending evels of alliance members, principally NATO (Murdoch and Sandler 984). Although economic models of defence spending are used as a guide o appropriate specification of an expenditure demand function for the US, he main goal of the chapter is not to estimate spillover effects between the JS and its allies. Instead, the demand function is specified in an attempt to ssess the relative importance of the causal factors in the list above. This ection also tests the model of the demand for military expenditures, and iscusses the empirical results. Finally, the chapter presents concluding emarks and an appraisal of future directions of US defence spending.

ast performance of the US economy

one level, military planners mostly ignore economics when devising strategies and determining appropriate force requirements. Ideally, foreign policy objectives are established first, then a military strategy and force structure are designed to meet those objectives. The cost of this force structure determines the defence budget, at which point the economic environment and budget priorities enter the picture (Olvey *et al.* 1984). In reality, this ideal sequence is often completely reversed, as in the recent Gramm–Rudman era. In this sequence, economic constraints and budgetary ceilings dictate the acceptable force-structure options. The alternative selected is the one that best meets the foreign policy objectives.

Regardless of the process whereby foreign policy objectives and military programmes are aligned, ultimately a nation's current real income and future economic growth set important constraints on the fulfilment of basic military strategies – 'in some measure, military power reflects economic power' (US Commission on Integrated Long-Term Strategy 1988: 6). These basic economic parameters not only determine a nation's ability to meet its military requirements but also establish the opportunity costs of doing so. During wartime, of course, nations must mobilize a significant share of the nation's scarce resources for military activities. Both the US in 1944 and Iraq in 1986 devoted over 41 per cent of GNP to military purchases. But even during peacetime strategic choices vary tremendously. Although estimates of Soviet defence spending vary considerably (Becker 1986), by most accounts the Soviet defence burden (as a per cent of GNP) is between 15 and 17 per cent, at least three times larger than the defence burden of the US. Other extremes in defence burdens include poor nations that devote a high portion of their GNP to the military (North Korea, 23 per cent; Syria, 22 per cent; Libya, 18 per cent) and wealthy nations that devote a low share to the military (Japan, 1 per cent; Austria, 1.3 per cent).

Although wide variations in the share of GNP devoted to defence are observed, over time sustained economic growth is necessary to maintain a high level of defence effort. A slowdown in aggregate economic growth constrains the growth of national defence expenditures because the burden of defence spending increases. In a slow- or no-growth environment, the implicit cost of increasing the share of defence expenditures, in terms of foregone capital formation and civilian production, increases sharply.

The relationship between economic growth and defence efforts is underscored by recent events in the Soviet Union. The most reliable data on Soviet military expenditures (compiled by the CIA) indicate that the growth rate of Soviet defence outlays began to decrease after 1977. A major cause of this slowdown was a pronounced slowdown in the growth of the Soviet economy (Brada and Graves 1988). The slowdown in economic

able 2.1 Performance of the US economy

ear	Growth rate (%)[a]	Unemployment rate (%)	Inflation rate[b]	Federal deficit ($bn)	Trade balance ($bn)
960	2.2	5.5	1.5	0.3	5,191
965	5.8	4.5	1.9	−1.4	8,378
970	−0.3	4.9	5.5	−2.8	5,773
975	−1.3	8.5	7.0	−53.2	22,984
980	−0.2	7.1	12.4	−73.8	9,466
982	−2.5	9.7	3.9	−127.9	278
984	6.8	7.5	4.0	−185.3	−94,835
985	3.0	7.2	3.8	−212.3	−101,083
986	2.9	7.0	1.1	−221.2	−125,684
987	2.9	6.2	4.4	−150.4	na
988	2.4[p]	5.4[c]	na	−146.7[d]	na

ource: Council of Economic Advisers, *Economic Report of President*, Feb. 1988
Notes: [a] Percentage change in real GNP, 1982 $.
[b] Percentage change in all items of CPI.
[c] Annual rate for March, 1988.
[d] Preliminary forecast.
na = not available.

eluctant to do. Thus, the real rate of growth of defence – especially procurement – was cut drastically (Ofer 1987).

Economic growth plays an equally important role in constraining US defence efforts. Statistical indicators of the performance of the US economy since 1960 are displayed in Table 2.1. The most notable feature of the economic landscape in the early 1980s was the recession in 1981–3. A trough was reached in 1982 when the unemployment rate peaked at 9.7 per cent, and the economy registered a 2.5 per cent decline in real GNP. Since 1982, however, economic growth has been robust, exceeding that of most other industrialized western nations. By July 1988 the economy had experienced 69 months of economic expansion, and the unemployment rate had reduced to 5.4 per cent, a level many economists believe represents the natural rate of unemployment.[3] The annual growth rate of real GNP averaged 3.8 per cent between 1982 and 1987, exceeding the growth rates of West Germany, Italy, Great Britain and France but falling slightly below that of Japan.[4] As Table 2.2 indicates US growth also outpaced the Soviet economy.

There is considerable debate over the precise causes of the continuous expansion of the economy in the last 5 to 6 years.[5] Some economists attribute the expansion to standard demand-side (Keynesian) economic policies, whereas others trace the expansion to the supply-side policies instituted by the Reagan Administration. The supply-side stimulus was spurred principally by the Economic Recovery Tax Act of 1981, which reduced the maximum tax bracket from 70 per cent to 50 per cent and cut income taxes by about 23 per cent over the 3 years following 1981.

Table 2.2 Relative annual growth rates

Period	US	European Community	USSR
1966–70[a]	3.0	4.6	5.0
1971–75[a]	2.2	2.9	3.0
1976–80[a]	3.4	3.0	2.3
1982	−2.5	0.8	2.7
1984	6.8	2.4	1.5
1986	2.9	2.6	3.8
1987	2.9	2.3	1.0

Source: Council of Economic Advisers, *Economic Report of the President*, Feb. 1988
Note: [a] Measured as average annual growth rate of real GNP (in %).

expenditures also were introduced into the law. The tax cut clearly stimulated investment spending, which contributed to the economic growth record.

However, the rapid growth also can be traced in part to substantial increases in federal government spending. In real terms total spending grew by 30 per cent from 1980 to 1987. The federal tax cuts of 1981 were put in place at roughly the same time that a major buildup in defence spending was launched.

A major concern for the economy has been the federal deficits incurred during this period. Because the anticipated supply-side boost to productive activity from the tax cut was not as great as expected, tax revenues fell short of expectations, producing unprecedented peacetime budget deficits. Until 1982 deficits typically represented less than 1 per cent of GNP; since 1982 the federal deficit has averaged 4.6 per cent of GNP. As Table 2.1 shows, federal deficits grew from $73bn in 1980 to a peak of $221bn in 1986, representing about 5 per cent of GNP and 18 per cent of federal government expenditures. The accumulated debt has caused considerable controversy in the US, including calls for a constitutional amendment requiring a balanced budget. More important was passage of the Emergency Deficit Control (Gramm–Rudman–Hollings) Act of 1985 that mandated automatic spending cuts if progress was not made towards eliminating the budget deficit by 1991.

Regardless of the stimulative effect of deficit spending, there are numerous other macro-economic consequences of the large federal deficit. The low rate of saving since 1982 is explained in part by the high rate of government dissaving, and has been blamed in part for holding down capital formation and long-term economic growth. In addition, the budget deficit appears to carry some of the blame for a growing external deficit. Payment of interest and dividends abroad increased the current account deficit to a record $125bn in 1986. The federal deficit also may have acted as a brake on the recovery of labour productivity (output per manhour).

/ith GNP growth. When labour productivity in the business sector of the conomy was growing briskly between 1948 and 1973 by 2.8 per cent per ear, real GNP growth averaged 3.7 per cent annually. However, when ıbour productivity growth fell to only 0.7 per cent annually from 1973 to 981, the growth rate of real GNP also dropped to only 2.2 per cent. Some nprovement has been achieved in labour productivity since 1981, with an nnual growth rate of 1.2 per cent between 1981 and 1986 (Council of conomic Advisers 1987), but this remains an important question for the ıture.[6]

ecent policy developments and prospects

After the stock market crash of October 1987 the US economy appeared to e teetering between the potential for recession on the one hand and enewed fears of inflation on the other. However, consumer and investor onfidence recovered quickly and the index of leading indicators has onsistently pointed toward continued expansion. Recession fears have bbed and the economy is projected to grow at roughly 2.75 per cent nnually in 1988 and 1989.[7] Mid-term projections show the economy rowing at 3.3 per cent annually for the 1989–93 period, a rate which is in ne with the post-war average. Indeed, some analysts are predicting the ost-1982 economic expansion may last for several more years.[8]

Part of the strength of the economy is derived from continued improvement in real net exports. The dollar has depreciated sharply since March 985 leading to a 17 per cent increase in exports of goods and services in 987. Indeed, for the first time since 1980, the contribution to growth of eal net exports has become positive. In part the need for additional apacity will stem from export demand. Business fixed investment rose 3.7 er cent in 1987 after a precipitous decline in 1986, and it is forecast to rise .4 per cent in 1988.

Despite the recent depreciation of the dollar and the fall in unemployment, inflation has not accelerated. With productivity growth in manufacturing averaging 3.5 per cent per annum, unit labour costs have fallen lmost continuously since 1982. The outlook for inflation is good but uarded. Whereas the inflation rate is expected to increase slightly from 3 er cent in late 1987 to 4.5 per cent in late 1989, numerous factors could ıange that picture rather quickly.

A major policy debate that has surfaced in the US, which has national efence implications, concerns the causes of the reduced competitiveness f US products in world markets. Some analysts argue that the current conomic expansion and improvement in exports are due solely to the epreciation of the dollar. They feel that the underlying structural causes f the competitive weakness of US goods abroad have not improved. A

part of this problem is that compared to, say, Japan, the US invests far less in civilian R & D.

Other analysts have argued that conditions have improved in American manufacturing and they forecast further improvements in industrial competitiveness. They cite healthy improvements in labour productivity, R & D spending, and investment-to-output ratios. They also cite improvements in product quality control by American manufacturers and the recent restraint in wage demands and increases.[9]

Support for the latter group is provided by several long-term forecasts of positive US productivity growth. The personal saving rate (as a percentage of disposable income) increased somewhat in 1987 to 5 per cent from its near-record low of 3 per cent in mid-1987, and it is forecast to improve further in 1988. Other factors cited for these rosy forecasts are: (a) increases in the age and, therefore, experience of the US labour force; (b) recent declines in energy prices; and (c) increased expenditures on R & D. However, it should be noted that some offsetting factors are at work. Whereas the 1986 Tax Reform Act further lowered the maximum marginal tax rate from 50 per cent to 33 per cent, incentives for investment also were reduced. The Act increased the tax rate on nominal capital gains, eliminated the investment tax credit, and eliminated the generous treatment of depreciation expenses. Thus, gains in productivity stemming from improvements in saving and investment remain a question mark for the economy.

The federal deficit is projected to remain around $150bn for fiscal 1988 and 1989. This implies a neutral fiscal stance and places major reliance on monetary policy to stabilize economic fluctuations. It is also noteworthy that, as a percentage of GNP, the US budget deficit is either less than or about the same as that of Italy, Canada and France, and only slightly exceeds that of West Germany. Moreover, the federal government deficit is in part offset by the surpluses consistently run by state and local governments ($57bn in 1986) and the significant surpluses building up in the social security fund, which are expected to grow from $20bn in 1987 to $46bn in 1989 and to nearly $100bn by 1993.

In summary, economic influences on defence spending will come from two sources – one positive and one negative. The pressure to slow federal spending to meet the deficit-cutting guidelines in Gramm–Rudman will likely translate into no real growth of defence spending, and possibly real cuts through at least 1991. The positive effect will stem from continued growth of the economy, which will likely buoy federal tax revenues and lessen the need for deeper cuts. Of course, factoring in changes in international events and domestic political events, such as the change in administration in 1989, muddies the water but probably does not alter the basic directions determined by economic considerations.

rade-offs and choices in defence spending

ecent defence policies in the US highlight the interaction between ɔnomic constraints and defence strategies. After the Soviet invasion of fghanistan in 1979, President Carter announced in 1980 that any attempt gain control of the Persian Gulf region would be considered an assault ı the vital interests of the US. Thus, the Carter Doctrine, as it came to be ıown, imposed a new obligation on US conventional forces already ained to meet existing commitments in Europe and the Far East. Thus, ıe legacy of the Carter Administration was a huge gap between military ɔligations and the resources necessary to meet the new requirements ecord 1984).

The Reagan Administration pursued a military strategy that emphasized e ability of the US to wage war simultaneously on several fronts, a ɔncept that was implicit in the Carter Doctrine. The Administration also as committed to expanding and modernizing conventional forces in order implement this strategy in reality as well as on paper. Thus, Reagan ıdertook to finance the obligations implied by the multi-front strategy th major sustained real increases in defence spending. In 1981 the eagan Administration embraced the goal of the US Navy, established as ırly as 1974, of the 600-ship fleet, including 15 carrier battlegroups, 100 tack submarines and the amphibious lift capability for four Marine igades. In 1986 the Navy introduced 'The Maritime Strategy', the ɔjectives of which are, in the event of war, to exert global pressure on ɔviet naval forces and to strike targets in Soviet home waters and on the ɔviet mainland (Watkins 1986). Although the objectives of 'The Maritime rategy' provide the foundation for the 600-ship fleet, they have been the bject of intense debate and scrutiny (Kaufmann 1987).

The figures in Table 2.3 represent the evolution of US defence expendi- res by major mission over the last decade. Following adoption of the ırter Doctrine and the multi-front strategy by the Reagan Administration e share of the defence budget devoted to conventional forces expanded nsiderably, from 32 per cent in 1975 to 42.4 per cent in 1985. This ɔrease in conventional forces also reflects the outlays necessary to ɛet the buildup to the 600-ship navy. Note, too, that some increase in ɛ percentage of the budget devoted to nuclear forces has occurred as ɛ Reagan Administration has sought modernization of these weapons stems.

The main missions that appear to have suffered under the recent fence buildup are 'Training, Medical and Other Personnel Activities', d 'Support of Other Nations'. It is noteworthy that the Guard and ɛserve Forces have grown proportionately to the overall growth in fence spending in line with adoption of the Total Force Concept the 1970s. The reserves play an increasingly important role in US

Table 2.3 DOD expenditures by mission – 1975–85 (total spending, $bn, and percentage distribution)

Summary by programme	*1975*		*1980*		*1985*	
	($)	*(%)*	*($)*	*(%)*	*($)*	*(%)*
Strategic forces	7.2	8.25	11.1	7.8	27.8	9.8
General purpose forces	28.1	32.0	52.2	36.6	120.6	42.4
Intelligence and communications	6.3	7.2	9.1	6.4	25.1	8.8
Airlift and sealift	0.9	1.0	2.1	1.5	7.0	2.4
Guard and reserve forces	4.8	5.5	7.9	5.5	15.7	5.5
Research and development	7.7	8.7	11.9	8.3	24.6	8.6
Central supply and maintenance	9.1	10.3	16.0	11.2	24.4	8.5
Training, medical and other general personnel activities	20.0	22.8	29.2	20.5	33.1	11.6
Administration and associated activities	2.0	2.3	2.5	1.7	5.9	2.1
Support of other nations	1.8	2.0	0.6	0.4	0.5	0.2
Total	87.9	100.0	142.6	100.0	284.7	100.0

Source: Office of Management and Budget, *Budget of US Government*, various years

conventional force strategies, and that role is programmed to expand in the future.

Defence versus social programmes

There are numerous ways to represent the relative burden of defence spending on an economy, and the social opportunity cost of defence. In this section military spending is measured as purchases of newly produced goods and services, a component of the National Income and Product

Table 2.4 Shares of GNP (per cent)

Year	*Government–military*[a]	*Government–non-military*[b]	*Private*[c]
1950	5.0	8.5	86.5
1960	8.8	10.7	80.5
1965	7.2	12.4	80.4
1970	7.6	13.9	78.5
1975	5.6	15.4	79.0
1980	5.2	14.2	80.6
1982	6.1	14.1	79.8
1983	6.3	13.5	80.2
1984	6.2	13.2	80.6
1985	6.5	13.9	79.6
1986	6.6	13.9	79.5
1987	6.6	14.0	79.4

Sources: Higgs (1988); *Economic Report of President*, Feb. 1988
Notes: [a] Military purchases as percentage of GNP.
[b] Total government (all levels) purchases as percentage of GNP.
[c] Sum of consumption, investment, plus net exports as percentage of GNP.

counts, rather than the budgetary outlays of the Defense Department.[10]
ble 2.4 divides GNP into three exhaustive categories – military purses, other government purchases (by all levels of government), and the dual all-private purchases. Private purchases are composed of the sum consumption, investment, and net export spending.
Viewed in this light, since 1950 the military share of GNP reached a peak 8 per cent in 1960 and declined for the next 20 years to a low of 5.2 per t in 1980. The share grew after 1980 stabilizing at 6.6 per cent. It is not ar whether non-defence programmes and the private sector, or both, d to grow at the expense of defence. The government non-military re grew steadily until 1975, and has fallen slightly since. Conversely, the vate share of GNP declined until 1960, where it has remained essentially stant.
Higgs (1988) investigated this issue further and concluded that in the 48–86 period the government non-military share of GNP gained at the pense of both the military and private share. However, his analysis owed that 'changes' in the military share were almost exactly offset by posite changes in the private share. A one percentage point 'increase' in military share of GNP was offset by a one percentage point 'decrease' the private sector share. A partial explanation for this tendency is ovided in Table 2.5, which computes the percentage of federal expendies accounted for by defence and by federal transfer payments. In 1966, fence purchases were almost 43 per cent of total outlays; by 1980 they d fallen to only 23 per cent. Conversely, transfer payments had risen m 23 per cent of federal expenditures in 1966 to over 40 per cent in 1980. us, defence programmes and transfer programmes have reversed their ative positions in the federal budget.

ble 2.5 Shares of Federal Government spending

ar	*Federal expenditures ($bn)*	*Defence purchases (%)*	*Federal transfer – payments to individuals (%)*
46	145.3	42.6	23.0
50	207.8	36.9	29.6
55	364.2	24.6	40.3
60	615.1	23.2	40.2
62	781.2	24.8	40.4
64	895.6	26.1	38.4
65	984.6	26.3	37.2
66	1,032.0	26.9	37.3
67	1,069.1	27.6	37.5

Current defence policies

Recent policy initiatives have proceeded along two fronts – one political, the other technological. Diplomatic efforts have produced the Intermediate Nuclear Forces (INF) treaty, which eliminates missiles in western Europe with ranges between 300 and 3,000 miles. Negotiations are also proceeding on START (Strategic Arms Reduction Talks), the goal of which is large reductions in the superpowers' nuclear forces. At the Reykjavik summit in 1986 Gorbachev offered a 50 per cent cutback in nuclear weapons contingent upon the US stopping research on the Strategic Defense Initiative (SDI).

SDI is the technological direction that has been pursued actively by the Reagan Administration since 1983. The defensive system seeks to develop both ground-based and space-based interceptors that would destroy attacking missiles immediately after launch, rather than just before the warheads strike their targets. In 1987 DOD approved a plan to fund six specific projects to be operational by the mid-1990s and built at a cost of $250bn over the entire period (Heppenheimer 1988). This would produce a defensive force, known as Phase I, with the capability of destroying about one-fourth of attacking Soviet missiles. The advantage of Phase I is that it would strengthen deterrence by increasing the uncertainty of the success of a Soviet first-strike. If just one quarter of Soviet missiles can be destroyed, the Soviets must consider the possibility that sufficient US missiles will survive the first strike and be launched in retaliation to destroy considerable Soviet targets.

It is clear that the technological (SDI) and diplomatic initiatives are complementary. By proceeding with SDI development the US will be in a better position to negotiate treaties on new missile systems (e.g. fast-burn rocket boosters) that offer no military advantages to either side once Phase I is in place. Indeed, the current improved climate of superpower relations may be traced in part to American insistence upon continued funding of SDI.

The administration's plans, however, have been forced to yield to domestic budget and political realities. Although Congress authorized $4bn to be spent on SDI in fiscal year 1989 it revealed a strong scepticism of the more exotic space-based interceptors, reducing the allocation to such systems to a meagre $85m for fiscal year 1989. Congress continues to push ground-based interceptors, and allocated $350m for such systems in 1989.[11] In October 1988 the Defense Department acceded to these political and fiscal pressures by reducing the proposed number of space-based interceptors by one-half, and stretching out completion of the first phase of SDI to the late 1990s.

Similarly, the Reagan Administration requested $800m for the multiple-

lidgetman. The Democratic-controlled Congress allotted $250m to each
ıd set aside another $250m for the incoming administration to allocate as
wishes. President Reagan vetoed the entire defence authorization bill in
ugust 1988 and was able to reach some compromises with Congress in the
ıal bill. None the less, the future of SDI and the different offensive
'stems will be influenced by the party that wins the presidency in
)89. Whereas the Republicans favour the MX and Midgetman offensive
'stems and SDI, the Democrats oppose all three systems.

The successful negotiation of the INF treaty with the USSR to reduce
ıort- and medium-range nuclear missiles in Central Europe presents some
'awbacks as well as obvious benefits. As the number of nuclear weapons
ɛld by each side drops, the US and its NATO allies will be forced to turn
ıeir attention to conventional weapons. Unfortunately, as Table 2.6
ıows, the Warsaw Pact nations maintain a substantial superiority in

ıble 2.6 NATO/Warsaw Pact conventional forces, 1987

	Atlantic to Urals[a]		*Global*	
	NATO	*WP*	*NATO*	*WP*
ənpower (000)				
:tive ground forces	2,385	2,292	2,992	2,829
ɜserve ground forces	4,371	4,276	5,502	5,348
'ound force equipment				
ɜin battle tanks	22,200	52,200	30,500	68,300
tillery mortar	13,700	46,500	24,100	64,000
ıti-tank weapons[b]	10,570	17,650	20,120	24,970
\M	2,250	12,850	3,000	16,150
ɜlicopters (armed)	780	1,630	2,020	2,130
ICV	4,200	25,800	8,000	34,400
ınd combat aircraft				
ɪmbers	285	450	518	1,182
tack	2,108	2,144	5,157	3,119
erceptors/fighters	899	4,930	1,763	5,265
ıval forces				
bmarines	196	231	238	301
ırriers	16	2	23	4
uisers/destroyers/frigates	358	224	400	309
ıphibious	200	100	250	123
ıC	168	238	168	415
ıval air				
ɪmbers	38	250	38	390
tack	379	177	621	235
erceptors/fighters	180	12	264	12
;W (includes helo.)	535	374	1,179	544

urce: International Institute of Strategic Studies (1987)
tes: [a] For NATO includes most of Western Europe. For the Warsaw Pact, includes Soviet forces in
ɜscow, Volga, Ural, and North and Trans-Caucasus Military Districts.
ıcludes ground-based and helicopter.

conventional forces in Europe. The cost of conventional weapons significantly exceeds that of nuclear weapons, and attempts by the US and its European allies to reduce the gap with the Warsaw Pact will impose greater strains on alliance budgets.

Factors influencing defence spending

This section discusses more fully the factors mentioned in the introductory section as potential determinants of defence spending levels. These factors will be used to specify an empirical model of the demand for defence output.

International events

As might be expected both the Korean and Vietnam wars had a great impact on US defence spending, with the Korean war producing by far the stronger effect. According to Kahn (1982: 47):

> In June 1950, the United States Congress was engaged in a great debate over whether the defense budget should be $14, $15, or $16 billion. Along came the North Korean attack on South Korea. Congress quickly authorized $60 billion, an increase by a factor of four ... that authorization alone represented an enormous military defeat for the Soviets. And yet it was almost three years before the funding was fully translated into increased defense expenditures and corresponding military power ... the fear of an impending Soviet attack on Western Europe – and the attack on South Korea – provided most of the motivation for the 300 per cent increase in new obligational authority.

The Vietnam war produced a less dramatic example of an international event stimulating higher allocations to the US defence budget, as did the Soviet invasion of Afghanistan in December 1979. Other examples of international events affecting defence spending were the activist policy that the Soviet Union pursued during the mid-1970s in the Middle East, Angola and Ethiopia. These actions certainly contributed to the upward trend in US expenditures that began about this time.

Changing administrations – the electoral cycle

The allocation and distribution of federal resources is an inherently political process. A major issue in assessing the United States defence budget centres around the control of the military budget by the executive branch. As Zuk and Woodbury (1986: 446) note, this is done in two ways. First, because a large portion of the defence budget, unlike social security spending, is not mandated by law, the President has wide latitude in

ırmulating the defence budget. The dollars involved in defence spending ıd the President's ability to influence such spending gain more impor- ınce when it is realized that military spending requests from the chief ıecutive are rarely reduced by Congress.

Zuk and Woodbury found that in the years in which Congress cut the ıtal request, the average decrease was 2 per cent and never exceeded 5.3 er cent. And although Congress is prone to make programmatic changes ı the defence spending categories of procurement, R & D, and military ɔnstruction, the fact remains that only twice in the last 30 years has 'ongress altered executive budget requests by more than 10 per cent in the ıore important procurement and R & D categories. From this they ɔnclude that the President's proposals are usually approved, and the large ums spent for defence can indeed be used to influence macro-economic ɔnditions.

The best examples of incoming presidents changing defence spending in ıe post-war era are Kennedy and Reagan, both of whom opted for ıcreased spending. The 1960 Democratic Party platform specifically romised to recast the US military capability to provide forces and 'eapons of a diversity, balance and mobility sufficient to deter both limited nd general aggressors. This concept eventually produced the Kennedy–AcNamara strategic doctrine of 'flexible response', which in itself ıcreased defence costs (Schneider 1988: 56). The Reagan Administration ; an even stronger example of a new leadership determined to increase efence spending.

In an analysis of US electoral cycles, Zuk and Woodbury (1986) found o support for an electoral-defence spending cycle in the post-war era. In ıree of the nine presidential contests, defence spending decreased sub- tantially rather than increased during the election year. Moreover, three f the six times defence spending rose, the change was quite modest, anging from 2.1 per cent to 3.8 per cent. Also, the other three election ıcreases occurred either during wartime or during periods when US–JSSR relations were especially bad. In summary, Zuk and Woodbury 'ere unable to find a systematic relationship between defence spending nd presidential elections.[12] The implication of these results seems to be hat defence spending in the United States is probably not used on a ystematic basis by the President or Congress as a macro-economic policy ıstrument and, by extension, not used for the purpose of winning lections.

'ublic opinion

n a democratic society electoral competition normally ensures that in he long run some correlation exists between what the public wants and

must rely on voter opinion. Perhaps the best example of the link between public opinion and defence expenditures concerns the so-called 'Vietnam Syndrome'. From 1971 to 1978 more Americans favoured cuts than favoured increases in defence spending. The percentage favouring increased spending then mounted very sharply until 1980, after which it again sharply declined.

The factors that may have brought about the downward trend in support for defence spending in the 1980s are many and complex. Among the more important were probably the prolonged and serious recession of 1981–3, a perception that the Reagan Administration was pouring money into the Pentagon while cutting back on social programmes, and growing awareness of the federal budget deficit as a national concern (Schneider 1988: 64). Whatever the reasons, by mid-1985, the American public was in favour of cutting defence spending ahead of a whole host of social programmes, usually by lopsided margins.

As for the direct relationship between public opinion regarding defence spending (increase or decrease) and total authorized spending, spending began to recover in 1975 well before those favouring increases began to outnumber those favouring cuts. However, the plurality favouring more spending peaked in early 1980, about 5 years before total authorized allocations peaked. Indeed the Reagan Administration (and Congress) continued to increase total authorized allocations for about 3 years after the public shifted back to favouring less defence spending. One author concludes that the relationship between public opinion on defence and actual spending is fairly weak:

> spending increases *usually* occurred when the opinion balance was positive; spending decreases *usually* occurred when the opinion balance was negative. But no closer connection has been found. Linkages between the public and defense decision makers clearly had much slack and there is little basis for portraying defense policies as responses to articulate public demands (Higgs 1988: 47).

Congress

Congress plays a significant role in determining defence spending. The executive branch essentially sets the general level of spending by its request to Congress, and the legislative branch normally either cuts or increases the amount requested and some sort of compromise emerges. Korb (1982) has analysed Congressional responses to executive branch proposals for defence spending, and has noted a sharp change following Vietnam. From the outbreak of the Korean War through 1968, the Pentagon enjoyed a special relationship with the Congress in that, compared to the non-

equests were almost always treated favourably by the legislative branch.)efence cutbacks in this period averaged only 1.7 per cent whereas those n the non-defence areas were more than five times greater (9.2 per cent).

However, beginning with the first budget presented to Congress after the 'et offensive (fiscal year 1970), the legislative branch completely reversed ts attitude toward defence and non-defence programmes. From fiscal year 970 to fiscal year 1975, the Democrat-controlled legislature appropriated nore money than the Republican presidents sought in 4 of the 6 years. The otal impact of Congress in this period was to increase federal spending by .5 per cent. However, it achieved this by slashing a full 6 per cent from lefence requests and adding nearly 5 per cent to the non-defence portion)f the budget.

'erceptions of the Soviet threat

'he very notion of defence conjures up, at least by implication some sort of hreat. Clearly the only perceived serious threat to the United States is that)osed by the Soviet Union. Beginning in the early 1960s the Soviets ndertook a rapid expansion of military capabilities. If one excludes the ncremental costs of the war in Southeast Asia, by 1968 the Soviets had orged ahead of the United States in the amount of money allocated nnually to defence (Korb 1982: 52). Moreover, because the Pentagon was orced to expend a large percentage of its budget first for prosecuting the /ar in Southeast Asia and then for paying the additional personnel costs aused by the changeover to the all-volunteer force, the Kremlin began to utstrip the United States in outlays for a wide spectrum of military apabilities.[13]

This situation continued through the 1970s, so that by the end of that ecade the gravity of the military threat posed by the Soviet Union began) impress the American people and their leaders. The changing military

able 2.7 US–USSR strategic nuclear warhead inventory, 1960–84

	US			*USSR*		
ear	*Delivery vehicles*[a]	*Warheads*	*Yield*[b]	*Delivery vehicles*[a]	*Warheads*	*Yield*[b]
)60	529	1,734	1,812	215	415	475
)65	2,034	4,110	4,433	442	598	2,066
)70	2,255	5,074	4,213	1,891	2,047	6,915
)75	2,145	9,170	3,386	2,458	2,614	6,723
)80	2,040	9,668	3,265	2,645	7,451	4,766
)84	1,986	10,630	2,771	2,728	9,146	5,170

ource: Brada and Graves (1988)
otes: [a] Aircraft and missiles.
[b] In megatons.

balance between the two nations began to appear in quantifiable measures. For example, as Table 2.7 shows, the US enjoyed strategic superiority to the USSR for many years. But this superiority was lost by the 1970s when the USSR achieved strategic parity, if not dominance.

To deal with this situation the Carter Administration, which had planned to cut defence spending by $5–7bn, actually raised the fiscal year 1979 and 1980 defence budgets by 3 per cent in real terms and pledged to maintain continued real increases of that magnitude for the foreseeable future. Congress, which had been hostile to absolute or relative increases in defence spending throughout 1969–78, ultimately appropriated the 3 per cent increase requested by the administration and urged the President to devote even more resources to areas like strategic nuclear forces and naval combatants.

Arms control agreements

It is impossible to assess the degree to which arms control agreements have affected United States military spending. As one observer has noted:

> When one considers such programs as the ABM, B–1, and Trident – all of which received considerable funding during the first SALT negotiations – one begins to wonder if SALT 1 produced *any* economic savings (Blacker and Duffy 1984: 248).

Here, probably the more significant factor reducing defence expenditures was the general spirit of *détente* that lasted for a period of time in the 1970s.

It may be that the way arms control agreements affect spending is simply not easily observed. For example, the US and USSR are on the verge of a strategic arms agreement (START) that would leave each nation with 6,000 warheads, about one-half of the current US arsenal. Although this agreement would have a minor direct effect on spending, it could have indirect effects. As an illustration, DOD could decide to reduce the number of warheads allocated to the Navy and increase the allocation of land-based missiles controlled by the Air Force, a change in force structure that would require fewer costly Trident submarines. Another possibility is that spending could rise if each side takes steps to better protect their remaining arsenals, such as via the SDI programme in the US.

Inter-service rivalries

Many Washington observers have noted that inter-service rivalries have tended to push defence spending upward. Ball (1980) contends that during the Eisenhower era, the Navy typically asked for more than twice as many submarines as the administration saw fit to authorize, and that in the early 1960s, Air Force requests for Minuteman missiles were for about 1,000

ıore than the Defense Department would approve. He also states that the \ir Force lobby in Congress succeeded in obtaining funds for the manned ·omber from fiscal year 1962 to fiscal year 1966 that were over and above hose requested by the administration.

Whereas this and other anecdotal evidence is suggestive, it is hardly onclusive evidence that inter-service rivalry has caused US military xpenditures to be higher than they otherwise would have been. Apart rom specific cases of one service or another pressing for particular ·rogrammes to be included in the defence budget, a key manifestation of nter-service rivalries affecting military spending is the drive of each to)btain, preserve and maximize its share of the total.

Schneider (1988) concludes that inter-service rivalries have tended to nake the defence budget larger than it otherwise would have been, and ended to maintain the shares of each service near their traditional levels. Iowever, no comprehensive empirical test of this hypothesis has been ıttempted.

Moreover, there is little reason to expect this factor to have played an mportant role in defence spending levels as the relative service shares have)een stable over time. The Air Force received a larger share (average 35)er cent) than the other services during most of the 1948–85 period, followed by the Navy (31.5 per cent), and the Army (26.7 per cent). The Army's share increased during the land wars in Korea and Vietnam. Finally, the Navy's share has gradually increased from about 30 per cent in he early 1970s to about 34 per cent in the last several years, due to the)uildup to the 600-ship navy.

Alliances and burden sharing

A final factor to consider in explaining military expenditures is the manner in which US expenditures are affected by those of its major NATO allies. Olson and Zeckhauser (1966) argued that in alliances the pure public good ıttribute of national defence and differences in member size combine to :reate free-riding behaviour by smaller alliance members. These theoreti-:al arguments have added fuel to what has become a major policy :ontroversy – the question of continued US military support of South Korea, Japan and NATO. For example, estimates of the share of the US defence budget devoted to the defence of Western Europe ranges from 50 o 64 per cent (Krauss 1986).[14] The combined wealth of the NATO nember nations has prompted many analysts to argue that NATO–Europe should assume a larger share of the cost of its own defence. The US Senate ıas informally instituted a 'burden sharing initiative' and appointed a special representative who will negotiate with allied nations to increase heir share of defence costs.[15]

It should be noted, however, that analysts have also pointed out that

defence output is composed of different types of weapons systems, which vary in the degree of publicness. Consequently, some defence outlays may induce complementary behaviour by allies rather than the substitution effects envisioned by Olson and Zeckhauser. Murdoch and Sandler (1984) and Sandler (1988) indicate that burden sharing in the NATO alliance crucially depends on the ratio of private (country-specific) benefits to the total benefits derived from the alliance arsenal. The larger this ratio, the greater the degree to which allies' contributions will match efficient provision levels for defence expenditures. A high proportion of private benefits induces allies to pay for their own share of defence outlays rather than relying on other allies to provide security, because these benefits can be withdrawn at will by the provider unless a payment is received.

When, however, the arsenal provides benefits that are mostly public (alliance-wide) as in the case of nuclear deterrence, greater burdens are placed on the dominant allies with the largest economies. In the case of public benefits, a defence provider finds it difficult if not impossible, to exclude other allies from relying on the defence benefits derived from its arsenal. Those allies with the most at stake become the contributors.

Sandler's work indicates that during most of the 1950s and into the 1960s, the European NATO countries were able to free-ride on the US nuclear deterrence capability. Since the early 1970s, however, it appears that a decline in the role of nuclear deterrence and implementation of the 'flexible response' doctrine as a viable defence strategy has shifted the burdens toward the European countries. Murdoch and Sandler's empirical results are not inconsistent with the hypothesis that the flexible response doctrine has reduced free-riding through an induced complementarity among the jointly produced defence outputs.

Empirical analysis

Several previous studies have specified and estimated demand functions for military output. Most formal models of the demand for military output have employed an approach that involves maximizing a social utility function subject to a general budget constraint (Smith 1980; Murdoch and Sandler 1982; 1984). The Murdoch and Sandler studies yielded important insights by modelling NATO's decision structure as a Nash–Cournot process. None the less, this approach ignored the role of the internal political process in collective choices. Dudley and Montmarquette (1981) attempted to correct this omission by formulating an explicit collective choice model of defence spending. The median voter theorem was employed to derive military expenditure demand functions and to empirically estimate tax-price and income elasticities for defence. Their effort was only partially successful because many of the nations in their empirical sample either were non-democratic or based on proportional representation.

The median voter theorem postulates a single-dimensional issue space in which each issue is decided by a direct vote of fully informed voters. These requirements may appear restrictive especially because most political systems are representative rather than direct democracies. However, Downs (1957) has demonstrated that in a two-party system, electoral competition between the parties produces essentially the same outcome as the median voter theorem.

One key feature of the median voter model that may limit its application at the national level is the assumption (Borcherding and Deacon 1972) that governments supply output at the point where marginal cost equals demand and, in return, obtain a budget equal to the minimum necessary cost of producing the selected output level. Although this assumption may be reasonable for local governments, which ultimately are constrained by the mobility of residents, it is questionable for central governments. Perhaps most important, the median voter paradigm rules out autonomous behaviour by government decision-makers on output and price.

With these weaknesses in mind, Gonzalez and Mehay (1987) analysed military spending utilizing a theoretical framework that stresses the ability of decision-makers to choose between alternative fiscal outcomes. The model integrates the role of bureaux in basic supply decisions and in the determination of defence output (Niskanen 1971; 1975). Gonzalez and Mehay argued that, in contrast with the median voter model, a bureau supply model appears to be more compatible with the expenditure determination process at the central government level.

Because the appropriate conceptual collective choice paradigm for specifying a defence spending model is not settled, in this chapter the question is framed in terms of the budget level achieved by defence decision-makers. This approach is compatible with a Niskanen-type bureau supply model where decision-makers act to maximize budget size. Note that this maximand in the Niskanen model is equivalent to output maximization so long as the marginal benefit of output is positive. Bureaux are subject to the constraint that cost cannot exceed output.[16]

Defence decision-makers are hypothesized to adjust expenditures over time to bridge the gap between what decision-makers consider to be the optimal level of defence capability, and that which exists at any point in time. The optimal level of preparedness is assumed to be a function of events such as the Vietnam war and *détente*, and factors such as domestic economic constraints, NATO responses, the perceived Soviet threat, inter-service rivalries and perhaps the election cycle and/or whether a Republican or Democrat administration is in power.

Obviously each of the factors discussed above makes a priori sense. However, whether or not it makes a significant contribution to our understanding of the pattern of US military expenditures is clearly an empirical issue. A major problem lies in the fact that because of

deficiencies in the data, several of the factors are probably not capable of being empirically tested (public opinion, congressional attitudes, arms control agreements and inter-service rivalry). In this chapter an attempt is made to model factors such as the Soviet threat, domestic economic constraints, international events like Vietnam, and NATO burden sharing relationships. The purpose of the empirical analysis is not so much to test the implications of a particular theoretical model of government decision-making as to assess the relative importance of the various demand factors already identified.

The technique adopted here is to evaluate competing hypotheses concerning the relative importance of the factors already identified. Defence decision-making is assumed to be characterized by a partial adjustment process, which can be represented as follows:

$$M_t = \alpha M_t^* + (1 - \alpha) M_{t-1} \tag{1}$$

where M_t is actual military spending in time t, M_t^* is the desired level, and α is the coefficient of adjustment. Thus, observed expenditures are a weighted average of the desired expenditures at t and the actual expenditures in the previous period. We further assume that M_t is a linear function of the factors already mentioned:

$$M_t^* = \beta_0 + \sum_{i=1}^{k} \beta_i x_t^i + \varepsilon_t \tag{2}$$

Substituting equation (2) into equation (1) yields the partial adjustment model:

$$M_t = \alpha\beta_0 + \alpha \sum \beta_i x_t^i + (1 - \alpha) M_{t-1} + \alpha\varepsilon_t \tag{3}$$

In specifying equation (3) for empirical estimation, it is assumed that domestic economic considerations and the Soviet threat constitute the most important determinants of desired military spending levels. The speed of adjustment α is assumed to be a constant. Thus, the primary model to be estimated is

$$\begin{aligned} MX_t = a &+ \overset{+}{b_1} MX_{t-1} + \overset{+}{b_2} REXP_t + \overset{+}{b_3} RUEXP_t + \overset{-}{b_4} UCPI_t \\ &+ \overset{+}{b_5} REVD_t + \overset{-}{b_6} DEF_{t-1} + \overset{+}{b_7} VIET + e_t \end{aligned} \tag{4}$$

where MX_t is real US defence spending in year t (\$ m), MX_{t-1} is US defence spending lagged one year, $REXP_t$ is expected Soviet defence spending, $RUEXP_t$ is unanticipated Soviet defence spending, $UCPI_t$ is unanticipated US inflation, $REVD_t$ is the deviation from the trend in federal revenue, DEF_{t-1} is the federal deficit lagged one year, VIET is a dummy variable for the Vietnam War period, and e_t is an error term.

The Soviet threat is proxied by the expected level of real Soviet military expenditures. The expected spending variable is constructed by regressing the level of Soviet military expenditures each year on its value for the previous year. This variable should have a positive effect on MX if Soviet spending levels are employed as indicators of Soviet military intentions by US decision-makers and they are able to alter budget requests in response to the perceived threat.

Changes in US domestic economic constraints are also assumed to influence the level of optimal (desired) spending levels by defence decision-makers. Desired spending is further assumed to depend on the rate of unanticipated inflation in the US, the federal budget deficit, and on the revenue side, deviations from the trend in real federal revenues. Inflation concerns are proxied by increases in unexpected inflation. Unanticipated inflation is constructed as the difference between actual and expected inflation, where the latter is obtained by regressing the inflation rate each year on its value for the previous year. If inflation accelerates, it is assumed that budget-makers react by holding down discretionary expenditures, especially defence. Similarly, if the economy is growing more rapidly than projected, the growth of federal revenues will exceed projected levels and discretionary expenditures will tend to grow. The previous year's budget deficit should have an obvious constraining effect on defence spending. Note that since the economic variables, especially REVD, reflect the level and growth rate of the economy, GNP is not included as an explanatory variable in the specification. The basic model also includes a dummy variable (VIET) for the Vietnam War period (equal to 1 for 1967–72, 0 otherwise).

It should be pointed out why some of the potential factors discussed in a previous section were omitted from the specification. The impact of inter-service rivalry could have been measured by each service's share of total defence outlays. However, as these shares have been relatively stable over the period covered by the data, very little variation in the data would have been observed. Similarly, presidential or congressional elections could have been measured by the party in power, but it was unclear which political party has consistently influenced defence spending, and in which direction.

The expected signs of the coefficients are indicated above the variables in equation (4). Data used for the estimation are for the 1965–85 period.[17] Because of serial correlation of the residuals, the model is estimated using the first-order autoregressive iterative (Cochrance–Orcutt) technique. Parameter estimates are presented in Table 2.8.

In column 1 a basic model is estimated that includes as explanatory variables only the Soviet threat, lagged US spending, and a dummy variable for the Vietnam War period. The results of the estimation are fairly robust; the coefficients have the expected sign and are statistically

Table 2.8 Parameter estimates of spending model

Variable	*Equation* (1)	*Equation* (2)	*Equation* (3)	*Equation* (4)
MX_{t-1}	0.723	0.740	0.935	0.916
	(4.31)[a]	(8.29)	(14.22)	(14.22)
REXP	0.642	0.844	0.361	0.295
	(2.88)	(6.03)	(5.21)	(3.94)
VIET	28,007	27,580	17,282	14,987
	(2.47)	(5.12)	(3.78)	(2.79)
UCPI	—	−204,497	−247,085	−246,543
		(6.18)	(7.66)	(7.13)
REVD	—	203.85	261.36	232.93
		(3.92)	(5.50)	(4.26)
DEF_{t-1}	—	−67.39	−91.91	−92.94
		(1.86)	(2.74)	(2.77)
NATODT	—	—	5,227.27	6,067.25
			(7.62)	(9.65)
DETENT	—	—	—	−3,073.80
				(1.20)
Constant	−111,300	−159,505	−68,046	−48,071
ρ	0.533	0.629	0.196	0.027
R^2_{adj}	0.622	0.897	0.965	0.974
F statistic	10.90	27.31	73.68	85.67
DW[b]	2.86	2.15	2.82	2.56

Notes: [a] t ratios in parentheses.
[b] DW, Durbin–Watson statistic.

significant. The adjusted R^2 indicates that the basic model accounts for about 62 per cent of the variation over time in US spending.

Column 2 in Table 2.8 introduces the effect of domestic economic constraints into the estimation. Again, in all cases the signs of the estimated coefficients are as expected and they are statistically significant. Moreover, this model explains about 90 per cent of the variation in defence spending.

Column 3 introduces NATO members' spending into the model. The NATO variable, NATODT, is measured as the deviation from the trend in total NATO spending (net of US spending), where the trend is established by first estimating a linear trend equation. Again, it is hypothesized that US defence budget-makers adjust the optimal spending levels based on European NATO spending levels. Although the coefficient of NATODT in column 3 is statistically significant, the positive sign indicates that unexpected increases in European NATO member spending tends to induce US decision-makers to increase, rather than lower, their own spending. This provides some evidence that the US does not free-ride on the NATO alliance. Unfortunately, it is difficult to compare these results to those of earlier studies that observed free-riding by the US (Murdoch and Sandler 1982; 1984) due to differences in theoretical and empirical specifications.

Finally, in column 4 of Table 2.8 the impact of *détente* is included in the

stimation. DETENT is a dummy variable equal to 1 for the period when old war tensions were relaxed in 1972–6. The results in column 4 indicate hat the period of *détente* had the expected downward effect on US pending, although the coefficient is not significant.

Conclusions

JS defence expenditures are likely to level off or decline in real terms over he next 5 years or so. The major factor driving the military build up in the arly 1980s – the perceived Soviet threat – appears to be subsiding, or at east is not the burning political issue it was in the late 1970s. Even if it were, fears of increased inflation, concern over budget deficits, and Gramm–Rudman budget-cutting would make any major increases extremely unlikely. This future period of retrenchment confronts defence policy-makers with an unusually large number of challenges.

It is possible that the Gramm–Rudman–Hollings Balanced Budget Act will require deep cuts in defence spending and painful trade-offs both between social and defence programmes, and across different types of defence programmes. For example, if military pay cuts are selected as one quick-fix method of reducing military outlays, force manning and readiness may suffer, as it did in the late 1970s when the military-to-civilian pay ratio fell dramatically. Reduced recruitment and retention may bring renewed calls for reinstituting the draft for first-term personnel, with all of the potential social disruptions.

However, the probability of a serious fiscal crunch will probably be mitigated by the strong economic growth of the US economy. With continued economic growth the economy will continue to generate high growth rates of personal income and federal tax revenues, which should enable DOD to meet primary force structure objectives within the confines of Gramm–Rudman. Moreover, the impact of any cuts on national security will be lessened by the improvement in superpower relations and the apparent willingness of the Soviet leadership to reduce their military posture.

The slowdown in Soviet economic growth provides a partial explanation for why the USSR has agreed to negotiate the INF treaty, to withdraw from Afghanistan, and appears willing to discuss conventional, as well as nuclear, arms reductions. The US defence buildup in the 1980s posed a serious policy dilemma for the Soviet leadership. If the Soviets had followed suit, the cost could have been further economic stagnation of the civilian economy, reduced capital formation, and even lower future growth. This ultimately would reduce the ability of the economy to meet future military requirements. On the other hand, if the Soviets had not followed suit, they may have found themselves at a severe military

any military advantages that the US would otherwise have achieved without unduly raising defence spending requirements in the Soviet Union.

Future US defence directions

Future US defence strategies are, of course, difficult to predict and depend heavily on evolving international relations. The future international climate will depend in part on the policy changes currently underway in the Soviet Union. Some observers have concluded that the new policies of *perestroika* and *glasnost*, and the restructuring of the Soviet economy are signalling an era of benign Soviet foreign policies. Many observers, however, have argued that it is unlikely that the current reform movement will lead the Soviet Union to significantly reduce its military capabilities (Lee 1986; Zycher 1986). They point out that military strength is the only reason the USSR has achieved superpower status. Therefore, they conclude it is dangerous to believe that the poor performance of the Soviet economy will force the USSR to disarm. Unilateral or even bilateral disarmament would reduce the USSR to a second-rate world power, whereas the US still would remain a super ower.

A second area of uncertainty in international relations is the growth of other potential superpowers. The US Commission on Integrated Long-Term Strategy (1988) argues that rapid economic growth in Japan, and the projected growth of China (following their own economic reforms) will confront strategic planners with a future world composed of as many as four, or more, major military powers. It should be added that this multi-polar world will be further complicated by the likely emergence of an economically integrated Western Europe in the early 1990s, which may choose to pursue its own independent security goals. Clearly, the grand US defence strategy that has worked so well since the Second World War will need to be altered to incorporate a wider range of contingencies and international relationships. Strategic planning will require greater flexibility if the US is to attain a military posture sufficiently robust to deal with future superpower alignments.

Notes

1 The materials for this chapter were completed in 1988. The views, opinions and findings in this paper are those of the authors and should not be construed as official policy of any agency of the US government. The authors would like to thank Rodolfo Gonzalez, Todd Sandler, and James Tritten, Commander USN for helpful comments.

2 *The Economist*, 16 July 1988, p. 24.

3 *Business Week*, 8 August 1988, p. 20.

4 *The Economist*, 16 July 1988, pp. 61–2.

6 'The productivity paradox', *Business Week*, 6 June 1988, p. 100.
7 OECD, *OECD Economic Outlook*, June 1988, Paris.
8 *Business Week*, 15 August 1988, p. 30.
9 *Business Week*, 8 August 1988, p. 18.
10 DOD outlays include military pensions, which have become the fastest growing segment of the budget. Also, some defence-related purchases originate in government departments other than DOD.
11 *The Economist*, 16 July 1988, p. 24.
12 Zuk and Woodbury feel that their results are consistent with those of Krell (1981), who found the irregular pattern of US expenditures to have been largely determined by two international factors – war and the state of relations with the Soviet Union. The picture is not this straightforward, however, because the war–defence spending relationship apparently varies by type of defence spending.
13 It should be noted that estimates of Soviet spending levels vary widely. Becker (1986) surveys the various methods of estimation.
14 In 1986, the US maintained 250,000 military personnel in West Germany, 75,000 in other parts of Europe, 43,000 in South Korea, and 48,000 in Japan (US Secretary of Defense, 1988).
15 *Navy Times*, 25 July 1988, p. 15. See US General Accounting Office (1988) for a history and evaluation of defence burden sharing initiatives.
16 See Gonzalez and Mehay (1987) for a detailed derivation of the model.
17 Military spending data are in constant dollars and are derived from US Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers*, Washington, DC, various issues. Economic data are taken from the International Monetary Fund, *International Financial Statistics Yearbook*, Washington, DC, various issues.

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Chapter three

The political economy of military effort in the Warsaw Treaty Organization

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Introduction

For the USSR and the six East European members of the Warsaw Treaty Organization (WTO, or Warsaw Pact), the economics of defence spending were once largely moot. Soviet hegemony obviated choices that might have been made among East European states based upon their own economic considerations. Poland, the German Democratic Republic, Czechoslovakia, Hungary and Bulgaria acted as junior partners in the Warsaw Pact because their ruling regimes' political futures depended on it, economic consequences notwithstanding. Romania's behaviour, from 1964 distinctive within the alliance, nevertheless had substantial limits to the breadth or depth of its 'independence'.

In this chapter a full treatment of the complex political economy of a multi-state European communist system and its relationship with expenditures for defence is impossible. Nevertheless, it is important to underscore at the outset that the theme of choices and alternatives elaborated elsewhere in this book – the perennial guns-for-butter debate in Western competitive democracies – was less relevant to the Warsaw Pact during most of its first three decades (1955–85). During these decades, the defence policies of member states were inextricably interwoven within the political and economic hegemony of the USSR and the mutual dependencies created by that regional dominance.[1] Romania was the exception to this generalization, but still remained within the Pact, and exercised choice only to limited degrees on specific issues (e.g. relations with Israel or China and arms control). Choices were made at the margins of foreign and defence policies, if at all, effecting modest changes in Soviet use of the WTO for its own security planning.

In the era of Mikhail Gorbachev, this has changed and Eastern Europe and the USSR have become less bound to one another, and their development and maintenance of military forces are now less intertwined. At least through the mid-1980s, however, politically and economically forced defence policies produced high levels of military effort by WTO member