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Report

drawn up on behalf of the
Committee on Economic and Monetary Affairs

on the European Community's machine tool industry

Rapporteur: Mr O. FRANZ

PE 88.674/fin.
Or Fr

English Edition

By letter of 21 June 1983, the Committee on Economic and Monetary Affairs requested authorization to draw up a report on the European Community's machine tool industry.

At its sitting of 12 September 1983, the European Parliament authorized the Committee on Economic and Monetary Affairs to draw up a report and instructed the Committee on Social Affairs and Employment to deliver an opinion.

At its meeting of 19/20 September 1983, the Committee on Economic and Monetary Affairs appointed Mr FRANZ rapporteur.

At its meetings of 30 November 1983 and 28/29 February 1984, the committee considered the draft report. It adopted the motion for a resolution as a whole unanimously on 28 February 1984.

The following took part in the vote: Mr MOREAU, chairman; Mr FRANZ, rapporteur; Mr BONACCINI, Mr DELOROZOY, Mr de FERRANTI, Mr HALLIGAN (deputizing for Mr CABORN), Mr HERMAN, Mr LEONARDI, Mr MARCHESIN (deputizing for Mr SCHINZEL), Mr NORDMANN, Mr WEDEKIND (deputizing for Mr von BISMARCK), Mr WELSH and Mr von WOGAU.

The Committee on Social Affairs and Employment did not deliver an opinion.

The report was tabled on 2 March 1984.

The deadline for tabling amendments to this report will be indicated in the draft agenda for the part-session at which it will be debated.

Contents

A

The Committee on Economic and Monetary Affairs hereby submits to the European Parliament the following motion for a resolution, together with explanatory statement

MOTION FOR A RESOLUTION

on the European Community's machine tool industry

The European Parliament,

- having regard to the reports by the Committee on Economic and Monetary Affairs (Doc. 1-801/83) on the Twelfth Report on Competition Policy by the Commission of the European Communities (Doc. 1-253/83),

- having regard to the following reports by the Commission of the European Communities

COM(81) 639	A Community strategy to develop Europe's industry
COM(81) 574 final	Scientific and technical research and the European Community - proposals for the 1980s
COM(82) 365	Communication from the Commission to the Council on the problem of investment
COM(82) 387	The competitiveness of the Community's industries
COM(82) 641	Communication from the Commission to the Council on initiatives for promoting investment
COM(82) 287 and 486	Towards a European strategic programme for research and development in information technologies
COM(83) 151 final	The European Community's machine tool industry: its present position and its prospects

- having regard to the report by the Committee on Economic and Monetary Affairs (Doc. 1-1527/83),

Economic and employment-related significance of the machine tool sector for the European Community

1. Is aware of the special strategic importance of the machine tool industry for the European Community's future industrial development because a certain degree of innovation in many manufacturing areas originates in this industry, which, owing to its influence on user productivity, is an important factor in determining industrial competitiveness;

2. Is convinced that those countries which master machine tool technology and thus determine the state of the art and the efficiency of production plant clearly improve their competitive position vis-à-vis countries which become technologically development;

3. Calls for all necessary measures to be taken to ensure that the European Community retains and develops its know-how in the world machine tool industry; is aware that considerable efforts will be required on the part of the Member States, their undertakings and the Commission of the European Communities in order to achieve this;

4. Believes that a large number of jobs in the European Community will be in jeopardy if a start is not made soon on implementing measures to promote machine tool technology in Europe, particularly for specialized applications, since it is primarily Japan that will continue to benefit from the job-creating effects of using high technology while its job-destroying effects will continue to be felt predominantly in the European Community;

5. Is convinced that the loss of jobs with bad working conditions that is taking place in many branches of industry as a result of the increasing use of modern industrial production methods can be at least partly offset by new jobs in the machine tool industry and in the Community's machine-tool-using industries, which are becomig internationally more competitive;

6. Calls on the Commission to conduct a detailed study of the positive and negative effects of an intensified expansion of the Community's machine tool industry on job numbers and employment quality and of the social effects of such an expansion;

The European Community's machine tool industry: its present position and its prospects

7. Notes that, in machine tools, the European Community, with 28% of world production and 50% of world exports, is still the front-runners in a number of areas, ahead of the United States of America and Japan, but that this commanding position will be threatened if certain measures are not taken;

8. Is aware that the machine tool industry's level of development and of efficiency still varies considerably from Member State to Member State;

9. Notes that the lion's share of the Community's machine tool industry (96% of production) is concentrated in four Member States (the Federal Republic of Germany, France, Italy and the United Kingdom) but that other Member States, such as Belgium, Denmark and the Netherlands, also have technologically advanced and economically powerful undertakings active in machine tool production;

10. Is deeply concerned at the fall in investment in industry in the European Community over the last ten years - itself part of the general decline in investment - and at the resulting serious threat to the European economy of a qualitative deterioration in its production capability as compared with that of Japan and of the United States of America, which may weaken Europe's industrial base;

11. Is convinced that, since 1969, manufacturing industry has been modernized more quickly and more extensively in Japan than in the European Community and that the average age of machinery is lower in Japan;

12. Believes that considerable competitive disadvantages are to be feared because of the clear lead Japan and the United States have gained over the countries of the European Community in recent years as regards investment in numerically controlled machine tools, industrial robots and flexible manufacturing systems;

The European Community's machine tool industry: prerequsites for a strategy for the future

A functioning internal market

13. Acknowledges that unimpeded access to the common market is of particular importance to the European machine tool industry, since this would permit a better return on the considerable research and development efforts needed to increase its effectiveness;

14. Regrets deeply the fact that, contrary to the spirit and the letter of the Treaties of Rome, contrary to the wishes of the European Paliament and of the Commission of the European Communities and contrary to Europe's present and future requirements, the Community's free internal market has not been fully established, although more than 25 years have elapsed since the founding of the European Community;

15. Calls on the Council of Ministers, national governments and national parliaments to work intensively with the Commission and the European Parliament, inter alia by dismantling non-tariff obstacles to trade, on the establishment of a fully functioning European internal market as the basis of European Union;

Free trade

16. Is aware, given the high export figures and considerable trade surpluses achieved by the Community's machine tool industry, that free trade is a sine qua non for mounting a strategy for the future of this industry and that success will depend on the Community's ability to ensure that free world trade will continue;

17. Emphasizes that voluntary restraint agreements are not an alternative to free trade and can be concluded only in exceptional circumstances and for a limited period with a view to furthering competitiveness and that state-directed export programmes cannot replace innovation and flexibility in the European Community's machine tool industry;

18. Calls, therefore, as a matter of urgency for the elimination, in all the Member States, of protectionist measures, which are hindering necessary structural changes and the recovery of international competitiveness and are thus endangering jobs in the Community;

Market competition

19. Emphasizes that market competition is the regulative principle that makes it possible for the machine tool industry to adapt to international technical and economic advances and that preservation subsidies hinder free world trade and thus inhibit the increased involvement of developing countries in the international division of labour, which should be encouraged;

20. Stresses therefore that the European Community must not grant blanket subsidies for the machine tool industry - since this would hamper innovation and structural improvements and divert financial resources from other, important areas - and calls for subsidies, insofar as they are necessary, to be completely transparent and granted for a strictly limited period, if possible as part of a uniform Community concept on restructuring;

Intensified research and development

21. Believes that a clear distinction must be made between subsidies and assistance for research and development and that support for research and development measures for the machine tool industry should be granted as a matter of principle;

22. Is convinced that the Community's machine tool industry can maintain its position as the world production leader only if it receives support in the form of specific research and development aid, permitting it to cut down the lead Japan has in some areas of highly advanced production engineering, and if it resolutely uses its technological capacity in order to capture a significant section of the market for automated production systems without neglecting innovation in machine tools for specialized small-scale production;

23. Calls for a uniform concept, geared precisely to existing support programmes for the machine tool sector and taking into account the particularly close intermeshing of machine tool technology and information technology, as the basis for selecting the instruments to promote the machine tool sector and for deciding on the orientation of the measures to be implemented throughout the Community under the direction of the Commission;

Improved training

24. Attaches great importance to improving the training of those who are or will be involved with the new technologies, as regards both the production and use of the hardware and software;

25. Calls on the Commission to draw up a basic report on the training requirements of the machine tool industry, with a view to submitting a training concept for the industry, (with regard also to the developing countries) in close cooperation with the industry itself and the relevant educational institutions at various levels;

26. Endorses the use of budgetary resources to support qualifications-related measures for trainees, students and workers in the field of machine tool technology;

Sufficient financing to stimulate innovation and investment

27. Considers, in the light of the considerable financing that the machine tool industry will require as a result of its strategy for the future, that it will be necessary to use special financing instruments, which will also make better provision for tax relief on investment, and that existing obstacles to capital movements must be eliminated;

28. Endorses the creation of a special Community instrument to finance innovation in the machine tool sector and welcomes the setting-up of private venture-capital institutions;

29. Expects the Commission to submit a report on existing Community and private-sector financing instruments, as well as on any such instruments

that may have to be extended or created in order to implement the machine tool industry's strategy for the future, and on their suitability as part of a Community-wide financing concept on the stimulation of innovation and investment in the machine tool industry;

Promotion of technical cooperation

30. Endorses the setting-up of a fund for research and development to be carried out by the Community's machine tool producers with a view to technical innovations;

31. Welcomes an extension of the successful technical and economic cooperation, including patent and licensing agreements, in the machine tool industry at international level and opposes any hampering of technological transfers;

32. Considers that close technical cooperation between producers and users provides an opportunity

- to secure a more rapid opening of the market for equipment which will maintain international competitiveness and to overcome users' negative attitudes, which result from a lack of information by way of preparation, and

- to increase productivity in small and medium-sized undertakings too;

Measures to ease conversion to new technologies and their applications

33. Stresses that the machine tool industry will more speedily be able to help to increase the European Community's international economic competitiveness if it can be made easier to convert to the new technologies and to put them into practice;

34. Is convinced that, for this to be done, cooperation between machine tool producers and electronics manufacturers on the one hand and users and trade unions on the other must be stepped up, with a view to an intensive exchange of information and to clarification of unresolved technical and social issues;

35. Instructs the Commission to submit proposals, on a realistic basis and in the light of experience, for measures in this field;

Better opportunities for small and medium-sized undertakings

36. Calls for the strategy for the future to provide for better opportunities for small and medium-sized undertakings, in respect of both producers and users;

37. Is aware that small and medium-sized undertakings are of particular significance to this industry, in which specialization to satisfy specific user requirements often calls for customized engineering solutions;

38. Is convinced that, on a free world market, the presence of a large number of small and medium-sized undertakings helps to keep the European machine tool industry competitive and constantly innovative;

The drawing-up of a comprehensive market study

39. Considers the absence in the European Community of adequate information on demand trends and machine tool producers' and users' lack of important data for their future decisions to be a problem;

40. Approves therefore the drawing-up of a comprehensive market study in close cooperation between producers, users and the Commission; calls on the Commission to indicate approaches, geared to the different users, towards solving as many as possible of the abovementioned problems and to give the study organizational and financial support; calls for the creation of a 'harmonized' data bank which would be accessible to small suppliers too;

41. Considers that it would be useful for a study of the European Community's installed machine-tool base to be conducted at a given moment, using the same criteria throughout;

42. Considers it important for the market strategies pursued by producers of electronic machine tools and producers of electromechanical machine tools to be better attuned with a view to providing a coherent overall concept for the Community's future output;

43. Calls on the Commission to encourage or promote directly meetings and conferences between producers in this sector and potential users in order to provide more information and highlight the need for innovation and the opportunities for cooperation between producers and between producers and users in very specialized sectors, which are of interest to smaller undertakings and to many of the countries with plans to embark on industrial development;

Concluding remarks

44. Takes the view, in conclusion, that the technological potential of the machine tool industry in the Community is comparable, overall, with that of its competitors on the world market, so that, provided the necessary restructuring operations and improvements are carried out in the Community, there will be a future for this industry;

45. Calls, with this in mind, on the national governments of the Member States to work with the Commission and the European Parliament to create framework conditions for economic, financial and social policies that will permit the efficient undertakings in the Community's machine tool industry to ensure long-term competitiveness through their own efforts without resorting to government subsidies;

46. Stresses in particular the value of the work carried out by the Commission on the strategy for the future of the machine tool industry and awaits with great interest the further reports called for in this resolution;

47. Calls on the Committee on Economic and Monetary Affairs to follow this matter closely and to submit, during the next legislative period, any proposals it considers necessary;

48. Instructs its President to forward this resolution, together with the accompanying report by the committee responsible, to the Council and Commission.

B

EXPLANATORY STATEMENT

I. Economic and employment-related significance of the machine tool sector for the European Community

1. The term 'machine tool' covers all metal-forming and some wood-forming machines plus all electronically and numerically controlled machines such as industrial robots. The machine tool industry creates the technical basis for industrial production. Machine tool production world-wide was worth $7,800 m in 1971 and $26,400 m in 1981, doubling in value in 10 years even with inflation taken into account. The machine tool industry is of prime importance to manufacturing industry in general, and to the motor vehicle industry and to the arms industry in particular, and has thus acquired a structural significance far beyond that indicated by its share of gross national product.

In the European Community, the industry comprises about 2,800 undertakings. Metal-working and the processing of other materials, where the engineering emphasis lies, have undergone radical technological change and development since 1952; and an end is not in sight. The first numerically controlled (NC) machine tools were developed in 1952 at the Massachusetts Institute of Technology; industry began using them - initially, they were mainly drills - from 1960 onwards. The first computer numerical control (CNC) machine tool was installed in 1973, the first flexible manufacturing systems (FMS) and industrial robots in 1980. The effects of these revolutionary technical developments can be seen in the production sectors of all branches of industry; their influence on the productivity and competitiveness of the entire economy is considerable. High-technology machines have not completely ousted conventional, exclusively mechanical machines, though their diffusion rates are considerably higher: it is estimated that the annual rate of diffusion of industrial robots between 1980 and 1990 will be 30 percent, while NC machine tools' share of the world machine-tool market rose from 10 percent in 1975 to 20 percent in 1980.

2. As the Commission rightly points out, the rapid diffusion of automated production systems must undoubtedly be considered the form of industrial change that will characterize the decades to come; as a result of advances in microprocessor technology, production-process automation can penetrate hitherto inaccessible areas; the use of electronic systems, which was relevant initially only to 'continuous' production processes and later to volume production, will now be possible for non-continuous, small-scale production too. This means that more and more sections of manufacturing industry can now be automated. The economic effects of this development are of particular importance to the Community: manufacturing industry contributes about 30 percent of its gross domestic product.

Below is a table of world machine-tool statistics (production, trade, consumption) for 1982.

World machine-tool statistics 1982
(excluding accessories and spare parts)

expressed in millions of DM and percentage shares of the world aggregate market (estimates*)
- nominal evolution -

Order of countries by production	Production		Exports		Imports		Domestic Consumption**	
	Million DM	%	Million DM	%	Million DM	%	Million DM	%
1. Japan	9,439	17,1	3,090	13,4	555	2,8	6,904	13,4
2. USA	8,780	15,9	1,554	6,7	3,157	16,0	10,383	20,1
3. Federal Republic of Germany	8,497	15,4	5,598	24,2	1,250	6,3	4,149	8,0
4. USSR	7,126	12,9	595	2,6	2,352	11,8	8 863	17,2
5. Italy	3,047	5,5	1,819	7,9	538	2,7	1,766	3,4
6. GDR	1,962	3,6	1,559	6,7	478	2,4	881	1,7
7. Switzerland	1,866	3,4	1,651	7,1	419	2,1	634	1,2
8. UK	1,786	3,2	1 191	5,1	936	4,8	1,531	3,0
9. France	1,505	2,7	767	3,3	1,176	6,0	1,914	3,7
10. Roumania	1,495	2,7	351	1,5	480	2,5	1,624	3,2
11. People's Republic of China	c 1,141	2,1	c 61	0,3	c 316	1,6	c 1,396	2,7
12. Czechoslovakia	1,066	1,9	799	3,5	274	1,4	541	1,0
13. Yugoslavia	738	1,3	232	1,0	247	1,3	753	1,5
14. Spain	728	1,3	465	2,0	412	2,1	675	1,3
15. Poland	c 680	1,2	c 291	1,3	c 340	1,7	c 729	1,4
16. Canada	538	1,0	392	1,7	633	3,2	779	1,5
17. Bulgaria	c 537	1,0	c 534	2,3	c 663	3,4	c 666	1,3
18. Sweden	520	1,0	374	1,6	456	2,3	602	1,2
19. India	513	0,9	64	0,3	257	1,3	706	1,4
20. Brazil	511	0,9	51	0,2	270	1,4	730	1,4
21. South Korea	486	0,9	158	0,7	607	3,1	935	1,8
22. Taiwan	485	0,9	362	1,6	196	1,0	319	0,6
23. Hungary	317	0,6	238	1,0	308	1,6	387	0,7
24. Austria	256	0,5	236	1,0	660	3,4	680	1,3
25. Belgium	296	0,4	282	1,2	300	1,5	234	0,5
26. Israel	c 170	0,3	c 61	0,3	c 243	1,2	c 352	0,7
27. Australia	c 150	0,3	c 12	0,1	c 446	2,3	c 584	1,1
28. Netherlands	132	0,2	142	0,6	174	0,9	164	0,3
29. Singapore	98	0,2	53	0,2	261	1,3	306	0,6
30. Denmark	94	0,2	91	0,4	60	0,3	63	0,1
31. Argentina	c 86	0,2	38	0,2	114	0,6	c 162	0,3
32. South Africa	51	0,1	10	0,0	515	2,6	556	1,1
33. Mexico	c 44	0,1	c 5	0,0	c 486	2,5	c 525	1,0
34. Portugal	31	0,1	8	0,0	122	0,6	153	0,3
35. Hongkong	18	0,0	10	0,0	11	0,1	19	0,0
World aggregate (35 countries)	55,144	100,0	23,144	100,0	19,692	100,8	51,665	100,0

Based on the 1982 average exchange rate of DM 2.4287 to the US$

*) Mainly based on estimates (in US$) provided by the national machine-tool producers' associations, November 1982

**) Domestic consumption = production - (exports + imports)

c = rough estimate

0.0 > 0.1

Source: American Machinist, February 1983

Compiled and published by the German Association of Machine Tool Producers (Verein Deutscher Werkzeugmaschinenfabriken e.V.)

3. The most important benefits that can be gained by using state-of-the-art machine tool technology in the various machine-tool-using industries - benefits which directly contribute towards improving competitiveness - are:

- increased productivity,
- more flexible production capability,
- increased production reliability,
- improved product quality.

Countries with advanced machine tool technology at their disposal enjoy considerable competitive advantages on the world market. The table below provides an overview of the structure of the installed machine-tool base (in selected countries), which differs greatly from country to country:

STRUCTURE OF THE INSTALLED MACHINE-TOOL BASE

IN 1980 (figures given are estimates)

(NC machine tools, advanced industrial robots, and flexible manufacturing systems)

Country	NC machine tools		Advanced industrial robots	Flexible manufacturing systems	Average age of installed base (% under 10 years old)
	Units	% *			
JAPAN	50,000	7.1	14,250	33	46%
UNITED STATES	70,000	2.7	4,100	19	31%
FEDERAL REPUBLIC OF GERMANY	25,000	2.0	1,420	13	34%
ITALY	20,000	4.4	353		49%
FRANCE	10,500	1.2	600	2	35%
UNITED KINGDOM	7,000	0.8	371		39%

* As a percentage of the total installed base

After many years of continuous growth, the machine tool market has suffered a setback in the last two years; the United States has been particularly affected. However, it is expected that machine tool specialization, and therefore world trade in such tools, will increase considerably in the coming years.

Many industrialized countries are suffering from a large investment gap; yet there has been a wealth of technical innovation. Although the last five years have brought a great increase in the number of numerically controlled machine tools installed in the industrialized countries, their share of the overall machine tool market is still less than 3 percent but will undergo disproportionately high expansion because of rising labour costs. However, it is in the developing countries with emerging industries that machine tool requirements will increase more dynamically than in the industrialized countries, with an ever-increasing demand for manufacturing systems and complete machine-tool-based production lines. Machine tools are a high-technology growth industry.

4. The number of people directly employed in the machine tool industry today is relatively small: in the Federal Republic of Germany, it employs 1.38% percent of the industrial workforce; in all the other Community countries, its share is lower (considerably lower in some cases).

The table below illustrates the evolution of employment in the machine tool industry in selected countries over the last few years.

Evolution of employment in the machine tool industry in selected countries

	1978	1979	1980	1981	1982
Federal Republic of Germany	98,700	101,000	99,000	99,000	94,000
France	20,745	20,158	19,650	18,984	17,661
Italy	36,500	37,000	37,200	36,000	33,800
United Kingdom	52,000	51,000	45,000	43,400	39,300
Switzerland	17,300	17,000	16,800	16,600	16,000
United-States	89,500	96,100	110,000	n.a.	65,700[1]

[1] As of February 1983, according to 'A Report on the American Economy and its Machine Tool Market', submitted by James A. Gray, President of the NMTBA, in June 1983 at the 5th E.M.O Paris Fair.

However, many more workers actually use machine tool technology: according to the French Economic and Social Committee, an estimated 4.6 million jobs in French industry will eventually be affected by robot technology.

5. Technological progress is considered a fundamental evil by many of its critics: the root cause of our employment and environmental problems. By taking such a narrow view of an issue of vital importance to an industrial nation, any opportunity of using new technologies for the benefit of the economy as a whole is thrown away. The view persists that the prime effect of using machine tools, particularly industrial robots, is to destroy jobs. The Luddites in the last century were convinced that technological progress would lead to mass unemployment; they were wrong, as are all those who today are convinced that all rationalization, computers, and indeed robots are the work of the Devil. Jobs will, of course, disappear as a result of using robots; and, of course, the use of robots will create problems, as does any innovation. However, despite such worries, which are understandable, it cannot and must not be forgotten that the greatest job losses have occurred in industries that have shut themselves off from technical progress or have not adapted in time. Robots not only destroy jobs; they also create and preserve jobs.

6. Many trade unionists, too, have welcomed the fact that robots are taking over fatiguing and dangerous work. As a result of using this technology, automated production facilities in Japan can be run by as little as 10 percent of the workforce that would otherwise be required. Forty-eight percent of the undertakings that have introduced automation have increased their workforce, however, despite the general decline in the level of employment in Japan's manufacturing industry.

II. The European Community's machine tool industry: its present position and its prospects

7. In 1971, the European Community's share of world machine-tool production was 40 percent; in 1981, it was only 28 percent. During the same period, the United States and Japan increased their share from 13 and 12 percent respectively to 20 and 18 percent respectively. The European Community is still the world leader in machine tool production; 20 percent of all machine tools are installed in the Community, where over 50 percent of world machine-tool exports originates. At DM 3,059 m, the value of its machine tool exports in 1980 was 50 percent higher than that of the United States' (DM 899 m) and of Japan's (DM 1,128 m) combined.

8. The lion's share of machine tool production in the European Community is concentrated in the Federal Republic of Germany, France, Italy and the United Kingdom; but there are also high-technology, efficient machine-tool production facilities in other Member States. Of world production in 1982, the Federal Republic of Germany's share was 15.2 percent, Italy's 5.5 percent, the United Kingdom's 3.2 percent, and France's 2.7 percent.

9. The European machine-tool industry can look back on a rich history and benefit from its highly advanced supply and demand structure with regard to both exports and the domestic market. Where it suffers is in its electronics sector, which is at a low level of development and is finding it difficult to satisfy the particular requirements involved in converting to electronics-based machinery. The following tables provide a breakdown of the Community's machine tool imports and exports, as well as an overview of world machine-tool production and requirements.

Breakdown of Community machine-tool imports and exports

	Year	Community of Nine (million ECU)	Federal Republic of Germany (%)	France (%)	Italy (%)	Netherlands (%)	Belgium/ Luxembourg (%)	United Kingdom (%)	Ireland (%)	Denmark (%)
Exports										
(i) To Community countries	1976	650	58.1	8.1	13.2	3.8	6.8	9.0	0.1	0.8
	1980	1,398	48.8	9.7	17.2	4.3	5.9	12.2	0.7	1.1
(ii) To third countries	1976	1,852	59.9	10.3	13.0	1.1	2.4	12.2	-	1.1
	1980	3,059	55.2	11.1	15.1	1.1	1.7	14.8	0.1	0.9
Imports										
(i) From Community countries	1976	595	12.5	35.6	13.6	7.7	8.0	17.7	1.5	3.5
	1980	1,369	18.0	24.6	13.5	7.7	11.0	20.1	2.7	2.4
(ii) From third countries	1976	454	27.4	21.8	12.9	3.5	3.1	27.2	0.5	3.5
	1980	1,175	38.8	14.4	10.8	4.3	4.4	24.4	0.7	2.3

Source: Eurostat

eographical breakdown of Community machine-tool exports 1976-1980

Destination	1976		1980	
	Value	%	Value	%
(1) Rest of Western Europe	423,3	22,9	586,8	22,8
of which: Switzerland	52,1	2,8	142,1	5,5
Austria	53,0	2,9	95,2	3,7
Sweden	94,4	5,1	84,8	3,3
(2) Eastern Europe	596,7	32,2	641,7	24,9
of which: USSR	350,0	18,9	396,6	15,4
Poland	120,6	6,5	61,8	2,4
(3) North America	167,2	9,0	408,2	15,8
of which: USA	145,6	7,9	354,4	13,8
(4) Latin America	195,1	10,5	302,2	11,7
of which: Brazil	105,6	5,7	105,4	4,1
Mexico	27,8	1,5	101,9	4,0
(5) Middle East	128,2	6,9	87,7	3,4
(6) Africa	150,2	8,1	223,1	8,7
of which: South Africa	43,1	2,3	103,7	4,0
(7) Asia	165,1	8,9	261,3	10,1
(8) Oceania	25,1	1,4	61,5	2,4
(8a) (OPEC Countries)	(187,5)	(10,1)	(142,2)	(5,5)
Total Extra-Community	1,851.6	100	2,575,4	100
(Intra-Community)	(650,4)	(35,1)	1,075,4	(41,8)

Source: Eurostat

Units: Million ECU

Breakdown of machine tool production by country

Country	1971 in %	1975 in %	1980 in %	1981 in %	1982 in %
1. European Community	40.2	35.8	33.8	27.9	27.6
of which: Federal Republic of Germany	22.6	17.6	17.6	15.3	15.4
Italy	5.9	6.4	6.5	5.3	5.5
UK	5.9	5.3	5.2	3.5	3.2
France	4.7	5.0	3.6	3.1	2.7
Belgium	0.6	0.8	0.5	0.4	0.4
Netherlands	0.3	0.4	0.2	0.2	0.2
Denmark	0.2	0.3	0.2	0.2	0.2
2. USA	12.7	18.0	18.0	19.5	15.9
3. Japan	11.9	7.8	14.3	18.4	17.1
4. USSR	14.8	14.5	11.5	12.2	12.9
5. Switzerland	3.4	3.9	3.7	3.1	3.4
6. GDR	3.7	4.3	3.3	2.9	3.6
7. Roumania	0.3	0.8	2.2	2.3	2.7
8. China	0.7	2.2	1.6	1.7	2.1
9. Czechoslovakia	3.2	2.2	1.2	1.3	1.9
10. Spain	1.3	1.7	1.3	1.2	1.3
11. Brazil	0.5	1.0	1.2	1.2	0.9
12. Poland	2.2	3.1	1.5	1.2	1.2
13. Yugoslavia	0.5	0.5	0.9	1.0	1.3
14. Taiwan	0.2	0.2	0.9	0.9	0.9
15. Sweden	1.0	1.0	0.9	0.8	1.0
16. Canada	0.5	0.5	0.7	0.8	1.0
17. South Korea	-	-	0.5	0.8	0.9
18. India	0.6	0.7	0.6	0.7	0.9
19. Austria	0.4	0.5	0.6	0.5	0.5
20. Hungary	0.7	0.4	0.5	0.5	0.6
21. Others	1.4	0.9	0.8	1.0	2.3
Total (Million US$)	100% = 7,843	100% = 13,644	100% = 26,748	100% = 26,391	100% = 22,705[1]

[1] The 1982 figures do not include accessories or spare parts

Breakdown of machine tool requirements by country

Country	1971	1975	1980	1981	1982
1. European Community	31.6	22.0	24.2	20.4	17.8
of which: Federal Republic of Germany	14.2	5.9	9.5	8.3	7.5
France	6.0	5.1	3.7	4.0	3.5
Italy	5.6	4.8	4.7	3.9	3.2
UK	4.4	4.5	5.0	3.1	2.8
Belgium	0.8	0.8	0.5	0.5	0.4
Netherlands	0.6	0.5	0.5	0.4	0.3
Denmark	0.2	0.3	0.2	0.2	0.1
2. USA	10.5	16.1	19.9	20.7	18.8
3. USSR	16.6	16.8	14.0	14.9	16.1
4. Japan	12.4	6.0	9.5	12.8	12.5
5. Canada	1.3	1.9	2.0	2.9	1.4
6. China	1.5	2.6	2.0	2.0	2.5
7. Mexico	0.9	1.8	1.2	1.8	1.0
8. GDR	1.1	2.0	1.7	1.6	1.6
9. Brazil	1.0	1.5	1.6	1.4	1.3
10. Korea	-	-	1.7	1.4	1.7
11. Poland	2.4	5.1	2.0	1.3	1.3
12. Yugoslavia	0.6	1.0	1.3	1.2	1.4
13. Switzerland	1.5	1.6	1.3	1.1	1.1
14. Australia	0.9	0.8	0.6	1.0	1.1
15. India	0.8	0.9	0.8	0.9	1.3
16. South Africa	0.7	0.7	0.9	0.9	1.0
17. Sweden	1.4	1.6	0.9	0.9	1.1
18. Spain	1.5	2.3	0.9	0.8	1.2
19. Czechoslovakia	2.3	1.8	0.8	0.7	1.0
20. Hungary	0.6	0.4	0.6	0.7	0.7
Total (Million US $)	7.843	13.644	26.748	26,391	22,705[1]

[1] The 1982 figures do not include accessories or spare parts

10. The position of the European Community's machine tool industry as the world market leader is in jeopardy; developments in recent years have indicated a decline in its international competitiveness vis-à-vis the United States and, in particular, Japan. The determination with which Japan is preparing the ground for the automation of production - an unstoppable process in any event - should be considered a challenge rather than a threat: in its industrial policy, Japan is setting an example of how to adapt to far-reaching technological and industrial change.

Five years ago, many experts assumed that the Community's machine tool industry would go the same way as the motor cycle and camera industries; concern for the survival of the industry in Europe was justified. It scarcely seemed possible to imitate the development of Japan, which gained considerable cost benefits through its electronics industry, its lower labour costs and through conversion to volume production in many areas. Fortunately, the Community's machine tool industry mainly comprises small and medium-sized undertakings. Many countries were not prepared to help this industry become more obsolescent through subsidies and other protectionist measures. The result was that firms in most European Community countries had only two options: either to carry out the radical technical changes required and adapt to the new market conditions, or to drop out of the market altogether.

In its report on the Commission's Twelfth Report on Competition Policy, the Committee on Economic and Monetary Affairs mentions the Trumpf machine tool works and the MAHO company as examples of undertakings that have understood the Japanese challenge.

In its 1982 annual report, Trumpf GmbH of Ditzingen stated that, in its own particular field, German electronics manufacturers were no longer inferior to Japanese producers. This company manufactures machine tools and power tools for sheet-metal working. In September 1982 it presented, for the first time, a CNC sheet-metal-working machine which can be programmed on the shop-floor with the aid of video graphics; well over a hundred have been sold in recent months. As a result of this new product, which permits, at the machine itself, interactive parts design and interactive NC programme creation, new customers and markets have been acquired. Despite the crisis in the machine tool industry, this company's sales grew by 8 percent in the Federal Republic of Germany last year. (The figure is 12 percent if its Japanese subsidiary is also included.) In the second half of 1983, there was a 30-percent increase in orders over the previous year. Sales last year amounted to DM 202 m; annual research and development

expenditure is about 6 percent of sales, i.e. DM 12 m in the last business year. New investment amounted to DM 20 m, 50 percent of which went abroad. The figures for this medium-sized undertaking speak for themselves.

MAHO pioneered, in Europe, the Japanese model of volume production and standardization and have scored impressive successes, under free-market conditions, with volume-produced, standardized (mid-range-technology) universal milling and drilling machines and CNC machining centres. MAHO is the European market leader in CNC machining centres of this size, ahead of even its Japanese competitors. This is the result of successfully combining standardization, volume production, a high degree of convenience, a sophisticated production and assembly concept, and a high level of sensitivity to market forces. Unfortunately, however, it has to be assumed that these two undertakings are not typical of all the countries of the European Community.

11. The Commission rightly points out that the evolution of the Community's production capabilities in recent years indicates relatively sluggish investment in capital equipment by Community undertakings vis-à-vis their Japanese and US competitors. Investment in machine tools gives particular cause for concern: all available data indicates that the Community's machine tool base is rapidly becoming obsolescent, as compared with Japan's and the United States'. Investment in NC machine tools is characteristic of the overall situation: in 1980, there were almost as many such machine tools installed in Japan as in France, the Federal Republic of Germany and Italy combined. If the low level of investment in the European Community persists, there is a danger that the industrial base of the Community will be progressively undermined and that the competitiveness of its manufacturing industry will deteriorate.

12. Japan achieves considerably larger trade surpluses than the European Community on the rapidly expanding NC machine-tool market. Developments have been favourable for Japan vis-à-vis the European Community, whose position as the world's most important machine tool exporter is beginning to be eroded, and the United States, whose trade balance has been deteriorating seriously for some years.

In 1971, Japan imported 15 percent of its domestic requirements in the field of machine tools and exported 12 percent of its production; in 1981, 6 percent was imported and 35 percent of its production was exported.

- 50 percent of Japanese exports in 1980 were destined for North America and the European Community (37.4 and 13.3 percent respectively), while only 18 percent of the European Community's exports went to Japan and North America and only 29 percent of the United States' exports went to the European Community and Japan.

- More than 60 percent of Japanese exports were NC machine tools (mainly lathes and machining centres), as opposed to 16.2 percent and 17.3 percent for the European Community and the United States respectively.

Among the particularly promising machine-tool-producing countries outside the European Community are the People's Republic of China, South Korea, and Taiwan. In addition to a number of developing countries, the USSR too can be expected to show a dynamic increase in demand for machine tools.

For the European Community, the concerted expansion of the machine tool industry is not only necessary to avoid being left behind by its competitors world-wide; it also presents a great opportunity to make crucial improvements in the structure and effectiveness of its industry as a whole. Taking advantage of this opportunity depends on a number of preconditions, which are discussed in the following.

III. The European Community's machine tool industry: prerequisites for a strategy for the future

A functioning internal market

13. A fully functioning intra-Community market could considerably strengthen the competitiveness of the European machine tool industry vis-à-vis international competitors.

14. There are intra-Community obstacles to trade which hamper competition, particularly as a result of:

- preferential treatment for suppliers from the purchaser's own country, particularly in respect of machine tools for the arms industry, despite competitive bids from suppliers from other Community countries;

- differing legislation in the countries of the Community and a lack of fiscal harmonization, the effects of which vary from Member State to Member State; technical standards in particular, which are important for the machine tool industry, are often misused to seal off a market (insofar as they are not based on international standards);

- hampering of goods traffic at frontiers within the Community, delays because of border controls, red tape, and proliferating paperwork.

15. No European Community country can do without the Common Market. However, the benefits could be much greater if there were a fully functioning internal market, as is shown by the US and Japanese markets. This is the cause we must champion: national obstacles to trade must not be allowed to threaten the successes that have been achieved through the dismantling of tariffs. Because of the

radical technological change in progress, there is more and more mass production. Sealing-off Community markets makes it difficult for adaptation to be effective and hampers any adaptation that may still be necessary. If the internal market, which is far larger than either the US or Japanese market, were fully functioning, it would be the world's most dynamic market: on no other market in the world would there be a greater return on research and development, new investment, and innovation of every kind in the machine tool sector; it might also stimulate growth, which is important for our future. The machine tool industry cannot take full advantage of the benefits of a European market as long as hidden protectionism is not eliminated.

Free trade

16. Because of the Community's very heavy involvement in exports in the machine tool sector - a much heavier involvement than that of the United States or of Japan - a free world trading system is of particular importance to the Community's machine tool industry: if we cannot succeed in defeating protectionism, and thus in ensuring free trade for the machine tool industry, the competitiveness of this strategically important sector will be in jeopardy. Advances and long-term success in the leading-edge technology used in the machine tool industry will be achieved not by expanding protectionist measures, but through free competition; and it cannot be pointed out clearly enough that the EEC Treaty confers upon the European Community the task of ensuring domestic competition and free world trade.

17. Voluntary restraint agreements are a substitute for import quotas, and they have a similar effect: they are used to restrict domestic investors' access to state-of-the-art machine tools which they would like to purchase; this narrowing of supply prevents price reductions which would otherwise take place, and hinders the

necessary modernization of the production capabilities on which the European Community's competitiveness depends. Voluntary restraint agreements with Japan may give the Community's machine tool industry a breathing-space; however, they reduce the pressure to innovate and to adapt as is required.

18. At US$ 3,900 m, the value of the machine tools produced in Japan in 1982 exceeded the value of US production for the first time, making Japan the world's largest machine-tool-producing country. With an aggregate machine-tool production value of US$ 6,300 m, the countries of the European Community are still far ahead of Japan, however. The European Community, whose 1982 machine tool production exceeded Community demand by more than 50 percent, will be able to retain its position as the world leader in machine tool production only if protectionist measures are eliminated as soon as possible, not if the trend towards protectionism increases.

19. 'Preservation' subsidies represent a danger to the Community's machine tool industry, too, in that they prevent unprofitable undertakings from dropping out of the machine tool production market; this often prevents competitive undertakings from making profits, which are necessary in order to finance the modernization programmes required to safeguard jobs in the long term. Subsidies cause distortions in competition in the European Community, curb free enterprise and reduce efficiency and initiative; these are all essential elements of a market economy. Only through unrestricted competition that is not artificially distorted can the machine tool industry be kept at full strength and sufficient stimulus be given to technical and economic progress in this industry. Without competition, a market economy cannot be a social market economy.

Increasing the competitiveness of the Community's machine tool industry is a necessity for all Member States despite the fact that its level of efficiency and of development differs from State to State. Thus, when giving its opinion on aid measures of which it has been notified pursuant to Article 93 of the EEC Treaty, the Commission must ensure in particular that the preconditions for adapting production capabilities are still met.

20. There should be intensified support programmes - fully transparent and strictly limited in duration - for the machine tool industry as part of a Community concept on restructuring.

Intensified research and development

21. With some exceptions, research in the machine tool industry in the European Community is not being pursued with sufficient intensity: research and development expenditure averages less than 2 percent of sales, as opposed to up to 15 percent in highly innovative undertakings, while state-supported research programmes in the United States (Man Tech Programme, Small Business Programme and the AMRF Programme) and in Japan (MITI Large-Scale R & D Programme, MUM Programme) are well-coordinated and are cornerstones of technological innovation there.

22. The European Community's research and development programmes in the field of basic technological research and on utilizing new technologies, which were adopted in 1983, and the first European strategic programme for research and development in information technologies ('Esprit') may become very significant for the machine tool industry if the work of all concerned can be coordinated within a uniform strategic research concept and the available personnel and resources can be deployed for specific purposes. The declared aim of the Esprit programme - to achieve technological parity with, if not outright superiority over, international competitors within 10 years - is entirely

applicable to a specific spin-off research programme on machine tools too. It will be particularly important for industry, higher education, research institutes and the Commission to cooperate closely in order to ensure that, fully in keeping with international practice as regards innovation and in the light of the close interrelationship of machine tool technology and information technology, great attention is paid to the scientific and technical strategy. One of the main areas at which the Esprit programme's research efforts will be directed is fully computerized integrated production, i.e. the development of the technological basis for the gradual introduction of information technology at every production stage. However, given that the aim should be to implement a comprehensive research and development programme for the machine tool industry, this is but one area, albeit an important one, of a much-needed programme.

23. It would therefore seem particularly important for the Commission not only to continue its efforts to coordinate Member States' policies on promoting research, but also to use its close contacts with the engineering and electronics industries to work towards the successful combination of their research and development approaches. This might permit better coordination of initiatives and give industrial research an urgently needed 'shot in the arm'.

Therefore, in line with its recently proposed guidelines, the Commission should intensify its efforts to harmonize research support measures for the machine tool sector in the Member States.

Improved training

24. All those concerned rightly take the view that training in the Community's machine tool industry is inadequate, not only as regards information technology and automation, but also

in areas such as hydraulics and precision engineering. The European Metalworkers' Federation (EMF) has pointed out to the Commission that funds for worker training and re-training should be stepped up and that the problem of worker training and re-training in general should be tackled as soon as possible.

25. These demands must be taken up as a matter of principle. Thus, there must be further study of the effects of the increased use of automated production methods on employment, and the resources allocated to training in the Community must be stepped up.

26. The European Committee for Cooperation of the Machine Tool Industries (CECIMO) has pointed out that, although there should not be any particular problems as a result of the quantitative evolution of employment in the machine tool sector in the years to come, problems of a qualitative nature in the field of training will have to be solved. (CECIMO expects a reduction in the work-force of about 5 percent in total over several years.)

A strategy for the future of the Community's machine tool industry will be successful only if the level of qualification can be raised considerably on the basis of a Community-level approach. This must apply not only to trainees and students, but also to factory workers, fitters, foremen, sales engineers, systems engineers, project engineers, and senior staff. The training concept to be drawn up must also be suitable for workers in small and medium-sized undertakings, both now and in the future; indeed, it must be suitable for them in particular.

The following demands, made by the EMF, should also be supported:

- workers' representatives to be given relevant information at an early stage;

- studies and experiments to be carried out with a view to elaborating new organizational forms in order to upgrade and extend the functions performed;

- a wide-ranging education programme to be introduced within the general training programme and the adult professional training programme, enabling those concerned to understand and know how to use the new automated and computer-controlled production systems.

Sufficient financing to stimulate innovation and investment

27. The Community's machine tool sector - predominantly small and medium-sized undertakings - primarily suffers from a shortage of funds, which often leads to large-scale indebtedness, and from a disproportionately high level of short-term debts. Rapid technical change in this sector is the main reason for both situations. The investment rate (gross fixed capital formation as a percentage of gross domestic product) for the machine tool industry in recent years has been much higher in Japan than in the European Community: higher capital expenditure per employee is one of the main reasons why Japan has gained ground.

28. As the Commission rightly stresses, one of the main weaknesses affecting undertakings in the Community's machine tool industry, as compared with their Japanese competitors, is the difficulty in obtaining long-term loans from banks in the Community on the basis of considerations of business strategy or production technology rather than the classic criteria of financial analysis. The success of a recovery strategy for the future will be dependent on, inter alia, the availability of long-term lending and risk capital. Because the sector is insufficiently profitable at present, it has insufficient own resources and therefore other sources of (risk) capital must be found.

29. With a view to solving this problem, the Commission is examining ways of using Community financing instruments to promote innovation. However, it is so difficult for any interested party to grasp how the Community's existing public and private-sector financing instruments can be coordinated that their combined use is hardly feasible. It would therefore be useful if the Commission could provide greater transparency here, in the form of a summary showing any gaps that may still exist and indicating how they may be closed.

Promotion of technical cooperation

30. The flow of information in the European Community between those involved in machine tool innovation - both sides of industry, research institutes, users, and governments - must be improved in order to make research more effective. More small and medium-sized undertakings should be enabled to take part in this necessary research, and there should be better distribution and availability of the results of research and development work for all potential users.

31. In the machine tool sector there is a tradition of international knowledge and technology exchanges, in addition to technical cooperation within the Community, and these should be extended in specific areas. The following table shows that a number of agreements between Community undertakings and Japanese producers were concluded between 1970 and 1982; in some cases, the results have been positive.

between Japanese and European Community firms in machine tools and robotics since 1970

Builder	Partner	Country	Product	Type of cooperation	Start	Remarks
Aida Engineering	Ductile	U.K.	Robots	Market licensing	03/82	
	Hoesch	Federal Republic of Germany	CAD/CAM for dies	Manuf./mrkt.licensing	06/82	
Dainichi Kiko	W.E. Sykes	U.K.	Robots	Mrkt. licensing	1981	
Eguro Machinery	G. Boley	Federal Republic of Germany	Compact NC lathes	Mrkt. licensing	02/82	
Fanuc	Siemens	Federal Republic of Germany	NCs	Joint development mrktg. tie-up	06/75	
	The 600 Group	U.K.	Robots	Manuf./mrkt. licensing joint venture	01/82	Estd. 12/82
Hitachi	GEC Electrical Project	U.K.	Robots	Manuf./mrkt. licensing	11/82	Subsidiary of GE
	Zeppelin	Federal Republic of Germany	Robots	Mrkt. licensing	10/82	
Kitagawa Iron Works	Paul Forkardt	Federal Republic of Germany	Hydraulic chucks	Mrkt. licensing	11/82	Receiving tech. know-how
Makino Milling Machines	Heidenreich & Harbeck	Federal Republic of Germany	Milling machines, machining centres	Manuf./mrkt. licensing, capital participation	10/78	
Matsumoto Machine	Autoblok-Bronzino	Italy	Chucks	Business/tech.	12/81	Mutual support

Builder	Partner	Country	Product	Type of cooperation	Start	Remarks
Mori Seiki	Schiess Moweg	Federal Republic of Germany	Machining centres	Mrkt. licensing	01/82	
Okuma Machinery Works	T I Machines	U.K.	Cylindrical grinders	Manuf./mrkt. licensing	06/73	Mutual tech. supply
	Alfred H. Schuette	Federal Republic of Germany	Machining centres	Manuf./mrkt. licensing	11/82	Mutual tech. supply
Sanyo Seiki Mfg.	CGMS	France	Robots	Manuf./mrkt. licensing	01/82	
Seibu Electric Mfg.	Herbert Walter	Federal Republic of Germany	Wirecut EDMs	Capital participation	01/82	
Schoun Machine Tool	Robert Bosch	Federal Republic of Germany	FMSs	Joint development	-	Tech. received by affiliate
Sodick	A.A. Jones & Shipman	U.K.	EDMs	Manuf./mrkt. licensing	12/82	
Tokyo Seimitsu	Carl Zweise	Federal Republic of Germany	3D measuring machines	Mrkt. licensing	10/82	Mutual support
Toyoda Machine Works	Danobat	Spain	Cylindrical grinders	Manuf./mrkt. licensing	12/75	
	H.E.S. Toyoda	France	Machining centres	Manuf./mrkt. licensing	07/80	
Yakawa Electric Mfg.	Messer Griesheim	Federal Republic of Germany	Robots	Mrkt. licensing	11/82	

32. Less willingness on the part of the Community's machine tool sector to enter into licensing agreements in respect of product and production-related innovation would have a detrimental effect. The draft regulation on group exemptions for patent licensing agreements, which is currently being revised, must help to solve the problems relating to the application of Article 85(3) of the EEC Treaty: it must clarify the legal position in unequivocal terms and create a more favourable climate for research and development measures and for technology transfers. On no account must it deter undertakings from concluding licensing agreements; rather, it must recognize patents (and industrial property rights in general) as a means of ensuring proper competition and economic and technical progress. Irrespective of their size, all undertakings must be able to take part in exchanges of technology and know-how: a more active licensing market is an important prerequisite for achieving the desirable aim of speeding up the process of innovation in the machine tool industry.

Measures to ease conversion to new technologies and their application

33. An intensive, uninterrupted exchange of information between machine tool producers (in the narrow sense), electronic-component manufacturers, and users is of particular importance to the development of machine tool technology with a view to its more widespread and more specialized application in industrial production.

34. This will benefit the economy as a whole only if the technologies that are to play a role in the strategy for the future can be applied on a large scale. The success of the strategy will largely depend on the disappearance of user and market resistance.

35. An important task for the Commission would be to examine ways of increasing user acceptance of machine tool technology; the opinions of all the parties concerned should be taken into account.

Better opportunities for small and medium-sized undertakings

36. Small and medium-sized undertakings play a particularly important role in the Community's machine tool industry. The following table illustrates the level of concentration of the machine tool industry in a number of Community countries, the United States and Japan.

Undertakings with more than 1,000 employees

	% of undertakings	% of employees	% of production
JAPAN	23.0	50.7	55.1
USA	0.7	20.0	
FEDERAL REPUBLIC OF GERMANY	3.6	23.6	22.0
ITALY	0.2	15.9	16.0
UNITED KINGDOM	1.7	25.8	25.5

The number of producers, in selected Member States, with fewer than 500 employers can be seen in the following table.

Size of undertakings in the European Community's machine tool sector

Member State	Federal Republic of Germany	France	Italy	U.K.	Belgium
1. All undertakings					
a) Number of undertakings	440	163	1 233	982	36
b) Number of employees	99,000	18,984	46,400	55,200	3,138
c) Average size of workforce	225	116	38	56	87
2. Undertakings with more than 500 employees					
a) % of undertakings	11.6	4.9	0.6	1.9	2.8
b) % of employees	49.1	33.7	21.1	49.7	17.3
c) % of sales	50.0	34.7		49.9	

37. The European Community's machine tool market will not be dominated by large undertakings in the future, any more than it is now. However, these undertakings do enjoy better access to extra-Community markets, as well as to finance for investment in research and increased productivity. Thus, small and medium-sized undertakings must use their other advantages, such as their ability to specialize and to adapt rapidly to market conditions, which they will have to improve on still further by increasing their efficiency and reducing their costs.

38. The promotion of innovation in small and medium-sized undertakings, as provided for in the Commission proposal (Doc. COM(83) 241 final), is therefore to be welcomed: it acknowledges that such undertakings are often unable to bear the increased innovation risk, particularly at the initial marketing stage.

The drawing-up of a comprehensive market study

39. The association representing the machine tool industry at European level (CECIMO) has proposed to the Commission that a technological market reconnaissance and research study be carried out in order to analyse the future demand profile for machine tools, to establish what would be the technical solutions and market target-areas most appropriate for the Community's industry, and, finally, to estimate the supply capacity that would be needed to satisfy this demand. CECIMO rightly points out that individual undertakings would find both the scope and the cost of this study prohibitive and uneconomic. The results of the study should, however, be used in promoting the development of technologies that most meet the requirements of European industry as a whole and to provide undertakings with appropriate guidelines for their own programmes.

40. Industry and the Commission should cooperate in conducting a wide-ranging examination of the machine tool market's prospects and of strategies for adapting the supply structure of the Community's industry to market developments.

41. It is to be welcomed that the Commission has already begun a feasibility study with a clearly defined area of examination and frame of reference, which will also lay down the procedures and operational structures for ensuring that the aims pursued are commensurate with the means employed. The requisite appropriations for funding the study are contained under a separate heading in the 1983 budget.

IV. Concluding remarks

42. If more intensive use is made of state-of-the-art technologies and of research and development, the Community's machine tool industry will continue to be a growth industry and will safeguard European jobs. This can only be achieved under free-market conditions, not by means of a protectionist policy; it is the Community's task to create suitable framework conditions permitting market competition. Effective market competition demands innovation and a high degree of mobility; competition also demands adaptability, flexibility and mobility and facilitates structural change, which is imperative for the European Community's machine tool industry.