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An Annotated Bibliography of Defence, Disarmament, and Peace

**Keith Hartley and Nicholas Hooper
University of York**

for

**Contracting Officer's Representative
Michael Kaplan**

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Michael Kaplan, Director**

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AN ANNOTATED BIBLIOGRAPHY OF DEFENCE, DISARMAMENT, AND PEACE

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Introduction

The preparation of an Annotated Bibliography of the Economics of Defence, Disarmament, and Peace represents an original contribution to knowledge in a rapidly expanding and increasingly important field of study. The aim is to provide a definitive, authoritative, and comprehensive reference work on the subject. The Bibliography will be invaluable to theoreticians and applied economists, to governments and military staffs, and to those who approach the subject from either defence or peace perspectives.

The Case for an Annotated Bibliography

1. There is general agreement among academics, practitioners, and military staffs that a comprehensive, authoritative, and definitive Annotated Bibliography would be a valuable addition to knowledge in a rapidly expanding and important field of study.
2. Recent years have seen an increased public concern and interest in issues of defence, disarmament, and peace. These are worldwide concerns--e.g., United Nations; US-USSR summits; the INF treaty; Star Wars, Cruise missiles, and nuclear weapons in Europe. Increased public concern has highlighted the need for greater information and understanding of these issues. Since the publication of Hitch and McKean's Economics of Defence in the Nuclear Age, 1960, there has been a steady expansion of economics literature on aspects of defence, disarmament, and peace. A survey of the current literature will be invaluable to policy makers, politicians,

teachers, researchers, and students and will embrace the various schools of thought (e.g., defence and peace economics).

3. The Annotated Bibliography meets three sets of needs:

- a. It provides a research tool for further development and understanding of all aspects of defence, disarmament, and peace. It will identify gaps in research and areas for further study.
- b. It directs teachers to current studies and indicates the principal areas of concern as shown by the balance of topics covered in the published literature.
- c. It provides an invaluable guide to current knowledge and the state of the art.

AN ANNOTATED BIBLIOGRAPHY OF DEFENCE, DISARMAMENT, AND PEACE

GENERAL WORKS

military tactics

BRENNAN, G.; TULLOCK, G.

An Economic Theory of Military Tactics: Methodological Individualism at War, Journal of Economic Behaviour and Organisation, Vol 3 (2-3), June/Sept 1982, pp 225-242.

Applies an economic method of analysis to the theory of military tactics, based on the individualistic perspective of economics and a concern with the institutional order that governs the interaction of individuals to achieve objectives. Armies are thus analysed as collections of independent individuals each of whom has an incentive to act in a way disastrous for the army as a whole. Military tactics must thus establish a set of private incentives that will induce each soldier to act in the collective interest. This leads to increased emphasis on enforcement and monitoring of incentives. The objective of an army in a conflict is not to annihilate the opposing mass but to sever the web which holds the individuals together. No data. Bibliography of four references.

Country studies, International comparisons, developing countries, International trade, growth, Inputs, licenced production, International collaboration, industrial studies, models of arms race, disarmament.

SCHMIDT, C. (ed),

The Economics of Military Expenditures: Military Expenditures, Economic Growth and Fluctuations. Proceedings of a Conference held by the International Economic Association in Paris. Macmillan, London, 1987, pp xxiii, 391.

This book presents fifteen chapters, comments and an introduction analysing and critically assessing the economic impact of military spending. There are four parts dealing with the statistical treatment of armament and disarmament; the macroeconomic analysis of the impact of military expenditure; strategic-economic approaches to armaments dynamics; and the anatomy of arms industries. There are data on defence and arms production in NATO and developing nations; on cost trends and measures of product improvement; on defence burdens in Egypt, Israel and Latin America; on French defence budgets, arms production and involvement in joint projects; and aerospace industries in Europe and the USA.

Urquidi V.L., **Introductory Remarks**, pp xiii-xvi; Schmidt, C., **Introduction**, pp xvii-xxiii; Blackaby, F.; Ohlson, T., **Military Expenditure and the Arms Trade: Problems of the Data**, pp 3-24; Fontanel, J., **Note on the paper by Blackaby and Ohlson**, pp 25-28; Fontanel, J., **A Note on the International Comparison of Military Expenditures**, pp 29-43; Blackaby, F., **Note on the paper by Fontanel**, pp 44-46; Pilandon, L., **Quantitative and Causal Analysis of Military Expenditures**, pp 47-68; Cars, H. C., **Negotiations to Reduce Military Expenditures - Problems and Possibilities**, pp 69-84; de Haan H., **Military Expenditures and Economic Growth: Some Theoretical Remarks**, pp 87-97; Greenwood, D., **Note on the Impact of Military Expenditure on Economic Growth**, pp 98-103; Rivlin, P., **The Burden of Defence in Developing Countries**, pp 104-112; Herrera-Lasso, L., **Economic Growth, Military Expenditure, the Arms Industry and Arms Transfer in Latin America**, pp 113-134; Nishikawa, J., **Note on the Impact of Military Expenditure on the Japanese Economy**, pp 135-137; Miyasaki, I., **Further Note on the Impact of Military Expenditure on the Japanese Economy**, p 138;

Schmidt, C., Semantic Variations on Richardson's Armaments Dynamics, pp 141-175; Intriligator, M. D., Note on the Paper by Schmidt, pp 176-179; Intriligator, M. D.; Brito, D. L., Can Arms Races Lead to the Outbreak of War?, pp 180-196; McGuire, M. C., US Foreign Assistance, Israeli Resource Allocation and the Arms Race in the Middle East: An Analysis of Three Interdependent Resource Allocation Processes, pp 197-238; Harkavy, R. E., Arms Resupply During Conflict: A Framework for Analysis, pp 239-279; Hartley, K., Efficiency, Industry and Alternative Weapons Procurement Policies, pp 283-300; Deutsch, E., Note on the Paper by Hartley, pp 301-303; Kolodziej, E. A., Re-evaluating Economic and Technological Variables to Explain Global Arms Production and Sales, pp 304-335; Deutsch, E.; Schopp, W., Civil versus Military R & D Expenditures and Industrial Productivity, pp 336-356; Wulf, H., Arms Production in Third World Countries: Effects on Industrialisation, pp 357-384. Data for 1950-1980. No bibliography: chapter references are given.

Economic Models, Arms Race, International Companies
 SCHMIDT, C.; BLACKABY, F. (eds)

Peace, Defence and Economic Analyses, Proceedings of a Conference held in Stockholm jointly by the International Economic Association and the Stockholm International Peace Research Institute, Macmillan, London, 1987, pp xxxiii, 450.

Twenty chapters with a preface, introduction and opening presentation deal with theoretical, empirical and policy issues, presented in four parts. Part I provides a general perspective; Part II deals with defence and war modelling; Part III with macroeconomics in an international political framework and Part IV with econometrics and applied microeconomics. Data on US military expenditure 1974-83; arms production in developing nations 1960-80; military and civilian price indices; military-related debt; relative defence burdens in NATO 1978-82; military employment by total and region in France and UK 1981; UK defence spending 1960-82; and defence contractors in France and USA, 1983.

BLACKABY, F., Preface, pp xv-xviii; SCHMIDT, C., Introduction, pp xix-xxiv; TINBERGEN, J., World Peace Policy, pp xxvi-xxxiii; BOULDING, K., Unilateral National Defence Organisations: An Economic Analysis of Non-economic Structures, pp 3-19; SCHMIDT, C., Peace and War Economics in Retrospect: Some Reflections on the Historical Background of Defence Economics, pp 20-39; BRODY, A., Defence Spending as a Priority, pp 40-44; SEN, A., Comment, pp 45-49; SHUBIK, M., The Uses, Value and Limitations of Game Theoretic Methods in Defence Analysis, pp 53-84; LAMBELET, J. C.; LUTERBACKER, U., Conflict, Arms Races and Wars: A Synthetic Approach, pp 85-103; BRITO, D. L.; INTRILIGATOR, M. D., Arms Races and the Outbreak of War: Application of Principal Agent Relationships and Asymmetric Information, pp 104-120; ISARD, W., Comment, p 121; MCGUIRE, M. C., Economic Considerations in the Comparison Between Assured Destruction and Assured Survival, pp 122-149; ROTHSCHILD, K., Comment, pp 150-154; WOLFSON, M.; FARRELL, J. P., Economic Warfare Between the Superpowers, pp 155-184; RUSSETT, B., Economic Change as a Cause of International Conflict, pp 185-205; KOLODZIEJ, E. A., Whither Modernization and Militarisation? Implications for International Security and Arms Control, pp 206-232; ALBRECHT, U., The Current Warfare-Welfare Alternative and the Evidence from Technology, pp 233-249; CARS, H. C.; FONTANEL, J., Military Expenditure Comparisons, pp 250-265; ADAMS, G.; GOLD, D. A., The Economics of Military Spending: Is the Military Dollar

Really Different? pp 266-300; PASSADEOS, C., Comment, p 301; TULLBERG, R. M., Military-related Debt in Non-oil Developing Countries, pp 302-316; URQUIDI, V., Comment, pp 317-318; GIGENGACK, A. R.; de HAAN H; JEPMA, C. J., Military Expenditure Dynamics and a World Model, pp 321-341; MARTIN, S.; SMITH, R. P.; FONTANEL, J., Time-series Estimates of the Macroeconomic Impact of Defence Spending in France and the UK, pp 342-361; de HAAN H, Comment, p 362; SANDLER, T., Nato Burden-Sharing: Rules or Reality? pp 363-383; ABEN, J.; SMITH, R. P., Defence and Employment in the UK and France: A Comparative Study of the Existing Results, pp 384-398; HARTLEY, K., Reducing Defence Expenditure: A Public Choice Analysis and a Case Study of the UK, pp 399-423; DASSUAGE, P., The Conversion of Military Activities: A Strategic Management of the Firm Perspective, pp 424-437. Data for 1960 to 1983. No bibliography: chapter summaries and references are given.

MACROECONOMICS

GENERAL

efficiency of programmes, congressional control

BENSON, S.

The Military on Capitol Hill: Prospects in the Quest for Funds, Annals of the American Academy of Political and Social Science, Vol 406, March 1973, pp 48-58.

Public support for defence expenditure in the USA is low. Congress has an impact on the efficiency of programmes but less effect on the choice of programmes. The role of Congress, pressure groups and the President are reviewed. The likely outcome for funding in 1976 is considered. Data for 1952 to 1971. No bibliography; footnote references are given.

Sanctions, Iran, USA

CARSWELL, R.

Economic Sanctions and the Iran Experience, Foreign Affairs, Vol 60 (2), Winter 1981/82, pp 247-265.

The US government responded to the taking of American hostages by Iran in 1979 by freezing all assets of the government of Iran in the United States and under the control of US banks, businesses and individuals around the world. The eventual effect of such sanctions was to deprive Iran of the use of more than \$12bn in assets. The impacts on Iran are traced and the effects on policies and actions analysed. The study concludes that the sanctions achieved their objective of clarifying the thinking of Iran's leaders and forcing a solution to the hostage crisis. However, sanctions worked because of special circumstances applying to this situation, and relied on cooperation by other allies to achieve maximum effect. They also involved costs which can not yet be fully assessed, including risks to the status of the dollar as the principal reserve currency. No data. No bibliography.

Military Keynesianism, Military Functionalism

CYPHER, J.M.

Ideological Hegemony and Modern Militarism: The Origins and Limits of Military Keynesianism, Economic Forum, Vol XIII (1), Summer 1982, pp 1-20.

Military spending has been the main form of state activity in the USA since World War II. The macro-socio-economic effects of military spending are analysed, particularly the dynamic effects on conditions of production, social class, state policy and ideology. Traces the development of military keynesianism and considers the implications of the current shift to the functionality of military spending as a way of reasserting US hegemony. No data. Bibliography of seventeen references.

Maxism, theory of the state

CYPHER, J.M.

Critical Analysis of Military Spending and Capitalism, Eastern Economic Journal, Vol xi (3), July - September 1985, pp 273-282.

Classifies the arguments of Marxist critics of military spending into Neo-Marxist and classified Marxist. The arguments of each are outlined, and an approach to a synthesis suggested. The central weakness found in both groups is their failure to consider military spending within the context of a theory of the state. No data. Bibliography of twenty six references.

USA, NATO

ENTHOVEN, A. C.; SMITH, K. W.

What Forces for NATO?: And from Whom?, Foreign Affairs, Vol 48 (1), October 1969, pp 80-96.

The rising cost of keeping US troops in Europe, combined with severe budgetary pressures, require a review of US policy towards NATO. The justification of maintaining a large force in Europe is analysed in terms of the functions of NATO forces. The forces needed to maintain a conventional balance with the Warsaw Pact are considered. The study concludes that the balance between the US and Europe in NATO is unsatisfactory and unstable, and leads to financial and political pressures which will require a restructuring of the relationship between the US and NATO. Unless a gradual, agreed change occurs the Alliance will deteriorate through a continuing series of unplanned responses to financial and domestic political pressures. No data. No bibliography.

Expenditure models, efficiency, R & D, disarmament, mobilisation.

HITCH, C. J.; MCKEAN, R. N.

The Economics of Defense in the Nuclear Age, Harvard University Press, Cambridge, Mass, 1960, pp vii, 422.

This book made a substantive and pioneering contribution by approaching all military problems as economic problems in the efficient allocation and use of scarce resources. Part 1 considers the resources available for defence, opportunity costs and the indirect effects of defence spending. Part 2 is concerned with efficiency in the use of defence resources and the choice of defence systems. Part 3 reviews some special problems and applications, including research and development, logistics, alliance, disarmament, mobilisation and deterrence. The analysis centres on the implications of continued expenditure for preventive deterrence, in contrast to previous emphasis on war-time requirements. Examples refer to 1950's. Bibliography of 260 references.

Procurement Costs, spin-off, third world.

HOAG, P.

High Technology Army Weaponry, Economic Forum, Vol XIII (1), Summer 1982, pp 95-110.

Reviews developments in army weapons and implications for procurement costs. Despite some spin-off the diversion of resources from civilian industries reduces the provision of housing, health, safety, nutrition, environmental protection and education. Scientists and engineers are attracted away from civilian projects, lowering productivity and technical development. Military production is capital intensive and produces fewer jobs. There are also political consequences, particularly for the third world. No data. Bibliography of thirty six references.

Development, trade, industrialized countries, convention, manpower

TUOMI, H.; VÄYRYNEN, R. (eds)

Militarization and Arms Production, St. Martin's Press, New York, 1983, pp 310.

Papers presented at an International seminar organised by the Tampere Peace Research Institute in Tampere, Finland, August 1981, against the background of the United Nations study on the relationship between disarmament and development. The economic problem of defence for most nations has been how to finance military activity. Military preparedness has itself emerged as a

factor of insecurity. More information is needed on the economic and social costs of military preparations and the alternatives. Data for various periods from 1945. Chapter bibliographies given.

I The Study of Armament, Disarmament and Development
 Huisken, R., *Armaments and Development*, pp 3-25; Hovstadius, B.; Wangborg, M., *Linking Disarmament and Development: Some Ideas from a United Nations Research Project*, pp 26-33; Ball, N., *Defence and Development: a critique of the Benoit study*, p 39-56.

II Militarization and Arms Production in Industrialized Countries
 Brzoska, M., *Economic Problems of Arms Production in Western Europe: Diagnoses and Alternatives*, pp 59-92; Engelhardt, K., *Arms Buildup and Disarmament: Effects on Manpower Situations in Countries of Different Social Systems*, pp. 93-107; Leitenberg, M., *Efforts at Reducing Military Expenditure in the United States, 1960 to 1978*, pp 108-138; Klare, M. T., *Opening the Floodgates: The New US Arms Sales Policy*, pp 139-147; Tuomi, H., *Transnational Military Corporations: The Main Problems*, pp 148-160.

III Militarization and Armament Process in Developing Countries.
 Väyrynen, R., *Semiperipheral Countries in the Global Economic and Military Order*, pp 163-192; Landgren-Backström, S., *The Transfer of Military Technology to Third World Countries*, pp 193-204; Brigagao, C., *Brazil's Nuclear Energy Policy: Dilemmas and Options*, pp 205-222.

IV Alternative Perspectives
 Gleditsch, N.P.; Bjerkholt, O.; Cappelen, A.; Moum, K., *The Economic Effects of Conversion: A Case Study of Norway*, pp 225-258; Rosas, A., *Conventional Disarmament: A Legal Framework and Some Perspectives*, pp 259-286.

V Discussion
 Oberg, J., *Is the Conversion Idea to be Converted? Some Sceptical Comments from a Non-convert*, pp 289-299.

Annexes 1-6: The Largest Arms Producers in Western Europe.
Annex 7: Rank Order of the Twenty-five Largest Third World Arms Importers, 1977-80.
Annex 8: Rank Order of the Twelve Largest Third World Major Weapon Exporters, 1977-80.

COUNTRY STUDIES

Regional expenditure, USA

ALDRICH, M.

The Impact of the War in Southeast Asia upon State Economies, 1964-1969, Western Economic Journal, Vol X (4), December 1972, pp 449-459.

The impact of the war in Indochina on the incomes of the fifty states of the USA and the District of Columbia is analysed for the period 1964 to 1969 using a model of the regional impact of defence spending. The model makes state personal income dependent on autonomous income, including defence. The defence income of states was estimated for military wages and salaries, civilian defence payrolls, and military procurement. The results show that pre-war procurement patterns were basically undisturbed by the Vietnam war. The largest gains were experienced by the Western and Southern Central states, rather than the older industrial areas of the Midwest. The concentration of procurement and payrolls was increased by the war and states' ranking by defence dependency largely unaffected. Data for 1956 to 1968. Bibliography of sixteen references.

USA, regional expenditure

ANTON, T. J.

The Regional Distribution of Federal Expenditures, 1971-1980, National Tax Journal, Vol 36 (4), December 1983, pp 429-442.

Traces the distribution of US Federal spending in states and regions for the period 1871 to 1980. The distributional pattern remained relatively stable when measured by total outlays. Increased military outlays benefitted the Northeast and the Pacific states. Defence spending became more specialised by geographic region during the 1970's. Data for 1971, 1975 and 1980. Bibliography of thirteen references.

USA, Marxist Models, Productivity

ANTONIO, R.J.; BRAA, D.

Military Spending and the Contemporary American Crisis: A Marxist Analysis, Economic Forum, Vol XIII (1), Summer 1982, pp 111-134.

Outlines the Marxist framework for analysing social systems of production, focusing on social configurations consisting of forces and relations of production and a legal and political superstructure. Reviews post-war developments in capitalist countries and analyses the Reagan Administration military budget, focusing on the potential impact of planned increases in military spending on US productivity. By encouraging increased concentration of capital and granting advantages to the oligopolistic sector, arms expenditure will intensify the contradiction between productive forces and social relations of production. The consumption of resources by the military will lead to no-growth or decline. The defence budget is thus directly contradictory to the major expressed goals of promoting re-industrialisation, increased productivity and continued growth. Data for 1979 to 1980. Bibliography of fifty references.

USA, model of output

BARRO, R. J.

Output Effects of Government Purchases, Journal of Political Economy, Vol 89 (61), December 1981, pp 1086-1121.

A theoretical and empirical analysis of the difference between permanent and temporary changes in government purchases. The theoretical model is presented and the implications of changes in purchases described. The empirical application is divided between defence and non-defence purchases, for the period 1889 to 1978. The study concludes that defence purchases have a positive output effect, with temporary shifts having about twice the impact on output of equivalent permanent shifts. The effects of non-defence changes are imprecisely determined. No data. Bibliography of nineteen references.

USA, post-nuclear war capacity, defence planning

BEAR, D. V. T.; CLARK, P. G.

The Importance of Individual Industries for Defense Planning, American Economic Review, Vol 51, May 1961, pp 460-464.

Examines possible supplies and demands in the US economy after a nuclear war as a guide to peacetime defence preparations. The study identifies a list of potential economic targets and the proportion of peacetime capacity likely to be destroyed. The likely demands are identified on the basis of GNP at about half the pre-war level, with a high proportion devoted to fixed investment. In reality both supply and demand functions would change, with many substitutions. The study concludes with a ranking of industries by importance ratios derived from the ratio of demand to supply, which can form a guide to civil defence priorities and decisions as to which industries to support. Examples of data (undated). No references.

USA, Inflation

BEST, M.

Notes on Inflation, Review of Radical Political Economics, Vol 4 (4), August 1972, pp 85-112.

The US economy faces the anomaly of unemployment and inflation. Considers reasons why monetary policy may have contributed to inflationary pressures, and the impact of changing relationships between alienation and inflation. The role of monetary policy as an anti-inflationary instrument was subordinated in the 1960's to the need to finance the Vietnam war and alleviate a severe corporate liquidity squeeze. Qualitative long-run changes have led to increased militancy of workers contributing to wage-push inflation. Suggests the roots of inflation lie deep in corporate capitalism, specifically in the alienating nature of the production process and materialisation status criteria. Data for 1950-1971. Bibliography of thirteen references.

USA, Regional Model, Occupational Model, forecasting models.

BEZDEK, R. H.

The 1980 Economic Impact - Regional and Occupational - of Compensated Shifts in Defence Spending, Journal of Regional Science, Vol 15 (2), Aug 1975, pp 183-198.

Estimates the likely impact of a compensated 30% increase and a 30% decrease in military spending in 1980 on the US economy, on 14 regions and on occupational requirements in each region. Uses a large-scale integrated stochastic-interindustry model supplemented with regional data. Results presented for 1980, showing for the nation as a whole that a fall in defence spending would increase employment and an increase in spending reduce employment. The impact on individual industries and regions would vary substantially. Whatever the overall effect on employment in a

region there would be a shift between occupations. The occupation effects would vary between regions. Suggestions are made for alternate models. No data. Bibliography of sixteen references.

USA, Regional Models, indirect impact.

BILLINGS, R. B.

Regional Defence Impact: a Case Study Comparison of Measurement Techniques, Journal of Regional Science, Vol 10 (2), August 1970, pp 199-216.

A comparison of models of the regional impact of defence expenditures, using Arizona as an example. Uses a fourteen sector input-output model of Arizona and an economic base model. A survey of defence-related firms in Arizona provided additional data. Inverse coefficients and survey results are given and government data sources reviewed. No clear preference for either type of model was established, both models giving similar aggregate estimates of indirect and induced expenditures. The input-output model indicates a relatively high dependence of state and local government on defence spending via induced effects, and a large indirect demand on utilities and transportation. Only the input-output model can provide disaggregated production, income and employment estimates. Data for 1965-66. Bibliography of twenty-three references.

USA, defence budget

BINGHAM, J. B.

Can Military Spending be Controlled?, Foreign Affairs, Vol 48 (1), October 1969, pp 51-66.

In 1969 America was beginning to face the choices between military expenditure and meeting other needs that were to become a dominant issue of the 1970's. The acceptance of a standing peace-time army, the competition between services, the increasing costs of high-technology equipment and fear of developments by a potential opponent lead to demands for increasing military expenditure. The possibility of loss of control over expenditure by the civilian administration is considered, and the requirements for a review of military expenditure identified. The problem of setting national priorities is complicated by the absence of a common measure of the relative urgency of civil and military issues. No data. No bibliography.

Employment, Output, productivity, conversion

BLANK, R.; ROTHSCILD, E.

The Effect of United States Defence Spending on Employment and Output, International Labour Review, Vol 124 (6), November-December 1985, pp 677-697.

Examines the changing composition of US spending from the 1960's into the 1980's. Analyses the industrial composition and employment impacts of such spending, including variations between industries, occupations and income groups. Employees in military-oriented private industries are more highly paid but less productive than other workers, and are concentrated in technically skilled occupations. Government employees are taking a falling share of defence spending as purchases from private industries increase. Purchases are concentrated in a few durable goods industries, notably metal products and electronics. The multiplier effects of military spending are not considered. The effects of conversion would be different for reductions in defence procurement than for direct defence employment. Concludes that conver-

sion is unlikely to present intolerable economic problems, but should be seen as part of the continuing process of adaptation within the civilian economy. Data for 1958 to 1984. Bibliography of twenty-three references.

USA, defence budget

BLECHMAN, B. M.; FRIED, E. R.

Controlling the Defense Budget, Foreign Affairs, Vol 54 (2), January 1976, pp 233-249.

The annual process by which the US defence is determined is effectively a political trade-off between the government and military requiring greater outlays to meet a perceived threat and other political actors arguing for lower military expenditure to permit increased spending on social and other problems. There is no analysis of the factors increasing defence costs, the ways to reduce them and the consequences of alternative policies. The trends in defence costs are considered and the reasons for increases outlined. Changes in attitude are proposed, including recognising the need to change plans rather than reduce their size, consider manpower as well as equipment and accept short-term increases in cost to achieve long-term reductions. The study concludes that the US can afford the forces it needs, provided the budget is limited to necessary and efficient expenditure. No data. No bibliography.

USSR, spillover

CAMPBELL, R. W.

Management Spillovers from Soviet Space and Military Programmes, Soviet Studies, Vol XXIII (4), April 1972, pp 586-607.

Examines innovation and planning in the Soviet economy to see if space and military programmes have been the source of improvements in planning and management in other parts of the economy, and how the diffusion process may have worked. Five topics are considered: the systems concept, two quality control programmes, reliability assurance and network methods. The study concludes that the space and military programmes have been the source of important developments, but there is more evidence of spillover in managerial techniques than in process innovation, materials or equipment. There were difficulties in the diffusion process, particularly through a lack of incentive to improve managerial performance. No data. No bibliography; footnote references are given.

Cost of cold war, USA, national security expenditure

CLAYTON, J. L.

The Fiscal Cost of the Cold War to the United States: The First 25 Years, 1947-1971, Western Political Quarterly, Vol XXV (3), September 1972, pp 375-395.

The cost of national security may be greater than the defence budget. The additional expenditure incurred by the US government as a result of the cold war is estimated and theories of war-cost analysis critically examined. National security expenditures are adjusted to allow for costs arising from past wars, and for peacetime defence costs not attributable to the cold war. Outlays for international affairs, space and technology, and veterans benefits are taken into consideration. Finally the part of interest costs and general government expenditure due to the cold war is considered. The study concludes that the cold war accounted for forty-two percent of total US government expenditures between 1947 and 1971. The opportunity cost of these payments is briefly considered. Data for 1850 to 1970. No bibliography; footnote references

are given.

USA, Growth, Investment, Macroeconomic Planning

CYPHER, J.

Capitalist Planning and Military Expenditures, Review of Radical Political Economics, Vol 6 (3), Fall 1974, pp 1-19.

Aims to clarify the macroeconomic role of military expenditure in the post-war US economy, being used to dampen the cycle and prevent stagnation. Analyses the relationship between fluctuations in growth of GNP and military expenditure. Reviews the problems of capitalist planning. Opportunities are outlined for replacing military expenditure as the major instrument of planning with non-military state and local expenditure. Data for 1947-1972; Appendix on Defining Military Expenditures. Bibliography of thirty-six references.

US balance of payments

DUDLEY, L.; PASSELL, P.

The War in Vietnam and the United States Balance of Payments, Review of Economics and Statistics, Vol L (4), November 1968, pp 437-442.

Considers the effect of expenditure for the Vietnam War on the US balance of payments. Three possible effects are analysed: increased direct foreign purchases; purchases of foreign inputs into US defence production, deterioration in exports due to inflation and to bottle-necks in supply. The actual values recorded are taken for non-war expenditures. The estimates suggest the war contributed four billion dollars to the current account deficit in 1967. The study concludes that without these expenditures the US would have been in international surplus. Data for 1965 and 1968. No bibliography; footnote references are given.

USA, productivity, conversion.

DUMAS, L.J.

The Impact of the Military Budget on the Domestic Economy, Economic Forum, Vol XIII (1), Summer 1982, pp 71-86.

By pre-empting the supply of scientists and engineers the emphasis on military-related activity has produced a serious retardation in the US economy. The slowing of productivity growth has led to inflationary pressures, resulting in loss of markets at home and abroad, and hence growing unemployment. The revitalization of the economy requires productivity growth, which depends on technological conversion, itself dependent upon political will. Data for 1955 to 1971. Bibliography of eighteen references.

Appropriations, national income measures

GALBRAITH, K. D., WAKEFIELD, T. L.

National Defense Spending: A review of Appropriations and Real Purchases, Survey of Current Business, Vol 64 (11), November 1984, pp 11-16.

Appropriations are the form in which the budgetary aspects of US defence policy are debated and acted upon by Congress. They reflect many of the factors behind the build-up in defence. Other factors affect actual defence expenditure, including delaying or extending production runs. Analysis of real national defence purchases at the point of delivery to the military provides a national income measure of defence activity. Data for 1972-1983. No bibliography; footnote references are given.

Models of expenditure, Alliances, NATO, Political economy
HARTLEY, K.; LYNK, E.

The Political Economy of UK Defence Expenditure, Royal United Services Institute Journal, March 1980, pp 29-34.

An economic framework for evaluating defence expenditure is outlined. Consideration is given to the economic and political aspects of choice, the role of alliances (Nato) and the difficulty of measuring output. The facts of UK defence expenditure and its determinants are reviewed and the broader social and economic benefits are outlined and critically assessed. Three alternatives facing the UK in the 1980's are identified - increased spending, reduced commitments or greater efficiency. Data for 1948-1978. Bibliography of two references.

UK, Models of Expenditure, International Comparisons, Political economy, alliances

HARTLEY, K.; McLEAN, P.

Military Expenditure and Capitalism: a Comment, Cambridge Journal of Economics, Vol 2, 1978, pp 287-292.

A response to R. Smith "Military Expenditure and Capitalism". The conclusion that military expenditure is necessary for capitalism to survive does not follow from the analytical framework nor the empirical results presented by Smith. A model of UK defence expenditure is tested incorporating economic, political and strategic variables, based on 1948-1973, including allies and rivals expenditure and the economics of politics. Bibliography of six references.

UK, Model of Expenditure, Political economy

HARTLEY, K.; McLEAN, P.

UK Defence Expenditure, Public Finance, Vol XXXVI (2), 1981, pp 171-192.

The paper develops and tests a model based on economic, political and strategic factors which policy-makers claim to have determined UK defence spending since 1948. Influences include income levels, unemployment, balance of payments, civil consumption, the political stance of the government and technical progress. Strategic factors include the influence of allies and potential enemies, local wars and the end of conscription. Data for 1948-1973. Bibliography of thirty-five references.

UK, Research and development, growth.

KALDOR, M.; SHARP, M.; WALKER, W.

Industrial Competitiveness and Britain's Defence, Lloyds Bank Review, Vol 162, October 1986, pp 31-49.

Examines the argument that Britain's commitment to the development and production of military equipment contributes to her relative economic decline. After considering the size and industrial composition of defence procurement, attention is focused on military research and development. The monopsonistic market and the impact on industrial competitiveness are also considered. The study concludes that many of the failings of British industry can be explained, at least in part, by the presence of a very large protected military sector. A reduction in defence expenditure and military research and development is necessary before Britain can break the vicious circle of decline. Data for 1964 to 1984. No bibliography; footnote references are given.

UK, Political economy, internal comparisons, NATO, collaboration, conversion, arms reduction, employment, case studies.

KALDOR, M.; SMITH, D.; VINES, S. (eds)

Democratic Socialism and the Costs of Defence: The Report and Papers of the Labour Party Defence Study Group, Croom Helm, London, 1979, pp 557.

Contains the report of the Labour Party Study Group on UK defence expenditure, the arms trade and alternative employment originally published as 'Sense about defence', Quartet Books, London, 1977; together with the main discussion papers and a Ministerial response.

Kaldor, M.; Smith, D.; Vines, S., Introduction, pp 4-15.

Part One: The Study Group Report

Mikado, I., Introduction, pp 19-21; Study Group, **Background to the Study**, pp 23-125.

Part Two: The Study Group papers

A: Political and Strategic Issues

Cockle, P., **Observations on the Proposal to Align UK Defence Expenditure with the Average Percentage Spent on Defence by the Federal Republic of Germany, Italy and France**, pp 130-136; Greenwood, D., **Defence Programme Options to 1980-1**, pp 137-195; Cockle, P., **Note on the Budget Approach and a Programme which Retains the UK Nuclear Strategic Force**, pp 196-202; Williams, A. L., **Defence Programme Options to 1981: Politico-strategic and Economic Implications**, pp 203-208; Smith, D., **Strategic and Political Implications of Reduced Defence Programmes**, pp 209-250.

B: Military Expenditure and the Economy

Blackaby, F., **Note on the Military Expenditure and National Product: UK and Certain Other Countries**, pp 212-261; Smith, R., **The Resource Cost of Military Expenditure**, pp 262-280; Kaldor, M., **Defence Costs and the Defence Industry**, pp 281-314; Greenwood, D., **The Employment and Other Economic Consequences of Reduced Defence Spending**, pp 315-354; Blackaby, F., **Note on the Employment Consequence of a £1000 Million Cut (at 1974 prices) in Military Expenditure Over Five Years**, pp 355-359.

C: Industrial Conversion and Alternative Employment

Blackaby, F., **Military Expenditure Cuts: Note on the Transfer of Resources**, pp 361-365; Smith, D., **Aspects of Conversion of Arms Industries**, pp 366-392; Kaldor, M.; Booth, A., **Alternative Employment for Naval Shipbuilding Workers: a Case Study of the Resources Devoted to the Production of the ASW Cruiser**, pp 393-415; Smith, D., **Tornado: Cancellation, Conversion and Diversification in the Aerospace Industry**, pp 416-444; Smith, D., **Community Planning and Base Conversion**, pp 445-457; Vines, S., **The Lucas Aerospace Corporate Plan**, pp 458-478; Vickers National Combine Committee of Shop Stewards, **The Vickers Proposals: Building a Chief-tain Tank and the Alternative Use of Resources**, pp 479-503

Part Three: The Ministerial Response

Gilbert, J.; Tomlinson, J.; Wellbeloved, J., **Study into Defence Spending: Summary of Conclusions**, pp 505-548.

Appendix One: **A List of Papers Submitted to the NEC Study Group on Defence Expenditure, the Arms Trade and Alternative Employment**, pp 549-550.

Appendix Two: **A List of Products Identified as being Suitable for Manufacture in the Converted Defence Industries**, pp 551-555.

The study group sought a joint answer to the related questions of reducing defence costs and military expenditure, arms control, international relations and British industrial policy. The policy changes required are suggested to be substantial but possible.

The ministerial response rejected the reduction in military expenditure under the circumstance prevailing at the time and was thus unable to support the conclusions. Data included for various years from 1952 to 1981. No bibliography; chapter references are given.

UK, Inflation, forecasting

KENNEDY, G.

Managing the Defense Budget, The Royal Bank of Scotland Review, Vol 150, June 1986, pp 17-28.

Forecasting the defence budget is particularly difficult. Modern weapon systems have a long lead time, while the contingencies they prepare for are continually changing. Uncertainty also surrounds the resources which will be available for future military expenditure. Expectations that the UK will face a critical funding gap are exaggerated. Expenditure growth is forecast using past increases in relative defence prices whilst government revenue is based on expected future inflation rates. The gap is manageable without drastic reductions in commitments if the management of the defence budget is changed. Data for 1984/85. No bibliography.

Eastern Europe, Education Expenditure, Health Expenditure, growth.

LAZARCIK, G.

Defense, Education and Health Expenditures and their Relation to GNP in Eastern Europe, 1960-1970, American Economist, Vol XVII (1), Spring 1973, pp 29-34.

Presents estimates of the total gross national product, total military, public education and public health expenditures for the six communist nations of Eastern Europe (Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania) for each year from 1960 to 1970. The official data are adjusted to be consistent with Western definitions. Results are presented in current and constant (1967) dollars and as indexes and growth rates. A comparison is made between Eastern Europe and the USSR, NATO (excluding USA), USA, developing countries and the world total. The most distinctive finding is the resurgence of military spending in Eastern Europe, the U.S.S.R. and the developing countries in the second half of the 1960's. Data for 1960 to 1970. Bibliography of thirty four references.

USA, Industrial policy, procurement policy, surge capacity.

LEHMAN, J.; WILLETT, T. D.

National Security and Industrial Policy: The Need for a Public Choice Perspective, Contemporary Policy Issues, Vol IV (1), January 1986, pp 36-47.

Reform of U.S. industrial policy requires changes in the political institutions involved. On theoretical grounds centralization of policy may either increase or decrease efficiency. The U.S. Department of Defense was created in 1947 to improve operational efficiency and may illustrate the likely outcome of centralization. Defence procurement is frequently criticized for inefficiency, particularly through poor analysis of requirements and the pursuit of special interests. Department of Defense procurement policies and planning for industrial surge capacity are reviewed for types and sources of inefficiency. Two types of problem are identified: how the government can create the best incentives for private sector response, and how to create better incentives for the various levels of government to seek efficient outcomes. The

study concludes that a central agency for industrial policy is not likely to substantially increase the efficiency of government involvement in the economy. No data. Bibliography of twenty eight references.

USA, War economy

MELMAN, S.

Ten Propositions on the War Economy, American Economic Review, Vol LXII (2), May 1972, pp 312-318.

Suggests the existence of a war economy intertwined with the American civil economy, comprising a network of firms with different operating characteristics and controlled from the Pentagon. Military-industrial firms maximise costs and subsidies and produce goods with no economic use-value. Discusses ten features of the US war economy: the military-industrial firm is not autonomous; is controlled by state management; does not minimise cost; is not a profit-maximiser; state management is a new concentration of industrial capital; GNP is composed of productive and parasitic growth; economically parasitic output produces inflation; foreign military spending endangers the value of the dollar; military systems entail a larger opportunity cost for society; and military industrial firms lack flexibility for conversion to civilian work. No data. Bibliography of thirteen references.

Australia, alliances, models of expenditure.

MURDOCH, J. C.; SANDLER, T.

Australian Demand for Military Expenditures, 1961-79., Australian Economic Papers, Vol 24 (44), June 1985, pp 142-153.

Presents a military expenditure equation for Australia for the period 1961 to 1979, with OLS regression estimates. Both income elasticity and the responsiveness of defence expenditure to its allies defence expenditure (Spillin elasticity) are estimated. The results also show the influence of the Viet Nam war and the NATO doctrine of flexible response on Australian defence expenditure and the ANZUS alliance. The pure public good and joint product models of alliances are reviewed and an equation derived for Australian expenditure. The empirical results suggest NATO expenditures do not have a direct effect on Australian military expenditure, but may have an indirect effect through the UK and USA. The results support the unintegrated nature of ANZUS, suggesting that Australia must depend on its own expenditure to deter conventional aggression. Data for 1962 to 1979. Bibliography of twenty references.

International Companies, models of arms race, Scandinavia.

MURDOCH, J.C.; SANDLER, T.

The Political Economy of Scandinavian Neutrality, The Scandinavian Journal of Economics, Vol 88, No. 4, 1986, pp 583-603.

The theory of alliances is applied to three neutral European nations, namely, Sweden, Switzerland and Finland. Are these neutral nations self-reliant for their defence or do they depend (free-ride) on existing alliances for their protection? An econometric model is tested in which a nation's military expenditure is determined by its income levels, the defence spending of its neighbours or allies and by NATO's adoption of the doctrine of flexible response. The results show that Sweden before 1974, together with Switzerland and Finland were self-reliant, not dependent on either NATO or USSR defence spending. However, since the introduction of flexible response (more conventional forces)

after 1974, Sweden seems to have relied to a limited extent on NATO (free-riding). Predictions are made of the likely effects on Sweden's defence spending if it were to join NATO. Data for 1962 to 1982. Bibliography of twenty seven references.

US economy, role of military spending.

REICH, M.

Does the US Economy Require Military Spending?, American Economic Review, Vol LXII (2), May 1972, pp 296-303.

Argues that a major shift in social and economic priorities away from military spending would require a fundamental transformation of the US capitalist economy. Presents three propositions on the role of military spending: inadequate private demand to sustain growth; military spending is the most convenient outlet for government expenditure; social expenditures are not a feasible alternative. Military spending adds to rather than competes with private demand, and is profitable. Social spending undermines profitable activity and weakens incentives. Concludes that a capitalist economy with inadequate demand will turn to military rather than social spending. No data. Bibliography of sixteen references.

USA, military keynesianism, military functionalism.

RIDDELL, T.

Militarism: The Other Side of Supply, Economic Forum, Vol XIII (1), Summer 1982, pp 49-70.

Considers the political-economic context of the substantial increase in America's military forces planned by the Reagan Administration. Four reasons are offered for the build-up: the Soviet threat, international expansion, military keynesianism, and the military-industrial complex. The militarization of American foreign policy is intended to renew US prosperity and world leadership. The possible impact on non-military growth and the likely political repercussions at home and overseas are outlined, raising doubts about achieving the objectives. Data for 1949-1986. Bibliography of thirty eight references.

Czechoslovakia, Economic potential, social system.

SELESOVSKY, J.; STANICEK, J.

To ensure Security is also an Economic Task, Czechoslovak Economic Digest, 3, May 1983, pp 71-84.

The new arms build-up by NATO involves the strengthening of all the armed services. Technical progress has increased the links between the military defence of socialism and economic power. The growth of defence spending in Czechoslovakia indicates the economic strength needed to maintain military-economic and military-technical equality with NATO. Comparison of economic strength must take into account the character of the social system along with other factors determining economic potential. The advantages of socialist countries in the sphere of production relations guarantee that the change in the balance of forces in favour of socialism will last. Data for 1955 to 1980. No bibliography.

UK, political economy, collaboration, arms reduction

SMITH, D.

The Defence of the Realm in the 1980's, Croom Helm, London, 1980, pp 276.

A critical analysis of the way the state acquires armed forces in support of its interests and in response to international politics. Reviews the objectives of defence, the British situation,

and the fundamental British problem of finding resources in the face of increasing costs. Concludes that opportunities exist to benefit from collaboration and through arms reduction. Data for 1968-1981. No bibliography; chapter references are given.

UK, Models of Military Expenditures

SMITH, R.

The Demand for Military Expenditure, Economic Journal, Vol 90, December 1980, pp 811-820.

Develops a formal model of the neoclassical approach to defence expenditure, assuming that social welfare is a function of civilian output and security. The role of the state is to balance the welfare benefits from extra security against the opportunity cost in foregone civilian output. The model is applied to UK data for 1951-1975 and results presented. The limitations of the model are discussed. The results suggest the elasticity of substitution between security and civilian output is quite high; that UK security was relatively insensitive to UK military expenditure, being largely dependent on the ratio of USA to USSR share of military expenditure in output; and that the UK is free-riding on US spending. Appendices describe data sources and examine the robustness of the model. No data. Bibliography of nine references.

South Africa, multi-national companies

VAYRYNEN, R.

The Role of Transnational Corporations in the Military Sector of South Africa, Journal of Southern African Affairs, Vol v (2), April 1980, pp 199-255.

The role of multinational corporations in the military sector of South Africa is closely related to the international position of South Africa and to its domestic economic structure. The military market is described and the main sectors analysed. The role of multinational corporations is reviewed. The study ends with a section on the military uses of the South African nuclear weapon. No data. Bibliography of 204 references.

INTERNATIONAL COMPARISONS

OECD, military expenditure and performance
CAPPELEN, A.; GLEDITSCH, N. P.; BJERKHOLT, O.
Military Spending and Economic Growth in the OECD Countries, Journal of Peace Research, Vol 21 (4), 1984, pp 361-373.
Previous studies of the effect of military spending on economic growth have produced apparently contradictory results. Cross-section studies suggest a negative relationship whilst time-series indicate a positive association. A model of economic growth is applied to pooled cross-section and time-series data for seventeen OECD countries for the period 1960 to 1980, and for three sub-groups of countries. Military spending was found to have a positive impact on manufacturing output but a negative effect on investment. The net effect on economic growth was negative, except for the Mediterranean countries. The study concludes that conversion of military spending to areas which would stimulate investment is likely to increase economic growth in the developed countries. No data. Bibliography of twenty-five references.

Models of expenditure, growth
CHESTER, E.
Military Spending and Capitalist Stability, Cambridge Journal of Economics, Vol 2, September 1978, pp 293-298.
A comment on Smith 'Military Expenditure and Capitalism'. Regression analysis is used to estimate the relationship between military expenditure and unemployment, growth and investment. As in Smith, cross-section data for developed capitalist countries are used but the sample is changed. The hypotheses linking military expenditure with high rates of unemployment and slow rates of growth are not confirmed. The analysis suggests that military expenditure does not only divert funds from private sector investment but also from private consumption and public social service funding. No data, but a short appendix on data sources. Bibliography of sixteen references.

Defence and welfare spending, trade-offs
CLAYTON, J. L.
The Fiscal Limits of the Warfare-Welfare State: Defense and Welfare Spending in the United States since 1900, Western Political Quarterly, Vol XXIX (3), September 1976, pp 364-383.
Compares defence and welfare spending in the US using a range of definitions for both. A common method of measurement is proposed, enabling a better comparison between the two. The study concludes that different statistical approaches produce different conclusions. A quantitative approach will thus not resolve all the ideological differences over defence and welfare spending. The public sector as a whole has increased in size throughout this century. Social welfare expenditure has replaced defence expenditure as the major fiscal factor in terms of both size and growth. Whilst all the defence data are trending downwards, social expenditure continues to grow. A re-examination of welfare spending is necessary before judgement is made on the size of defence expenditure. Data for 1902 to 1976. No bibliography; footnote references are given.

USA, USSR, China, Military expenditure
CUSACK, T. R.; WARD, M. D.
Military Spending in the United States, Soviet Union, and the People's Republic of China, Journal of Conflict Resolution, Vol 25

(3), September 1981, pp 429-470.

The reasons for resources being allocated to military uses in the United States, the Soviet Union and China are considered. Alternative models of military expenditure are discussed, and data problems described. A modified Richardson model of the arms race is applied, followed by a model explaining expenditure in terms of internal political factors. The study concludes that the arms race formulation is the less powerful of the two approaches. Political economic cycles best explain the US military expenditure and provide a useful insight into Soviet spending. Military spending in China is less well explained. The choice of data significantly affected the results for the USSR. The use of country-specific models may be required when attempting to explain military expenditure. Data for 1947 to 1978. Bibliography of sixty-seven references.

Defence Burden, detente, alliances, internal violence.

KÖHLER, G.

Some Observations on Defence Burden Decline, its Causation and Manipulation, Bulletin of Peace Proposals, Vol 10 (3), 1979, pp 291-296.

Considers the factors which contribute to a decline of the defence burden, expressed as the share of national product taken by military expenditure. Out of a sample of 90 countries, 44 experienced a significant decline in defence burden from the early 1960's to the early 1970's. International detente was the main cause in the North, whereas regime-related changes were most common in the South. The decline in the centre of the world system (Nato, Warsaw Pact) is a collective process involving planning within alliances and diplomacy between them. In the third world a declining burden involved a single country or small local group. The analysis suggests defence burden reduction requires action to reduce internal violence, governmental reliance on force and international tension. Data for early 1960's to early 1970's. Bibliography of fourteen references.

Military expenditure and performance

LINDGREN, G.

Armaments and Economic Performance in Industrialized Market Economies: A Review Essay, Journal of Peace Research, Vol 21 (4), 1984, pp 375-387.

There are two main approaches adopted by empirical studies of the relationship between military expenditure and economic performance. The Marxist approach sees military expenditure as essential for the survival of capitalism. The second approach considers the trade-off between military and other forms of expenditure. The literature is reviewed with particular emphasis on the conclusions for five relationships. The study concludes that investment is hindered by military expenditure, which contributes to a negative effect on economic growth. No clear association was found with employment, but the same amount of other public expenditure creates more jobs. There was some evidence that military expenditure has a counter-cyclical effect in the US, but inconclusive results were found for US electoral cycles. Data problems preclude analysis taking into account the context of military expenditure and differences in sectoral impacts. No data. Bibliography of eighty-nine references.

Latin America, Budgetary Trade offs

LOONEY, R.G.

Military Expenditures in Latin America: Patterns of Budgetary Trade offs, Journal of Economic Development, Vol 11 (1), July 1986, pp 69-103.

An empirical examination of the extent, direction and form of budgetary trade-offs between defence and other social-economic programmes in major Latin American Countries. Considers whether there is a relationship between defence and social-economic expenditures over time; whether defence spending reduces other programmes; if common elements exist among countries with similar patterns of allocation; and whether military regimes differ from civilian regimes in the way allocations are made. A review of the literature is followed by a discussion of methodology. Results are presented for regression estimates of each of thirteen country time series, and positive and negative trade-offs identified. The trade-off between defence and social services tended to be opposite to that between defence and economic services. No data. Bibliography of eighteen references.

Model of expenditure, growth

SMITH, R. P.

Military Expenditure and Capitalism: a Reply, Cambridge Journal of Economics, Vol 2, September 1978, pp 299-304.

A reply to comments by Hartley and McLean and Chester on Smith 'Military Expenditure and Capitalism', presenting further empirical evidence. The strategic explanation proposed in the first article was upheld by UK data whilst political and economic factors suggested by Hartley and McLean were insignificant. The military expenditure investment trade-off was supported, but the positive relationship suggested by Chester between unemployment and military expenditure was not. The equations explaining international differences in growth rates performed poorly but the balance of evidence seems to be that military expenditure reduces growth. Data for 1960-1970. Bibliography of two references.

Models of expenditure, growth

SMITH, R. P.

Military Expenditure and Capitalism, Cambridge Journal of Economics, Vol 1, March 1977, pp 61-76.

Analyses the military expenditure of advanced capitalist countries from a Marxist perspective. The paper presents empirical evidence on the size of expenditure, analysing it first in terms of ability by the state to deter aggression and defend national interests and secondly from the Marxist viewpoint of supporting capitalism by making up for underconsumption. Results are presented of regression analysis on a cross-section of fifteen countries using data averaged over the period 1960 to 1970. A simple underconsumption theory is rejected. The empirical evidence suggests military expenditure imposes a substantial burden, being associated with lower investment, lower growth and higher rates of unemployment. A tentative explanation is proposed based on military expenditure crowding out investment and hence reducing productivity, resulting in a balance of payments deficit and deflationary policies. Data for 1954-1973. Bibliography of twenty-one references.

Unemployment, growth, models.

SZYMANSKI, A.

Military Spending and Economic Stagnation, American Journal of Sociology, Vol 79 (1), July 1973, pp 1-14.

Examines the relationship between military spending and economic stagnation, using data for eighteen capitalist countries. Tests the hypothesis that military spending reduces unemployment and raises growth. The estimates are controlled for GNP, GNP per capita, and either military or non-military expenditure. The countries are divided between high and low military spending, and the ratio of the means of the high and low groups taken as the general indicators of the effect of each variable. Rank order correlations are also used. The level of unemployment was found to be associated with the level of military spending, but their growth rates were negatively associated. Non-military spending was found to play a much more important role than military spending. Data for 1968. Bibliography of two references.

WEIDENBAUM, M. L.

Arms and the American Economy: A Domestic Convergence Hypothesis, American Economic Review, Vol LVIII (2), May 1968, pp 428-437.

The domestic convergence hypothesis proposes that the close, continuing relationship between the US Department of Defense and its major suppliers is resulting in a convergence between the two, with the Department of Defense taking on many of the decision-making functions normally carried out by industry. Three aspects of public participation in private decision-making are identified: the choice of product, the source of capital funds, and the internal operation of the firm. A survey of thirteen large defence suppliers is analysed. Government involvement is only occurring in the case of unique and large-scale military weapons systems and related procurement. Considers the long-term structural impact on private industry. Suggests that convergence is limited to the defence industry, and that the government-oriented corporation is different from other large American business firms. Data for various years 1953-1965. No bibliography; footnote references are given.

DEVELOPING COUNTRIES

Turkey

AYRES, R.

Arms Production as a Form of Import-substituting Industrialization: The Turkish Case, World Development, Vol 11 (9), September 1983, pp 813-823.

The creation of new defence industries was regarded as important for Turkey to help achieve military independence and to assist in the policy of industrialization through import substitution. As well as saving imports, arms production was seen as a way to stimulate the economy and raise levels of productivity. The main economic problems facing Turkey are a shortage of foreign exchange, high levels of unemployment, extremes of poverty and affluence, dependence on imports and shortage of capital. After reviewing the consequences of arms production the study concludes that an enlarged arms industry would not solve Turkey's economic problems but would place an intolerable burden on scarce resources and seriously retard development. Defence production would contribute less to development than civil industries. Data for 1977. Bibliography of twenty-eight references.

Models of policy effects, disarmament simulation

BARLOW, R.; DAVIES, G. W.

Policy Analysis with a Disaggregated Economic-demographic Model, Journal of Public Economics, Vol 3, 1974, pp 43-70.

The use of a macro-economic model to provide information about the effects of government policies on an under-developed economy is demonstrated using simulation techniques. The policies considered are a) malaria eradication; b) birth control; c) malaria eradication combined with birth control; and d) disarmament. The model is outlined, with the equations and values of exogenous terms presented in appendices. The model is particularly detailed in the specification of the quantity and quality of labour inputs, reflecting the emphasis on policies involving investment in human capital. The simulations were performed on a hypothetical economy, obtained by using values for parameters thought to be typical of under-developed countries. The disarmament policy involved reducing the rates of military service, reducing the military share of the government budget, and accepting reduced inflows of foreign military aid. The result was a significant increase in income per consumer through an increase in labour and capital inputs. No data. Bibliography of twenty-one references.

BENOIT, E.

Growth and Defense in Developing Countries, Economic Development and Cultural Change, Vol 26 (2), January 1978, pp 271-280.

A brief report of an analysis of the growth rates, investment rates, and foreign aid receipts of forty-four developing countries between 1950 and 1965. The main finding was that countries with a heavy defence burden tended to have the most rapid growth of civilian output. Several measurement and spurious sources of the correlation are discussed and discounted. The direction and nature of causality between defence expenditure and growth are considered, leading to the conclusion that the direct causation runs from defence expenditure to growth. The policy implications are outlined. Data for average values (1950 to 1965) are given. No references.

Model of development

BISWAS, B.; RAM, R.

Military Expenditures and Economic Growth in Less Developed Countries: An Augmented Model and Further Evidence, *Economic Development and Social Change*, Vol 34 (2), January 1986, pp 361-372.

Considers some of the reasons for the differences in the relationship between defence and economic growth found in previous studies, and presents estimates from a model which separately identifies two impacts of military expenditure on growth: the extent to which the military sector generates externalities for civilian activity; and the relative factor productivity of the two sectors. The study concludes that previous results differ because of variations in the samples used, the specifications of the relationships, and the different time periods analysed. The results suggest there were no significant externalities for the civilian sector from military production, and no significant productivity differences between the two. The study concludes that there is no consistent, statistically significant connection between military spending and economic growth. A positive or negative result can be found by concentrating on certain time periods, certain countries or adopting certain specifications. No data. Bibliography of twenty-five references.

Political economy

COOPER, O., FOGARTY, C.

Soviet Economic and Military Aid to the Less Developed Countries, 1954-1978, *Soviet and Eastern European Foreign Trade*, Vol XXI (1, 2, 3), Spring-Summer-Fall 1985, pp 54-73.

The aid programme of the USSR aims to replace Western influence, to counteract the Chinese challenge to leadership of national liberation movements, and to persuade third world countries that Soviet communism offers the only viable solution to their economic problems. This has required the supply of arms, capital and technical services on attractive terms. Reviews the operation of the programme since its inception, and analyses commercial and military aid in 1977-78. Considers the effectiveness of the assistance, and the prospects for the 1980's. Data for 1954-1978. No bibliography; a note on sources is included.

Arms transfers; data on defence expenditure, defence burdens in developing countries.

Deger S.; West R. (eds).

Defence, Security and Development, Francis Pinter, London 1987, pp xiii, 219.

A multi-disciplinary approach of economics, politics, international relations and strategic studies assesses the effects of defence expenditure on security and economic development in the Third World. The book is the result of an international colloquium of scholars. It is divided into four parts dealing with interpreting information on defence expenditures, the relation of defence and development, the determinants of defence expenditures and arms transfers to the Third World.

Deger, S.; West, R. L. **Introduction: Defence Expenditure, National Security and Economic Development in the Third World**, pp 1-16; West, R. L. **Improved Measures of the Defence Burden in Developing Countries**, pp 19-48; Ball, N., **Security Expenditure: Measurement and Trends**, pp 49-68; Smith, R.; Humm, A.; Fontanel, J., **Capital-labour Substitution in Defence Provision**, pp 69-80; Deger, S.;

Sen, S.; Defence, Entitlement and Development, pp 83-101; Thompson, W. S., Security and Development in the Third World: Some Policy Perspectives, pp 102-114; Fontanel, J.; Smith, R. The Creation of an International Disarmament Fund for Development, pp 115-126; Maizels, A.; Nissanke, M. K. The Causes of Military Expenditure in Developing Countries, pp 129-139; Rothstein, R. L., National Security, Domestic Resource Constraints and Elite-choices in the Third World, pp 140-158; Brzoska, M., Current Trends in Arms Transfers, pp 161-206. Data for various years. Bibliography of 145 references.

Models of growth, resource constraints.

FREDERIKSEN, P.C.; LOONEY, R.E.

Defense Expenditures and Economic Growth in Development Countries; Some Further Empirical Evidence, Journal of Economic Development, Vol 7 (1), July 1982, pp 113-125.

Reviews the literature on the effect of defence spending on economic growth and suggests that the effect may depend on the resource constraints faced by individual countries. Resource constraints may lead countries to reduce development expenditure to maintain defence programmes, whilst relatively unconstrained countries may pursue both development and defence. A regression model is developed, incorporating resource constraints. Countries are separated into a resource constrained and an unconstrained group, using cluster analysis. Empirical results are discussed for each group. The coefficient of the defence variable was positive and significant for the richer group, and negative but not significant for the poorer group of countries. The study concludes that defence does not compete excessively for scarce resources in countries which are relatively resource unconstrained. There is no statistically discernible effect on economic growth from defence in countries which are relatively lacking in resources. Data for 1960 and 1978. Bibliography of thirteen references.

Technology, weapon systems

KALDOR, M.

The Significance of Military Technology, Bulletin of Peace Proposals, Vol 2, 1977, pp 121-123.

Military technology reflects the level of technology and the generally prevalent method of organisation in any society. The current dominant military technology is the weapon system, comprising a weapon platform, weapon and a means of command and control. Such systems tend to be linked together in a larger hierarchical structure, for example an aircraft carrier. Such weapon systems are reaching diminishing military returns and hence escalating costs. In addition, technology is making such systems more vulnerable. The transfer of military technology implies the transfer of a social system and potential obsolescence leads to diversion of the weapons systems concept to new markets in developing countries. An alternative development pattern for the third world requires technical and military relationships based on domestic forms of social organisation, with far reaching consequences for the international military system. No data. Bibliography of two references.

Technology, trade

LANDGREN-BACKSTROM, S.

The Transfer of Military Technology to Third World Countries, Bulletin of Peace Proposals, Vol 2, 1977, pp 110-120.

The arms race has spread to more countries, including the third world. Third world countries typically start by importing arms. Some also import technology and create an indigenous industry. National security and independence are the most common reasons. Economic arguments of lower cost and technical spin-off are also used. The SIPRI arms production register shows the spread of arms production into the third world. Case studies of Egypt and Iran are given. The military use of resources in the Third World is small by comparison with the industrialised countries but is growing more rapidly. Benefits from spin-off are doubtful and resources are diverted from other uses. Data for 1945-1976. Bibliography of fifteen references.

International Development Fund

LOCK, P.

Armament Dynamics: An Issue in Development Strategies, Alternatives, Vol 6(2), July 1980, pp 157-178.

The militarization of Third World Countries is analysed in terms of historical and structural linkages with the West, traced back to US military aid to emergent states during the cold war. The globalization of East-West conflict has led to increased intervention and regional arms races. At the same time reductions in military aid have led Third World countries to subordinate development needs to military preparedness. The spiral of military-related economic links with the world market leaves Third World countries facing chronic balance of payments problems and unemployment. An internationally administered fund devised from a tax on arms sales or military spending is proposed to provide an incentive for conversion of arms industries, without preventing all arms purchases. Data for 1976. No bibliography; footnote references are given.

Technology,

LOCK, P.; WULF, H.

Consequences of Transfer of Military-oriented Technology on the Development Process, Bulletin of Peace Proposals, Vol 2, 1977, pp 127-136.

Concerned with the impact of changes in the role of the military on the formation of society and development in the third world. Importing military technology often drastically reduces the capacity of developing countries to import what is needed for development and industrialisation. This continues through a chain of supplementary imports required to support the equipment. Third world production of arms is also increasing, aided by the gradual transfer of technology progressing from maintenance and the production of spares through assembly, production and finally design. The relevance of advanced military technology to developing countries is questioned. Military production has special requirements which distort the development process and divert resources. The transfer of arms does not change the dominance - dependance pattern between industrialised and developing countries. The alternative would be a military doctrine based on the needs of the third world. No data. Bibliography of twelve references.

Militarization, Africa,

LUCKHAM, R.

Armaments, Underdevelopment and Demilitarisation in Africa, Alternatives, Vol VI (2), July 1980, pp 179-245.

The militarization of Africa extends beyond the acquisition of weapons to include the expansion of the professional military establishment, the prevalence of authoritarian regimes relying on force, and an increase in external and internal war. National independence has become linked with military power. Militarization is closely tied to development and the way state power is used. The weapons trade and militarisation are analysed and the internal and external use of state power in Africa is described. Western proposals for disarmament are viewed with suspicion in Africa. Continued militarization will sustain dependance and deepen the contradictions in African society. Data for 1960 to 1978. No bibliography; footnote references are given.

Arms Trade

VAYRYNEN, R.

Economic and Political Consequences of Arms Transfers to the Third World, Alternatives, Vol VI (1), March 1980, pp 131-155.

Arms transfers help shape the structure of the international system, suppressing social and economic change in Third World Countries. The emerging arms industries are reviewed. Reliance on foreign technology and expertise to support domestic arms production further destroys economic, technological and social development in the Third World. Data for 1950 to 1977. No bibliography; footnote references are given.

INTERNATIONAL TRADE

Growth

BRZOSKA, M.; OHLSON, T.

The Future of Arms Transfers: The Changing Pattern, Bulletin of Peace Proposals, Vol 16 (2), 1985, pp 129-137.

Trade in major conventional weapons went into a decline in the 1980's after three decades of growth. The combined share of the USA and USSR is falling, whilst that of Western Europe is rising. The share of Third World exporters is also rising. The downward trend in overall trade is in part a reflection of global recession and shortage of hard currency funds. In addition, many countries are still absorbing weapon systems acquired in the 1970's. Domestic production and trade in components and technology are also replacing trade in weapons. The arms trade is entering a new phase with fierce supply-side competition coinciding with reduced demand for weapons. A buyers market is thus developing, with technology transfer, offset agreements and updating programmes becoming important elements in sales. The volume of trade is likely to increase again when economic conditions improve and weapons need replacing. Data for 1970 to 1984. Bibliography of five references.

Measurement

CAMPBELL, L. G.; SHUE, R. J.

Military Transactions in the US Balance of Payments, Survey of Current Business, Vol 52 (2), February 1972, pp 22-28.

Presents the 1971 data on defence expenditure which enter into the US balance of payments. Analyses US defence expenditure abroad for the period 1960-1970 by major category of expenditure and by geographic location of spending. Data for 1960-1971, plus a statistical note on definitions and coverage. No bibliography.

Receiving country view

CHAUDHURI, J. N.

The International Arms Trade: The Recipient's Problems, Political Quarterly, Vol 43 (3), July/September 1972, pp 261-269.

Considers the problems faced by recipients of arms, particularly countries which have recently started establishing armed forces. The difficulties arise from the need to maintain continuity of supply, to match equipment with needs and the technical capacity of the forces to use it, and the budgetary constraints on purchases. Four options are considered: indigenous production, open market purchase, restricted market purchase, and acquisition through gifts. The problems of each are considered, including political implications, ability to use the weapons and influence by a foreign supplier. The study suggests that there are few solutions to the problems. Each option has advantages which have to be balanced against the disadvantages. No data. No bibliography.

Arms production, sociology, nato, collaboration

EIDE, A.

Arms Transfer and Third World Militarization, Bulletin of Peace Proposals, Vol 2, 1977, pp 99-102.

The introduction to a special issue on the arms trade and the transfer of military technology. The third world is arming at an unprecedented rate, both by production and trade in arms. The centre of the world military structure remains the industrialised countries. The most important aspect of the control of the world

military structure is R & D. Other changes are the militarization of politics and the use of violence against the domestic population. Third world militarization wastes resources, structures the economy for military procurement rather than self-sufficiency and perverts political processes. Restraint by suppliers and an effort by third world countries to break out of military dependency are required. No data. No bibliography.

Balance of payments, burden sharing

FRIED, E. R.

The Military and the Balance of Payments, Annals of the American Academy of Political and Social Science, Vol 406, March 1973, pp 80-85.

The foreign exchange expenditures on US military activity overseas exceed receipts from sales of US military equipment and services abroad. Calls for measures to reduce the burden have been resisted by Western Europe and Japan. When the convertibility of the US dollar was suspended in 1971 the issue became not whether the imbalance should be corrected but what form the adjustment should take. After reviewing the size of the burden and likely future trends, the article suggests any future military balance of payment costs should merge into the general process of achieving equilibrium in the balance of payments. Examples refer to early 1970's. No bibliography; footnote references are given.

Protection, International Comparisons

JOSON, S. S.

The GATT Agreement on Government Procurement: Canada and Australia, Australian Economic Papers, June 1985, pp 76-94.

Estimates the protective element in government procurement for Australia and Canada at the aggregate and sector level, and the implicit nominal protection rate. International comparisons of protection for defence and civilian procurement are also provided. An input-output model is used to estimate the hypothetical government imports with no buy-local policy, and the increase in tariff protection needed to achieve the same result. Canada maintains a well-supported defence sector, while Australia offers more protection to civilian than defence industries. Protection for local industry is highest in the USA. Signing the 1981 GATT agreement would not prevent Australia developing a local defence industry. Appendix on data sources and preparation. Data for 1960's and 1970's. Bibliography of seventeen references.

Measurement

KEALY, W. G. Jr.; THORN, R. D.

Military Transactions in the US International Accounts, 1972-1977, Survey of Current Business, Vol 58 (5), May 1978, pp 22-27. Presents the 1977 data on defence expenditure which enters the US international accounts. Analyses military transfers and direct expenditure abroad by major categories of expenditure and by geographic location of sales. Data for 1972-1977, plus a technical note on definitions and coverage. No bibliography.

USA

KEMP, G.

Dilemmas of the Arms Traffic, Foreign Affairs, Vol 48 (2), January 1970, pp 274-284.

Tighter controls over US arms sales may effect the size and nature of military aid and sales programmes, but judgement of the issues

behind each case remains the basic problem. After reviewing the trends in US arms sales the policy issues are outlined and the implications for limiting the arms trade considered. The study concludes that there are potential costs and benefits involved in such sales. Each request for arms should be treated on its merits, taking into account the long-term implications of the arms trade. No data. No bibliography.

KEMP, G.

The International Arms Trade: Supplier, Recipient and Arms Control Perspectives, Political Quarterly, Vol 42 (4), October/December 1971, pp 376-389.

Presents an overview of the international arms trade since the end of World War II and suggests an analytical framework for assessing individual transfers. The trade is considered from the viewpoint of suppliers and recipients. In each case the political, economic and strategic factors behind the transfers are identified and the implications for arms control discussed. The study concludes that the prospects for reducing the trade are poor, given that demand is high and the rewards for supply outweigh the dangers. No data. No bibliography.

US arms sales, political factors; balance of payments.

KLARE, M.T.

The Political Economy of Arms Sales, Economic Forum, Vol VIII (1), Summer 1982, pp 33-47.

The volume and quality of US arms sales to other countries have increased rapidly. The factors behind US exports of arms are discussed, and an order of significance suggested. Politico-military factors take precedence over economic concerns. The political factors are support for allies, regional power balance, political leverage, access to foreign leaders and internal security. Economic factors cover aerospace productivity, cost sharing, balance of payments and petro-dollar accumulations. The study concludes that with little expectation of restraint on sales the prospect is for an ever expanding volume of arms transfers, with the heightened risk of war at ever-increasing levels of violence. Data for 1950 to 1980. Bibliography of twenty eight references.

Development, disarmament.

KLEIN, J.

Arms Sales, Development, Disarmament, Bulletin of Peace Proposals, Vol 14 (2), 1983, pp 157-163.

There has been strong growth in the trade in arms, particularly between industrialised countries and the third world. Arms production in the third world has also increased. Arms sales are often accompanied by technical assistance and support, and provide a vehicle for political influence. The arms trade also influences the foreign policy of supplying countries. Attempts to control or reduce the arms trade have met with little success. A general limitation on arms is probably required before the arms trade can be reduced. No data. Bibliography of twenty references.

Development, off-set, debt burden.

LANDGREN-BACKSTRÖM, S.

The World Arms Trade: The Impact on Development, Bulletin of Peace Proposals, Vol 10 (3) 1979, pp 297-300.

Arms transfers from industrialized to developing countries form

about 70% of the international arms trade and are growing rapidly. Industrialized countries normally reach off-set agreements for production by the importer. For developing countries, arms imports generally increase their debt burden. Increases have occurred in both the volume and sophistication of the arms traded. The trade is analysed, and the major suppliers and importers identified. The type of arms traded are also considered. Control over the arms trade requires control of production in developed and developing countries. Data for 1970's. No references.

Arms control, developing countries.

MALLMANN, W.

Arms Transfers to the Third World: Trends and Changing Patterns in the 1970's, Bulletin of Peace Proposals, Vol 10 (3), 1979, pp 301-307.

International trade in arms grew in the 1970's in both the monetary value and the sophistication of equipment traded. The changing pattern of trade is analysed by country and by type of equipment traded. Industrialised countries are now prepared to supply the latest types of equipment to developing countries, increasing the importance of the support and maintenance element of arms transfers. Suppliers have gained influence over the foreign and defence policies of recipients by controlling spares and maintenance. Arms transfers are a threat to arms control and must be seen in the context of North-South relations. An adequate forum for discussion of arms transfers is needed. A balanced approach to transfer and production is required to prevent domestic production replacing the arms trade. Data for 1966 and 1975. Bibliography of twenty-one references.

USSR, USA, France

PIERRE, A. J.

Arms Sales: The New Diplomacy, Foreign Affairs, Vol 60 (2), Winter 1981/82, pp 266-286.

Arms sales have become an element in world politics, raising political debates within supplier countries and becoming an integral part of foreign policy. After reviewing general trends in arms sales the policies and practices of the Soviet Union, France, and the United States are analysed and implications drawn for efforts to restrain international arms transfers. An initial priority on agreement between the USA and Europe is proposed, followed by agreement with the USSR when conditions are more favourable. The involvement of the recipients in limiting arms sales is also recommended. No data. No bibliography.

Licencing

STANLEY, J.

The International Arms Trade: Controlled or Uncontrolled?, Political Quarterly, Vol 43 (2), April/June 1972, pp 155-168.

The introduction of licencing for arms exports from the principal producing countries moved the arms trade into public policy, bringing a change of attitude towards the manufacture and sale of arms. The range of controls imposed by western governments are outlined and the national policy issues behind them briefly discussed. The role of the United Nations in the control of the arms trade is reviewed and regional measures described. The study concludes that increases in the number of suppliers have made control more difficult. Domestic and international opinion is becoming a more important constraint than formal control procedures. No data.

no bibliography.

Developing countries

BALL, N.

Defense and Development: A Critique of the Benoit Study, Economic Development and Cultural Change, Vol 31 (3), April 1983, pp 507-524.

The study by Benoit for ACDA (published in book form as Benoit, E., Defense and Economic Growth in Developing Countries, Lexington Books, Lexington Massachussets, 1973) is generally cited as supporting the contention that military expenditure may have some net positive impact on the development process in Third World countries. Benoit's conclusions were more tentative, but can be criticised in the way variables were defined. The conclusion depended less on the results of the regression analysis than on the assessment of the non-quantifiable contributions to the civilian economy. These criticisms are analysed in the light of subsequent studies, and inadequacies in the approach identified. The critique concludes that an understanding of the impact of the armament process on development requires case studies based on the socio-economic, political and ecological circumstances of the countries. No data. Bibliography of thirty-eight references.

GROWTH

Recession, defence cuts, conversion

BENOIT, E.

Cutting Back Military Spending: The Vietnam Withdrawal and the Recession, *Annals of the American Academy of Political and Social Science*, Vol 406, March 1973, pp 73-79.

The 1969-1971 US recession should not be blamed on defence cuts following the withdrawal from Vietnam, but on the failure to supply adequate public offset projects. The impact on GDP relative to the size of the cuts was greater than after the Korean war. The popular association of defence cuts with recession does not reflect the inevitable outcome of the transfer of resources from defence to civil use if policies to minimise the effects are pursued. Data refer to 1945-1971. No bibliography; footnote references are given.

Arms race, disarmament

BROWN, L. R.

Redefining National Security, *Challenge*, Vol 29 (3), July-August 1986, pp 25-32.

Since the second world war economic expansion has allowed the US and other countries military expenditure to expand at the same time as resources were devoted to other problems. Progress on both is no longer possible. New, non-military threats to national security are arising from oil depletion, third world debt and environmental destruction. Solving these problems requires demilitarization of the world economy and a shift of resources from the arms race. Data for 1984. No bibliography.

Tradeoffs, health expenditure, models of expenditure

PEROFF, K.; PODOLAK-WARREN, M.

Does Spending on Defence Cut Spending on Health?: A Time-series Analysis of the US Economy 1929-74, *British Journal of Political Science*, Vol 9 (1), January 1979, pp 21-39.

Trade-offs between public programmes occur even when resources are growing. A variety of possible defence-welfare trade-offs have been suggested, but the results of empirical analysis are mixed. Examines empirically four types of potential trade-off between defence outlays and total public health expenditure, health research and development, private health care expenditure, and private investment in hospital construction and medical technology. Uses regression analysis on a time series of US data for 1929 to 1974. Results are presented, including equations with controls for peace and war, the defence share of the budget, the stages of the budgetary process, and the type of financing for public expenditure. The results for public health lean slightly towards a trade-off. No trade-off was found between defence expenditure and health research. For private health care a trade-off exists only for capital investment in health. Only the control for budgetary process had an impact, with defence affecting health requests more than budgetary allocations or final expenditures. The possibility of a trade-off by preventing the introduction of programmes can not be assessed. No data. No bibliography; footnote references are given.

Output, employment, models, wages.

THORE, S.; KOZMETSKY, G.; BURRIS, M.

Effects of Defense Spending on the Texas Economy: An example of Concave Programming, Journal of Policy Modelling , Vol 6 (4), November 1984, pp 573-586.

Provides estimates of the additional output and the number of jobs created in 173 productive sectors of the Texas economy resulting from the projected US defence buildup through 1987. A concave programming format was used to compare the need for labour in 23 aggregate sectors with the available workforce. Wages rise in sectors with scarce labour, leading to an increase in the general price level and a reduction in real goods and services obtained with defence appropriations. The analysis is based on a regional input-output model. The optimization framework is described and empirical results presented for output and employment. The defence build-up is estimated to add more than a billion dollars to the Texas economy in 1979, rising to 1.5 billion in 1985 (1979 dollars). About 45000 new jobs will be created annually, rising to 64000 in 1985. The manufacturing sector will be the largest beneficiary. In most industries an adequate pool of labour is available, but the availability of skills and abilities has not been considered. Data for 1983 to 1987. Bibliography of twenty references.

GENERAL

Procurement Efficiency, NATO, International Collaboration, developing countries, disarmament
BORNER, S.; TAYLOR, A. (eds)

Structural Change, Economic Interdependence and World Development
Proceedings of the Seventh World Congress of the International Economic Association, Madrid, Volume 2: Natural and Financial Resources for Development, Macmillan, London, 1987.

Part IV of this volume reports the results of a special session of the World Congress devoted to the economic impact of the arms industry, comprising an introduction and five chapters. There are theoretical, methodological and empirical contributions. Data are presented on employment and concentration ratios in aerospace industries in 1980; the number of major arms produced indigenously or under licence; arms production and potential; arms imports; and Israel's arms purchases and arms exports.

SCHMIDT, C. Introduction, pp 175-180; HARTLEY, K., *The Evaluation of Efficiency in the Arms Industry*, pp 181-202; WULF, H., *Arms Industry Unlimited: The Economic Impact of the Arms Sector in Developing Countries*, pp 203-218; INTRILIGATOR, M. D.; BRITO, D. L., *A Game Theoretic Analysis of the Role of the Arms Industry in the International Security System*, pp 219-232; DEGER, S.; SEN, S., *Defence Industrialisation, Technology Transfer and the Choice of Techniques in LDCs*, pp 233-254; SCHMIDT, C., *Alternative Approaches to the Arms Industry: Some Suggestions for a Research Programme*, pp 255-263. Data for 1970-1980. No bibliography: chapter references are given.

Data, defence purchases
WAKEFIELD, J.C.; ZIEMER, R.C.

National Defense Purchases: Detailed Quarterly Estimates, 1977-82, Survey of Current Business, Vol 62 (11), November 1982, pp 13-17. Presents more detailed quarterly estimate of US national defence purchases of goods and services than previously published. Data are presented for current and constant dollar purchases and implicit price deflators for 1977-82, with a description of the series and their relationship to previous estimators. Data for 1977 to 1982. No bibliography.

TODD, D.; HUMBLE, R.D.

World Aerospace: A Statistical Handbook, Croom Helm, London, 1987, pp 226.

This book presents a survey of the aircraft industries of the USA, the Soviet bloc, Europe and the newly-industrialising nations. It describes collaborative defence programmes and the military support for aircraft industries in nations such as China, India, Israel and South Africa. Consideration is also given to technical change. There are seventy five tables providing data on the major firms and industries, together with fifty eight figures many of which deal with trends in product and process technologies. No bibliography but data sources are given.

TODD D.; SIMPSON, J.

The World Aircraft Industry, Croom Helm, London, 1986, pp 272.

Governments are closely involved in supporting their national aircraft industries for military reasons and also for wider economic benefits in the form of jobs, high technology, exports

and for prestige. This book reviews the aircraft industries of the world, their location, the markets for military and civil aircraft, the role of the state and the contribution of the industry to development. The chapter on the military aircraft market deals with demand, the suppliers and the military-industrial complex. There are data on world and NATO military and equipment expenditures, arms imports, aircraft deliveries to the less developed nations and the major military aircraft firms, especially in the USA, for various years 1960-85. Bibliography of 111 references.

EFFICIENCY IN PROCUREMENT: NATIONAL

Regulation, monopsony, industrial concentration.

AGAPOS, A. M.

Competition in the Defence Industry: an Economic Paradox, Journal of Economic Issues, Vol V (2), June 1971, pp 41-55.

Overregulation and inefficient administration by the government have led to inadequate competition and industrial concentration in US defence production. The government uses its monopsony position to control entry, growth and exit of contractors and to control production methods. No single strategy is likely to succeed in increasing competition, but a more effective mix of strategies could. No data, examples from 1960's. Bibliography of twenty-one references.

Profitability, risk

ANDERSON, R. M.

Handling Risk in Defense Contracting, Harvard Business Review, Vol 47 (4), July-August 1969, pp 90-98.

The shift of responsibility for cost performance to prime contractors in US defence procurement made the risk element more significant for industrialists. Fixed price and total package contracting reduced the opportunities for recovering from underbidding through contract changes or follow-on orders. Ways to identify the possible risks in development are identified and methods of appraisal and control of uncertainties are examined. The application of the technique is illustrated by examples. No data. No references.

US procurement policy,

ANDERSON, R. M.

Anguish in the Defense Industry, Harvard Business Review, Vol 47 (6), November-December 1969, pp 162-170 and 176-180.

The US defence industry has been experiencing hard times in the face of cost over-runs, criticism and cut-backs. The performance of the industry is analysed against the environment established by the procurement policies of its essentially single customer, the US government. The effect of changes in procurement policies on the contractors are considered, and changes proposed for both sides. The government procedures should be revised to provide a better appraisal of cost and scheduling requirements and of the prospects for Congressional approval before full-scale competitions are initiated. Documentation during development should be reduced, and contracts enforced strictly, without being influenced by companies profit problems. Defence companies need to strengthen their estimating, risk management and control procedures, learning to manage by objectives with the first concern being achievement of results and profits. No data. No references.

Procurement systems

BRECKNER, N. V.

Government Efficiency and the Military "Buyer-Seller" Device, Journal of Political Economy, Vol 68 (5), October 1960, pp 469-486.

Buyer-seller schemes are intended to introduce simulated markets into relationships between units of government to enable comparison to be made between competing resource claims, and efficient allocations to be achieved. In the USA the schemes are principally found within the Department of Defense. The coverage of the schem-

es is described and their operation analysed. An internal pricing and allocation model is outlined and implications for supplier incentives and cost minimization considered. For the schemes to work there must be real choice open to users (consumers), incentives to adopt efficient solutions, monitoring of achievements, and development of criteria for allocating resources to centres of decision-making. The study concludes that simultaneous fulfilment of the conditions is unlikely. The buyer-seller schemes can identify issues even if they do not ensure efficient solutions. Data for 1955 to 1958. No bibliography; footnote references are given.

USA, incentive contracting

CUMMINS, J. M.

Incentive Contracting for National Defense; A Problem of Optimal Risk Sharing, Bell Journal of Economics, Vol 8 (1), Spring 1977, pp 168-185.

Risk sharing in US defence contracting is analysed using a model of insurance with moral hazard. The hazard arises because it is not in the firms interest to hold down costs if the government agrees to bear all the costs. After deriving the equilibrium conditions, a simple incentive contracting system is analysed. The study suggests that the firms attitude to risk and its propensity for moral hazard was more important than the extent of cost overrun and percentage profit. A modified contingent claims form of contracting is proposed, with several contingent sets of contract terms agreed initially, the set applied depending on the design specification finally selected. No data. Bibliography of nineteen references.

EFFICIENCY IN PROCUREMENT: NATO

NATO, collaboration, equipment costs, competition, aerospace
HARTLEY, K.

NATO Arms Cooperation: A Study in Economics and Politics, Allen and Unwin, London, 1983, pp xi, 228.

A public choice analysis is applied to NATO weapons procurement policies. Theory and evidence on weapons standardisation in Nato is presented and critically assessed. Standardisation could result in unit cost savings of 20-30%. Aerospace is taken as a case study. Evidence is presented on the costs and benefits of such alternative procurement policies as independence, free trade, co-production and joint projects. Proposals are made for introducing greater competition into Nato weapons markets. Two appendices summarise the results of surveys of European and US firms, and of joint projects. Data for 1977-1980. Bibliography of 136 references.

Cooperation, political economy, standardisation
HARTLEY, K.

Public Procurement and Competitiveness: a Community Market for Military Hardware and Technology?, Journal of Common Market Studies, Vol XXV (3), March 1987, pp 237-247.

Within the EEC, separate national defence industries have resulted in wasteful duplication of costly research and development and relatively short production runs. European arms industries are not competitive. Economic principles are outlined relating to the cost savings from larger outputs, the gains from trade and the benefit of competition. An EEC common market in defence equipment is an appropriate solution but is politically unlikely. European collaboration is more likely and its benefits and costs are outlined. Even with its inefficiencies, collaboration results in cost savings for each partner, of possibly 35% on research and development and up to 10% on production costs. Examples refer to 1980's. Bibliography of twenty references.

Standardisation, Political Economy, Cooperation, Nationalisation
HARTLEY, K.

Nato, Standardisation and Nationalism: An Economists View, Royal United Services Institute Journal, September 1978, pp 57-60.

The increasing cost of weapons and absence of major wars has brought pressure for lower defence outlays. Standardisation in Nato is one way of improving efficiency in military expenditure but increased co-operation conflicts with the nationalism of members. The economic logic of standardisation is evaluated and critically assessed. The failure to break a NATO free trade area in weapons is explained by each nation's desire for independence, fears that it will lose from a free market and by the economics of the political market. Costs are incurred as a result of market failure when international competitive procurement is rejected for political reasons. No data. Bibliography of eight references.

Alliances, Political economy
HARTLEY, K.; PEACOCK, A.

Combined Defence and International Economic Cooperation, World Economy, Vol 1 (3), June 1978, pp 327-339.

Applied to NATO, the economics of military alliances raises issues of free riding, burden sharing and international trade in

weapons. Conventional economic analysis ignores important aspects of establishing and maintaining international defence agreements. The wider framework provided by the economic theory of politics is required. Economics alone can not explain why Nato appears unable to correct market failures in defence when government intervention is frequently the source of the problem. Data for 1950-1976. Bibliography of eight references.

EFFICIENCY IN PROCUREMENT: EUROPEAN COMMUNITY

CREASEY, P.; MAY, S. (eds).

The European Armaments Market and Procurement Cooperation, Macmillan, London 1988, pp x, 201.

An analysis of the reasons for success or failure in European efforts at cooperation in defence procurement. There is both a general analysis and case studies of battlefield communications, fighter aircraft and helicopters. There are five chapters and an appendix listing European cooperative ventures and data on world market shares, arms exports and European defence producers.

Creasey, P.; May, S., **The Political and Economic Background;** Hartley, K., **The European Defence Market and Industry;** Heisbourg, F., **Public Policy and the Creation of a European Arms Market;** Creasey, P., **European Defence Firms in Cooperation Agreements;** Creasey, P., **The Options and Prospects for Defence Procurement Collaboration.** No bibliography; chapter references are given.

EQUIPMENT PROCUREMENT: DEFENCE INDUSTRIAL BASE

ADAMS, W.

The Military-industrial Complex and the New Industrial State, American Economic Review, Vol LVIII (2), May 1968, pp 652-665. Proposes the hypothesis that concentration in US industry is often the result of unwise, man-made, discriminating, privilege-creating government action. In the process the institutional fabric of society is transformed from economic capitalism to political capitalism. In the military-industrial complex the government creates and institutionalises power concentrations which become self-sustaining and outside public control. The government becomes a monopsonistic buyer of unproven and non-existent products from powerful oligopolists. Considers the policies which support the military-industrial complex, including defence and space contracts, government research and development and patents, stock-piling, and removal of potential competitors from alternate public policy or foreign trade. Concludes that the problem is largely political, arising from the creation, protection and subsidization of private privilege by government. No data. Bibliography of twenty references.

Monopsony, market structure,

ADAMS, W.; ADAMS, W. J.

The Military-Industrial Complex: A Market Structure Analysis, American Economic Review, Vol LXII (2), May 1972, pp 279-287. Suggests that poor performance by US defence industries arises from a market structure dominated by government intervention and privilege creation. Some structural remedies are considered. Oligopoly suppliers prevent the monopsony buyer acquiring the information necessary to exploit its monopsony position. The government thus continues with existing suppliers and performance. By supporting multiple sources of development early in a project the government would obtain the information necessary to make rational choices based on quality, price and delivery. Nationalization would replace oligopoly with monopoly, making the suppliers less likely to find and to apply the optimum solution. Regulation would need the information currently lacking and adds little power to a monopsony trader. Market power of suppliers can be reduced by increasing their number or redistributing risk sharing between government and suppliers. No data. Bibliography of fifteen references.

Soviet Union

ASPATURIAN, V.V.

The Soviet Military - Industrial Complex: Does it Exist?, Journal of International Affairs, Vol 26 (1), 1972, pp 1-28.

A military-industrial complex in the broad sense of a sharing of interests by the military, industry and politicians probably exists in all countries. The more restricted sense of an interdependent structure of interests behaving as a distinctive political actor probably does not exist anywhere. The Soviet military-industrial complex is somewhere between the two. The physical component consists of the armed forces, the defence industry and related research and development, heavy industry, and the conservative wing of the Party. The political role of the military is considered, and the defence industries described. The views shared by the four components are summarized in terms of military policy, economic policy, ideological policy and foreign

policy, and their implications for international tension discussed. Soviet economic development is distorted by the military-industrial complex, which poses a threat of economic stagnation and public restiveness which may force the Soviet leadership into confrontation with the military-industrial complex - but not before it achieves superiority in military capability. Data for 1950 to 1970. No bibliography; footnote references are given.

USA, history of MIC, political economy

BAACK, B.; RAY, E.

The Political Economy of the Origins of the Military-industrial Complex in the United States, Journal of Economic History, Vol XLV (3), June 1985, pp 369-375.

The rapid growth of the US Navy between the Civil War and World War I is examined for evidence of the origins of the subsequent development of the military-industrial complex. The period saw the alignment of political and economic interest groups, reflected in the voting patterns on military appropriations. The study concludes that the seeds of the military-industrial complex were planted and the pattern from growth established during the peacetime build-up of the Navy in the late nineteenth and early twentieth centuries. No data. No bibliography; footnote references are given.

International Companies, Political economy, conversion

BALL, N.; LEITENBERG, M. (eds)

The Structure of the Defense Industry: An International Survey, Croom Helm, London & Canberra, 1983, pp xi, 372.

Ten chapters, with an introduction and two appendices, constitute this major review of the role of the defence industry in the industrial and economic structure of ten countries since World War II.

Blackaby, F., Introduction: the Military Sector and the Economy, pp 6-20; Reppy, J., The United States, pp 21-49; Holloway, D., The Soviet Union, pp 50-80; Kolodziej, E. A., France, pp 81-110; Brzoska, M., The Federal Republic of Germany, pp 111-139; Holmstrom, P.; Olsson, U., Sweden, pp 140-180; Tiedtke, S., Czechoslovakia, pp 181-213; Rossi, S. A., Italy, pp 214-256; James, S., China, pp 257-277; Steinberg, G., Israel, pp 278-309; Wulf, H., Developing Countries, pp 310-343.

Appendix 1: Ball, N., The United Kingdom, pp 344-360.

Appendix 2: Leitenberg, M., Use of Raw Materials for Military Purposes, pp 361-362.

The study aims to identify the extent to which military procurement is influenced by political and economy factors such as the maintenance of employment and the industrial structure of the country. The chief determinants of military expenditures and arms procurement are choices and desires based primarily on political decisions, rather than economic pressures. The conversion of defence industries would be necessary if military expenditure, force levels and weapons procurement were to be reduced. Such adjustment would be likely to cause relatively minor dislocations. Data varies, up to 1980. No bibliography; chapter references are given.

Arms trade, data sources

BLACKABY, F.; OHLSON, T.

Military Expenditure and Arms Trade: Problems of Data, Bulletin of Peace Proposals, Vol 13 (4), 1982, pp 291-308.

The world military sector is a very large economic sector about which knowledge, particularly statistical, is limited. With a few exceptions classification systems do not distinguish arms, and most countries either exclude arms or combine them with other items. SIPRI has built up information on arms transfer agreements as a way of identifying trade flows. The only alternate source is the US arms control and disarmament agency, mainly using data from US government sources. Military expenditure is also difficult to measure and serious deficiencies exist in national and international data. Valuation and inflation adjustment are further problems. Significant improvements in data could be made, and proposals are included for estimating production, trade and stocks of weapons. Data for 1962-1981. Bibliography of three references.

Profitability

BOHI, D. R.

Profit Performance in the Defense Industry, Journal of Political Economy, Vol 81 (3), May-June 1973, pp 721-728.

Examines the profit performance of US defence firms in the 1960's to see if profits differ from non-defence-oriented firms. The study uses data on 36 defence firms which consistently appeared in the Department of Defense list of "Top 100 Defense Contractors" for the period 1960 to 1969. Profit rates for the sample were compared with those for the 500 largest manufacturing firms over the same period and with shares of total sales formed by defence. Defence shares were compared with the growth of sales to test dependency. The study concludes that there was no apparent relationship between defence business and profit performance, and that defence contractors were diversifying towards civilian business. The Vietnam war generated more profits for civilian business through increased indirect spending than for defence firms. Whether defence companies are too profitable depends on relative risk and efficiency rather than relative profit performance. Data for 1960 to 1969. Bibliography of six references.

Australia, industry studies, importing and licensed production

BUREAU OF INDUSTRY ECONOMICS

The Australian Aerospace Industry; Structure, Performance and Economic Issues, Research Report 20, Australian Government Publishing Service, 1986, pp xxxvi, 425.

In 1984, the Australian Government became concerned about the problems, performance and prospects of its aerospace industry. This study was commissioned to provide an adequate data base for analysis and evaluation as part of the Government review of the industry. Information was obtained from available data sources, a mail survey of over 100 firms and visits to 20 enterprises. The results are presented in 11 chapters describing the development of the industry, its structure, performance, research and development, international aspects, government support and assistance. Some of the benefits of a domestic aerospace industry are reviewed. The offsets programme, for example, is reputed to provide a variety of benefits, including defence, high technology, jobs, exports, national prestige and the promotion of Australia's industrial base. The conclusion recommends that on the basis of its

defence benefits, the aerospace industry should receive a level of support similar to that given to Australian manufacturing industry, with any extra support having to be justified by verifiable defence benefits. Data on sales, defence aerospace expenditure, employment, productivity, concentration, R & D, exports and profitability for various years, usually 1970-85. Bibliography of 346 references.

Growth

COOK, F. J.

The Warfare State, Annals of the American Academy of Political and Social Science, Vol 351, January 1964, pp 102-109.

The term 'the warfare state' refers to the growth in the USA of a military-industrial power complex. This has developed from the assumption that security can be achieved only through power, and that prosperity can only be sustained by military expenditure. The result is a self-perpetuating system, requiring increasing military expenditure in the pursuit of peace through deterrence. Examples refer to the 1960's. No bibliography, footnote references are given.

Organisational study

CUFF, R. D.

An Organizational Perspective on the Military-Industrial Complex, Business History Review, Vol LII (2), Summer 1978, pp 250-267.

Approaches the connection between business, government and defence as an historical problem in the evolution of organisational forms. This enables the study of the military-industrial complex to be integrated into the organisational synthesis perspective on American history and draws attention to the social science literature on public administration and organisation. Developments between World War I and the Vietnam war are reviewed and analysed using the framework of the politics of administration. The influence of wars on the development of administrative techniques and organisations is considered and the shift from reliance on private institutions to a state-managed system as the basis for mobilisation outlined. No data. No bibliography; footnote references are given.

Theory of the firm, payment functions, efficiency

DUMAS, L.J.

Payment Functions and the Productive Efficiency of Military Industrial Firms, Journal of Economic Issues, Vol X (2), June 1976, pp 454-474.

Firms in the military-industrial complex cannot be understood by reference to the typical microeconomic formulation of neoclassical theory as they operate under conditions which violate the assumptions of that theory. The military-industrial firm has a single customer, its status is influenced by political as well as economic factors, and each contract relates to the production of a technology different and hence unique good. The level of output and the form of the revenue function are determined by the customer, not by the firm. The only variables the firm can directly manipulate are the initial cost price and the ultimate cost of production. The customer can directly influence the firm's behaviour through the payment function. Political and economic factors are integrated in a theoretical analysis of payment formula incentives and efficient production, focusing on the firm's objectives as a determinant of its response to incentives. Most of the incentive functions which would induce efficient, cost

minimizing production in profit maximising firms produce the opposite in sales revenue maximizing firms. Such firms need a cost plus incentive fee or fixed price plus incentive fee formula, rigidly enforced and comprehensively audited. No data. Bibliography of twelve references.

Political economy

ENGLAND, R.

Capitalism and the Military-Industrial Complex: A Comment. Review of *Radical Political Economics*, Vol 4 (1), Spring 1972, pp 117-124.

A comment on Reich and Finkelhor 'Capitalism and the Military-Industrial Complex: The obstacles to Conversion'. Suggests two substantive defects in the analysis. The first arises from inadequate analysis of the historical process leading to the militarization of America since 1939. The second stems from the insistence that military spending is the only fiscal device which can stimulate full-employment production and is acceptable to American corporate capital. Suggests environmental protection may emerge as an alternative in the 1970's. Data for 1946-1970. Bibliography of fifteen references.

History of military-industrial complex, USA.

FERRELL, R.H.

The Merchants of Death: Then and Now, *Journal of International Affairs*, Vol 26 (1), 1972, pp 29-39.

A historical perspective on the military-industrial complex, tracing the development of US Congressional concern and academic interest in the relationship between the military and industry. Popular feeling about the existence of a military-industrial complex reached a peak in 1968 and the debate over an anti-ballistic missile system. Military spending at an all-time high had to be linked to an unpopular war before the military-industrial complex became a focus of public attention. No data. No bibliography; footnote references are given.

Competition

HARTLEY, K.; HOOPER, N.

Defence Procurement and the Defence Industrial Base, *Public Money*, Vol 7 (2), September 1987, pp 21-26.

The commitment by the UK government to maintain a strong defence policy in a time of falling expenditure has implications for defence industries and employment. The government hope to avoid a defence review and the cancellation of projects by improving efficiency in procurement. To achieve the size of savings necessary without a defence review the government may have to abandon its support for the UK defence industrial base and buy competitively in world markets. Lack of information on the defence industrial base, or even agreement as to its meaning, makes it difficult to analyse the effects of such a policy. Data for 1985. No references.

International comparisons, manpower,

KEEGAN, J.

World Armies, Macmillan Publishers, London, 1983, pp xvi, 688.

A detailed account of the armies of 150 countries, arranged alphabetically by country. The principal aim is to describe each army in the context of the historical, social, political and military conditions of the country. A standard format is used for each

country, with nine main headings: history; strength and budget; command and constitutional status; role, commitment, deployment and recent operations; organisations; recruitment, training and reserves; equipment and arms industry; rank, dress and decorations; current developments. Data refer mainly to 1982. No bibliography.

History

KOISTINEN, P. A. C.

The Military-Industrial Complex: A Historical Perspective, Praeger Publishers, New York, 1980, pp xiv, 168.

Analyses the development of the military-industrial complex from the civil war through the first and second world wars to the 1970's. Develops support for the conviction that the complex does exist, having its origins in the evolutionary nature of US institutions and owing its growth to the nation's foreign policy. The military establishment of today is a formidable force for supporting the arms race, but it is questionable whether it originated policies of arms expansion and imperialism. Any attempt to control the military-industrial complex must start with changes in foreign policy, reducing reliance on military solutions to what are essentially social, political, ideological and economic issues. No data. Chapter references and bibliography of 608 references.

Aircraft industry. political economy

KURTH, J. R.

The Political Economy of Weapons Procurement: The Follow-on Imperative, American Economic Review, Vol LXII (2), May 1972, pp 304-311.

Decisions to purchase new weapon systems in the US can be explained on strategic grounds or by theories of bureaucratic politics. An alternative explanation for aircraft procurement draws on the relationship between aerospace systems and the corporations which produce them. Pressures exist to award new contracts to production lines which are phasing out an old major contract. This gives rise to the follow-on imperative. No data. Bibliography of ten references.

Poverty

KRAUSE, E. A.

Poverty, Human Resources, and the Military-Industrial Complex: Some Research Issues, Social Sciences Quarterly, Vol 50 (3), December 1969, pp 548-556.

Research is needed into whether the US military-industrial complex is a competitor for funds with anti-poverty programmes or a reflection of a more fundamental reluctance to provide resources for the poor. Analysis of budgetary policies, organizational ideologies, the emergence of institutional complexes, and the technological evolution of society may indicate whether the military-industrial complex is a cause of poverty or a symptom. No data. No bibliography; footnote references are given.

Soviet Union

LEE, W.T.

The "Politico-Military-Industrial Complex" of the USSR, Journal of International Affairs, Vol 26 (1), 1972, pp 73-86.

Four aspects of the Soviet counterpart of the military-industrial complex are distinguished: the institutional structure devoted to

the organization of weapons development and production; the characteristics and quantities of weapon systems; the principal tenets of military doctrine; the budget trends and economic consequences of military programmes. Each is described in turn. The Soviet military-industrial complex is seen as a thriving and productive concern, relatively sure of its right to priority treatment and the political value of its product. Only a SALT agreement would appear to threaten its claim to some 10% of the Soviet GNP. Data for 1954 to 1971. No bibliography: footnote references are given.

Intenernational comparisons, measurement, economic input
STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

Resources Devoted to Military R & D, Almquist and Wicksell, Stockholm, with Humanities Press Inc., New York, and Paul Elek Ltd., London, 1972, pp 112.

The first attempt to estimate the overall size of world military research and development expenditure. Information is given on twenty-two countries, with a review of major weapons development projects from 1960 to 1968. Almost 85% of total military R & D expenditure is by the USA and USSR. Military R & D is more concentrated than total military expenditure. Only the UK and Canada reduced the range of weapons under development compared with the 1950's. Includes notes on sources and methods. Data for 1939 to 1971. Bibliography of 254 references.

Efficiency, costs, budgeting, sect/2 country studies.
TERRY, F. (ed).

Managing the Costs of Defence, Public Finance Foundation, London, 1986, pp iv, 49.

The proceedings of a one day seminar which assessed the choices for UK defence policy following the end of the 3% growth commitment. There are five papers, a summary of the discussion and data on defence costs. Terry, F., Introduction; Freedman, L., Policy Implications of Defence Budgeting; Hartley, K., Improving Efficiency : Prospects and Problems, Smith, R.P.; Humm, A., Managing the Cost of Defence : A Comparison of the British and French Experience; Levitt, M., Need Defence Costs Keep Rising? Data for various years. No bibliography; chapter references are given.

Weapons development programmes, contracting systems, international competition, aerospace.
UDIS, B.

The End of Overrun: Prospects for the High Technology Defense Industry and Related Issues, Annals of the American Academy of Political and Social Science, Vol 406, March 1973, pp 59-72.

Dissatisfaction with military procurement in the USA focusses on inefficiency and waste in contracting for and management of weapons development programmes. Efficiency in weapons acquisition is difficult to define in the absence of a measurable concept of military value. Experiments with alternate contracting systems have failed to yield the expected returns. Further development in procedures, particularly 'fly before buy' and separating development from production, may help contain costs. Tougher competition from European aerospace companies may also encourage efficiency if protectionist pressures are resisted. Examples refer to 1960's and 1970's. No bibliography; footnote references are given.

EQUIPMENT PROCUREMENT: RESEARCH AND DEVELOPMENT

Data Sources, definitions

ALBRECHT, U.

The Military Use of Research and Development: A Global Perspective, Scandinavian Journal of Development Alternatives, Vol III (1), March 1984, pp. 3-14.

Reviews definitions of military research and development, concluding that satisfactory definitions cannot be empirically applied. Sources of data are reviewed and estimates of military research and development expenditure presented for twenty-one countries. Among the OECD, only ten nations devote more than 0.3% of GDP to military R & D objectives. The exclusion of private funding of R & D for military purposes distorts the picture. Data for 1970's. Bibliography of seventeen references.

Opportunity cost of R & D

BOBROW, D. B.

Military Research and Development: Implications for the Civil Sector, Annals of the American Academy of Political and Social Science, Vol 351, January 1964, pp 117-128.

Military R & D contributes to security but imposes an opportunity cost on the civil sector. It can also provide civil benefits from use of the results and from experience in organising industrial R & D. These costs and benefits are reviewed for the USA. Claims that reducing military R & D is necessary if civil R & D is to be adequately funded, US industry to become technologically competitive, civil technology to flourish and scholars become free and inquiring are not substantiated. Data for 1953 to 1972. No bibliography; footnote references are given.

political economy,

COUNCIL FOR SCIENCE AND SOCIETY.

UK Military R & D, Oxford University Press, Oxford, 1986, pp xii, 65.

Half of British research and development expenditure goes into the military sector. Reviews the origin and history of military research and development, the consequences for the economy, its relationship to science and technology policy and arms control. Recommendations for the development of policy involve reducing and concentrating resources, and improving public accountability. Data for period 1956 to 1986. Bibliography of forty-nine references.

GUMMETT, P.

Britain's Military Research and Development: New Proposals, Defense Analysis, Vol 2 (2), 1986, pp 158-159.

Summarises the report issued by the British Council for Science and Society on 'UK Military R and D'.

CASE STUDIES: INDUSTRIES

Aircraft industry, unit costs

ALCHIAN, A.

Reliability of Progress Curves in Airframe Production, *Econometrica*, Vol 31 (4), October 1963, pp 679-693.

Compares the different relationships of direct labour per pound of airframe for various airframe manufacturers using US, World War II data. The functions vary between airframe types and manufacturing facilities both in the amount and rate of change of labour productivity. An average function would produce an error of 25% in predicting the total direct labour requirement for the first 1000 aeroplanes of a particular model, and also for the total output of any particular airframe produced in one facility. Where the past conditions of production no longer hold, the range of error is likely to be greater. Data are included, but the years are not given. No bibliography; text references are given.

International Comparisons, Aircraft Industry.

HARTLEY, K.

Development Time Scales for British and American Military Aircraft, *Scottish Journal of Political Economy*, Vol XIX (2), June 1972, pp 115-134.

Compares the time taken to design, develop and produce aircraft in the UK compared with the US industry. Reviews evidence and presents a model of time scales. Data problems are outlined. Empirical results are presented, based on data for fourteen British and twenty-nine US combat aircraft which entered operational service between 1944 and 1967. Support is found for the proposition that time scales were shorter in the US industry. Three sets of hypotheses are considered, relating to the structure of the industry, procurement policy and the relative knowledge and experience of each industry. The possibility of resource inputs explaining the differences was noted but not tested due to lack of data. Implications are drawn for UK procurement policy. Data for 1944-1970. Bibliography of eighteen references.

Aircraft Industry, labour inputs, learning curves.

HARTLEY, K.

Estimating Military Aircraft Production Outlays: The British Experience, *Economic Journal*, Vol LXXIX (316), December 1969, pp 861-881.

Examines the techniques used and the assumptions made by the UK Ministry of Technology when estimating production costs of military aircraft in the 1960's, with particular reference to airframes. The UK military aircraft market is described, and the system of fixed-price contracts reviewed. Regression equations similar to those used by Ministry estimators are presented, relating production man-hours to aircraft weight and speed. Estimates of learning-curves are also presented. Concludes that estimating errors as well as efficiency in production can determine the profitability of non-competitive fixed-price work. The changes made to the contracting system in 1968 suggest the Government is concerned with the distribution of rewards between itself and the contractors, rather than with the efficiency of resource allocation. Recommends the Ministry to consider competitive procurement, or at least to obtain estimates of costs from alternate sources. No data, based on examples from 1944 to 1964. No bibliography; footnote references are given.

UK, efficiency, models of PROCUREMENT, political economy
HARTLEY, K.; LYNK, E.

Input Demands and Elasticities in UK Defence Industries, International Journal of Industrial Economics, Vol 3, 1985, pp 71-83.
UK arms industries are believed to be inefficient. Two hypotheses are tested. First, the demand elasticity of inputs in UK defence industries is predicted to be lower than that of similar civilian sectors. Second, defence reviews are expected to result in a shake-out of resources. Both hypotheses are tentatively rejected on the basis of initial empirical evidence. Non-competitive contracts and state support for domestic weapons suppliers are likely to explain the results. Based on data for 1948-1976. Bibliography of twenty-six references.

Political economy, regulation
HARTLEY, K.; WATT, P. A.

Profit, Regulation and the UK Aerospace Industry, Journal of Industrial Economics, Vol XXIX (4), June 1981, pp 413-428.
An empirical investigation of the UK aerospace industry to assess the effect of government regulation and state-determined profit rates. Results show the influence of output, share of procurement and factor proportions on profit. The close link between aerospace and manufacturing profitability suggests the profit formula was successful. Data for the period 1949 to 1973. Bibliography of twenty-four references.

Aerospace, subsidies, contract system.
KAUFMAN, R. F.

MIRVing the Boondoggle: Contracts, Subsidy and Welfare in the Aerospace Industry, American Economic Review, Vol LXII (2), May 1972, pp 288-295.

The US aerospace industry has grown into one of the dominant forces in the economy. The government's relationship with the aerospace sector and the military contract system are reviewed. Aerospace contractors can be expected to continue subsidy-maximising and welfare-maximising behaviour, with the acquiescence of government. Recommends a regulatory agency for military procurement, independent of the Department of Defense; an increase in in-house capabilities, including a public non-profit aerospace corporation; and more information on military procurement. No data. No bibliography.

UK, political economy
LINKLATER, M.; LEIGH, D.

Not with Honour: The Inside Story of the Westland Scandal, Sphere Books, London, 1986, pp 218.
An account of the political issues behind the take-over of Westland by United Scientific Technologies. Includes a useful insight into the UK governments views on the helicopter industry and the concept of a defence industrial base in the UK and in Europe. Data for 1985-1986. No bibliography.

Wage controls, price controls
ROCKOFF, H.

The Response of the Giant Corporations to Wage and Price Controls in World War II, Journal of Economic History, Vol XLI (1), March 1981, pp 123-128.
A re-examination of the extent to which large US corporations cooperated with wage and price controls during World War II. Two

sources of evidence are used: the records of court cases involving the Office of Price Administration and large corporations; and accounts of the period by administrators of the period. The study concludes that the giant firms did not openly defy or evade the controls as did many smaller firms. One reason is the effect such action would have had on the public image of the corporations. They based their actions on political as well as economic considerations, taking the opportunity to put pressure on the stabilization authorities after the war, with little political risk. Data for 1943 to 1946. No bibliography; footnote references are given.

Aerospace, profitability,

SUAREZ, J. M.

Profits and Performance of Aerospace Defense Contractors, Journal of Economic Issues, Vol X (2), June 1976, pp 386-402.

Investigates the effect of a firm's earlier performance on its ability to win new US Defense Department contracts. A review of aerospace procurement between 1957 and 1976 is followed by an examination of the performance of defence contractors on major aerospace projects. The analysis indicates the contractors performed poorly in terms of meeting cost estimates, technical specifications and delivery dates. The study concludes that inadequate performance did not affect receipts of new work. The characteristics of the defence industry and the relationship between purchasers and contractor are suggested as explaining the inadequate performance of major producers. Data for 1957 to 1976. Bibliography of thirty two references.

political economy

WOOD, D.

Project Cancelled: A Searching Criticism of the Abandonment of Britain's Advanced Aircraft Projects, Macdonald and Janes, London, 1975, pp ix, 253.

An examination of the military and civil aircraft projects embarked on in Britain since World War II and cancelled before completion. The projects are re-evaluated to see with hindsight which might have proved successful. The cancellations are ascribed to wrong decisions, poor specification of requirements and vacillation by the government and the armed services. Data from period 1945 to 1974. No bibliography.

CASE STUDIES: PROJECTS

Emergency stocks,
BIGMAN, D.; WEKSLER, I.

Emergency stocks: A Theoretical Analysis and an Illustration for Israel, Journal of Policy Modelling, Vol 6 (1), Feb 1984, pp 81-94.

Emergency stocks are maintained to supply the needs for essential commodities in the event of disruptions. A methodology is proposed for designing and evaluating the performance of such stocks. The dynamic behaviour of the system as strategic situations change and stock authorities react is described as a Markov process. The model shows that the reliability of the system increases with stock size, but with diminishing marginal productivity. Lowering the consumption rate permits a sizeable reduction in costs. Systems which take into account prior information about the severity of the strategic situation and advance stockbuilding perform significantly better. Ideas for an optimal stock policy are outlined, to determine the size of stocks and rules for requisition and release. No data. Bibliography of four references.

Political Economy, programme budgeting, models of expenditure.

HARTLEY, K.

Choices in Defence Expenditure, Journal of Economic Affairs, Vol 1 (1), October 1980, pp 31-35.

Considers the UK purchase of Trident missiles as part of a complex set of choices in defence. A programme budget framework provides a basis for assessing the costs and benefits of different solutions. The principle of substitution is outlined and the analysis is modified to allow for the impact of voters, politicians, bureaucracies and other interest groups on defence choices. Data for 1980. No bibliography.

Public Choice, aircraft costs

McGIVEN, M. A.

Engineering, Jobs and Public Policy: the F-18 as a Case Study, Bulletin of Peace Proposals, Vol 14 (2), 1983, pp 199-201.

The F-18 aircraft is made by McDonnell Douglas Corp. in St. Louis for the US Navy. The city and its locality are heavily dependent on the F-18. Criticism of the aircraft on grounds of cost and performance has been intense and prolonged and may lead to cancellation. The procurement decision illustrates public policy issues including a wish to spread aircraft procurement amongst contractors and prevent supplier dominance. McDonnell Douglas opted not to diversify production at St. Louis, and to concentrate F-18 output there. Examples for 1982. No references.

Nuclear deterrent, political economy, cooperation

McINNES, C.

Trident: the only option?, Brassey's Defence Publishers, London, 1986, pp xv, 235.

Examines the options open to the British government in replacing Polaris as Britain's independent nuclear deterrent. Issues behind the choice were a long time period, high costs and political considerations. The way the decision was reached, the priorities it reflected and the impact on the defence budget are outlined. Trident is the best missile in the best submarine, but the opportunity cost is high. The alternatives - US cruise, British cruise, and Anglo-French co-operation - are discussed. Four options

are identified : continue Trident as planned, reduce the size and cost of the force, cancel and adopt a cheaper system, or abandon an independent strategic capability. Data mainly 1980's. Bibliography of 102 references.

GENERAL

Veteran earnings

BERGER, M. C.; HIRSCH, B. T.

The Civilian Earnings Experience of Vietnam-era Veterans, Journal of Human Resources, Vol XVIII (4), Fall 1983, pp 455-479.

Compares the civilian earnings experience of Vietnam-era US veterans with that of non-veterans between 1968 and 1977. The findings of previous studies are reviewed. The earnings experiences are analysed using a model which allows the effects of veteran status to vary by birth cohort, age, and sample year. A sample of 72632 records of males born between 1942 and 1952 is used, taken from the Current Population survey. The study concludes that whereas veterans of earlier periods benefited relative to non-veterans, Vietnam-era veterans were penalised in the labour market for lost training and seniority. In addition, they re-entered the market when opportunities had deteriorated. The results suggest the long-run differential between the two groups will be small. Data for various periods, 1942 to 1977. Bibliography of thirty-one references.

Occupational structures

BIDERMAN, A. D.; SHARP, L. M.

The Convergence of Military and Civilian Occupational Structures: Evidence from Studies of Military Retired Employment, American Journal of Sociology, Vol 73 (4), January 1968, pp 381-399.

Most members of the US armed forces leave the services by the time they are half way through a civilian working lifetime. Most pursue a second career. The experience of transition is examined, using survey data relating to second-career problems of retired military men. Four aspects of possible convergence between military and civilian employment are considered: structural similarities, dynamic similarities, interpenetrability, and attitudinal and ideological similarities. The study indicates that the majority of retired men obtained jobs. Employment was disproportionately high in government and institutional areas and there was concentration in regions of military activity. In general, transfer took place without much formal retraining. The study suggests convergence of the civilian and military occupational structures has facilitated the transfers. Data for 1960 and 1963. No bibliography; footnote references are given.

Income effect of service

BROWNING, H. L.; LOPREATO, S. C.; POSTON, D. L. Jr.

Income and Veteran Status: Variations Among Mexican Americans, Blacks and Anglos, American Sociological Review, Vol 38, February 1973, pp 74-85.

The effects of military service on the income of three ethnic groups - Mexican Americans, Blacks, and Anglos - are examined for five Southwestern States. After reviewing the links between income and veteran status Anglo veterans are predicted to be at an economic disadvantage relative to Anglo non-veterans, whereas Mexican Americans and Black veterans are expected to be at an advantage over their non-veteran counterparts. The differentials between non-veterans and veterans for minority groups are likely to be lowest where job continuity is important. Where continuity is not important the effect of military life as a bridging agent will improve the income of veterans. The expectations were tested using the 1960 US Census, controlling for the effects of education

and occupation differences between the groups. The study concludes that overall the analysis supports the hypothesis that for the minority groups the veteran has an income advantage compared with the non-veteran, and that where continuity is important there is little or no advantage in being a veteran. Data for 1960. Bibliography of thirty-one references.

Veterans and non-veteran earnings

CUTRIGHT, P.

The Civilian Earnings of White and Black Draftees and Nonveterans, American Sociological Review, Vol 39 (3), June 1974, pp 317-327. The effect of military service on adult economic status is examined using a sample of men examined for US selective service in 1954. Civilian earnings in 1964 are compared for draftees and three groups of non-veterans. The analysis is controlled for race, region of employment, academic achievement and years of education. The results show most draftees with earnings at or below those of non-veterans. There is little evidence of benefit to future earnings from job training during military service. The study concludes that placing disadvantaged groups in bridging environments is likely to have less of an impact than direct policies to reduce unemployment and low pay. Data for 1964. Bibliography of twenty-four references.

CONSCRIPTION VERSUS VOLUNTEER FORCE

Unemployment and enlistment, regional model, relative pay.

ALTMAN, H.

Earnings, Unemployment and the Supply of Enlisted Volunteers, The Journal of Human Resources, Vol IV (1), Winter 1969, pp 38-59. Elimination of the draft in the US means the military must increase recruitment through higher pay. A cross-section regression model is used to assess the extent to which regional enlistments have varied in response to relative military-civilian earnings. The estimated supply elasticities tend to support the conclusion that volunteers could be attracted by raising military pay, but large increases would be necessary to offset elimination of the draft. Data for 1963. No bibliography; footnote references are given.

Models of labour supply, military pay, USA

ALTMAN, S. H.; BARRO, R. J.

Officer Supply - The Impact of Pay, the Draft, and the Vietnam War, American Economic Review, Vol 61 (4), September 1971, pp 649-664.

A model of officer supply to the US army is developed on the assumption that in the absence of a draft a choice is made between two occupations: civilian and military. For a given level of military pay enlistment is determined by alternative civilian earnings and taste for civilian or military life. The introduction of a draft can be represented as an increase in officer pay which would have produced the same enlistment rate. The model is applied to data on ROTC enrollment rates for 1960 to 1970. The changes in relative taste for military life as a result of the intensification of the Vietnam war are analysed. The model is used to test whether officer supply is positively related to military earnings; the size of any premium which has to be paid to civilian volunteers; the effect of the Vietnam war on enlistments; and the impact of changes in the probability of being drafted. The model is described and results presented. The results suggest that the officer volunteer rate is positively related to the ratio of military to civilian earnings; the elasticity is slightly higher than one for the low enlistment rates without a draft, but falls as the volunteer rate increases with the draft; even in peacetime a premium has to be paid above civilian earnings; and the premium increased sharply because of the Vietnam war. Data for 1960 to 1970. Bibliography of ten references.

Cost of volunteer force

ALTMAN, S. H.; FECHTER, A. E.

The supply of Military Personnel in the Absence of a Draft, The American Economic Review, Papers and Proceedings, Vol LVII (2), May 1967, pp 19-31.

Summarises the method used by the US Department of Defense to estimate the budgetary costs of shifting to all-volunteer military recruitment. Uses regression analysis to model actual recruiting experience since 1954 and the impact of the draft. The effect of pay was examined by analysing the effect of regional variations in military relative to civilian pay on voluntary enlistment. The estimates of the cost of recruiting an all-volunteer force in the mid 1970's range from \$5.4bn to \$8.3bn, depending on the level of unemployment. Data for 1964. Bibliography of six references.

Draft, model of labour supply, forecasts
ASH, C.; UDIS, B.; MCNOWN, R. F.

Enlistments in the All-volunteer Force: A Military Personnel Supply Model and its Forecasts, *American Economic Review*, Vol 73 (1), March 1983, pp 145-155.

A model of US military labour supply is presented in which enlistment is determined by the pay at which individuals are indifferent between military and civilian employment, given their relative tastes for the two. The model was estimated using two-stage least squares for each armed service branch, for whites and non-whites, over the period 1967 to 1976. Pay elasticities are lower than expected; unemployment has no significant effect on recruitment; the draft stimulates volunteers; and tastes are changing away from military service. The model is used to forecast from the first half of 1977 to the second half of 1979, as one period and as a succession of updated projections. An accuracy analysis of the results is presented, with encouraging results. The model is re-estimated to include the period of the forecast, generally reinforcing the earlier results. No data. Bibliography of fourteen references.

Models of casualties, burden of draft
BERNEY, R. E.; LEIGH, D. E.

The Socio-economic Distribution of American Casualties in the Indochina War: Implication for Tax Equity, *Public Finance Quarterly*, Vol 2 (2), April 1974, pp 223-235.

The draft involves an element of transfer similar to tax transfer in that the burden falls unequally on the population. The concept of the draft as a tax-in-kind is extended to consider the burden of becoming a casualty. A theoretical model of the determination of casualties is developed and used to estimate the relationship between hostile casualties and the rate of mental disqualification, state unemployment rates, and percentage non-white male population. The study concludes that the draft lacked horizontal equity as so few were required to serve. The burden was more inequitable because draftees were significantly more likely to become casualties than other servicemen, and non-college-educated draftees more so than those with more education. The results imply that the casualty tax is regressive. This effect could be reduced by using only volunteers in conflicts, or requiring all military personnel to serve in combat units. No data. Bibliography of twenty-one references.

Monopsony
BORCHERDING, T. E.

A Neglected Social Cost of a Voluntary Military, *American Economic Review*, Vol 61, March 1971, pp 195-196.

A welfare cost may arise under voluntary military enlistment from the monopsonistic purchase of volunteers. Studies of conscription usually assume the actual cost is equal to the budgetary cost of manpower. To be consistent, this assumption should be applied to the analysis of voluntary enlistment as well. Given the unlikelihood of wage discrimination, the marginal supply schedule is appropriate rather than the average. A monopsonistic allocation would result, leading to a welfare loss. Whether this happens in practice requires further consideration of the model of public choice and empirical analysis. No data. Bibliography of six references.

US recruitment, regional variation in recruitment

BROWN, C.

Military Enlistments: What can we Learn from Geographic Variation?, *American Economic Review*, Vol LXXV (1), March 1985, pp 228-234.

The use of peace-time cross-section data avoids the difficulty of allowing for the impact of the Vietnam war when estimating the impact of wages on US army voluntary recruitment. As military pay does not vary between areas, the ratio of military to civilian pay must be assumed to determine enlistment. Pooling several cross-sections allows variations in tastes and abilities between States and regional differences in unemployment to be taken into account. Regression estimates are presented using quarterly data for fifty-one states for fiscal years 1976 to 1982. The results show unemployment to have a stronger effect on recruitment than shown by previous studies. As regional unemployment patterns changed, the Midwest replaced the South as the major supplier of army enlistees. Enlistment was also inversely related to civilian earnings. The study concludes that as unemployment rates fall the army will have difficulty in maintaining numbers of high-quality recruits at current pay levels. No data. Bibliography of ten references.

Business cycle, models of enlistment

DALE, C.; GILROY, C.

The Outlook for Army Recruiting, *Eastern Economic Review*, Vol XI (2), April - June 1985, pp 107-122.

Extends earlier analysis of the effects of the business cycle on US Army enlistments to include results by mental category. A model is developed with enlistment as a function of the unemployment rate, military pay and benefits, and the recruitment effort. GLS estimates are presented for enlistment in mental categories I to IIIA (high quality enlistees), with projections through fiscal year 1990. The paper concludes that unemployment is a significant but not all-important determinant of enlistment rates, and that relative military pay and benefits are important. No data. Bibliography of forty four references.

Slavery

EVANS, R. Jr.

The Military Draft as a Slave System: An Economic View, *Social Science Quarterly*, Vol 50 (3), December 1969, pp 535-543.

Military manpower procurement in the USA has usually been analysed in purely economic terms, assuming a free market in which the price of a significant portion of the labour force is too low. The military draft is also a social system and for many aspects of public policy should be seen as a forced labour or slave system. The necessary conditions for slavery and its operational characteristics are outlined. Examination of the draft shows it to exhibit most of the characteristics of modern slave systems. It is inefficient due to misallocation of labour and lack of proper motivation and morale. Ending the draft involves emancipation, upsetting economic and social relationships. It is only likely to occur when the opportunity cost to society of maintaining slavery is very great, as would be the case under a severe labour shortage. No data. No bibliography; footnote references are given.

Veterans, civilian employment

FREDLAND, J. E.; LITTLE, R. D.

Socioeconomic Status and World War II Veterans by Race: An Empirical Test of the Bridging Hypothesis, *Social Science Quarterly*, Vol 66 (3), September 1985, pp 533-551.

Analyses the reasons for US World War II veterans returning to military duty twenty years after discharge. The bridging hypothesis explains military enlistment in terms of new skills and abilities acquired during military service and conferring benefits when carried over into the civilian economy. Results are presented from a regression analysis of data for a cohort of World War II veterans. Bridging is supported for three skills for whites and two for blacks. Education is the most important explanation of the relative labour market success of veterans. Training makes a difference for whites, and personal independence for both groups. Unexpectedly, the enhancement of human capital is more important for white than black veterans. Good health also contributes to relative earnings success. Government hiring is based on equity, as a reward for service. No data. Bibliography of twenty-six references.

Utility function, re-enlistment, enlistment incentives.

FISHER, F. M.; MORTON, A. S.

Re-enlistment in the US Navy: a Cost Effectiveness Study, *American Economic Review, Papers and Proceedings*, Vol LVII (2), May 1967, pp 32-38.

Analyses the effect on first year re-enlistment in the US Navy of a number of possible incentives, falling into six categories - active duty pay; retirement pay; educational benefits; assignment, housing and other policies; other fringe benefits; promotion opportunities. The existing incentive system was also considered. A utility function for the navy is proposed, using a Cobb-Douglas formulation. The objective is to minimise costs for given targets set in terms of future utility streams. The results suggest the navy would do better to adopt selective re-enlistment incentives rather than raising the general re-enlistment rate. A general rise in the rate means fewer, relatively more experienced men, resulting in higher manpower costs. Data for 1964. Bibliography of four references.

Manpower models, enlistment, labour supply

HORNE, D. K.

Modelling Army Enlistment Supply for the All-Volunteer Force, *Monthly Labor Review*, Vol 108 (8), August 1985, pp. 35-39.

Presents a model of the peacetime supply of graduate-senior males with no prior military service available to the US army. The model is used to generate short-run forecasts for use in developing recruitment policy and allocating recruits to occupational specialities. The supply of graduate-senior males expressed as a proportion of the eligible male population is related to relative military pay, the unemployment rate for the 16-21 age group, the number of army recruiters, and army advertising expenditure. Various two-stage GLS specifications were estimated on quarterly data from 1977 Q1 through 1984 Q2. Results are presented, with projections from 1984 Q1 to 1987 Q1. The analysis concludes that the US army could face serious recruiting problems caused by civilian economic gains and a decline in the population of eligible males. Manpower management policies could reduce the shortfall. No data. Bibliography of fifteen references.

Social origins of manpower, manpower characteristics, labour force characteristics, viability of volunteer forces.

JANOWITZ, M.

The Social Demography of the All-volunteer Armed Force, Annals of the American Academy of Political and Social Science, Vol 406, March 1973, pp 86-93.

The creation of a permanent all-volunteer military establishment in the USA from 1973 breaks with the tradition of maintaining a cadre for mobilisation by draft. The ability to recruit the numbers and quality of personnel required and how representative the force is of US society will influence the internal viability of the forces and military-civilian relationships. The influences on recruitment and the characteristics of the manpower pool are reviewed. Data for 1950 to 1972. No bibliography.

Pay,

LEVITAN, S. A.; ALDERMAN, K. C.

The Military as an Employer: Past Performance and Future Prospects, Monthly Labor Review, Vol 100 (11), November 1977, pp 19-23.

Examines the changes in US military employment following the change from conscription to a volunteer force. Compensation of enlisted personnel increased dramatically in the 1970's, but post-service benefits were reduced. Discipline eased and women were increasingly accepted into the services. As the economy improves, the military will have a harder time competing for workers. Pay increases have limited impact on recruitment. Further reforms of the system may be required to induce selective re-enlistment and to overcome specific shortages. No data. No bibliography.

manpower costs,

OI, W. Y.

The Economic Cost of the Draft, American Economic Review, Papers and Proceedings, Vol 57 (2), May 1967, pp 39-62.

Compares the financial and economic costs of two hypothetical US armies, a voluntary force and a mixed force of conscripts and volunteers. The cost and composition of the all-volunteer force is estimated by assuming the draft is ended and the pay profile is shifted upwards to maintain the force strength. The pay-roll costs of the mixed force are estimated at just over \$12bn in fiscal 1965, those of the volunteer force at just over \$16bn. The opportunity costs in terms of civilian production are \$13bn and \$14bn respectively. The implicit tax on reluctant draftees receiving less pay than would be required to induce them to volunteer, plus the loss of rent to those volunteers, is estimated at \$5.4bn. Data for 1960-1965. No bibliography; footnote references are given.

Models of labour supply, monopsony

QUESTER, A.; NAKADA, M.

The Military's Monopsony Power, Eastern Economic Journal, Vol IX (4), October-December 1983, pp 295-308.

Examines the labour market behaviour of the combined US military services. The debate between an all-volunteer force and the draft centres on the effectiveness of military pay in attracting personnel. The linkages between military and civilian wages are analysed as a basis for exploring the military's monopsony power in the economy. A dominant firm model of monopsony, based on dominant product pricing, is developed and implications for wages,

employment, equity and efficiency are considered. Data deficiencies limit the analysis of the use of monopsony power. The study concludes that the monopsony effects are preferable to the draft. No data. Bibliography of seventeen references.

EFFICIENCY

Models, Cost-plus contracts

HARTLEY, K.; CORCORAN, W. J.

British Aircraft Firms and the Employment Effects of Defence Contracts, Bulletin of Economic Research, Vol 28 (2), November 1976, pp 95-103.

Examines the hypothesis that cost-plus defence contracts resulted in excess employment by UK defence contractors, reflected in a relatively labour-intensive response to increased sales and a slow response to cancellations. Based on survey data of firms in the UK aircraft industry. A standard employment model was used, suggesting short-run employment by a profit maximiser will be determined by given technology, capital stock and output, with a lag in adjusting actual employment. Concludes that support for the hypothesis was limited and tentative. Further work incorporating the economics of politics is suggested. An appendix summarises the survey results. No data. No bibliography; footnote references are given.

Industry case study

HARTLEY, K.; LYNK, E.

Labour Demand and Allocation in the UK Engineering Industry: Disaggregation, Structural Change and Defence Reviews, Scottish Journal of Political Economy, Vol 30 (1), February 1983, pp 42-53. Incorporates variable elasticities for employment-output and technology in a labour demand model through the use of a spline function. The model is estimated using disaggregated data for the UK engineering industry. Labour demand functions are then used to test the hypothesis held by successive British governments that cuts in defence expenditure will release manpower from military work in engineering, allowing an expansion of civil employment. The application of a spline function is outlined, and empirical results presented for standard employment functions and spline adaptations. The effects of defence reviews on employment are estimated using log-linear regression equations. The estimates are shown to vary according to the degree of data disaggregation and the precise estimating form, but there was little support for variable employment-output elasticities. There was no evidence of a shake-out of employment following defence reviews. No data. Bibliography of nineteen references.

COSTS

Taxation of military pay

BOWMAN, J. H.

Federal Restrictions on State Taxation of Military Pay: Are they Justified?, National Tax Journal, Vol 29 (2), June 1976, pp 131-142.

The US federal government restricts the taxation of military pay by the individual states through two provisions which do not apply to non-military pay: a prohibition on withholding state income tax; and limiting tax jurisdiction to the domicile state. This leads to administrative problems and inequitable treatment of the military relative to civilian pay. The implications are analysed in terms of administrative and compliance costs, tax base erosion, revenue loss, and equity. The study concludes that the restrictions are not justified and should be ended. Data for 1974. Bibliography of thirty-nine references.

LEVELS

Unemployment elasticity, pay elasticity, enlistment forecasts, enlistment model

DALE, C.; GILROY, C.

The Effects of the Business Cycle on the Size and Composition of the US Army, Atlantic Economic Journal, Vol XI (1), March 1983, pp 42-53.

Considers various single equation models of the effect of pay and unemployment on military enlistment in the USA. Ordinary least squares regression results are presented for army enlistment, and generalised least squares results for the navy, air force and marine corps, using monthly data for October 1975 to March 1982. Published estimates of unemployment and pay elasticities are presented. Enlistment is forecast up to 1986. The paper concludes that the rise in unemployment led to a substantial rise in enlistment; the elasticity of army enlistment with respect to relative pay is 2.3, implying a significant pay increase will be required to maintain enlistment after economic recovery; educational benefits and other non-economic factors are significant. Suggestions for further work include age-specific civilian data and a pooled cross-section analysis. Based on data for 1975-1982. Bibliography of twenty references.

Occupations

DEMPSEY, R.; SCHMUDE, D.

Occupational Impact of Defense Expenditures, Monthly Labor Review, Vol 94 (12), pp 12-15.

Discusses the occupational impact of US defence purchases in fiscal 1970 and estimates the effect of reductions in expenditure on employment levels in a range of occupations. Blue-collar workers and engineers have the largest share of their occupational groups in defence-related work, and have been hardest hit by the reduction in spending. Department of Defense employment remained relatively stable during the period 1968-1970, with civil employment bearing the cuts. Data for 1968-1970, and a note on estimating methods. Bibliography of three references.

Model of employment, aircraft industry.

FRANZ, W. W.

A Theoretical Model of the Employment Impacts of Defense Contracts and Private Orders, with Empirical Applications to the Aircraft Industry, American Economist, Vol XV (1), Spring 1971, pp 23-37.

Aims to develop a theoretical framework for the relationship between orders and employment for an industry which produces to order, with an application to the American aircraft industry. Output of goods produced to order is a lagged function of past orders. A labour requirement function is derived as the inverse of an industry production function, incorporating production worker-hours, non-production worker-hours, capital, technology and intermediate products. An employment demand function is derived, based on production-man-hours, hours of work, fixed labour costs, overtime rates and the unemployment rate. An order-employment relationship is established from these functions. Regression results incorporating various time lags are presented, using data on U.S. military prime contract awards and employment in the aircraft industry. The study concludes that the theoretical relationships between orders and production worker employment are supported empirically, with a lag of six quarters between the receipt of a contract and

the impact on production workers. The model suggests a one billion dollar increase in defense contracts would create a total of 105060 quarters of production worker employment. No data, an appendix describes data sources. Bibliography of twenty references.

Models of Bureaucracy, employment models.

HARTLEY, K.; LYNK, E.

Budget Cuts and Public Sector Employment: The Case of Defence, Applied Economics, Vol 15 (4), August 1983, pp 531-540.

Presents the results of empirical tests of the direct employment effects of reductions in UK defence spending. Reductions in military spending occurred following defence reviews in 1957, 1965-1968, and 1975. An economic model of bureaucracy is used to develop three testable hypotheses. The first predicts that defence reviews would result in a once-and-for-all release of manpower from the armed forces. Secondly, the different services would show different propensities to retain manpower, the army being expected to release the least. The third hypothesis predicts that civil servants would be protected from cuts and numbers would be unresponsive to output changes. Results are presented for a standard employment function incorporating a dummy variable for defence reviews, and a seemingly-unrelated regression model for military employment. Results are also presented for civilian employment and civil servants. The analysis shows mixed support for the hypotheses. The shock effect was not substantiated. Elasticities varied between services, but the army had the highest elasticity. There was some support for civil servants being immune from cuts. No data. Bibliography of ten references.

Demographic characteristics, occupations.

LEON, C. B.

Working for Uncle Sam: A Look at Members of the Armed Forces, Monthly Labor Review, Vol 107 (7), July 1984, pp 3-9.

Compares the demographic and occupational characteristics of the 1.7mn military personnel stationed in the US with those of civilian workers. Describes data sources and coverage, and trends in military employment by size and composition. Concludes that the military is an attractive alternative to many job-seekers. Those in the armed forces tend to be younger and include relatively more blacks but fewer women. Combat jobs are not prevalent. Crafts predominate among enlisted men, while women are more likely to hold clerical and administrative positions. Data for 1950-1982. Bibliography of twenty-three references.

Industry employment

OLIVER, R. P.

Increase in Defense-related Employment during Viet Nam Build-up, Monthly Labour Review, Vol 93 (2), February 1970, pp 3-10.

Presents estimates of employment generated in industry by US Department of Defense military expenditures. Revises estimates for 1965 and 1967, and adds fiscal 1968. An interindustry model was used to determine direct and indirect output effects of military expenditure, and employment-output ratios for each industry used to estimate the employment effects. The employment generated in the private sector was widely distributed over industries, and the defence dependencies of industries varied greatly. Four out of ten new jobs were in ordnance, aircraft and transportation. Data for 1965 - 1968, and a note on procedures. Bibliography of seven ref-

erences.

Industrial employment

OLIVER, R. D.

Employment Effects of Reduced Defense Spending, Monthly Labor Review, Vol 94 (12), December 1971, pp 3-11.

Estimates the change in the amount and industrial distribution of US defence employment requirements for fiscal 1968 through fiscal 1971, as the US participation in the Vietnam conflict was reduced. An interindustry model was used to derive direct and indirect output resulting from US Department of Defense Expenditure, and output-employment ratios applied to estimate employment. The decline of US activity in Vietnam had major employment impacts, particularly in the aerospace industry and the electronics sector. Many industries are already close to their pre-Vietnam levels of employment. The problem has been increased by the concurrent decline in NASA purchases and the slow-down in the remainder of the economy. Data for 1968-1971, and a note on the estimating procedure. Bibliography of nine references.

Industry employment

OLIVER, R. P.

The Employment Effect of Defense Expenditures, Monthly Labor Review, Vol 90 (9), September 1967, pp 9-16.

Presents estimates of the employment generated in individual industries by US Department of Defense military expenditures in fiscal years 1965 and 1967, and the proportion of 1967 employment that might be attributed to the Vietnam build-up. An inter-industry model was used to estimate the direct and indirect output required to supply military purchases. Productivity factors for 1965 and 1967 were used to obtain employment estimates from the output figures. Defence expenditure increased employment in all sectors, but the chief impact was on manufacturers of heavy durable goods. Data for 1965 and 1967, and a note on estimating procedures. No bibliography; footnote references are given.

Regional Impact

RIEFLER, R.F.; DOWNING, P.B.

Regional Effect of Defense Effort on Employment, Monthly Labour Review, Vol 91 (7), July 1968, pp 1-8.

The Economic Information Survey jointly developed by the US Department of Defense and the National Aeronautical and Space Administration directly measures employment in 453 major defence contractors plants and estimates employment for the remainder. These data are used to compare the importance of defence as a source of employment in various parts of the USA. Employment on subcontract work undertaken by the prime contractors surveyed is included, but other indirect employment by suppliers and through expenditure by direct employees is not estimated. Considerable regional variations were found in employment and in defence dependancy. Data for 1965 to 1967. No bibliography, footnote references are given.

Industry employment, occupations,

RUTZICK, M. A.

Workers Skills in Current Defense Employment, Monthly Labour Review, Vol 90 (9), September 1967, pp 17-20.

Estimates the work skills required in US civilian defence-related employment in 1965 and 1967, and the changes between the years.

Provides information on 53 occupations, primarily professional and blue-collar. In general, defence workers are more skilled than the civilian labour force. The defence programme is a substantial source of employment for engineers, technicians and draughtsmen. Continuing demand could lead to shortages. Electronics and metal-workers are also important. Data for 1965 and 1967, and a note on methods. No bibliography; footnote references are given.

Industry employment, occupations, regional distribution

RUTZICK, M. A.

Skills and Locations of Defense-related Workers, Monthly Labor Review, Vol 93 (2), February 1970, pp 11-16.

Describes the work skills found in US government and private defence-related enterprises in fiscal 1968, and changes between 1967 and 1968. The regional distribution of defence employment by broad occupation groups is also discussed. The labour force in defence-related industries is generally more skilled than the civilian labour force as a whole. A fifth of engineers and nearly a tenth of skilled and semi-skilled workers were in defence-related jobs in 1968. Regional patterns are derived on the assumption that defence expenditure by industry generally follows the pattern of regional industrial production. The estimated defence employment for each industry was weighted by the relative importance of that industry in each state. Data for 1967 and 1968, and a note on the estimation method. No bibliography; footnote references are given.

Demographic characteristics, occupations

SIDER, H.; COLE, C.

The Changing Composition of the Military and the Effect on Labor Force Data, Monthly Labor Review, Vol 107 (7), July 1984, pp 10-13.

Examines some of the changes in the US military services as a result of the change to an all-volunteer force. Considers the effect of demographic changes in the military on the analysis of civilian labour force trends. The racial composition of the services changed significantly, with the proportion of the military made up by non-whites increasing three-fold between 1963 and 1982, compared with an increase from ten to thirteen per cent of the population. Roughly thirty per cent of the relative decline in the number of non-white teenagers and young adults in the civilian labour force can be attributed to change in the demographic composition of the military. Data for 1963-1982. Bibliography of nine references.

PEACE, DISARMAMENT, AND CONVERSION

GENERAL

World war industry, opportunity cost

BOULDING, K. E.

The Economics and the Non-economics of the World War Industry Contemporary Policy Issues, Vol IV (4), October 1986, pp 12-21.

The world war industry relates to that part of human activity devoted to producing, maintaining and sometimes using means of destruction. Most output is purchased with the military budgets of nation states. National income accounts assume the product is equal to its costs, while in reality the product for the world as a whole is negative. The opportunity cost of the war industry is much higher than the military budget, due to long-run effects on economic growth of diverting high quality resources. Measuring the benefits is difficult as most benefits are psychological on the part of decision-makers. Wars of conquest do not pay off for the conquerors in economic terms, whereas defeat has often led to cultural and economic expansion. Nuclear weapons and long-range missiles have made unilateral national defence obsolete as an instrument of national security. Military culture must change towards a more economic approach, based on a sophisticated cost-benefit analysis of defence. No data. Bibliography of six references.

New International Economic Order, War System.

COLE, S.

The War System and the New International Economic Order: Directions for Disarmament, Alternatives, Vol VI (2), July 1980, pp 247-286.

The war system facilitates economic and political objectives through the exercise of power and the production of arms. The industrial countries are shifting the burden of recession onto developing countries by exporting arms. The significance of the economic crisis is considered and approaches to a New International Economic Order reviewed from different perspectives of world development. The role of the war system is analysed and attitudes toward growth, distribution, social rights and international conflict considered from each perspective. An alternative to disarmament as the basis for the New International Economic Order is considered, based on a reinterpretation of the self-interest of all groups. No data. No bibliography; footnote references are given.

Arms race, militarization, disarmament.

IVANEK, L.

The Socio-Economic Aspects of Militarization, Czechoslovak Economic Digest, 7 November 1982, pp 59-76.

The new wave of the arms race places high demands on the economies of NATO countries, is reflected in new tendencies towards militarization of their economies and has negative socio-economic consequences. Technical progress plays an important role, resulting in an orientation towards qualitative armament through improvement and modernization of equipment. Such equipment is more complex, more expensive and has a shorter life. The growth of military spending in NATO is reviewed and analysed. Western assessment of the impact of military expenditure stresses the positive benefits, ignoring the destabilising aspects, the impact on prices and the fact that military spending does not increase productive capacity. Any increase in employment or economic activity can only be short-

term. The problems of disarmament are considered. The possibilities depend primarily on political decisions. Data for 1970 to 1981. No bibliography; footnote references are given.

Conventional deterrence, NATO

KOMER, R. W.

A Credible Conventional Option: Can NATO Afford it?, Strategic Review, Vol XII (2), Spring 1984, pp 33-38.

Doubts about the credibility of low-cost nuclear deterrence coupled with technological developments have improved prospects for a NATO ability to outlast a Soviet conventional attack. A survey of the requirements suggests additional costs may be low compared with past and planned expenditure. A deep-strike capability of some 6000 conventional missiles is suggested. Burden-sharing schemes need to be devised to ensure national sharing of full costs, including operation and maintenance. Suggestions are made for an incremental policy moving towards a credible NATO conventional option, beginning with a programme to counter Soviet arms capability. No data, examples for 1980's. Bibliography of three references.

Food aid,

SORENSEN, D. S.

Food for Peace - or Defense and Profit? The Role of P.L. 480, 1963-73. Social Science Quarterly, Vol 60 (1), June 1979, pp 62-71.

US Public Law 480 initiated the Food for Peace Program in 1954. Three possible models of the programme are considered, with results from regression analysis across recipient nations for the period 1963-1973. The models explain aid in terms of support for national security, humanitarian motives, or donor economic benefit. The results only partly confirm the national security model, as the expected relationship between arms transfers and food aid was not found. The humanitarian model was not supported by the discovery that nutrition levels in recipient countries were positively correlated with food aid. There was insufficient evidence to suggest PL 480 was used to develop profitable outlets for food exports. The study concludes that no hypothesis was strongly confirmed, and questions whether the programme achieved any clear objectives. Data for 1963 to 1973. Bibliography of twenty nine references.

manpower, civilian resistance

TATCHELL, P.

Democratic Defence: A Non-nuclear Alternative, GMP Publishers Ltd., London, 1985, pp 223.

The book proposes an alternative to nuclear weapons for the UK based on the creation of a citizens army and non-violent civilian resistance. The work is not primarily an economic analysis, but it does include consideration of the manpower aspects and some pointers to the economic implications. Data up to 1984. No bibliography; chapter references are given.

Optimum social order, Integrating Security Policy and Socio-Economic Policy,

Tinbergen, J.; Fischer, D.

Warfare and Welfare; Wheatsheaf Books, Sussex and St. Martin's Press, New York, 1987, pp xiv, 189.

The book is in two parts dealing with the optimum structure and

management of world society and policies to attain the optimum. An inter-disciplinary approach of economics and peace research is used to design an ideal social order which yields maximum welfare and security. It is suggested that the threat to world peace will come from accidents, regional conflicts and nationalism in a world of too many weapons, especially nuclear, and the arms race. Solutions proposed include more treaties (e.g. banning chemical weapons and weapons in outer space), voluntary integration between nations (e.g. EEC) and a modified UN structure (e.g. World Treasury; UN police force). No data. No bibliography, chapter references are given.

MODELS OF THE ARMS RACE

Collaboration, NATO

BATTISTELLI, F.

Arms Production in Europe: the Sociology of the Arms Race, Bulletin of Peace Proposals, Vol 13 (4), 1982, pp 323-327.

Considers the way in which the crisis in Europe's relationship with the USA has affected European arms production and trade. The arms race has to be seen as one element in a model of socio-economic development. Internally the European economy is dominated by oligopolistic forces supported by the state. Externally collaborative-competitive relations with the US and Japan and an unequal relationship with the third world are important. Industry has two responses to the growing cost of arms - specialisation and collaboration or economies of scale through market expansion. This leads European countries to support active military policies both nationally and through NATO. An independent, democratic Europe needs to encourage detente, arms limitation and a cutback in resources allocated to arms production. Examples refer to 1970's and 1980's. Bibliography of six references.

BRITO, D. L.

A Dynamic Model of an Armaments Race, International Economic Review, Vol 13 (2), June 1972, pp 359-375.

Develops a dynamic economic model of an arms race by considering a system with two nations, each of which can produce for consumption or to increase its stock of weapons. Each nation attempts to maximise a utility function consisting of consumption and defence. The model is presented and used to consider whether an equilibrium exists, under what conditions an equilibrium would be stable, and whether total disarmament can be stable. An equilibrium level of armaments is shown to exist if costs are incurred in maintaining existing weapons, or if increases in arms reduces the level of defence. In either case the existence of equilibrium depends only on technology, income and marginal substitution between consumption and defence. The analysis suggests that many conclusions about the stability of the equilibrium are possible, but total disarmament is unstable. No data. Bibliography of twelve references.

BRITO, D. L.; INTRILIGATOR, M. D.

Conflict, War, and Redistribution, American Political Science Review, Vol 79 (4), December 1985, pp 943-957.

Uses a formal model to analyse the circumstances under which conflict leads to the outbreak of war. A two-period model is presented in which countries are treated as rational agents choosing between consumption and producing arms. Subsequently the threat or the use of force can lead to a reallocation of resources. The study concludes that a voluntary redistribution of resources will occur if both countries are fully informed. If one country does not have full information it may commit itself to a war to prevent bluffing by the informed country. Where alternative strategies to bluffing are adopted war can be avoided. One implication is that an arms race which results in the use of threats as part of deterrence has a positive probability of leading to war. No data. Bibliography of twenty-eight references.

US economy, war economy.

MELMAN, S.

Arms Race: Economic Drain, Economic Forum, Vol XIII (1), Summer 1982, pp 87-93.

The arms race pre-emptes resources and weakens the American economy. Abandoning a war economy requires an economic alternative through conversion to civilian production and a political balance to the military. Military employment in the services and industry forms a potential swing vote should military - economic policy become an election issue. Nationwide pressure to make a reversal of the arms race a political priority is required. No data. Bibliography of thirty four references.

Research and Development, military-industrial complex

THEE, M.

Halting the Momentum of Nuclear Armaments: Challenge and Response Bulletin of Peace Proposals, Vol 13 (4), 1982, pp 283-290.

Halting the nuclear arms race has become a life-and-death question requiring a political rather than a military solution. The principal model of armament dynamics involves an action-reaction-overreaction momentum propelled by internal and external factors. Military expenditure is justified as a response to action by an adversary and on ideological grounds. Military R & D is the major internal impetus through the military-industrial complex. The arms race can only be halted by reducing nuclear stockpiles and bringing military R & D under international control. No data. Bibliography of nineteen references.

DISARMAMENT

Development fund

AVRAM, I.; AVRAM, M.

Economic and Social Implications of Arms Race, Revue Roumaine d'Etudes Internationales, Vol XV (6), 1981, pp 567-579.

Disarmament is debated in a number of international contexts but the arms race continues. The negative consequences of the arms race are discussed, covering the waste of natural, human and financial resources; the diversion of research and development potential; pollution of the environment; slower growth of the economy and of productivity; inflationary pressures; reduced opportunities to solve social problems; continuation of gaps between states; and delays in establishing a new world order. A United Nations fund financed by reductions in military expenditure which lent assistance to countries pursuing development rather than militarization would help to end underdevelopment and to establish a new world economic order. No data. No bibliography: footnote references are given.

Development

BALL, N.; LEITENBERG, M.

Disarmament and Development: Their Interrelationship, Bulletin of Peace Proposals, Vol 10 (3), 1979, pp 247-259.

A reduction in military expenditure is necessary if disarmament is to occur, but such reductions may not automatically result in social or economic development for either the industrialised or developing countries. The links between military expenditure, lower growth and higher inflation have not been empirically established. Even if they were, the reallocation of resources from a reduction in military expenditure would depend on political priorities. There are two schools of thought concerning the relationship between armament and development. The first concentrates on the relationship between defence expenditure and economic growth; the second focuses on defence expenditure, self-sustaining economic growth and social development. The development of a new economic order directed at equalising relations between and within nations requires less emphasis on defence expenditure, the needs of military production and any beneficial impact they may have on GDP. Data for 1975. Bibliography of forty-four references.

National debt

BENOIT, E.

The Propensity to Reduce the National Debt out of Defense Savings, American Economic Review, Vol 51, May 1961, pp 479-488.

The rapid diffusion of nuclear weapons and technological developments may make the system of balanced deterrents unstable and lead to new systems of international security involving a reduction in armaments. Using defence savings to reduce the US national debt may aggravate the stabilization and growth problems arising from a major arms reduction. The evidence for expecting a reduction in national debt is reviewed, and the implications analysed. The study concludes that running a surplus and reducing the debt would prove markedly deflationary, and that the persistent pursuit of debt reduction may be dangerous. No data. No references.

International Comparisons

BENOIT, E.

The Monetary and Real Costs of National Defense, American Economic Review, Vol LVIII (2), May 1968, pp 398-416.

Concerned with the opportunity cost of military expenditure. Summarizes methods of estimating monetary and real defence expenditure and presents preliminary estimates for 1966 for 120 countries. While expenditure is generally lower in poorer countries, the opportunity cost may be higher. Opportunity cost is often ignored, as the main expense is for manpower which is in excess supply. This ignores seasonal shortages and the disproportional impact on skilled labour, foreign exchange and managerial capacity. A full assessment of the impact of reduced military expenditure on living standards requires a more detailed analysis of the resources used and the impact on the civilian economy. The real economic benefits of disarmament would depend on the social utility and productiveness of the alternative uses for resources. Notes on data sources and methods. Data for 1966. No bibliography; footnote references are given.

Monetary Policy, Fiscal Policy, model of adjustment

BENOIT, E.

The Financing of Disarmament: The Role of Monetary and Fiscal Policies in Disarmament Adjustments, The Journal of Finance, Vol XVIII (2), May 1963, pp 113-129.

Presents a model of disarmament in the USA through phased cut-backs in expenditure over a ten year period. An econometric analysis of the effect of resulting changes in taxes and government expenditures is used to identify an optimum set of monetary and fiscal policies to aid economic adjustment. A policy of balanced offsets is proposed, despite difficulties expected to arise from resistance to a budget deficit, disbelief in tax cuts and political opposition to expanding federal non-defence programmes. By choosing offsets to replace the role of military research and development in technical development the impact on the economy can provide an opportunity to benefit from disarmament. Discussion by J.R. Schlesinger. Data for 1960. No bibliography; footnote references are given.

World economic order, arms race

COLE, S.

Disarmament in the Context of a New International Economic Order, Bulletin of Peace Proposals, Vol 10 (3), 1979, pp 260-265.

The set of interactions between military, political and economic entities which form the war system is an integral part of the world economic order. Discussions of a new international economic order have tended to omit the role of armaments in the economic system and of war as an instrument of trade, aid and technical cooperation. Industrial countries have strong political and economic interests in involving developing countries in the arms race. Developing countries enter the arms race to gain economic and political advantage. The tendency towards a multi-polar military and economic world poses dangers but also offers opportunities for a new international economic order with a reduced role for the war system. No data. No references.

Models of arms control

FERGUSON, A. R.

Mechanics of Some Limited Disarmament Measures, American Economic

Review, Vol 51, May 1961, pp 479-488.

The effect of arms control on the economics of military power are analysed using theoretical models. The study considers the impact of banning particular types of weapons, and of limiting the quantity of specific weapons. The initial impacts and the cumulative effects are considered. The study concludes that the broader the class of weapon covered by the control the greater the effect, but the impact of restricted measures is increased if further expansion of control is expected. The fact that a weapon is inefficient and not used does not mean there would be no effect from its abolition. No data. No references.

Financial Model, forecasting, policy options

KAVESH, R. A.; MACKEY, J.

Financial Aspects of the Disarmament Process, Journal of Finance, Vol XVIII (2), May 1963, pp 130-150.

Considers the impact disarmament might have on the financial structure of the US for the period 1965 to 1975, assuming full employment. Uses the Benoit model of disarmament to show the effect of four major financial approaches - tax cuts, debt reduction, increased federal spending, or a balanced combination. The paper does not present a plan for disarmament, rather an outline of the likely outcome of some options. The choice from these options is a political one. Discussion by J.R. Schlesinger. Data for 1959. No bibliography; footnote references are given.

Conversion

REGNER, V.

Social and Economic Aspects of Disarmament, Czechoslovak Economic Digest, 7, November 1977, pp 34-52.

The most important problem of contemporary international relations is the problem of halting the arms race and reaching disarmament. The social and economic consequences of disarmament will be the release of material and human resources. The policy of armament is supported by social forces represented by the military-industrial complex. Complete disarmament would make available stockpiled equipment, land and facilities; the equivalent of 300,000 million dollars military expenditure; some 25m serving in the armed forces and 25m in war industries or installations; and research institutes and personnel. All countries would benefit from conversion from non-productive military use, but difficulties in the transition process would have to be overcome, and in particular the threat of unemployment. No data. No bibliography.

Development fund,

THEE, M.

The Establishment of an International Disarmament Fund for Development: a Feasibility Study, Bulletin of Peace Proposals, Vol 12 (1), 1981, pp 52-100.

Outlines the 1978 French proposal for a United Nations fund linking disarmament and development assistance. The establishment of the fund, possible systems of budgetary contribution and the institutional organisation are considered. A key concept is the idea of overarmament, or military expenditure exceeding an optimum security threshold. Contributions to the fund would come from savings on arms expenditure, and the system would be designed to encourage further disarmament. Development assistance by the fund would be based on criteria reflecting the goals of disarmament and development. Aspects of such criteria are considered. Data

for 1972-76. Bibliography of six references.

Development,

VLAD, C.; RADUICA, I.

The Disarmament-Development Correlation, *Revue Roumaine d'Etudes Internationales*, Vol 15 (6), 1981, pp 557-566.

The analysis of the relationship between disarmament and development should proceed from an acknowledgement of the direct and close connection between the two. Some disarmament measures imply a greater concern for channelling resources towards developing countries. The gap between developed and developing countries contributes to tension. The production of armaments uses a significant share of resources which could be used for development. Both are international problems and require international solutions, such as the proposed fund to channel savings from military expenditure into development. No data. No bibliography: footnote references are given.

Expenditure levels, job losses, conversion.

WALLENSTEIN, P.

Contradictions in Disarmament Economics, *Bulletin of Peace Proposals*, Vol 10 (3), 1979, pp 266-268.

The economic question of disarmament involves a contradiction between the benefits of reducing expenditure at a national level and the disadvantages of job losses at a local level. Such problems may become an obstacle to disarmament. Conversion offers a possible way forward. Conversion of products faces difficulties in finding alternative uses and gaining their acceptance as constituting reduced military expenditure. Conversion of the production process is required, and in a way which makes re-conversion difficult. Organizational change is required to give priority to civilian uses. Arms limitation agreements need to prevent the transfer of resources to other military uses. Conversion policies need to be established in advance of arms limitation agreements. No data. Bibliography of four references.

ARMS LIMITATION

Economic Sanctions

BORNSTEIN, M.

Economic Sanctions and Rewards in Support of Arms Control Agreements, American Economic Review, Vol LVIII (2), May 1968, pp 417-427.

Analyses the potential usefulness of economic sanctions and rewards in supporting arms control measures. Economic sanctions are reviewed and problems identified. The application of sanctions to Rhodesia is examined as a case study. The potential for economic rewards is briefly considered. The analysis concludes that the conditions necessary for a successful application of economic sanctions are not easily fulfilled. The potential of economic incentives is also limited. No data, examples refer to 1960's. No bibliography; footnote references are given.

Verification, Statistics.

BRZOSKA, M.

Third World Arms Control: Problems of Verification, Bulletin of Peace Proposals, Vol 14 (2), 1983, pp 165-171.

Attempts to limit arms transfers must take into account east-west and superpower problems and the economic problems of the secondary arms exporting countries. Increasing economic pressure and political factors suggest more third world countries should become interested in arms control. Any such control would require verification. The implications of satellite verification, requiring the USA and USSR to provide surveillance facilities, are considered. Conventional verification through monitoring international arms production and trade offers limited scope for verification, but may help establish confidence in verification. Data for 1975-79. Bibliography of nineteen references.

Economic growth, political stability

ZYCKER, B.

Soviet Incentives in Arms Control, Contemporary Policy Issues, Vol IV (4), October 1986, pp 52-59.

Most conventional analysis suggests growing economic problems in the Soviet Union enhance Soviet willingness to make concessions in arms control negotiations. It is equally plausible that falling living standards will cause Soviet leaders to emphasize external threats. Interpreting arms reduction as a way to reallocate resources to non-military uses without reducing security ignores the magnitude of resources likely to be available, the potential transformation rate, and problems of using additional resources when markets are cleared through queuing. The political legitimacy and stability of the regime rests on its ability to deliver a growing standard of living and a creditable deterrence of and defence against aggression. If the economic programme does not fulfil its goal the incentives to offer arms control concessions may not exist. No data. Bibliography of fourteen references.

SIZE OF FORCES

Models of security

WIBERG, H.; BERG, J.

Concepts of Security and their Implications, Scandinavian Journal of Development Alternatives, Vol III (1), March 1984, pp 15-35. Argues that security has decreased since the beginning of the century, in spite of a twenty-five-fold increase in resources devoted to military expenditure. Reviews the objectives of the analysis of security. Over-emphasis on security as safety from attack and preservation of national sovereignty has resulted in military overconsumption, as illustrated by a model of Swedish security policy. Alternative socio-economic structures could provide more security with less military use of resources, based on civilian defence. No data. Bibliography of seven references.

CONVERSION

Workforce, industrialized countries

BALL, N.

Converting the Workforce: Defence Industry Conversion in the Industrialised Countries, International Labour Review, Vol 125 (4), July-August 1986, pp 401-422.

The need to convert resources from the defence industry to civil use exists even in the absence of disarmament. An evaluation of the impact of conversion requires detailed information about the firms which produce military equipment. Industrial dependence on arms production is analysed for the USA, France, the German Federal Republic and the Soviet Union. The dependence of the labour force on defence expenditure is considered, and the idea of conversion as one type of economic restructuring considered. The study concludes that cut-backs in defence production need not seriously damage the economy of any of the major arms-producing countries, although particular industries and occupations may experience adjustment problems. Data for 1972 to 1980. Bibliography of twenty-seven references.

US War Production Board

BERNSTEIN, B. J.

The Debate on Industrial Reconversion: The Protection of Oligopoly and Military Control of the Economy, American Journal of Economics and Sociology, Vol 26 (2), April 1967, pp 159-172.

The War Production Board was one of the most important of the temporary federal agencies which controlled the US economy during World War II. The problems faced by the Board and the relationship between business and government are identified by an analysis of the arguments over reconversion in 1944. Industrialists and military leaders combined to prevent or delay reconversion. Only when market shares could be reestablished was a return to civilian production actively pursued, guaranteeing that the wartime benefits would not be lost by new competition. No data. No bibliography; footnote references are given.

War surplus

CAIN, L.; NEUMANN, G.

Planning for Peace: The Surplus Property Act of 1944, Journal of Economic History, Vol XLI (1), March 1981, pp 129-135.

The Surplus Property Act of 1944 was concerned with the disposal of US war surplus after the second world war. The social objectives of the Act are considered and the potential of realising such goals through reconversion discussed. The study concentrates on the effect of the disposal programme on industrial concentration in the US. A review of the plants concerned is followed by an examination of concentration ratios from 1931 to 1947. The study concludes that overall concentration did increase in the post-war period, but such an increase is not an inevitable result of war mobilization and reconversion. Objectives such as promoting competition may have helped pass the Act through Congress and played a part in disposal, but in practice the revenue objective was paramount. Data for 1931 to 1947. No bibliography; footnote references are given.

Occupations, industry employment

CAMBERN, J. R.; NEWTON, D. A.

Skill transfers: Can Defense Workers adapt to Civilian Occupat-

ions? Monthly Labour Review, Vol 92 (6), June 1969, pp 21-25.

A job analysis study of a hypothetical lay-off at two California missile-producing plants suggests that prospects are good for the transfer of skilled and semi-skilled workers to non-defence jobs using similar skills. The 1966 study analyzed 127 technical and production occupations, in which more than 5600 workers were employed in the two plants. The study found that more than three-fifths of the defence occupations have transfer prospects with no apparent barriers except for lower civilian wage levels. However, case studies of actual lay-offs have indicated that the transition period is difficult and assistance with mobility and income maintenance may be required. Data for 1966. Bibliography of four references.

Military-industrial complex, technical change, growth.

DUMAS, L. J.

Disarmament and Economy in Advanced Industrialized Countries: the US and the USSR, Bulletin of Peace Proposals, Vol 12 (1), 1981, pp 1-10.

Military oriented production does not add to the supply of consumer or producer goods and is thus unproductive. This has an impact on the ability of the economy to produce. In the USA the military bid up the price of resources and determine the direction of technical progress. US civilian business innovation has been retarded, with a consequent reduction in productivity and growth. Conversion requires a re-orientation of defence technologists to civilian requirements, and managements to be converted to competitive market conditions. In the USSR the allocation of top priority to military industries diverted the best resources from civilian use. In addition, civil production facilities were designed to facilitate conversion to military use. In the USA the economic damage appears mainly as high inflation with high unemployment; in the USSR mainly as chronic problems of shortage and quality of consumer goods. Conversion in the USSR requires similar retraining and re-orientation as in the USA. Advance planning is required in both countries. No data. Bibliography of five references.

Labour

EATON, B. C.

Defense Engineers: Do they have Special Re-employment Problems? Monthly Labor Review, Vol 94 (7), July 1971, pp 52-54.

Considers whether US defence scientists and engineers are at a disadvantage with respect to employment relative to other defence workers. Analyses empirical evidence from two defence-related lay-offs in 1963 and 1964. As measured by duration of unemployment, salary loss and labour market status, the engineer-scientist group appeared to have a less severe re-employment experience than those holding degrees in the social sciences and business. In 1963-64 defence scientists and engineers do not appear to have been at a disadvantage in seeking employment. Data for 1963-1964. Bibliography of four references.

Industrialised countries, developing countries

FARAMAZYAN, R.

Military Production: The Problem of Conversion, Social Sciences, Vol XII (1), 1981, pp 151-160.

The most difficult and complex economic issue in disarmament is the conversion of military production. Outlines a Soviet view of

the implications, particularly for NATO countries, drawing on studies of conversion. Alternate uses for facilities and resources can be found, but temporary difficulties may arise during conversion. The problems of conversion will largely fall on the industrialised countries, whilst disarmament would relieve the developing countries of a burden. Socio-economic development in all countries would benefit from the resources released from military use. No data. Bibliography of six references.

Sociological factors, political factors

HOROWITZ, I. L.

Noneconomic Factors in the Institutionalization of the Cold War, Annals of the American Academy of Political and Social Science, Vol 351, January 1964, pp 110-120.

For the first time since the start of World War II opportunities are arising for conversion from military to peace-time production. Most attention has been paid to the economic issues involved. Other factors which deter conversion include absence of awareness, rise of new industries dependent on military spending, belief in arms as a support for society, cultural acceptance of security and coercion, and fears over the impact on the Western alliance. On examination these factors prove to be insubstantial, but indicate the need for sociological and political adjustment as well as economic. No data. No bibliography; footnote references are given.

Planning, social expenditure

MELMAN, S.

Economic Alternatives to Arms Prosperity, Annals of the American Academy of Political and Social Science, vol 351, Jan 1964, pp 121-131.

Considers the obstacles to conversion of US military production to civil use. Conversion is feasible given sufficient planning. Opportunities for new civilian markets in the underdeveloped regions of the US and in social expenditure in health, education, housing - may ease the transition. Examples from the 1960's. No bibliography; footnote references are given.

Demographic characteristics, occupations, labour

MICHELOTTI, K.; GOVER, K. G.

The Employment Situation of Vietnam Era Veterans, Monthly Labor Review, Vol 95 (12), December 1972, pp 7-15.

Reviews the employment situation of male Vietnam era veterans, including information on occupation and industry of employment, residence, household relationship and reasons for being unemployed. Describes the special programmes for veterans. Data for 1971-1972. Bibliography of eight references.

Labour, Demographic characteristics, occupations.

WALDMAN, E.; GOVER, K. R.

Employment Situation of Vietnam Era Veterans, Monthly Labor Review, Vol 94 (9), September 1971, pp 3-11.

Examines the overall employment picture for US Vietnam era veterans under thirty years old in mid-1971. Analyses experience by age group, race, educational attainment, duration of unemployment and other characteristics. Compares with the experience of veterans following world war two and the Korean conflict. Reviews programmes, services and benefits available. The problems of increasing numbers of Vietnam veterans who could not find jobs led to a national campaign. Data for 1969-1971. Bibliography of nine

references.

Adjustment, defence reduction, policy.

WEIDENBAUM, M.L.

Adjusting to a Defense Cutback: Government Policy Toward Business, Quarterly Review of Economics and Business, Vol 4 (1), Spring 1964, pp 7-14.

Considers the potential capability of US defence industries to adjust to a reduction in military demand, and the associated public policy issues. Problems arise from the specialised nature of defence industries and companies. The lack of incentive for companies to diversify has impeded past adjustment. Policies are needed to determine alternative uses of resources and the role of public and private bodies. Data for 1960. No bibliography; footnote references are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE YEARBOOKS

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

SIPRI Yearbook of World Armaments and Disarmament, 1968-69, Almqvist and Wiksell, Stockholm; Humanities Press Inc., New York; Duckworth and Co. Ltd., London, 1969, pp 440.

The first SIPRI yearbook aims to provide a factual and balanced account of the arms race and attempts to end it. Chapter authors are not given. The main authors are given as follows:

Blackaby, F.; Davinic, P.; Goldblat, J.; Govansson, E.; Jamtin, C.; Kaldor, M.; Leitenberg, M.; Naidu, H; Prawitz, J.; Perry Robinson, J.; von Schreeb, H.

Part I: Account of 1968/69

World Military Expenditure; The Technological Arms Race; Disarmament Effects.

Part II: Reference Material

Military Expenditure and the Trade in Arms; The Technological Arms Race; Disarmament; Conflicts. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

SIPRI Yearbook of World Armaments and Disarmament 1969/1970, Almqvist and Wiksell, Stockholm; Humanities Press Inc., New York; Gerald Duckworth and Co Ltd, London; Oxford and IBH Publishing Co., New Delhi, 1970, pp xxiii, 540.

This and subsequent editions aim to provide a factual and balanced account of the arms race and attempts to stop it. Chapter authors are not given. The main authors are given as follows:

Blackaby, F.; Davinic, P.; Forsberg, R.; Goldblat, J.; Goransson, E.; Hirdman, S.; Huisken, R.; Landgren, S.; Leitenberg, M.; Neild, R.; Robles, A. G.; Von Schreeb, H.; Vuorenkoski, M.

Introduction, Summary and Guide, pp xv-xxiii.

Part I: Account of 1969/70

World Military Expenditure and the Arms trade, pp 2-35; The Main Arms Race: SALT and European Security, pp 36-91; The Militarization of the Deep Ocean: The Sea-bed Treaty, pp 92-184; The CBW Debate and Other Disarmament Measures, pp 185-215.

Part II: Special Article

The Treaty for the Prohibition of Nuclear Weapons in Latin America, pp 218-256.

Part III: Reference Material

Military Expenditure and the Trade in Arms, pp 259-357; Background to SALT and the European Security Conference, pp 358-424; Background to Other Disarmament Questions, pp 425-485. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1972, Almqvist and Wiksell, Stockholm; Humanities Press, New York; Paul Elek, London, 1972, pp xxiv, 611.

The continuing analysis of the world's arms races and attempts to stop them, up to 31 December 1971.

Chapter authors are not given. The main authors are given as follows:

Barnaby, F.; Davinic, P.; Forsberg, R.; Goldblat, J.; Grenback, E.; Hindman, S.; Landgren, S.; Leitenburg, M.; Lissakers, K.; Svensson, B.; Tottie, C.

Part I: Strategic Nuclear Forces and SALT

Chapter 1: Advances in Strategic Nuclear Forces by the USA and the

USSR during SALT, pp 1-22; Chapter 2: The Strategic Arms Limitation Talks, November 1969- December 1971, pp 23-39; Chapter 3: The Implications of SALT for the Arms Race, pp 40-49.

Part II: The Development and Spread of Arms Races

Chapter 4: World Military Expenditure 1970-1971, pp 51-73; Appendix 4a: Sources and Methods, pp 74-99; Chapter 5: The Trade in Major Weapons with the Third World, 1970-1971, pp 100-110; Appendix 5a: Sources and Methods, pp 111-123; Appendix 5b: Arms Trade Register, pp 124-148; Chapter 6: Resources Devoted to Military Research and Development, pp 149-210; Appendix 6a: Statistical Tables, Sources and Methods, pp 211-231; Appendix 6b: US Estimates of Soviet Expenditure on Military Research, pp 232-239; Chapter 7: Foreign Military Presence in 1971: Armed Forces and Major Bases, pp 240-275; Chapter 8: The Economic and Social Consequences of Military Expenditure: Comments on the UN Report, pp 276-282.

Part III: The Problem of the Proliferation of Nuclear Weapons

Chapter 9: The Near-nuclear Countries and the Non-proliferation Treaty, pp 283-365; Appendix 9a: On Nuclear Power Reactors as a Source of Plutonium, pp 366-370; Appendix 9b: Enriched Plutonium Technology, pp 371-374; Chapter 10: Nuclear Safeguards, pp 375-388; Chapter 11: The Test Ban, pp 389-432; Appendix 11a: Evidence on Understatement of the Number of Nuclear Tests and its Significance, pp 433-436; Chapter 12: Non-Seismic Detection of Underground Nuclear Tests, pp 437-460; Chapter 13: Nuclear Weapon Testing Programmes 1945-1970, pp 461-469; Chapter 14: World Uranium Supplies, pp 470-482; Chapter 15: China and Disarmament, pp 483-500.

Part IV: Developments in Arms Control and Disarmament, 1970-1971

Chapter 16: Chemical and Biological Disarmament, pp 501-516; Appendix 16a: Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, pp 517-522; Chapter 17: The Nuclear Test Ban Debate, pp 523-532; Chapter 18: Preventing an Arms Race on the Sea Bed, pp 533-536; Appendix 18a: Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other Weapons of Mass Destruction on the Sea Bed and Ocean Floor and in the Subsoil thereof, pp 537-541; Chapter 19: The Treaty for the Prohibition of Nuclear Weapons in Latin America, pp 542-549; Chapter 20: Declaration of the Indian Ocean as a Zone of Peace, pp 550-555; Chapter 21: The Disarmament Decade, pp 556-560; Chapter 22: UN General Assembly Resolutions on Disarmament Matters 1970-1971, pp 561-573; Chapter 23: List of States which have Signed, Ratified, Acceded or Succeeded to the Treaties related to Disarmament, pp 574-593; Chronology of Major Events Related to Disarmament Issues, September 1970- December 1971, pp 594-602. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1973, Almqvist and Wiksell, Stockholm; Humanities Press, New York; Paul Elek, London, 1973, pp xxviii, 510.

The fourth edition of the SIPRI Yearbook. Chapter authors are not given. The principal authors are given as follows:

Booth, R.; Davinic, P.; Forsberg, R.; Goldblat, J.; Grenback, E.; Jasani, B.; Landgren-Backstrom, S.; Lumsden, M.; Svenson, B.; Tottlie, C.

Part I: Strategic Arms Limitation

Chapter 1: Strategic Arms Limitation Agreements, pp 1-19; Appendix 1a: Treaty between the United States of America and the Union of

Soviet Socialist Republics on the Limitation of Anti-ballistic Missile Systems, pp 20-24; Appendix 1b: Interim Agreement between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms, pp 25-27; Appendix 1c: Protocol to the Interim Agreement, pp 28; Appendix 1d: Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War between the United States of America and the Union of Soviet Socialist Republics, pp 29-30; Appendix 1e: Agreement between the United States of America and the Union of Soviet Socialist Republics on Measures to Improve the USA-USSR Direct Communications Link, pp 31-35; Appendix 1f: Agreement between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on the Prevention of Incidents on and over the High Seas, pp 36-39; Chapter 2: The Prospects for SALT II, pp 40-59; Chapter 3: Verification using Reconnaissance Satellites, pp 60-102.

Part II: Special Topics

Chapter 4: Security in Europe through Disarmament and Related Measures, pp 103-131; Chapter 5: The Prohibition of Inhumane and Indiscriminate Weapons, pp 132-152; Appendix 5a: Chronology of Events related to the Prohibition of Inhumane and Indiscriminate Weapons, April 1968-March 1973, pp 153-165; Appendix 5b: Amendments Submitted by Government Experts to the ICRC Conference, pp 157-163; Chapter 6: UN Peacekeeping Forces, pp 164-203; Appendix 6a: Summary of a "Status of Forces" Agreement, pp 204.

Part III: The Development and Spread of Arms Races

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World Armaments and Disarmament: SIPRI Yearbook 1974, Almquist and Wiksell, Stockholm; MIT Press, Cambridge and London, 1974, pp xvii, 526.

In the fifth issue the Institute takes the view that disarmament is essential if nuclear holocaust is to be avoided, and recognizes

this influences their judgement of arms control measures. Chapter authors are not given; the main authors are given as follows: Barnaby, F.; Forsberg, R.; Goldblat, J.; Grenback, E.; Huisken, R.; Jasani, B.; Landgren-Backstrom, S.; Lumsden, M.; Staves, J.; Sukovic, O.; Tottie, C. E.; Tsipis, K.;

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World Armaments and Disarmament: SIPRI Yearbook 1975, Almqvist and Wiksell, Stockholm; MIT Press, Cambridge Massachusetts and London, 1975, pp xx, 618.

Chapter authors are not given. The main authors are given as follows:

Barnaby, F.; Booth R.; Goldblat, J; Huiskens, R.; Jasani, B.; Landgren-Backstrom, S.; Lumsden M.; Sanders, B.; Tsipis, K.

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World Armaments and Disarmament: SIPRI Yearbook 1976, MIT Press, Cambridge, Massachusetts; Almqvist and Wiksell, Stockholm, 1976, pp xvii, 493.

The SIPRI research staff mainly responsible for preparation of the Yearbook were: Barnaby, F.; Booth, R.; Goldblat, J.; Huisken, R.; Landgren-Backstrom, S. Contributions were also made by: Forsberg, R. (Appendix 1a); Jasani, B. (Chapter 5); Westing, A. (Indo-China Sections of Chapter 2).

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STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1977, MIT Press, Cambridge, Massachusetts and London; Almqvist and Wiksell, Stockholm, 1977, pp xvi, 421.

The main authors are given as:

Barnaby, F.; Booth, R.; Forsberg, R.; Goldblat, J.; Jasani, B.; Landgren-Backstrom, S.; Leitenberg, M.; Lodgaard, S.; Lohs, K.; Westin, A. H.; York, H.

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Other Documents Relating to the Prohibition of Chemical Weapons, pp 409-410; Chronology of Major Events Concerning Disarmament and Related Issues, pp 411-416. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament - SIPRI Yearbook 1978, Taylor and Francis Ltd., London, 1978, pp xvi, 518.

The ninth issue of the SIPRI yearbook continues the analysis of the world's arms races and the attempts to stop them.

Part I: 1977, Development of the Year

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STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI yearbook 1979, Taylor and Francis Ltd., London 1979, pp xviii, 698.

The tenth issue of the SIPRI Yearbook continues to provide in-depth reference information on the important issues of war and peace during the calendar year.

Barnaby, F., **Introduction**, pp 1-20; Chapter 1: Blackaby, F.; Skons, E., **World Military Expenditure**, pp 21-32; Blackaby, F.; Skons, E., Appendix 1a: **World Military Expenditure, 1978**, pp 33-57; Blackaby, F.; Skons, E., Appendix 1b: **Sources and Methods for the World Military Expenditure data**, pp 58-64; Chapter 2: Landgren-Backstrom, S.; Loose-Weintraub, E.; Stoltenberg-Hansen, C., **World Arms Production**, pp 65-71; Landgren-Backstrom, S.;

Loose-Weintraub, E.; Stoltenberg-Hansen, C., Appendix 2a: Registers of Indigenous and Licensed Production of Major Weapons in Industrialized Countries, 1978, pp 72-151, Landgren-Backstrom, S.; Loose-Weintraub, E.; Stoltenberg-Hansen, C., Appendix 2b: Registers of Indigenous and Licensed Production of Major Weapons in Third World Countries, 1978, pp 152-167; Chapter 3: Landgren-Backstrom, S.; Loose-Weintraub, G.; Stoltenberg-Hansen, C., World Arms Trade, pp 168-189; Landgren-Backstrom, S.; Loose-Weintraub, E.; Stollenberg-Hansen, C., Appendix 3a: Register of the Arms Trade with Industrialized Countries, 1978, pp 190-203; Landgren-Backstrom, S.; Loose-Weintraub, E.; Stoltenberg-Hansen, C., Appendix 3b: Register of the Arms Trade with Third World Countries, 1978, pp 204-241; Landgren-Backstrom, S.; Loose-Weintraub, E.; Stoltenberg-Hansen, C., Appendix 3c: Sources and Methods for the World Arms Production and Trade Data, pp 242-255; Chapter 4: Jasani, B., The Military Use of Outer Space, pp 256-304; Chapter 5: Lodgaard, S., Nuclear Power and Nuclear Proliferation: Export Policies and Proliferation Resistance, pp 305-328; Chapter 6: Karkoszka, A., The Expansion of Naval Forces, pp 329-388; Chapter 7: Wilkes, O., Command and Control of the Sea-based Nuclear Deterrent: the Possibility of a Counter-Force Role, pp 389-421; Forsberg, R., Appendix 7a: US and Soviet Strategic Nuclear Forces, 1970-79, pp 422-426; Chapter 8: Wilkes, O., Strategic Anti-submarine Warfare and its Implications for a Counter-force First Strike, pp 427-452; Chapter 9: Lumsden, M., The Prohibition of Inhumane and Indiscriminate Weapons, pp 453-462; Lumsden, M., Appendix 9a: The Rules of Engagement in Viet Nam as they Relate to Certain Specific Weapons, pp 463-467; Lumsden, M., Appendix 9b: Safety Zones Required to Reduce the Indiscriminate Effects of Conventional Weapons, pp 468-469; Chapter 10: Lundin, J., Stockpiles of Chemical Weapons and their Destruction, pp 470-489; Chapter 11: Goldblat, J.; Ferm, R., The UN Special Session on Disarmament: An Analytical Review, pp 490-523; Goldblat, J.; Ferm, R., Appendix 11a: Final Document of the Tenth Special Session of the General Assembly, pp 524-547; Goldblat, J.; Ferm, R., Appendix 11b: SIPRI Statement to the Special Session of the UN General Assembly Devoted to Disarmament, pp 548-549; Chapter 12: Goldblat, J.; Ferm, R., Disarmament at the 1978 Regular UN General Assembly Session, pp 550-573; Chapter 13: Goldblat, J.; Ferm, R., The Implementation of Multilateral Arms Control Agreements, pp 574-623. Chapter 14: Goldblat, J.; Ferm, R., The Humanitarian Rules of War, pp 624-636; Goldblat, J.; Ferm, R., Chapter 15: Bilateral Arms Control Agreements, pp 637-647; Chapter 16: Goldblat, J.; Ferm, R., Nuclear Explosions, pp 648-650; Goldblat, J.; Ferm, R., Appendix 16a: Nuclear Explosions, 1976-78 (Known and Presumed), pp 651-654; Goldblat, J.; Ferm, R., Appendix 16b: Nuclear Explosions, 1945-78 (Known and Presumed), pp 655; Chapter 17: Goldblat, J.; Ferm, R., Confidence Building in Europe, pp 656-662, Goldblat, J.; Ferm, R., Appendix 17a: Notification of Military Manoeuvres in 1978, pp 663-665; Chapter 18: Jack, H., NGOs and Disarmament, pp 666-680. Goldblat, J.; Ferm, R., Chronology of Major Events Concerning Disarmament Issues, pp 681-685. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1980, Taylor and Francis Ltd., London, 1980, pp xlvii, 514.

Barnaby, F., Introduction, pp xvii-xxxiv, Barnaby, F., Appendix A: Modernization of Strategic Nuclear Weapons, pp xxxv-xl; Forsberg,

R., Appendix B: US and Soviet Strategic Nuclear Forces, 1971-80, pp xlii-xlvi; Blackaby, F.; Skons, E., Chapter 1: World Military Expenditure, pp 1-18; Blackaby, K.; Skons, E., Appendix 1a: World Military Expenditure, 1979, pp 19-33; Blackaby, K.; Skons, E., Appendix 1b: Sources and Methods for the World Military Expenditure Data, pp 34-40; Chapter 2: Landgren-Backstrom, S.; Loose-Weintraub, E.; Ohlson, T., World Production of Conventional Armaments, pp 41-56; Chapter 3: Landgren-Backstrom, S.; Mallmann, W.; Loose-Weintraub, E.; Ohlson, T., World-wide Trade in Major Weapons During the 1970's, pp 57-126; Landgren-Backstrom, S.; Mallmann, W.; Loose-Weintraub, E.; Ohlson, T., Appendix 3a: Register of the Arms Trade with Industrialized and Third World Countries, 1979, pp 127-162; Landgren-Backstrom, S.; Loose-Weintraub, E.; Ohlson, T., Appendix 3b: Register of Licensed Production of Major Weapons in Industrialized and Third World Countries, 1979, pp 163-174; Chapter 4: Huisken, R.; Wilkes O., Eurostrategic Weapons, pp 175-186; Chapter 5: Jasani, B., A Role for Satellites in Verification of Arms Control Agreements, pp 187-208; Chapter 6: Goldblat, J.; Loewenson, C. Jr.; Salt II: An Analysis of the Agreements, pp 209-244; Appendix 6a: Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms, pp 245-269; Appendix 6b: Memorandum of Understanding between the United States of America and the Union of Soviet Socialist Republics Regarding the Establishment of a Data Base on the Number of Strategic Offensive Arms, pp 270; Appendix 6c: Statement of Data on the Numbers of Strategic Offensive Arms as of the Date of Signature of the Treaty, pp 271; Appendix 6d: Statement of Data on the Numbers of Strategic Offensive Arms as of the Date of Signature of the Treaty, pp 272; Appendix 6e: Soviet Backfire Statement, pp 272; Appendix 6f: Joint Statement of Principles and Basic Guidelines for Subsequent Negotiations on the Limitations of Strategic Arms, pp 273-274; Appendix 6g: Index to the SALT II Treaty, pp 275-284; Chapter 7: Karkoszka, A.; Wilkes, O., Verification of the SALT II Treaty, pp 285-316; Chapter 8: Barnaby, F.; Goldblat, J., The Non-proliferation Treaty, pp 317-334; Barnaby, F.; Goldblat, J., Appendix 8a: Convention on the Physical Protection of Nuclear Material, pp 335-344; Chapter 9: Goldblat, J.; Lodgaard, S., Negative Security Assurances, pp 345-352; Goldblat, J.; Lodgaard, S., Appendix 9a: Draft International Convention to Assure Non-nuclear Weapon States Against the Use or Threat of Use of Nuclear Weapons, pp 353-354; Goldblat, J.; Lodgaard, S., Appendix 9b: Draft International Convention on the Strengthening of Guarantees of the Security of Non-nuclear States, pp 355-358; Chapter 10: Goldblat, J.; Ferm, R., Nuclear Explosions, pp 359-360; Goldblat, J.; Ferm, R., Appendix 10a: Nuclear Explosions, 1978-79 (Known and Presumed), pp 361-363; Goldblat, J.; Ferm, R., Appendix 10b: Nuclear Explosions, 1945-79 (Known and Presumed), pp 364; Chapter 11: Goldblat, J.; Ferm, R., Chemical Disarmament, pp 365-372; Goldblat, J.; Ferm, R., Appendix 11a: Joint USSR-United States Report on Progress in the Bilateral Negotiations on the Prohibition of Chemical Weapons, pp 373-375; Goldblat, J.; Ferm, R., Appendix 11b: Parties in the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, pp 376-380; Chapter 12: Goldblat, J.; Ferm, K., The Prohibition of Radiological Warfare, pp 381-384; Goldblat, J.; Ferm, R., Appendix 12a: Joint USSR-United States Proposals on Major Elements of a Treaty Prohibiting the Development, Production, Stockpiling and Use of Radiological Weapons, pp 385-388; Chapter 13: Lumsden, M.,

The Prohibition of Inhumane and Indiscriminate Weapons, pp 389-396; Chapter 14: Goldblat, J.; Ferm, R., A Comprehensive Programme of Disarmament, pp 397-400; Goldblat, J.; Ferm, R., Appendix 14a: Elements of a Comprehensive Programme of Disarmament, pp 401-406; Chapter 15: Reinius, U.; Ferm, R., Confidence-building Measures in Europe, pp 407-416; Reinius, U.; Ferm, R., Appendix 15a: Notifications of Military Manoeuvres in 1979, pp 417-420; Chapter 16: Goldblat, J.; Ferm, R., Disarmament at the 1979 UN General Assembly Session, pp 421-424; Goldblat, J.; Ferm, R., Appendix 16a: UN Member States and Year of Membership, pp 425-426; Goldblat, J.; Ferm, R., Appendix 16b: UN General Assembly Resolutions on Disarmament Matters Adopted in 1979; pp 427-442; Chapter 17: Goldblat, J.; Ferm, R., The Implementation of Multilateral Arms Control Agreements, pp 443-468; Chapter 18: Goldblat, J.; Ferm, R., Bilateral US-Soviet Arms Control Agreements, pp 469-478; Chapter 19: Lehmann, I., United Nations Peace-keeping Operations in the 1970's, pp 479-494; Chapter 20: Goldblat, J.; Ferm, R., Chronology of Major Events Concerning Disarmament Issues, pp 495-500. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1981, Taylor and Francis, London, 1981, pp xxvii, 518.

The twelfth annual SIPRI Yearbook.

Barnaby, F., Introduction, pp xvii-xxvii.

Part I: The 1970's, Developments of the Past Decade

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Part II: Developments in World Armaments in 1980

Chapter 6: Blackaby, F., Skons, E.; Tullberg, R., World Military Expenditure, the Current Situation, pp 147-155; Blackaby, F.; Skons, E.; Tullberg, R., Appendix 6a: World Military Expenditure, 1980, pp 156-169; Blackaby, F., Skons, E.; Tullberg, R., Appendix 6b: Sources and Methods for the World Military Expenditure Data, pp 170-176; Chapter 7: Landgren-Backstrom, S.; Loose-Weintraub, E.; Jasani, B., Transfers of Major Conventional Armaments in 1980, pp 177-201; Landgren-Backstrom, S.; Loose-Weintraub, E.; Jasani, B., Appendix 7a: Register of the Arms Trade with Industrialized and Third World Countries, 1980, pp 202-244; Landgren-Backstrom, S.; Loose-Weintraub, E.; Jasani, B., Appendix 7b: Register of Licensed Production of Major Weapons in Industrialized and Third World Countries, 1980, pp 245-258; Chapter 8: Barnaby, F.; Jasani, B., Developments in Nuclear Weapons and Ballistic Missile Defence, pp 259-272; Forsberg, R., Appendix 8a: US and Soviet Strategic Nuclear Forces, 1972-1981, pp 273-278; Chapter 9: Jasani, B.; Stoltenberg-Hansen, C., Military Use of Outer Space, pp 279-293.

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Working Paper Reviewing Articles III, IV and V of the Non-proliferation Treaty, pp 348-354; Goldblat, J.; Levinson, M., Appendix 10d: Informal Working Paper Reviewing Articles VI, VIII and IX of the Non-proliferation Treaty, pp 355-362; Goldblat, J.; Levinson, M., Appendix 10e: Informal Working Paper Reviewing Article VII of the Non-proliferation Treaty, pp 363-365; Goldblat, J.; Levinson, M., Appendix 10f: Non-proliferation Aspects, International Nuclear Fuel Cycle Evaluation, pp 366-372; Chapter 11: Goldblat, J.; Ferm, R., Nuclear Explosions, pp 373-378; Goldblat, J.; Ferm, R., Appendix 11a: Nuclear Explosions, 1979-80 (Known and Presumed); pp 379-381; Goldblat, J.; Ferm, R., Appendix 11b: Nuclear Explosions, 1945-80 (Known and Presumed), pp 382; Goldblat, J.; Ferm, R., Appendix 11c: Tripartite Report to the Committee on Disarmament, pp 383-387; Goldblat, J.; Ferm, R., Appendix 11d: Comprehensive Nuclear Test Ban, Report of the UN Secretary-General, pp 388-390; Chapter 12: Goldblat, J.; Ferm, R., United Nations General Assembly Resolutions, 1980, pp 391-412; Chapter 13: Goldblat, J.; Ferm, R., The Implementation of Multilateral Arms Control Agreements, pp 413-438; Chapter 14: Goldblat, J.; Ferm, R., US-Soviet Strategic Arms Limitation Agreements, pp 439-444; Chapter 15: Sims, N., The Prohibition of Inhuman and Indiscriminate Weapons, pp 445-456; Sims, N., Appendix 15a: Draft Convention on the Prohibition or Restrictions of the Use of Certain Conventional Weapons, pp 457-460; Sims, N., Appendix 15b: Draft Protocol Concerning Non-detectable Fragments (Protocol I), pp 461; Sims, N., Appendix 15c: Draft Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-traps and Other Devices (Protocol II), pp 462-465; Sims, N., Appendix 15d: Draft Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III), pp 466; Sims, N., Appendix 15e: Resolution on Small-calibre Weapon Systems, pp 467-468; Chapter 16: Corradini, A., The Role of the United Nations in the Field of Disarmament, pp 469-479; Corradini, A., Appendix 16a: UN Disarmament Studies, pp 480-482; Chapter 17: Lodgaard, S; Ferm, R.; Berg, P., European Security and the Madrid Conference, pp 483-494; Lodgaard, S; Ferm, R.; Berg, P., Appendix 17a: Notifications of Military Manoeuvres in 1980, pp 495-496; Lodgaard, S; Ferm, R.; Berg, P., Appendix 17b: Notified Military Manoeuvres in Europe, 1975-1980, pp 497; Lodgaard, S; Ferm, R.; Berg, P., Appendix 17c: Proposal Submitted to the Madrid Conference on Confidence-building Measures, pp 498-500; Chapter 18: Goldblat, J.; Ferm, R., Chronology of Major Events Concerning Disarmament Issues, pp 501-504. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmaments: SIPRI Yearbook 1982, Taylor and Francis, London, 1982, pp xli, 504.

The thirteenth annual yearbook of World Armaments and Disarmament, with the objective to provide information on the world's military sector and progress in attempts at restraint. This edition gives special attention to European issues.

Blackaby, F., Introduction, pp xxiii - xli.

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Part IV: Development in Arms Control in 1981

Chapter 13: Goldblat, J., *Nuclear Explosions*, pp 429-436; Ferm, R., Appendix 13a: *Nuclear Explosions, 1980-81 (Known or Presumed)*, pp 437-439; Ferm, R., Appendix 13b: *Nuclear Explosions, 1945-81 (Known and Presumed)*, pp 440; Chapter 14: Goldblat, J., *Arms Control in Outer Space*, pp 441-446; Chapter 15: Lumsden, M., *The Prohibition of Inhumane Weapons: New Small Arms Ammunition*, pp 447-454; Chapter 16: Goldblat, J., *Disarmament at the 1981 UN General Assembly*, pp 455-459; Goldblat, J.; Ferm, R., Appendix 16a: *UN General Assembly Resolutions on Disarmament 1981*, pp 460-484; Chapter 17: Goldblat, J.; Ferm, R., *Multilateral and Bilateral Arms Control Agreements*, pp 485-498; Chapter 18: Goldblat, J.; Ferm, R., *Chronology of Major Events Related to Arms Control Issues*, pp 499-504. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1983, Taylor and Francis, London and New York, 1983, pp lvi, 681.

The fourteenth annual SIPRI Yearbook provides an overview of military expenditure, the arms trade and weapons development, production and deployment. Reports are included on the arms negotiations and discussions at Geneva, New York, Vienna and Madrid.

Blackaby, F., *Introduction*, pp xxvii-xxv; Barnaby, F.; Lumsden, M., Appendix A: *World Nuclear Weapons Stockpiles*, pp li-lvi.

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Chapter 1: Lodgaard, S., Long-range Theatre Nuclear Forces, pp 3-26; Chapter 2: Berg, P., British and French Eurostrategic Forces, pp 27-42; Chapter 3: Lunn, S.; Seabright, J., Intercontinental Nuclear Weapons, pp 43-68; Chapter 4: Donnolly, W., Changing Pressures on the Non-proliferation Regime, pp 69-96; Chapter 5: Ferm, R., Nuclear Explosions, pp 97-100, Ferm, R., Appendix 5a: Nuclear Explosions, 1982 (Preliminary Data), pp 98-99; Ferm, R., Appendix 5b: Nuclear Explosions, 1945-82 (Known and Presumed), pp 100; Chapter 6: Lumsden, M., Nuclear Weapons and the New Peace Movement, pp 101-126.

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ix 19a: Proposal Submitted by the Delegations in 1981, pp 609-610; Ferm, R., Appendix 19b: Notifications of Military Manoeuvres in 1982, pp 611-614; Chapter 20: Goldblat, J.; Ferm, R., Multilateral Arms Control Agreements, pp 615-644; Chapter 21: Jack, H., Non-governmental Organizations and Disarmament at the United Nations, pp 645-658; Jack, H., Appendix 21a: List of Non-governmental Organizations and Research Institutions, pp 656-658; Chapter 22: Goldblat, J.; Ferm, R., Chronology of Major Events Related to Arms Control Issues, pp 659-664. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1984, Taylor and Francis, London and Philadelphia, 1984, pp xxxix, 700.

The fifteenth issue of the SIPRI Yearbook surveys the world military sector and reviews attempts to set constraints on military activity.

Blackaby, F., Introduction, pp 1-14; Den Ouden, E., Appendix A: Public Opinion and Nuclear Weapons, pp 15-20.

Part I: The Nuclear Arms Race

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STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1985, Taylor and Francis, London and Philadelphia, 1985, pp xxv, 666.

The sixteenth annual SIPRI Yearbook. The main theme is to provide material to aid understanding of the disarmament negotiations between the United States and the Soviet Union.

Blackaby, F., Introduction, pp 1-30; Den Ouden, E., Appendix A: Public Opinion, pp 31-38.

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Chapter 1: Arkin, W. M.; Burrows, A. S.; Fieldhouse, R. W.; Cochran, T. B.; Norris, R. S.; Sands, J. I., Nuclear Weapons, pp 41-74; Chapter 2: Ferm, R., Nuclear Explosions, pp 75-79; Ferm, R., Appendix 2a: Nuclear Explosions, 1983 and 1984, pp 80-81; Ferm, R., Appendix 2b: Nuclear Explosions, 1945-84 (Known and Presumed), pp 82; Chapter 3: Tsipis, K., Third-generation Nuclear Weapons, pp 83-102; Tsipis, K., Appendix 3a: The X-Ray Laser, pp 103-106; Chapter 4: Ginsberg, A. S.; Golitsyn, G. S.; Vasiliev, A. A.; Global Consequences of a Nuclear War: A Review of Recent Soviet Studies, pp 107-125; Westing, A. H., Appendix 4a: Nuclear Winter: A Bibliography, pp 126-129.

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206-219.

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STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1986, Oxford University Press, Oxford, 1986, pp xxxii, 611.

The seventeenth edition of the SIPRI Yearbook.

Part I: Introduction

Chapter 1: Blackaby, F., *Introduction*, pp 1-16; Chapter 2: Den

Oudsten, E., *Public Opinion in Peace and War*, pp 17-35.

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Chapter 3: Arkin, W. A.; Burrows, A. S.; Cochran, T. B.; Din, A. M.; Fieldhouse, R. W.; Norris, R. S.; Sands, J. I., *Nuclear Weapons*, pp 37-80; Chapter 4: Blackaby, F., *Space Weapons and Security*, pp 81-96; Chapter 5: Fieldhouse, R. W., *Chinese Nuclear Explosions: An Overview*, pp 97-114; Chapter 6: Blackaby, F.; Ferm, R., *A Comprehensive Test Ban and Nuclear Explosions 1984-1985*, pp 127-130; Chapter 7: Jasani, B., *The Military Use of Outer Space*, pp 131-148; Appendix 7a: *Tables of Satellites Launched in 1985*, pp 149-158.

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Part V: Development in Arms Control

Chapter 18: Lodgaard, S., *The Building of Confidence and Security at the Negotiations in Stockholm and Vienna*, pp 423-446; Chapter 19: Goldblat, J., *Multilateral Arms Control Efforts*, pp 447-468; Chapter 20: Goldblat, J., *The Third Review of the Non-proliferation Treaty*, pp 469-480; Appendix 20a: *Final Declaration of the Third Review Conference of the NPT*, pp 481-494; Appendix 20b: *Nuclear Plants under Construction or Operating in the Developing Countries Outside Europe*, pp 495-498; Chapter 21: Fry, G. E., *The South Pacific Nuclear-free Zone*, pp 499-508; Appendix 21a: *The South Pacific Nuclear-free Zone Treaty*, pp 509-519; Appendix 21b: Goldblat, J.; Lodgaard, S., *Comparison of Arms Control Commitments in the Treaty of Rarotonga and the Treaty of Tlatelolco*, pp 520-522; Chapter 22: Goldblat, J.; Millan, V., *The Central American Crisis and the Contadora Search for Regional Security*, pp 523-548; Chapter 23: Goldblat, J.; Ferm, R., *Arms Control Agreements*, pp 549-560; Appendix 23a: *Status of the Implementation of the Major Multilateral Arms Control Agreements, as of 1 January 1986*, pp 561-585; Appendix 23b: *UN Member States and Year of Membership*, pp 586-588; Chapter 24: Goldblat, J.; Ferm, R., *Chronology*, pp 589-596. Data for various years. Chapter bibliographies are given.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

World Armaments and Disarmament: SIPRI Yearbook 1987, Oxford University Press, Oxford, 1987, pp xl, 495.

The eighteenth SIPRI Yearbook.

Stutzle, W., Introduction: A Year of Peace?, pp xxv-xl.

Part I: Weapons Technology

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