

Hasse, Rolf

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more realistic terms, this means if it had to tax its citizens so severely that a revolution would break out or, in more peaceful cases, if the income remaining to citizens offered so little incentive to work that all prospects of growth evaporated.

In none of the borrowing countries examined here is the relationship of debt service payments to national income likely to be so high after exhausting all possibilities for rescheduling that this situation would obtain. Without new loans, however, there could be a danger that several of these countries could find themselves in such a position.

Obviously there is nothing to be said against thinking about the possible instruments for such a "composition", but it remains to be seen in each individual case whether the cancellation of part of the debt really were inevitable one way or another. To anticipate such cases would only provoke "moral hazard" – many a debtor country would use every

means at its disposal to present itself as a candidate for debt cancellation.

If ways and means of granting the necessary amount of new loans to the heavily indebted developing countries that are willing to co-operate are found in time, which appears to be a possibility since the meeting in Seoul, there is not a high probability that we shall run into another round of debt crises.

One final remark in conclusion. It goes without saying that it would be far easier for the developing countries to move onto a steady growth path if the highly industrialised creditor countries themselves would improve their own climate for growth and full employment and, above all, would abandon protectionism. However, shortcomings in the economic policies of lending countries should on no account be accepted unreservedly as an alibi for further mistakes by the heavily indebted developing countries, not least for their own sake.

EAST-WEST TRADE

Technologies of the Future: Security and Competition Aspects

by Rolf Hasse, Hamburg*

The SDI technology initiative, which is directed towards military ends, and its civil counterpart Eureka pose a challenge to relations between East and West and within the Western world. Professor Rolf Hasse analyses their implications for security and competition.

One issue is coming increasingly to dominate discussions at the national and international levels: the technologies of the future. It is a subject that reaches into all areas of social life, affecting political, cultural, economic and security considerations. It is firing the imagination of futurologists and causing a boom in scenarios and predictions. It is thus exercising optimists and pessimists alike and arousing hopes and fears. It has thrown down a challenge to politicians and spurred them to compete even more keenly in determining the strategies and policies for the decades to come. The following article sheds light on a number of aspects

arising from the interdependence of the commercial and military exploitation of the new technologies. The Federal Republic of Germany is directly affected in both spheres:

□ economically, because the expected spin-offs from research in the civil and military fields may trigger a new Kondratieff cycle in the Schumpeter sense. The competitiveness and hence the real income of firms and economies will – in view of the high intensity of foreign trade – be determined partly by whether or not they participate in developing the new technologies or have access to them.

□ from the point of view of security, because the Federal Republic's membership of NATO, its

* Hochschule der Bundeswehr.

geographic location at the point of contact between the two military and political hemispheres, its economic power and its attitude towards and involvement in East-West trade propel it to the forefront of the controversy about the transfer of technology from West to East.

The technology programmes now taking shape constitute a departure from Malthusian thinking as formulated by the Club of Rome. They signal the triumph of a new "frontier spirit" over pessimistic doomsday attitudes and theories of stagnation. However, this change itself poses global challenges both to East-West relations and to relations among the members of the Western world.

Potential Tensions

For adherents to the Marxist doctrine the challenge is threefold:

- the doctrine of the crisis of capitalism is in danger of being refuted yet again;
- there is a danger that the CMEA countries will fall further behind free market economies as regards productivity and real incomes and hence that the claimed superiority of the planned economy will be further damaged at home and become less attractive for export to other countries;
- in addition, there are signs that military expenditure will impose severe strains on these economies, given their recognisable economic weaknesses and difficulties in importing technology, especially if the negotiations on disarmament and arms control break down.

However, there is also potential for tension among Western countries as a result of political and economic rivalry among themselves and vis-à-vis the countries of the Warsaw Pact and the CMEA.

- Fundamental problems are arising because both the civil and military technology initiatives entail large-scale state assistance and participation.¹ Regulations

¹ Cf. E. Staudt: Der technologische Aktivismus in der Bundesrepublik, in: Wirtschaftsdienst, No. 9, 1985, pp. 464-470.

² Joseph A. Schumpeter: Kapitalismus, Sozialismus und Demokratie, 2nd edition, Berne 1950, pp. 218 and 226 ff. Above all, heed should be paid to the Cartesian spirit of feasibility evident in many programmes and the fact that even if it does not lead to arteriosclerosis concentration shakes the political structure of a nation to the core.

³ Cf. inter alia the memorandum from the French Government to the Council of the European Communities of 12th September 1983 on the common industrial and research policy, reproduced in: Europa-Archiv, No. 24/1983, D 695-701; M. Richonnier: Europe's Decline is not Irreversible, in: Journal of Common Market Studies, Vol. XXII, 1984, pp. 227 ff.; cf. also J. Rallo: The European Communities Industrial Policy Revisited: The Case of Aerospace, in: Journal of Common Market Studies, Vol. XXII, 1984, pp. 245 ff.

governing the allocation of state funds tend to favour large enterprises and to encourage concentration. The danger of distorting the basis of free market economies in the way already described by Schumpeter² cannot and should not be concealed behind blind faith in progress.

- This view is reinforced by the fact that many state initiatives can be seen to be founded on mercantilistic thinking. The justifications put forward in analyses and forecasts (such as economic and political dependence) clearly reveal the underlying political objectives (such as independence and power). This becomes plain from the proposed means of safeguarding expected advantages, including foreign trade measures (duties to protect infant industries) and discrimination against foreign enterprises and even their domestic branches.³ State and business interests may coincide here, thus leading away from the unhindered transfer of technology towards technological protectionism, a tendency that is evident in the EC as well as the USA.⁴

- In addition, there is a political issue which can lead to security risks if positions are not co-ordinated: the transfer of technology from West to East, especially to the Soviet Union. This contentious issue, which sprang from misunderstandings and conceptual differences, emerged into the open in 1982 in connection with the gas pipeline project, when the President of the United States attempted to impose a unilateral extraterritorial embargo on trade in products manufactured using American technology, a move that the European states openly ignored.⁵

Opposing Positions

Within the US Administration the Department of Defense has for some years been calling for the overhaul and extension of the American and Cocom controls on exports to Warsaw Pact countries. In this context it is also being examined whether the ease with which it has been possible up to now to transfer American technology to the allies is not one of the causes for the ineffectiveness of the technology embargo.⁶ The European countries, for their part, are

⁴ Cf. K. Seitz: SDI - die technologische Herausforderung für Europa, in: Europa-Archiv, No. 13/1985, especially p. 386; cf. also K. Broichhausen: Den Technologie-Protektionismus abwehren, in: Frankfurter Allgemeine Zeitung, 13th August 1984; M. B. Wallenstein: Scientific Communication and National Security in 1984, in: Science, Vol. 224, 4th May 1984, pp. 460 ff.

⁵ Cf. Karl M. Meesen: Extraterritoriality of Export Control: A German Lawyer's Analysis of the Pipe-Line Case, in: German Yearbook of International Law, Vol. 27/1984, pp. 97 ff.; cf. also Douglas E. Rosenthal, William M. Knighton: National Laws and International Commerce. The Problem of Extraterritoriality, Chatham House Papers, Vol. 17, London 1982, pp. 53 ff.

resisting sweeping export controls and ad hoc sanctions.

SDI, Eureka and other similar initiatives are therefore open to abuse by both sides as a means of "nationalising" economic advantages and/or safeguarding diverging conceptions of security and East-West trade. Instead of open technology markets among the Western nations, parallel American and European technologies would develop,⁷ so that the two areas could keep open their own options with regard to relations and trade with the East – a monopolistic approach and the rigorous control of exports of technology to CMEA states in the case of the USA and a strategy to prevent the development of a monopoly over initiatives in trade with the Eastern bloc in the case of the European countries.

These then are the positions that have been adopted. The causes of this conflict among the allies and the stage it has reached are sketched below, followed by an assessment of the latest Soviet efforts to achieve greater economic efficiency against this background.

Parameters of East-West Relations

The basic parameters for the following analysis are:

□ East-West relations, and particularly relations with the Soviet Union, are a relationship between opponents, the stability of which depends heavily on parity in military potential or vulnerability.

□ This constant, which will remain valid for the foreseeable future, determines the military and economic strategies; if such strategies are to be flexible in a defence community of sovereign states, there must be a high degree of conceptual clarity and readiness to co-operate. The West's fundamental problem is that it does not integrate and co-ordinate the two levels of strategy sufficiently well. Hence it is not surprising that there is no clear integrated concept of economic and security interests in relation to the CMEA states.

Cocom controls and to an even greater extent ad hoc economic sanctions lack the necessary political foundation and organisational clarity. As a result, the

differences of opinion reflect conceptual divergences, imprecision as to content and divergent economic interests.

□ The security imbalance between East and West and the differences in the western allies' policies regarding security and trade with the Eastern bloc since the mid-sixties are the fault of the West. The main cause is the West's self-deception about the aims of the Eastern bloc's policy of co-existence. The West mistook the period of détente for a shift in strategic position. In retrospect, it was a period of weariness that afflicted only the West, which has still not overcome the disorientating effects it engendered.⁸ In the face of strong resistance, the European countries are now making amends for their mistaken assessment and its consequences as far as armament policy is concerned. East-West trade, however, has remained the battlefield of contrasting concepts of policy towards the Eastern bloc, ranging from "trade as an instrument of change" to strict and sweeping export controls.

□ Economic sanctions can seriously affect the Soviet Union and the other CMEA countries.⁹ Assertions to the contrary, argued from a "pragmatic" or normative standpoint, are based on the fact that embargoes have failed to achieve the postulated political aims. As a rule such claims pay too little heed to whether the means accorded with objectives, whether the sanctions were fundamentally unworkable or whether the economic damage only fell short of the expected or potential effects because of organisational shortcomings. However, even if sanctions are potentially effective, their objectives and implementation must be subjected to much more subtle analysis than in the past to weigh up the political and economic costs and benefits.

Policy of Containment

The dispute between Europe and the USA derives from or manifests itself in East-West trade. It is both a proxy and a testing ground for more deep-rooted policy differences, the causes and development of which can be traced from the four phases of the West's policy regarding trade with the Eastern bloc.¹⁰ Three aspects may be regarded as constant in this context:

⁶ Stiftung Wissenschaft und Politik: Die Ost-West-Wirtschaftsbeziehungen als deutsch-amerikanisches Problem, Ebenhausen 1983, pp. 97 ff.

⁷ The desire of other countries, such as Japan and China, to participate in Eureka on the one hand and SDI on the other must be judged partly from the point of view of the possible division between the two programmes (the customs union effect of technology development and transfer).

⁸ Cf. Claus D. Kernig: Osthandel, Technologietransfer und Sicherheit – Überlegungen zur westlichen Fehleinschätzung des Technologietransfers in die UdSSR, in: W. Link (ed.): Die neueren Entwicklungen des Ost-West-Konflikts, Cologne 1984, pp. 53 f.

⁹ See the individual analyses by J. Nötzold, W. Beitel, F. Müller, H.-D. Jacobsen and K. Schröder and the conclusions by C. Royen in the collection of essays by F. Müller et al.: Wirtschaftssanktionen im Ost-West-Verhältnis. Rahmenbedingungen und Modalitäten, Baden-Baden 1983, pp. 155 ff.; cf. also the theoretical analyses in R. Hasse: Theorie und Politik des Embargos, Cologne 1973, pp. 325 ff.

¹⁰ Cf. R. Hasse, op. cit., pp. 135-324; S. Woolcock: Western Policies on East-West Trade, Chatham House Papers, Vol. 15, London 1982, passim.

- Since 1917¹¹ the USA has always used East-West trade as a means of achieving its political objectives; Europe has also done so at various times.
- Since 1945 the USA has always controlled its exports to the Soviet Union more stringently than Europe.
- Since the fifties there has always been a problem of leads and lags between ostpolitik and trade policy with the Eastern bloc, constituting a latent source of acute political friction.

First phase – 1947-54: A strict policy of containment under American leadership. Extensive export controls (Cocom) against Warsaw Pact countries were introduced and co-ordinated, partly by exerting pressure and offering financial inducements (economic and military aid). The aim was to safeguard the West's economic lead and America's monopoly of the atomic and hydrogen bombs (monopoly approach). Export controls were therefore an integral part of the political and military strategy, which was also enforceable given America's supremacy at that time.

Second phase – 1954 to the mid-sixties: Erosion of the policy of containment, only briefly interrupted by the Berlin and Cuba crises (pipes embargo, blockade of Cuba). The USA lost its economic supremacy over its allies and its monopoly of military technology over the Soviet Union, with the situation even being reversed in some areas (sputnik shock). The Cocom lists were liberalised in 1954, 1956 and 1958 at the urging of the European countries for economic and political reasons (to strengthen the polycentric forces within the Eastern bloc). The USA followed suit hesitantly and only partially; the differences widened between the Cocom lists and the American lists for controlling exports to the Eastern bloc. Nevertheless, the allies failed to review the role and functions of East-West trade and the Cocom controls. The controls developed a limited life of their own and, like the ostpolitik, became the subject of ad hoc decisions. The ground was prepared for the move away from the strategy of "massive retaliation" and the transition to the concept of "flexible response" (Harmel report, 1967).

Third phase – 1968-75: Policy of détente, but based on divergent strategies. The roots of the conflicts within NATO about security and trade with the Eastern bloc are to be found in this period. It is true that the security aim of the "flexible response" was defined (continued deterrence by maintaining a technological lead designed to offset the numerical superiority of the

Warsaw Pact – the qualitative advantage approach), but the two pillars of the concept set out in the Harmel report (deterrence through military strength, and co-operation with the CMEA countries) were seen not as complementary and equal in importance but as interchangeable. Trade with the Eastern bloc and the Cocom rules were not integrated into the new NATO strategy but were partly separated from it: that the wording and timing of policies coincided does not gloss over the fact that the strategies pursued by East and West (détente, peaceful coexistence) were not congruent and did not become so.

During this phase the Soviet Union opened its economy for the second time since the New Economic Policy of 1921. The internal disparity between military strength and economic weakness was a central motive.¹² The first step was taken in 1965 with accession to the Paris Convention, but it was not until 1969 that Brezhnev adopted the strategy of importing technology to improve the efficiency of the economy, which had been advocated by Kosygin, and translated it into offensive foreign policy operations.¹³ Like Lenin in 1921, the Soviet leadership explained their actions in terms of the theory of peaceful coexistence and compromise.¹⁴ In the course of this process the Soviet Union also made political concessions that went beyond the orthodox interpretation of Leninist principles.¹⁵ However, it firmly rejected any trade-off between economic co-operation and concessions in the field of security.

The Soviet Union managed to incorporate civil electronics technology into weapons systems more quickly than NATO and to achieve strategic superiority in medium-range missiles by dint of its own development work and legal and illegal imports of technology products.¹⁶ The West was not unaware of these

¹² Further motives put forward are securing the western borders and keeping the Eastern European states in line, fear of China, moral legitimisation after 1968, cheap grain imports, arms controls and disarmament.

¹³ Cf. inter alia P. Wiles: On the Prevention of Technology Transfer, in: East-West Technological Co-operation, NATO Colloquium, Munich 1976, Brussels 1977, pp. 25 ff.

¹⁴ Cf. L. Gouré: Soviet Views on Détente and Military Power, Center for Advanced International Studies, University of Miami, Coral Gables 1975, passim.

¹⁵ Among other things, the treaty on Germany's borders and recognition of the status of West Berlin, permission for Jews to emigrate, Basket 3 of the Helsinki Final Act.

¹⁶ Cf. inter alia Bruce Parrott (ed.): Trade, Technology and Soviet-American Relations, Bloomington 1985; T. Gustafson: Selling the Russians the Rope? Soviet Technology Policy and U.S. Export Controls, Santa Monica 1981; P. Hanson: Trade and Technology in Soviet-Western Relations, London and Basingstoke 1981; J. Tuck: Die Computer-Spione. Der heimliche Handel mit NATO-Technologie, Munich 1984; L. Melvern, D. Hebditch, N. Anning: Techno-Bandits – How the Soviets are Stealing America's High-Tech Future, Boston 1984.

¹¹ Cf. R. Hasse, op. cit., pp. 45-56.

developments; the fact is that it judged Soviet strategy by its own objectives and standards of behaviour and as a result curtailed its own efforts in the field of security. Kernig states very appositely that the Soviet Union "pursued the best flexible response strategy".¹⁷

Functional Approach

The European countries radically changed their policy on trade with the Eastern bloc, especially the Federal Republic of Germany, which has a traditional interest in trade with that area.¹⁸ Nevertheless, the use of trade as an instrument of foreign policy remained an element even in the concepts of "change through closer relations" or "change through trade". Paradoxically, the *ex ante* conditioning of economic sanctions was replaced by a functional approach with a close affinity to Marxist thinking: trade became a factor in the creation of a political climate. Economic co-operation was to help break down antagonism.

The proponents of this policy of trade with the Eastern bloc failed to state the conditions or timing for successful application of the strategy. Experience has shown that experiments in this direction were too naive and vulnerable from the security point of view and created vested interests rather than achieving a long-term political consolidation.¹⁹

The United States also modified its policy with regard to Eastern bloc trade during this period. The initiative stemmed from Congress, which passed the Export Administration Act of 1969, reducing the Commodity Control List from 1,300 to 200 positions in order to place American enterprises on an equal competitive footing with European and Japanese suppliers. Led by President Nixon and Secretary of State Kissinger, the vacillating Administration modified the approach into the "linkage strategy",²⁰ the aim of which was to lock the Soviet Union into a network of agreements and codes of conduct, to be achieved partly by exploiting bottlenecks in the Soviet economy. The giving or refusing of economic advantages (grain shipments, transfers of technology, most-favoured-nation treatment) was to be

used as an incentive for foreign policy restraint or punishment for aggression.

The only point in common between the linkage strategy and the concept of "change through trade" is their functional approach. The USA did not abandon the geostrategic policy of containment – it merely endeavoured to use the instruments of that policy much more flexibly.

The failure of this strategy was due to the West's fundamental overestimation of economic incentives and sanctions, shortcomings in its political implementation, demands in Congress for direct conditionality (Jackson-Vanik and Stevenson Amendments) and the policy of Europe and Japan with regard to trade with the Eastern bloc, which blunted the impact of Basket 2 of the Helsinki Final Act. Any chance of a common Western policy on relations and trade with the Eastern bloc went by the board. On the Eastern side, Soviet foreign policy demonstrated the extent to which the Soviet Union regarded the USA as politically and militarily impotent and how ineffective it therefore considered the lever of trade policy (actions in Viet Nam and Africa, policy in the Middle East, expansion of the navy and medium-range missile strength). The USA was facing challenges on two fronts: a challenge to its geostrategic pretensions from the Soviet Union and also a challenge to its political leadership in regard to *ostpolitik* from its NATO partners and Japan.

Regained Ability to Act

Fourth phase – 1975-82: The West regains its ability to co-ordinate and to take action. After 1975 American domestic and foreign policies were shaped by these two challenges. In 1976 the Department of Defense identified exports of technology by Cocom states (NATO countries and Japan) as one of the main reasons for the Soviet Union's success in narrowing the gap in electronic weapons technology.²¹ It demanded an end to the policy of exemptions from Cocom controls and a re-organisation and expansion of the Cocom list to include goods with both civil and military uses (dual-use goods, critical technologies concept). Congress and the Departments of Commerce and Foreign Affairs, on the other hand, favoured the "availability approach". Its proponents rejected more extensive American controls as unworkable, since the USA did not enjoy a monopoly in the technology embodied in the goods in question and

¹⁷ Claus D. Kernig, *op. cit.*, p. 52.

¹⁸ Cf. C. Wörmann: *Der Osthandel der Bundesrepublik Deutschland. Politische Rahmenbedingungen und ökonomische Bedeutung*, Frankfurt and New York 1982, *passim*.

¹⁹ Cf. R. Hasse: *Was ist normaler Osthandel?* in: *Wirtschaftsdienst*, No. 3, 1980, pp. 115 ff.

²⁰ Cf. H. Kissinger: *The White House Years*, London 1979, pp. 150-155; William G. Hyland: *Soviet-American Relations: A New Cold War?*, The Rand Corporation (R-2763-FF/RG), pp. 21 ff.; G. Schweigler: *Interessen und Ziele der amerikanischen Politik gegenüber der Sowjetunion*, in: F. Müller et al., *op. cit.*, pp. 25-54.

²¹ Defense Science Board Task Force on Export of U. S. Technology: *An Analysis of Export Control of U. S. Technology: A DoD Perspective*, Department of Defense, Office of the Director of Defense Research and Engineering, Washington D.C., 1976 (the Bucy Report).

the other countries were not prepared to curb their exports to the Eastern bloc. These opposing views collided in the debate on the renewal of the Export Administration Act in 1979, preventing the passage of an amended text; the controversy is still significant today, though under different circumstances.²²

American Administrations found it difficult to develop policies on armaments and trade with the Eastern bloc that could replace their confusing ad hoc policies. The Europeans offered little support; they emphasised their independence and continued to differentiate between trade with the Eastern bloc and security issues, even after the deficiencies of their defence policies had been recognised. They were thus unable or unwilling to distinguish between export restrictions on security grounds and those justified by ad hoc sanctions. This led to conflicts over issues such as the implementation of the NATO twin-track decision and sanctions against Afghanistan and Poland, which displayed the rivalry between Europe, Japan and the USA over policy towards the Eastern bloc and exhausted the scope for consensus, particularly under the Reagan Administration. In American eyes the "Olson dilemma" was heightened twofold within Cocom and NATO: the Europeans were reducing their relative contribution to the costs of producing the public commodity "security through military parity" and Japan was persisting in playing the role of free-rider. At the same time they were raising production costs as a result of their economic relations with the Eastern bloc in the form of exports of technology and loans. The natural gas pipeline project led to an open trial of strength.

Productive Furore

In retrospect, it proved to be a productive furore. The gas pipeline contract was more a trigger than a cause. It was the culmination of an escalating chain of events and ran counter to the firm majority opinion of the American Administration, whose patience and tolerance had been exhausted. Whether or not one is inclined or able to consider the imposition of the embargo on 18th June 1982 as part of a rational strategy, it would be wrong to

²² Cf. Stephan A. Merrill (ed.): *Securing Technological Advantage: Balancing Export Controls and Innovation*, Center for Strategic and International Studies, Georgetown University, Washington D.C., summer 1985, *passim*.

²³ Cf. H.-D. Jacobsen: *Die Osthandelspolitik des Westens: Konsens und Konflikt*, in: supplement to the weekly newspaper "Das Parlament", B 5/85, 2nd February 1985, p. 22.

²⁴ 1. Economic policy towards CMEA countries is to be based on a global policy serving the security interests of the West. 2. No trade war is to be waged against the Soviet Union; economic relations are to be on the basis of the balance of advantages and without preferential treatment. 3. Trade is to be so arranged that it does not enhance the strategic and military capabilities of the Soviet Union.

regard the compromise of 13th November 1982 as a barely concealed diplomatic reverse for the USA.²³ It led to the clarification and co-ordination of policies on trade with the Eastern bloc, the drawing of a distinction between ad hoc sanctions and export restrictions on security grounds and the re-integration of Cocom into the security strategy:

- The policies of all parties with regard to trade with the Eastern bloc were based on three criteria.²⁴
- Export credit terms for CMEA countries were tightened. The minimum interest rate was raised and is now adjusted every six months to market interest rates in the countries whose currencies make up the SDR basket. In addition, the Soviet Union lost its credit preferences in that it was removed from the group of middle-income developing countries.
- In July 1984 the Cocom list was revised and extended.
- Within NATO a study group was set up to examine in particular the security implications of trade in emerging technologies.²⁵
- The European countries are supporting "Operation Exodus", which the US customs authorities have been staging since October 1981 to track down illegal transfers of high technology goods to CMEA countries.²⁶

Contrary to the prevailing assessment of this conflict and its outcome, it must be asked why it took an open trial of strength before the European countries and Japan could be induced to extend the security concept to parts of their trade with CMEA countries. Their "reluctance" to do so cannot be explained by the partly justified criticism of US ad hoc sanctions, as these may no longer be equated to Cocom controls. Given that the security objective of "qualitative advantage" is more limited than the policy of containment of the early fifties and that economic co-operation between East and West has found recognition in the strategy of the "flexible response", the Cocom controls do not fulfil the criteria of economic sanctions.²⁷

Conceptions held in the West

How stable is the compromise of 13th November 1982? It can be circumvented by both sides. On the

²⁵ Cf. H.-D. Jacobsen: *Die Osthandelspolitik des Westens*, op. cit., pp. 22-26.

²⁶ Cf. J. Tuck, op. cit., pp. 78 ff. and *passim*.

²⁷ Cf. R. Hasse: *Theorie und Politik des Embargos*, op. cit., pp. 105-134. For this reason the Export Administration Act of 1979 rightly distinguishes between "national security" and "foreign policy".

American side, the Department of Defense in particular is calling for the Cocom list to be extended to include "militarily critical goods and technologies" along the lines of its own extensive Militarily Critical Technologies List, which adopts a broad definition of dual use. At the same time, the Department is demanding powers of its own to control not only transfers of goods but also transfers of knowhow via other channels. It inclines towards a monopolistic strategy, as it sees the open transfer of American technology as the main cause of the multitude of suppliers of security-sensitive goods and software worldwide (the availability approach), so that international controls are necessary, but realises that the efficiency of controls diminishes as the number of suppliers increases; such a monopolistic strategy entails the development of technology in the United States and a refusal to transfer it (security by secrecy) or rigorous controls on transfers of technology or products by imposing conditions and restrictions on their re-export. In the case of spin-offs, the prospect of monopoly profits could create a coalition between business interests and security considerations, a coalition that must also appear workable in the eyes of politicians concerned with security, as the expected new technologies differ from the earlier largely civil innovations in electronics in that they are being developed using state funds and on conditions laid down by the state.²⁸

The opposing position displays key elements of the "parity through qualitative advantage" approach, for which the maintenance of innovative forces is essential, particularly as a technology embargo against the Soviet Union could not guarantee the West a permanent lead. This concept relies on co-operation within the alliance and with Japan and on the productiveness of reciprocal technology transfers to maintain the qualitative security advantage.²⁹

It will depend crucially on the direction of European technology policies whether the monopoly (or conflict) strategy or the co-operation strategy gains the upper hand. If the Europeans opt for a rival European scheme rather than participate in the American programmes, barriers will come down and economic and political conflicts will ensue. A combination of independence, participation in the American programme and reciprocity in the transfer of technology accords better with the spirit of the alliance and allows the compromise of 13th November 1982 to be adapted to changed circumstances.

²⁸ Cf. inter alia S. Woolcock, op. cit., pp. 41 ff.

²⁹ Cf. inter alia Stephen A. Merrill (ed.), op. cit., passim.

Reactions of the Soviet Union

The Soviet position is determined by three factors:

- The status of the Soviet Union as a superpower is founded solely on its military might, which is not only an instrument of deterrence but also a means of safeguarding and extending its political influence.
- The Soviet Union is weak economically.
- In recent years the Soviet Union has lost strategic advantages in the military and political fields.

The military and civil technology programmes of the West and Japan are a challenge to the Soviet Union in two areas: the economy and armaments. Its assessment of the innovativeness of Western economic systems is partly realistic and, in the words of Lenin, partly coloured by a "fear of the power of capitalism". The economic reforms instituted since 1979 are reactions to the changing situation. All the Soviet Union's attempts to exert political influence, and thereby hamper the West, failed in their purpose with the implementation of NATO's twin-track decision, the announcement of SDI in March 1983 and the start of the research involved.

The introduction of electronics into weapons systems has strained the economic strength of the Soviet Union and it has not been able to derive spin-offs. Its policy of giving priority to a limited number of fields enables it to make up for lost time and to achieve self-sufficiency in certain areas. It now fears that a phase has begun that could overtax the economy's ability to react, particularly as the boost from legal and illegal imports of technology will decline. To consolidate its own position, the Soviet Union is attempting to increase the efficiency of its economy and to stimulate and co-ordinate technological research and innovation in the CMEA (Council meetings of June 1982 and December 1985). In contrast to the situation in the sixties, it must therefore give preference to an "internal" solution and at the same time exploit every opportunity to import technology. Threats against countries wishing to participate in SDI are part of this strategy, which is now being deployed from a defensive position and carries less force.

The situation offers opportunities for disarmament and the long-term stabilisation of East-West relations. However, it should not be overlooked that rigorous exploitation of the present Soviet asymmetry between economic weakness and military strength may make Soviet foreign policy less predictable. The task of shaping or re-shaping the economic component of the "flexible response" strategy is therefore just beginning.