European Patent Office

APPLICANT PANEL SURVEY 2001

INTENTIONS FOR FORECASTING EUROPEAN PATENT APPLICATIONS

Directorate Strategic/Operational Controlling
Steen Andersen and Peter Hingley

Munich, February 2002

List of contents

0 Summary

0.1 Introduction

In the Year 2001, the EPO carried out its sixth annual exercise to question groups of applicants on their intentions for future numbers of patent filings. In this survey the sample size was considerably increased over that used in previous years. The interviews and data recording were carried out by a consultant (Roland Berger Forschungs-Institut, Munich, who made a valuable contribution), while the design of the survey and the analysis of results were done by the EPO. This survey broke new ground because an increased sample size and a more complex Questionnaire were used. This led to unforseen challenges and, unfortunately, a final data set was still not available in December 2001 when it became necessary to carry out the analysis reported here. Therefore at present only a provisional report can be presented.

0.2 The Year 2001 Survey

Participating applicants were selected either for a Biggest Group (from a list of 402 of the biggest applicants at the EPO in Year 2000), or for a Random Group (from a random sample of 2 003 of all applicants to the EPO in Year 2000). The total number of applicants involved was 2 053. In the first stage, contact details were established with 1 637 of these applicants. A Questionnaire was sent out in June 2001, with interviews starting in July 2001 and terminating in mid September 2001. The Questionnaire contained a full matrix of questions on patent filings broken down by *First Filings* and *Subsequent Filings*, not only at the EPO but also by the other main world wide patent systems. The total useful response rate was 35.7% of the preidentified applicants (585 out of 1 637). The survey covered an appreciable percentage of the applicants at the EPO (Annex I). It involved an approach of building up forecasts from primordial filing types and Blocs of residence of the applicants.

0.3 Analysis of results on patent filings at the EPO

An analysis was made of the specific responses on future expectations for filings at the EPO, taking account of the Bloc of residence of the applicants (EPC contracting states, Japan, USA, Others). For the Biggest Group, Table 3 shows that Growth Rates in *Total Filings*, compared to Year 2000, can be estimated as 10.4% in 2001, 14.4% in 2002 and 19.6% in 2003. For the Random Group, Table 4 shows that Growth Rates in *Total Filings* compared to Year 2000 can be estimated as 16.1% in 2001, 28.2% in 2002 and 36.4% in 2003. The 95% confidence limits for these Growth Rates encompass the Growth Rates predicted from the Biggest Group. Both methods suggest a continuation of the recent trend towards an increased use of the PCT system.

An experimental method was also used to make forecasts of patent filings at the EPO from expectations for filings in different patent systems (in particular *Distinct Patent Filings* and *Overall PCT Filings*). This was done by estimating Growth Rates in the

other systems, and then taking into account estimates of the Transfer Rates from the other systems into patent filings at the EPO. The results from this analysis can be seen in Table 5, and are similar to (but a little less optimistic than) the results in Table 4.

A further experimental analysis was carried out to investigate Growth Rates broken down by 32 Technical Units of the IPC (Table 6). For the time being, results are not conclusive.

No full analysis is currently reported of the information that was gathered on filings in the other main world-wide patent systems, although results on Growth Rates for *Distinct Patents* and *Overall PCT Filings* are shown in Table 5.

0.4 Forecasts of future filings at the EPO

It is suggested that the results from the Random Group give appropriate forecasts for future filings at the EPO (Table 4), as long as uncertainty in the forecasts expressed in the 95% confidence limits is taken into consideration. A high level summary of Table 4 appears in the following table. 95% confidence limits are given in italics.

Year	*Euro-direct Filings*	*Euro-PCT-IP Filings*	*Total Filings*	Percent. Euro-PCT-IP
2001 actual	56 101	104 901	161 002	65.2%
2001 forecast	57 824 *54 366 - 61 282*	110 774 *100 477 - 121 071*	168 598 *157 736 - 179 460*	65.7%
2002 forecast	59 151 *54 499 - 63 803*	126 914 *103 736 - 150 092*	186 065 *162 425 - 209 706*	68.2%
2003 forecast	61 308 *54 494 - 68 122*	136 784 *101 658 - 171 910*	198 092 *162 311 - 233 873*	69.1%

The mid-point forecasts in the above table are optimistic. A continuation is expected of the trend towards the PCT Filing route at the expense of the Euro-direct Filing route. Analysis of the Biggest Group gave lower forecasts, but these forecasts still lie within the 95% confidence limits shown in the above table. In theory however the Random Group is representative of the whole population of applicants while the Biggest Group represents only a stratum within the population. It is possible that the largest applicants are less optimistic about the future than applicants in general.

I Introduction

In the Year 2001, the Office carried out its sixth annual exercise to question groups of applicants on their intentions for future numbers of patent filings. In this year's survey the sample size was considerably increased. Previously only a mail survey method was used, but this time a mail survey was enhanced by telephone interviews with preestablished appropriate contact persons. The interviews and data recording were carried out by a consultant (Roland Berger Forschungs-Institut, Munich, who made a valuable contribution), while the survey design and analysis were done by the EPO. This survey broke new ground because an increased sample size and a more complex Questionnaire were used. This led to unforseen challenges and, unfortunately, a final data set was still not available in December 2001 when it became necessary to carry out the analysis reported here. Therefore at present only a provisional report can be presented. For a perspective on the development of the previous surveys please refer to *Applicant Panel Reports 1996 - 2000*.

The main aim of the survey was to calculate quantitative forecasts of patent filings at the EPO and other offices, by various filing routes and Blocs of residence of the applicants. A subsidiary aim was to explore various technological areas, both to make more detailed forecasts and to explore the relationship between R&D and patenting, to allow the construction of a database on the nature of the relationship between these variables.

II The Year 2001 Survey

Compared to the previous survey, the sample size for the Year 2001 survey was enlarged significantly from about 320 applicants in Year 2000 to more than 2 000 applicants in Year 2001. This enlargement allowed an improvement in the precision of the forecasts.

Participating applicants were selected, either for a Biggest Group from a list of 402 of the biggest applicants at the EPO in Year 2000, or for a Random Group of 2 003 from all applicants to the EPO in Year 2000. The Random Group was obtained from a simple random sample of applications. There was a large overlap, so that most of the applicants in the Biggest Group also appeared in the Random Group. A copy of the survey Questionnaire can be seen as Annex VI.

The Questionnaire was available in either English, French or German, depending on the procedural language previously used in applications made to the EPO by each selected applicant. Questions asked about expected numbers of filings for Calendar Years 2001 to 2003 (Questionnaire Sections B). The questions encompassed "Distinct patents requested" (*Distinct Filings*); "Patent applications under the EPC (excluding PCT)" (*Euro-direct Filings*); "Patent applications under the PCT" (*Overall PCT Filings*), "of which Designating EPO" (*Euro-PCT-IP Filings*) and designating various major countries; and finally "National applications (excluding PCT)" at major patent offices (*National Filings*). Furthermore a breakdown was requested of all the above in terms of *First* and *Subsequent* filings. This was a major departure from previous surveys, in which

questions had only been asked on *Euro-direct Filings* and *Euro-PCT-IP Filings.* Additional space was provided (in Section D) for the applicant to describe patenting activities at Offices not specifically mentioned in Section B.

A question was included on R&D usage and patenting intentions broken down by various technological areas, based on 29 of the 31 main technical units of the International Patent Classification (Questionnaire Section C).

A comments section was also included (Questionnaire Section E).

III Response Rates

The main question (in Section B) asked for the numbers of filings already made in the Base Year (Year 2000) together with estimates for future filings for the Years 2001, 2002 and 2003. An option was provided to give information in the form of Growth Rates rather than actual numbers.

A full report of the execution of the survey appears in the *Methodenbericht* (*Methodology Report*), from which the following information has been extracted. From lists provided by the EPO of a total of 2 053 selected applicants (2 003 in the Random Group, 402 in the Biggest Group, with 352 overlaps), the consultant strove to identify contact names, addresses and telephone numbers. This proved more difficult than expected, and a total sample size of only 1 637 contactable applicants was identified (1 567 in the Random Group, 378 in the Biggest Group, with 308 overlaps).

Before contacting the main body of identified applicants, a pretest was carried out on 25 applicants in Germany, the United Kingdom and the United States. This pretest indicated that Part B of the Questionnaire was not particularly easy to understand. Nevertheless the EPO decided to go ahead with the Questionnaire in its original form, even though this could result in fewer answers, provide a fairly comprehensive picture of the world-wide filing activities of the respondents. The pretest results were incorporated into the main set of survey results without differentiation in the analysis.

After the pretests, screening interviews were carried out by telephone in the appropriate language with all the remaining identified applicants. In each case, a contact person was found to whom the Questionnaire was sent[1]. This happened in June 2001, with interviews starting in July 2001 and terminating by mid September 2001. Interviews to obtain the answers only took place in about 5% of the cases, because most participants preferred to fill in the Questionnaire themselves and return it to the consultant.

An electronic version of the Questionnaire was provided by the consultant on the Internet, but very few respondents chose to make use of it.

---

[1] A package was sent containing the Questionnaire together with a letter of recommendation from the EPO and a letter of explanation from the consultant.

Table 1 shows the total numbers of applicants that were picked for the survey, the numbers dropping out for various reasons, and the final numbers of answers received.

Table I: Sample and answers received

Item	Number	Percentage
Total sample	2053	100.0
Addresses not found	416	20.3
Addresses confirmed	1637	79.7
Addresses confirmed	1637	100.0
Drop outs (1)	319	19.5
Contact obtained with Applicant	1318	80.5
Drop outs (2)	733	44.8
Applicants answered	585	35.7

(1) Company could not be reached; Company was identical to another already identified in the sample; No patents filed; Mailbox system which blocked further contact possibilities; Contact person not available; No data available; Language problems.

(2) General refusal to participate; Questionnaire not returned though promised; Contact person not available; No time available for dealing with the matter; Not participating in surveys on principle; No interest; Data are secret; Questionnaire forwarded to somebody else; Too much effort requested to fill-in the Questionnaire; No data available; No patent activity.

Table 2 shows the same information in terms of the Blocs of residence of the applicants. The table also compares the distribution of applicants in the population in Year 2000 with the distribution of applicants in the sample. Annex I, which is the first part of the analysis carried out by the EPO, provides an alternative breakdown of the samples, showing the coverage proportions of the underlying populations both in terms of applicants and applications.

The consultant made a plausibility check of the received answers. In case of perceived implausibility, a follow-up interview was made to verify the responses (Annex II).

IV Methodology

IV.1 Intentions for Future Filings

The samples were drawn from background data on numbers of filings per applicant in the EPO data file EPAREP01 VECTOR. This file reflects information in the monthly down loaded version of the EPO file EPASYS VECTOR as of March 2001. Unfortunately the information then available for *Euro-PCT-IP filings* in Year 2000 was incomplete. Therefore the selection of applicants for the survey was based on considerations of *Total Filings = Euro-direct Filings + Euro-PCT-RP Filings* in Year

Table 2: **Population Sizes, Sample Sizes and Response Rates in Terms of Patent Applicants to the EPO**

Bloc of residence	Population		Sample (All)				
	Applicants	%	Applicants selected	%	Valid addresses	Answers	Response rate %
EPC	15919	56,8	1080	52,6	893	335	37,5
JP	2025	7,2	263	12,8	234	128	54,7
US	7269	25,9	559	27,2	432	106	24,5
Others	2799	10,0	151	7,4	78	16	20,5
All	28012	100,0	2053	100,0	1637	585	35,7

Bloc of residence	Sample (Biggest Group)					Sample (Random Group)				
	Applicants selected	%	Valid addresses	Answers	Response rate %	Applicants selected	%	Valid addresses	Answers	Response rate %
EPC	159	40,1	153	82	53,6	1062	53,0	863	315	36,5
JP	103	25,9	101	70	69,3	248	12,4	220	116	52,7
US	123	31,0	115	45	39,1	545	27,2	408	95	23,3
Others	12	3,0	9	1	11,1	148	7,4	76	15	19,7
All	397	100,0	378	198	52,4	2003	100,0	1567	541	34,5

Sample counts from the *Methodenbericht*

2000. However applicants were asked questions *inter alia* about *Euro-PCT-IP Filings* rather than *Euro-PCT-RP Filings*, because the main purpose of the survey is to estimate *Total Filings = Euro-direct Filings + Euro-PCT-IP Filings*.[2]

After all the Questionnaires were returned from the panel members, the answers to each question were transcribed by the consultant to an Excel data file, in exactly the form that was given. New records were then created, after correcting missing fields using a set of rules, and these records were assigned an identification code to show that the resulting set of records had been interpreted (Annex II). At this stage, responses that were given in the form of Growth Rates were converted into numbers of filings. Calculations were then made of *Combined Filings*, for each Year 2001, 2002, and 2003, by adding the counts for the various primordial filing types (e.g. In the case of filings to the EPO, *First Filings* + *Subsequent Filings*, *Euro-direct Filings* + *Euro-PCT-IP Filings*). A rule was adopted that *Combined Filings* were only to be recorded where data were reported for all of the primordial filing types contributing to the combination. Eight subsidiary Excel files were created, containing interpreted records broken down by Group (Biggest / Random) and Bloc of residence of the Applicant (EPC contracting states, Japan, USA, and Other countries).

The set of transcribed data was made available to the EPO in December 2001, but a number of transcription errors were identified. It was established that these errors mainly concerned replies to questions about filings at National Offices and PCT designations other than the EPO. The data on filings at the EPO (*Euro-direct Filings, Euro-PCT-IP Filings), Distinct Filings* and *Overall PCT Filings* were felt to not be seriously influenced by the data quality problems. Therefore it was decided to go ahead with the preliminary analysis that is reported below, based on the status of the data as presented at that time.

The purpose of the survey is principally to estimate future filings at the EPO. It is appropriate to construct Indices as the intended filings in each forecast year divided by the actual filings in the Base Year (2000). For the Biggest Group, the appropriate average index is called the *Composite Index*, while for the Random Group the appropriate average index is a particular weighted mean of the individual respondent Indices (*Q Index*). In both cases the average Indices can be used to obtain estimates of future filings after multiplying by the known number of filings at the EPO in the Base Year. Annex III provides a summary of the way that these Indices are calculated, and also gives a formula for the standard error of the *Q Index*.

In the current survey, the random sample is large enough to allow the calculation of separate Growth Indices by Bloc of residence of the applicants. Testing of the data confirmed that a higher precision could be obtained in the overall Growth Indices by combining the estimates separately obtained from each Bloc of residence of the applicants. It was also clear that a better coverage could be obtained by estimating Growth Indices separately for each primordial filing type), and then combining the

---

[2] In contrast to the previous surveys, in this survey no information was provided to the selected applicants on the database counts for their applications in the Base Year. The rationale for this change in policy was that it was better for the applicants themselves to provide this information, since this was likely to be given on the same basis as the forecasts for future filings.

results to obtain overall forecasts. This was because more data were recorded for the primordial types than for the combined types. It also had the advantage that separate estimates of growth could be provided for each primordial type of filing. Annex IV discusses how the Growth Indices were combined to make forecasts of *Total Filings* with estimates of their standard errors. Since a simple random sample was used, the approach of combining data from primordial filing types and Blocs constitutes an analysis using *domains of study* (Cochran, 1977, page 34).

In the survey, the principle questions of interest for the EPO concern forecasts of future *Euro-direct filings*, *Euro-PCT-IP filings*, and *Total filings* (*Euro-direct* + *Euro-PCT-IP*). In Section V below, an analysis is presented of forecasted filings at the EPO from these response types. Further information is also available on filings by EPO clients using other world wide patenting systems. It is also possible to make forecasts of future filings at the EPO using Growth Indices for the other systems (Section VI). In order to do this, a Growth Index for another system can be combined with an estimate of the relative year-to-year Transfer Rate from that system to the EPO systems concerned (*Euro-direct* or *Euro-PCT-IP*). An initial experiment in this direction is described, using growth in *Distinct Filings* to estimate *Euro-direct Filings*, and growth in *Overall PCT Filings* to estimate *Euro-PCT-IP Filings*. For each primordial filing type, some respondents did not report applications for either the Base Year or some of the Forecast Years. These respondents were excluded when either Base Year or Forecast Year was missing, so that the numbers of respondents that contributed to each analysis were less than the numbers of respondents shown in Table 2.

IV.2 Breakdown of Patents and R&D Budgets

It is intended that the responses from the questions on R&D budgets and patenting by Technical Units (Section C) should be accumulated over several years, in order to explore the relationship between R&D and subsequent patenting at the microeconomic level. This is the fourth year that such data have been obtained. The data have not yet been analysed.

IV.3 General Comments

The Questionnaire invited general comments in Section E, as well as specific comments after each of the other sections. A selection of the comments is shown in Annex V (in German).

V Results 1: Forecasts from Specific Questions on Filings at the European Patent Office

V.1. Biggest Group

*A group covering as far as possible the 402 applicants who made at least 31 applications (*Euro-direct Filings + Euro-PCT-RP*) in Year 2000. (197 respondents).*

Since the Biggest Group is not a random sample, it is considered appropriate to use the *Composite Index* in this case, as explained in Annex III. The numerical values of the Indices obtained are shown in Table 3, with the resulting forecasts and actual numbers of filings where available. The actual numbers for Year 2001 are provisional at the time of writing. No confidence limits are given for the estimates, because this is as far as possible a census of the intentions of the largest applicants.

The overall forecast for *Total Filings* made for Year 2001 from this group seems quite good (160 212 forecast vs. 161 002 observed). However, there is a small under prediction for *Euro-PCT-IP Filings* and an over prediction for *Euro-direct Filings.* Therefore there is some imprecision in the estimated percentage of *Euro-PCT-IP Filings* among *Total Filings* in Year 2001 (64.1% predicted vs. 65.2% observed). The results per Bloc are more variable. There is only one observation from the Bloc "Others" and so the Growth Indices for this Bloc are not dependable. *Euro-PCT-IP Filings* have been over estimated for USA, but under estimated for both EPC contracting states and Japan. This effect holds for both *First Filings* and *Subsequent Filings.*

This method predicts Total Filings of 160 212 in Year 2001, 166 120 in Year 2002, and 173 601 in Year 2003.

V.2 Random Group

*A randomly sampled group of 2003 applicants to the EPO (*Euro-direct Filings + Euro-PCT-RP*) in Year 2000 (537 respondents).*

With the Random Sample it is appropriate to use the *Q Index* method and to calculate confidence limits on the Indices and resulting forecasts (Annex III). The numerical values of the Indices are shown with their standard errors in Table 4. The resulting predicted filings are given together with 95% confidence limits for combined counts of *Total Filings* after accumulating over Blocs of residence. The actual numbers for Year 2001 are provisional at the time of writing. A high level summary of the results is given below in Fig. 1 and Table 7.

The overall forecast for *Total Filings* made for Year 2001 from this group is optimistic (168 598 forecast vs. 161 002 observed), although the true figure is covered by the 95% confidence limits. However, the degree of optimism is somewhat similar for *Euro-PCT-IP Filings* and for *Euro-direct Filings.* Therefore the estimated percentage of *Euro-PCT-IP Filings* among *Total Filings* in Year 2001 is reasonably good (65.7% predicted vs. 65.2% observed). Looking at the results per Bloc, there is an under prediction in Year 2001 for *Subsequent Euro-direct Filings* from Japan. Both *Euro-direct Subsequent*

Table 3: Forecasts from specific questions on filings at the EPO. Biggest Group. Composite Indices

Assumption: All forecasts of combined totals made by combining primordial terms.

			Year							
			2000		2001			2002		2003	
Filings Type	Filing route	Bloc of origin	Index	Actual	Index	Predicted	Actual *	Index	Predicted	Index	Predicted
First	Euro-Direct	EPC	1	8 284	1,0901	9 031	8 935	1,1465	9 498	1,1502	9 528
		Japan	1	255	1,0574	270	247	1,1356	290	1,1921	304
		USA	1	1 227	0,9462	1 161	1 175	0,9474	1 162	0,9474	1 162
		Others	1	373	1,0000	373	487	1,0000	373	1,0000	373
		Total		10 139		10 834	10 844		11 323		11 368
	Euro-PCT-IP	EPC	1	1 218	0,9712	1 183	1 402	1,2500	1 523	1,6071	1 958
		Japan	1	1 016	1,0266	1 043	1 265	1,1117	1 129	1,2553	1 275
		USA	1	1 435	1,1339	1 627	1 469	1,2654	1 816	1,3503	1 938
		Others	1	798	1,7500	1 397	1 046	1,7500	1 397	1,7500	1 397
		Total		4 467		5 250	5 182		5 864		6 567
Subsequent	Euro-Direct	EPC	1	21 038	1,0320	21 711	20 546	1,0429	21 940	1,0415	21 912
		Japan	1	12 275	0,8367	10 270	13 890	1,0268	12 604	1,0740	13 183
		USA	1	9 528	1,1919	11 356	9 156	0,9672	9 216	1,0836	10 325
		Others	1	1 638	2,0000	3 276	1 665	2,0000	3 276	2,0000	3 276
		Total		44 479		46 614	45 257		47 035		48 695
	Euro-PCT-IP	EPC	1	33 247	1,0914	36 285	38 281	1,1136	37 022	1,1612	38 607
		Japan	1	7 441	1,1564	8 605	9 260	1,3008	9 679	1,4167	10 541
		USA	1	37 006	1,2339	45 661	41 173	1,3034	48 233	1,3744	50 860
		Others	1	8 397	0,8293	6 963	11 005	0,8293	6 963	0,8293	6 963
		Total		86 091		97 514	99 719		101 898		106 971
All	Euro-Direct	EPC		29 322		30 742	29 481		31 438		31 440
		Japan		12 530		10 540	14 137		12 893		13 487
		USA		10 755		12 517	10 331		10 378		11 487
		Others		2 011		3 649	2 152		3 649		3 649
		Total		54 618		57 448	56 101		58 358		60 063
	Euro-PCT-IP	EPC		34 465		37 468	39 683		38 545		40 564
		Japan		8 457		9 648	10 525		10 809		11 817
		USA		38 441		47 288	42 642		50 049		52 797
		Others		9 195		8 360	12 051		8 360		8 360
		Total		90 558		102 764	104 901		107 762		113 538
	Total	EPC		63 787		68 210	69 164		69 983		72 004
		Japan		20 987		20 188	24 662		23 702		25 304
		USA		49 196		59 806	52 973		60 427		64 284
		Others		11 206		12 009	14 203		12 009		12 009
	Grand Total			**145 176**		**160 212**	**161 002**		**166 120**		**173 601**
	% Growth from Year 2000			**0%**		**10,4%**	**10,9%**		**14,4%**		**19,6%**
	Implied % Euro-PCT-IP			**62,4%**		**64,1%**	**65,2%**		**64,9%**		**65,4%**

*** Estimates made in January 2002**

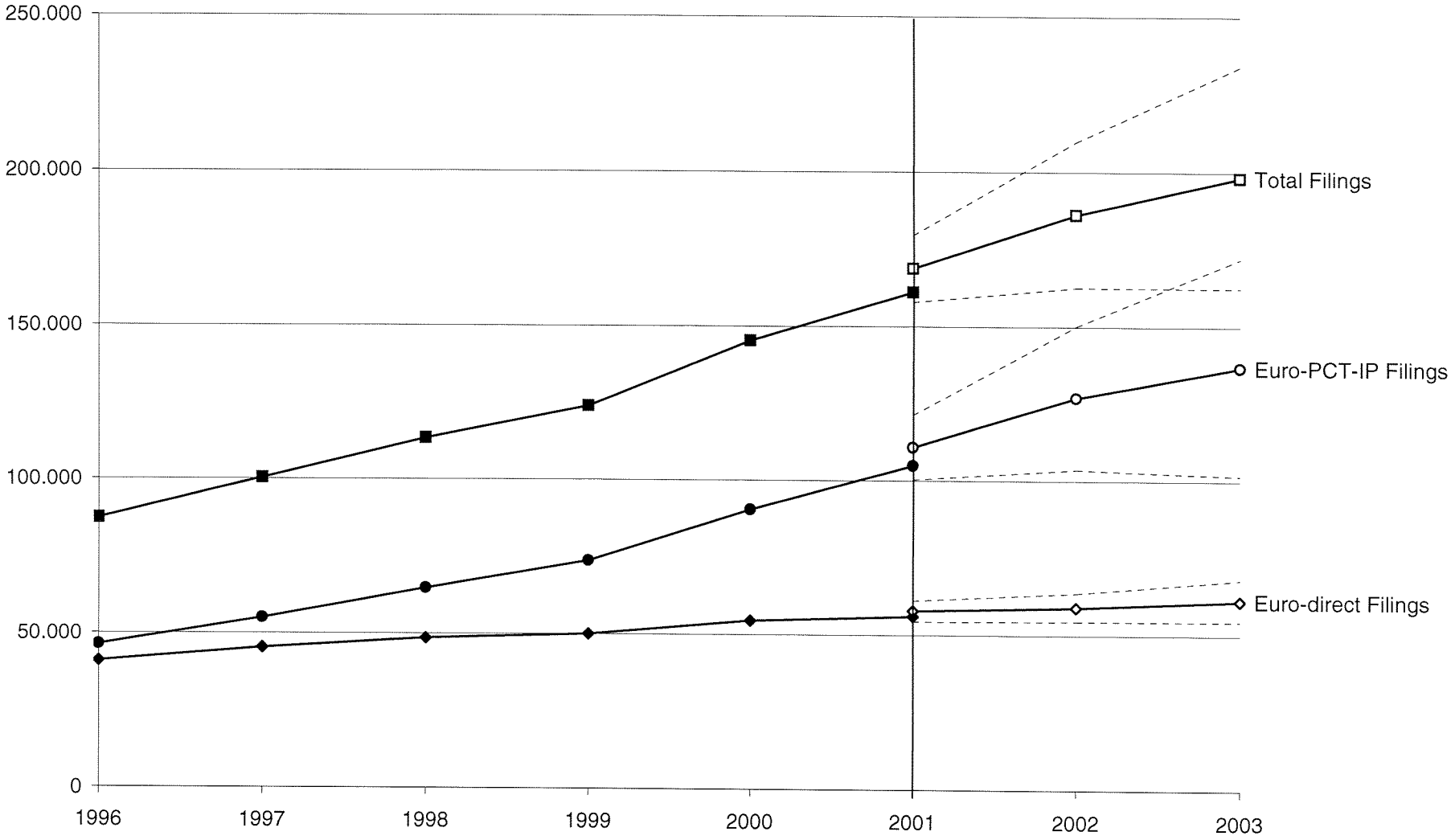
Table 4: Forecasts from specific questions on filings at the EPO. Random Group. Q Indices

Assumption: All forecasts of combined totals made by combining primordial terms.
S.E. indicates Standard Error **LCL / UCL** indicates Lower / Upper 95% Confidence Limit

			Year											
			2000	2001				2002			2003		
Filings Type	Filing route	Bloc of origin	Index	Actual	Index		Predicted	Actual *	Index		Predicted	Index		Predicted
					Estimate	S.E.			Estimate	S.E.		Estimate	S.E.	
First	Euro-Direct	EPC	1	8 284	1,2333	0,1096	10 216	8 935	1,1790	0,0664	9 767	1,1739	0,1006	9 725
		Japan	1	255	0,9434	0,0424	241	247	1,0181	0,0481	260	1,0255	0,0565	261
		USA	1	1 227	0,9371	0,0652	1 150	1 175	0,9564	0,1020	1 173	0,9501	0,1150	1 166
		Others	1	373	0,7711	0,2040	288	487	1,0000	0,0000	373	1,0000	0,0000	373
		Total		10 139			11 894	10 844			11 573			11 525
		LCL (Total)					(10 064)				(10 362)			(9 541)
		UCL (Total)					(13 724)				(12 784)			(13 509)
	Euro-PCT-IP	EPC	1	1 218	1,0901	0,0587	1 328	1 402	1,2808	0,0871	1 560	1,4542	0,1132	1 771
		Japan	1	1 016	0,8878	0,1404	902	1 265	0,8893	0,1608	903	0,9208	0,1662	935
		USA	1	1 435	1,0252	0,0766	1 471	1 469	1,1512	0,2189	1 652	1,3032	0,3657	1 870
		Others	1	798	1,1229	0,0557	896	1 046	1,2600	0,0975	1 005	1,3143	0,1293	1 049
		Total		4 467			4 597	5 182			5 121			5 626
		LCL (Total)					(4 199)				(4 296)			(4 306)
		UCL (Total)					(4 995)				(5 946)			(6 946)
Subsequent	Euro-Direct	EPC	1	21 038	1,0667	0,0358	22 440	20 546	1,0806	0,0532	22 733	1,1146	0,0831	23 448
		Japan	1	12 275	0,9762	0,0911	11 983	13 890	1,0951	0,0586	13 442	1,1319	0,0657	13 894
		USA	1	9 528	1,0767	0,0558	10 258	9 156	1,0383	0,1945	9 893	1,1338	0,2531	10 803
		Others	1	1 638	0,7618	0,1375	1 248	1 665	0,9218	0,0723	1 510	1,0000	0,0000	1 638
		Total		44 479			45 930	45 257			47 578			49 783
		LCL (Total)					(42 996)				(43 087)			(43 264)
		UCL (Total)					(48 864)				(52 069)			(56 302)
	Euro-PCT-IP	EPC	1	33 247	1,3221	0,0993	43 957	38 281	1,4187	0,1317	47 168	1,5033	0,1519	49 982
		Japan	1	7 441	1,2729	0,1056	9 472	9 260	1,3573	0,1150	10 100	1,5128	0,1564	11 256
		USA	1	37 006	1,1952	0,0979	44 230	41 173	1,2871	0,1821	47 632	1,4364	0,2822	53 157
		Others	1	8 397	1,0144	0,1610	8 518	11 005	2,0118	0,6511	16 893	1,9964	0,5076	16 764
		Total		86 091			106 177	99 719			121 793			131 158
		LCL (Total)					(95 888)				(98 630)			(96 057)
		UCL (Total)					(116 466)				(144 957)			(166 259)
All	Euro-Direct	EPC		29 322			32 657	29 481			32 500			33 173
		Japan		12 530			12 224	14 137			13 702			14 156
		USA		10 755			11 408	10 331			11 066			11 968
		Others		2 011			1 535	2 152			1 883			2 011
		Total		54 618			57 824	56 101			59 151			61 308
		LCL (Total)					(54 366)				(54 499)			(54 494)
		UCL (Total)					(61 282)				(63 803)			(68 122)
	Euro-PCT-IP	EPC		34 465			45 285	39 683			48 728			51 753
		Japan		8 457			10 374	10 525			11 003			12 192
		USA		38 441			45 701	42 642			49 284			55 027
		Others		9 195			9 414	12 051			17 899			17 813
		Total		90 558			110 774	104 901			126 914			136 784
		LCL (Total)					(100 477)				(103 736)			(101 658)
		UCL (Total)					(121 071)				(150 092)			(171 910)
	Total	EPC		63 787			77 942	69 164			81 229			84 926
		Japan		20 987			22 597	24 662			24 705			26 348
		USA		49 196			57 109	52 973			60 350			66 995
		Others		11 206			10 949	14 203			19 782			19 824
	Grand Total			**145 176**			**168 598**	**161 002**			**186 065**			**198 092**
	LCL (Grand Total)						(157 736)				(162 425)			(162 311)
	UCL (Grand Total)						(179 460)				(209 706)			(233 873)
	% Growth from Year 2000			**0%**			**16,1%**	**10,9%**			**28,2%**			**36,4%**
	Implied % Euro-PCT-IP			**62,4%**			**65,7%**	**65,2%**			**68,2%**			**69,1%**

*** Estimates made in January 2002**

Fig. 1: Historical Filings at the EPO, and Forecasts for Future Filings from Random Group, with 95% Confidence Limits.



Filings and *Euro-PCT-IP Subsequent Filings* have been overestimated from EPC contracting states. *Subsequent Filings* have also been overestimated to some extent from US applicants. The results for the Bloc "Others" are variable due to the small numbers of respondents, but the situation is better than that in the Biggest Group!

This method predicts *Total Filings* of 168 958 in Year 2001, 186 065 in Year 2002, and 198 092 in Year 2003.

V.3 Comparison of Results

The discrepancies between forecasts given from the Random Group and the Biggest Group require further investigation. It is possible that the difference reflects a greater degree of pessimism among larger applicants compared to applicants in general. In this case the results from the Random Group should be believed. However it is also possible that both methods could be subject to problems of response bias, if the probability of response is in some way connected to the degree of optimism regarding future filings. This might effect each Group to a different extent.

VI Results 2: Forecasts of Patent Filings at the European Patent Office, Obtained by Transfer from Forecasts of Filings in Other Systems

Further investigations were carried out, using the results in the Random Group for filings in other systems, to form an alternative set of forecasts for European filings. This method is experimental.

The first (and most basic) question in Section B of the Questionnaire asks for forecasts for *Distinct Filings*. It is possible to use the forecasts for Growth Rates of *Distinct Filings* to form an alternative set of forecast projections for filings at the European Patent Office. A way to do this is, firstly, to compute a set of Transfer Rates from *Distinct Filings* to *European Filings* either in the same year (*European First Filings*) or in the following year (*European Subsequent Filings*). Secondly, the Growth Rates computed for *Distinct Filings* in a particular year can be modified by the ratio of the Transfer Rates in the final and Base Years used for the Growth Index.

Initial analysis suggested that the Transfer Rates from *Distinct Filings* were not particularly useful for modelling *Euro-PCT-IP Filings*. Therefore, *Distinct Filings* were used to model only *Euro-Direct Filings* (Section VI.1). For *Euro-PCT-IP Filings,* a separate analysis was carried out using the question in Section B of the Questionnaire on *Overall PCT Filings* combined with the relevant Transfer Rates (Section VI.2). Finally the combined set of transfer forecasts was used to model *Total European Filings* (Section VI.3). See Table 5.

Table 5: Forecasts of patent filings at the EPO, obtained by transfer from forecasts of filings in other systems. Random Group. Q Indices

Assumptions: All forecasts of combined totals made by combining primordial terms.

			Year											
			2000	2001				2002			2003			
Filings Type	Filing route	Bloc of origin	Index	Actual	Index estimates		Predicted	Actual *	Index estimates		Predicted	Index estimates		Predicted
					Growth	Transfer Rate			Growth	Transfer Rate		Growth	Transfer Rate	
First	Euro-Direct	EPC	1	8 284	1,0953	0,3810	9 074	8 935	1,1736	0,3506	8 946	1,1931	0,3403	8 826
		Japan	1	255	1,0179	0,3110	260	247	1,1035	0,2521	228	1,1561	0,2741	260
		USA	1	1 227	0,8673	0,5412	1 064	1 175	0,9809	0,4028	896	0,9890	0,4010	899
		Others	1	373	1,0112	0,3725	377	487	1,2530	0,2289	287	1,4378	0,2289	330
		Total		10 139			10 775	10 844			10 357			10 314
	Euro-PCT-IP	EPC	1	1 218	1,1215	1,0010	1 366	1 402	1,1843	0,9444	1 361	1,3019	0,9533	1 510
		Japan	1	1 016	1,0723	0,9850	1 089	1 265	1,1454	0,9835	1 162	1,1699	0,9839	1 187
		USA	1	1 435	1,2592	1,1399	1 807	1 469	0,8951	0,9859	1 111	0,8768	1,0013	1 105
		Others	1	798	1,1169	1,0000	891	1 046	1,1437	1,0000	913	1,1437	1,0000	913
		Total		4 467			5 154	5 182			4 547			4 715
Subsequent	Euro-Direct	EPC	1	21 038	1,2337	0,7464	22 440	20 546	1,0953	0,7785	24 037	1,1736	0,7896	26 122
		Japan	1	12 275	1,1382	0,2854	11 983	13 890	1,0179	0,4429	19 388	1,1035	0,3455	16 396
		USA	1	9 528	1,0292	0,5955	10 258	9 156	0,8673	0,6282	8 716	0,9809	0,4026	6 318
		Others	1	1 638	0,9865	0,6343	1 248	1 665	1,0112	0,7396	1 931	1,2530	0,5556	1 798
		Total		44 479			45 930	45 257			54 072			50 634
	Euro-PCT-IP	EPC	1	33 247	1,2051	0,9962	40 067	38 281	1,2863	0,9955	42 738	1,3565	0,9981	45 185
		Japan	1	7 441	1,3495	0,8443	10 041	9 260	1,3891	0,9033	10 336	1,5185	0,8934	11 957
		USA	1	37 006	1,1797	0,9062	43 655	41 173	1,2202	0,9053	45 154	1,5233	0,8702	54 130
		Others	1	8 397	1,2355	0,8954	10 375	11 005	2,0782	0,9457	17 451	2,0142	0,9377	17 714
		Total		86 091			104 138	99 719			115 680			128 985
All	Euro-Direct	EPC		29 322			31 514	29 481			32 983			34 947
		Japan		12 530			12 243	14 137			19 616			16 656
		USA		10 755			11 323	10 331			9 612			7 218
		Others		2 011			1 625	2 152			2 218			2 127
		Total		54 618			56 704	56 101			64 429			60 948
	Euro-PCT-IP	EPC		34 465			41 433	39 683			44 099			46 695
		Japan		8 457			11 131	10 525			11 498			13 144
		USA		38 441			45 462	42 642			46 265			55 235
		Others		9 195			11 266	12 051			18 363			18 626
		Total		90 558			109 291	104 901			120 226			133 700
	Total	EPC		63 787			72 947	69 164			77 082			81 643
		Japan		20 987			23 373	24 662			31 114			29 800
		USA		49 196			56 784	52 973			55 877			62 453
		Others		11 206			12 891	14 203			20 582			20 754
	Grand Total			145 176			165 996	161 002			184 655			194 649
	% Growth from Year 2000			0%			15,4%	7,7%			13,6%			26,9%
	Implied % Euro-PCT-IP			62,4%			65,8%	65,2%			65,1%			68,7%

* Estimates made in January 2002

VI.1 *Distinct Patent Filings*

Forecasts by transfer from *Distinct Filings* were made to *Euro-direct Filings* only, and the results appear in Table 5 in the rows where the column labelled "Filing route" indicates "Euro-Direct". The data were analysed using the *Q Index* method (Annex III). The numerical values of the *Q Indices* are shown in the columns labelled "Index estimates / Growth".

Table 5 also shows the Transfer Rates from *Distinct Filings* to *Euro-Direct filings* in the columns labelled "Index estimates / Transfer Rate", for the rows where the column labelled "Filing route" indicates "Euro-Direct". For the primordial combinations involving *First Filings*, the Transfer Rates are measured as the proportions of *Euro-Direct Filings* in year t vs *Distinct First Filings* in the same year (t). For the primordial combinations involving *Subsequent Filings*, the Transfer Rates are measured as the proportions of *Euro-Direct filings* in year t vs *Distinct First Filings* in year t-1. The measured values of the Transfer Rates from the Blocs outside Europe are high compared to known overall proportions of *Euro-direct Filings* that quote the priority of previous *National filings* in other Blocs. This reflects the fact that the sample was selected from a population of previous applicants for European patents, rather than from a population of applicants to all world-wide patent offices.

The forecasts for *Euro-direct Filings* appear in the columns labelled "Predicted". For "First / Euro-Direct / 2001", the Growth Index for *Distinct Filings* is multiplied by the known number of *Euro-Direct Filings* in Year 2000. For "Subsequent / Euro-Direct / 2001", the Growth index from the question on "Subsequent / Euro-Direct" is multiplied by the known numbers of *Euro-Direct Filings* in Year 2000[3]. For both "First / Euro-Direct" and "Subsequent / Euro-Direct" in Years 2002 and 2003 (t), the Growth index for *Distinct Filings* is multiplied firstly by the numbers of *Euro-Direct Filings* in Year 2000, and then secondly by the ratio of the Transfer Rate in year t to the Transfer Rate in Year 2001.

VI.2 *Overall PCT Filings*

Forecasts by transfer from *Overall PCT Filings* were made to *Euro-PCT-IP Filings* only, and the results appear in Table 5 in the rows where the column labelled "Filing route" indicates "Euro-PCT-IP". The data on *Overall PCT Filings* from the Random Group were analysed using the *Q Index* method. The numerical values of the Indices are shown in the columns labelled "Index estimates / Growth".

Table 5 also shows the Transfer Rates from *Overall PCT Filings* to *Euro-PCT-IP Filings* in the columns labelled "Index estimates / Transfer Rate". The Transfer Rates are measured as the proportions of *Euro-PCT-IP Filings* in year t vs *Overall PCT Filings* in the same year (t). These Transfer Rates are all above 0.84, which reflects the fact that a large proportion of *Overall PCT Filings* transform to *Euro-PCT-IP Filings*. The

---

[3] This gives the same forecasts for Year 2001 as in Table 4, because the growth in *Subsequent Filings* in Year 2001 compared to Year 2000 should reflect growth in *Distinct Filings* in Year 2000 compared to Year 1999, for which no information was gathered in the survey.

proportion is known to be high from previous studies, but may again be influenced positively by the selection of the Random Group from the population of previous applicants for European patents. The Transfer Rate to *First Euro-PCT-IP Filings* from USA in Year 2001 is estimated as 1.14, which is greater than 1 and suggests multiple usage of priority claims in European applications. But the estimated Standard Error of the Transfer Rate is 0.16 - a high value which indicates that the result could be a consequence of statistical imprecision.

The forecasts for *Euro-PCT-IP Filings* appear in the columns labelled "Predicted". For "*2001*" the Growth Index is multiplied by the corresponding numbers of *Euro-PCT-IP Filings* in Year 2000. For "*2002*" and "*2003*" (t), the Growth Index for *Distinct Filings* is multiplied firstly by the numbers of *Euro-PCT-IP Filings* in Year 2000, and then secondly by the ratio of the Transfer Rate in year t to the Transfer Rate in Year 2001.

VI.3 Forecasts for *Total Filings* by the Transfer Method

The predicted filings from each primordial combination are then added in the usual way to give an overall set of forecasts for *Total Filings* (Table 5, lower part).

The forecasts by the Transfer Method for Year 2001 are closely related to the straightforward results from the Random Group discussed in Section V.2. Using the Transfer Method, the overall forecast for *Total Filings* in Year 2001 remains over optimistic (165 996 forecast vs. 161 002 observed), but not as optimistic as the forecast in Section V.1. (168 598). The estimated percentage of *Euro-PCT-IP* among *Total Filings* in Year 2001 (65.8%) is almost the same as that found in Section V.2.

The close relation with the results in Section V.2. continues to apply to the forecasts for *Total Filings* in Years 2002 and 2003 (184 655 in Year 2002 vs. 186 065 in Section V.2., 194 649 in Year 2003 vs. 198 092 in Section V.2.). But an interesting variation involves the forecasts for *Subsequent Euro-direct Filings* from Japan. These are predicted to increase from 11 983 in Year 2001 to 19 388 in Year 2002, before declining to 16 396 in Year 2003. The reason for the "bulge" in Year 2002 is not an increase in the Growth Rate for *Distinct Filings*, but a perceived increase in the Transfer Rate for that year (0.44 in Year 2002, 0.29 in Year 2001).

No attempt has been made in the above analysis to calculate confidence limits for the forecasts made by the Transfer Method. However standard errors are available for both Growth Indices and Transfer Rate estimates. For the Transfer Rates quoted above for *Subsequent Euro-direct Filings* from Japan, the standard errors are quite high (0.16 in Year 2002 vs. 0.13 in Year 2001). The "bulge" mentioned above may therefore be a statistical fluctuation due to imprecision in the estimation.

VII Results 3: Forecasts of Patent Filings at the European Patent Office, Broken down by Technical Units

At the stage of forming the sample for the Random Group, an assignment of Technical Units was made to each applicant in the sample on the basis of the first selected application for that applicant[4]. It is possible therefore to calculate Growth Indices and forecasts for applications for each Technical Unit. However in order to achieve a reasonable degree of statistical accuracy in the forecasts, it is advisable to disregard the Blocs of residence of the applicants and to pool information across the entire sample.

Table 6 shows a preliminary exercise to calculate *Q Indices* for two arbitrarily selected groups of Technical Units, compared to the results for the overall sample. The table shows estimates of Growth Rates with standard errors and sample sizes considered. The two groups selected were *Inorganic chemistry and Metallurgy* (combination of items 11 and 16 from Questionnaire Part C, IPC Technical Units 12 and 17) and *Electricity and Electronics* (combination of items 27 and 28 from Questionnaire Part C, IPC Technical Units 30 and 31).

Unfortunately it is clear from Table 6 that the small sample sizes for the Technical Groupings lead to rather imprecise Growth Rate estimates, particularly for *Inorganic Chemistry & Metallurgy*. But it seems that faster growth may be expected in Year 2002 from *Inorganic Chemistry & Metallurgy* than from the *Electricity & Electronics*. This may reflect the current stage of the business cycle.

The Growth Indices for *All Filings* could be used to provide an alternative set of forecasts for future European filings to those provided in Table 4. However this has not been done because the forecasts are less precise due to the implicit inclusion of variability between Blocs.

VIII Results 4: Unavailability of Forecasts for Filings at Other Major World Wide Patent Offices

In Section VI and Table 5, results have been presented on estimated Growth Rates for *Distinct Filings* and *Overall PCT filings*. Similar analyses could be made for the filings in other patent systems covered by the remaining questions in Part B of the Questionnaire. However the data recording problems that were encountered make it inadvisable to carry out such analyses on the data set provided in December 2001. It is planned to analyse such results on a corrected data set. However, it should be borne in mind that the population sampled is that of preexisting applicants to the EPO, and excludes applicants to other offices that did not apply to the EPO in Year 2000.

---

[4] The assignment was made from whichever of the 32 Technical Units of the IPC was mentioned for the first selected application. Information from Section C of the Questionnaire was not used.

Table 6: Forecasts of patent filings at the EPO, for two Technical Units and for All filings. Random Group. Q Indices

S.E. indicates Standard Error

			Year								
			2000	2001			2002			2003		
Filings Type	Filing route	Bloc of origin	Index	Index			Index			Index		
				Estimate	S.E.	# cases	Estimate	S.E.	# cases	Estimate	S.E.	# cases
First	Euro-Direct	Inorganic Chemistry & Metallurgy	1	1,0022	0,1403	5	1,3946	0,2126	5	1,6191	0,2459	5
		Electricity & Electronics	1	1,0894	0,0886	22	1,0717	0,1046	20	0,9694	0,1252	19
		All	1	1,1196	0,0710	158	1,1105	0,0467	131	1,1057	0,0648	124
	Euro-PCT-IP	Inorganic Chemistry & Metallurgy	1	1,3844	0,1975	3	1,3893	0,1945	3	0,9787	0,1886	3
		Electricity & Electronics	1	1,3820	0,3522	19	1,2126	0,1213	16	1,1614	0,2721	14
		All	1	1,1487	0,1299	96	1,0995	0,0682	82	1,1819	0,1102	77
Subsequent	Euro-Direct	Inorganic Chemistry & Metallurgy	1	1,2432	0,1545	10	1,4453	0,2553	9	1,2536	0,2934	9
		Electricity & Electronics	1	0,9401	0,0976	43	1,0051	0,0895	32	1,2329	0,1275	30
		All	1	1,0332	0,0372	239	1,0791	0,0402	195	1,1206	0,0569	180
	Euro-PCT-IP	Inorganic Chemistry & Metallurgy	1	1,3663	0,2534	15	1,7176	0,2887	13	2,1386	0,2971	13
		Electricity & Electronics	1	1,1778	0,1129	33	1,3196	0,1499	24	2,2964	0,1933	24
		All	1	1,2802	0,0612	222	1,3884	0,0844	189	1,5027	0,1056	176

IX Conclusions

The most appropriate set of provisional forecasts is given by the results developed in Section V.2, analysing the answers to the questions on filings at the EPO in the Random Group. But it is important to consider these together with their rather conservative 95% confidence limits. These confidence limits are rather wide.

Details of these results, including forecast filing flows to the EPO from each Bloc of residence and each type of filing, can be seen in Table 4. A high level summary of Table 4 appears in the following Table 7. 95% Confidence limits are given in italics.

Table 7: High level summary of results from Table 4.

Year	*Euro-direct Filings*	*Euro-PCT-IP Filings*	*Total Filings*	Percent. Euro-PCT-IP
2001 actual	56 101	104 901	161 002	65.2%
2001 forecast	57 824 *54 366 - 61 282*	110 774 *100 477 - 121 071*	168 598 *157 736 - 179 460*	65.7%
2002 forecast	59 151 *54 499 - 63 803*	126 914 *103 736 - 150 092*	186 065 *162 425 - 209 706*	68.2%
2003 forecast	61 308 *54 494 - 68 122*	136 784 *101 658 - 171 910*	198 092 *162 311 - 233 873*	69.1%

Fig. 1 shows a plot of actual recorded filings for Years 1996 to 2001, together with the forecasts and 95% confidence limits for Years 2001 to 2003 from Table 7. Even though the confidence limits are conservative (Annex IV), their widths are still somewhat narrower than those obtained for the Random Group in the Year 2000 Applicant survey for the first Forecast Year (51% as wide, comparing *Total Filings* Year 2001 in the current survey with *Total Filings* Year 2000 in the previous survey). However in the current survey the confidence limits widen significantly for the second and third Forecast Years (Years 2002 and 2003). This could reflect a divergence of views between applicants on the effects of the current uncertain economic environment.

The mid-point forecasts for Year 2001 in Table 7 are optimistic. A continuation is expected of the trend towards the *Euro-PCT-IP* filing route at the expense of the *Euro-direct* filing route. Analysis of the Biggest Group gave lower forecasts (Table 3, Section V.1), but these forecasts still lie within the 95% confidence limits shown in the above table. In theory however the Random Group is representative of the whole population of applicants while the Biggest Group represents only a stratum within the population. It is therefore possible that the largest applicants are less optimistic than applicants in general.

The survey covered an appreciable percentage of applications to the EPO (Annex I).

The responses that were received from the Biggest Group represented 23% of filings, and the responses that were received from the Random Group represented 26% of filings, using filings in Year 2000 as reference. Thus the results should be fairly representative of overall future intentions. Difficulties may however have arisen if the probability of response to the survey was lower among pessimistic applicants, or if perceptions and plans have changed after the time at which the survey took place.

The approach of building up forecasts from primordial types of filings and Blocs of residence seems valid. In Section VI an experimental approach was tried that developed alternative forecasts for *European Filings* from Growth Rates of *Distinct Filings* and *Overall PCT Filings*. This gave forecasts similar to those reported in Table 7, but a little less optimistic. Clearly the data obtained on world-wide filings can be used to enhance the quality of forecasts for filings at the EPO, and it is suggested that this kind of analysis should be developed further. The trilateral patent offices (EPO, JPO and USPTO) may decide to develop a joint approach to worldwide surveys of patenting intentions, in which case the design of the current survey provides a possible model.

X References

Applicant Panel Reports 1996 - 2000, EPO Munich.

Cochran, W.G. (1977), *Sampling Techniques*, Third edition, Wiley, New York.

Roland Berger Forschungs-Institut (2001), *Anmelderpanel 2001; Methodenbericht* (Full text in German).

Sizes of Populations and Samples for the EPO Applicant Panel Survey 2001.

		Euro- Applications in 2000			Euro- Applicants in 2000		
		-direct	-PCT- IP	All	-direct	-PCT- IP	All
1. Population (2000)		54 618*	90 565*	145 183*	14 276*	30 798*	41 996*
Sample group A: Largest applicants							
2.	Number asked	25 591*	22 888*	48 479*	377*	355*	402
	as % of 1.	46,9%	25,3%	33,4%	2,6%	1,2%	1,0%
	Number of quantitative responses	20 661	12 730	33 391	154	141	197
	as % of 1.	37,8%	14,1%	23,0%	1,1%	0,5%	0,5%
	as % of 2.	80,7%	55,6%	68,9%	40,8%	39,7%	49,0%
Sample group B1: Random sample.							
3.	Number asked	28 612*	27 356*	55 968*	1 307*	1 038*	2 003
	as % of 1.	52,4%	30,2%	38,5%	9,2%	3,4%	4,8%
	Number of quantitative responses	22 264	15 101	37 365	334	315	537
	as % of 1.	40,8%	16,7%	25,7%	2,3%	1,0%	1,3%
	as % of 3.	77,8%	55,2%	66,8%	25,6%	30,3%	26,8%

* From database Other Numbers are based on figures given by the respondents

Sample sizes summarised from responses analysed by EPO, which differ slightly from numbers given in the *Methodenbericht*.

Annex II

Plausibility Checks and Interpretation Rules

Plausibility Checks

To ensure that the answers given to Section B of the Questionnaire were logical and consistent, a number of plausibility rules were set up. Firstly the number under "Distinct Patents requested / First Filings" should ideally be the sum of the numbers that appear in the same column for *Patent applications under EPC (excluding PCT)*, *Patent applications under the PCT*, and various *National applications*. Also the numbers in any cell under "Subsequent filings" should be comparable (say not more than double) the number under "Distinct Patents requested / First Filings" for the previous year. Finally a number under "Distinct patents requested / Subsequent filings" should be at least as high as every other number that appears in the same "Subsequent filings" column.

Interpretation Rules for the Integration of Answers in the Electronic Data Base

A set of rules was developed, together with the consultant, to ensure that the answers given to the questions were correctly transcribed and interpreted in the electronic data base. In cases where percentage Growth Rates were given instead of real figures, a method was given for converting these into equivalent filings figures on which the analyses could be based. Rules were given concerning the interpretation of zero, to ensure correct interpretation where zero is given either as a figure or an indicator of no change compared to the Base Year. Finally, it was specified that combined Filings counts should only be given where real data (0 or higher) was given by the respondent for all underlying primordial filing types in the combination.

Annex III

Calculation of Growth Indices from Questions on European Filings.

Consider the calculation of Growth Indices for one of the primordial combinations (*Bloc of residence* / *Euro-Direct* vs *Euro-PCT-IP* / *First Filings* vs *Subsequent Filings*).

The individual respondent Index I_i for respondent i can be written

$$I_i = \frac{x_i}{A_i}$$

where x_i is the intended number of filings reported by the ith sampled applicant in the year of interest (2001, 2002 or 2003 in the current survey).

A_i is the known number of applications made by the i^{th} sampled applicant in the base year (2000 in the current survey).

It is intended to estimate the following quantity of interest, which will be termed the *Population Index* (*PI*) and represents intended growth in the population.

$$PI = \frac{\sum_{j=1}^{N} x_j}{\sum_{j=1}^{N} A_j}$$

where N is the number of applicants in the population, and summation is taken over the population members j, for j = 1, ..., N.

A straightforward Index can be constructed by dividing the sum of the quantitative expectations in a sample by the known total of applications made by the same respondents in the base year. This Index is termed the *Composite Index* (*CI*), and can be written as follows:

$$CI = \frac{\sum_{i=1}^{n} x_i}{\sum_{i=1}^{n} A_i}$$

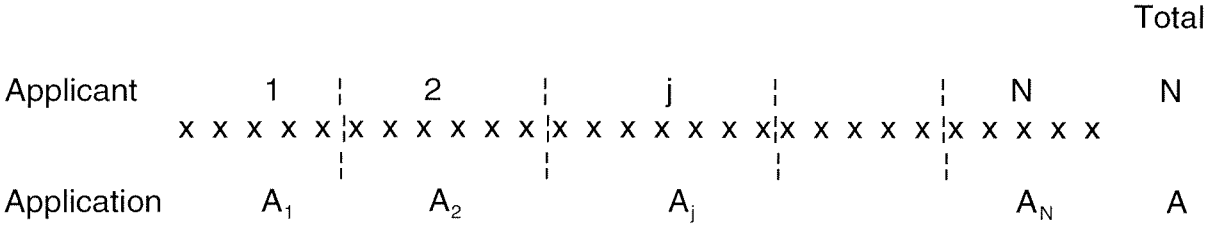
Where n is the number of applicants in the sample, and summation is taken over the sample members i = 1, ..., n.

It is appropriate to use *CI* where systematically selected groups of applicants are used. Therefore it can be applied to the Biggest Group in the current survey, which is as far as possible a selection of the 402 biggest applicants in 2000. However the sampling scheme for the Random Group involved a random sampling of applications rather than applicants. The sampling scheme implies that applicants with differing numbers of applications in the base year will give different weights to the sample estimate *CI* than they do to the population quantity *PI*. This means that *CI* could be biased if the filing intentions for larger applicants differ from those for smaller applicants.

It is also unsuitable to make a simple average of the sample respondent Index I_i values (to give a *Simple Index*, or *SI*, as defined below), because this could similarly give inappropriate weights to applicants of different sizes. It is better to create an alternative sample Index by using a weighted average of the individual I_i values, with weights chosen to give as far as possible an unbiased estimate of *PI*. In order to do this, some further consideration must be taken of the sampling scheme that was actually used.

The principle involved in construction of the random samples is that the probability of inclusion of an applicant is positively related to the number of applications that he makes in the base year. However a consequence is that sometimes more than one application is selected from a single applicant. In these cases further applications are sampled until the required number of applicants is reached.

Suppose that all the applications in the population are laid out in a hierarchical sequence, first by applicant number and then by application number within applicant.



The sampling scheme selects n^+ of the A applications at random, so that finally n applicants are contained within the sample ($n \leq n^+$). It can be assumed that A is large enough to allow the above sequence to be approximated by a continuous number line, with the length of the segment of the line corresponding to applicant j equal to the number of applications A_j that were made.

Let g_j represent the number of times that the applications of applicant j are selected for the sample. The probability distribution for g_j can be approximated by a Poisson distribution with a mean equal to $m_j = n^+A_j / A$.

$$Pr(g_j) = \frac{e^{-m_j} \; m_j^{g_j}}{g_j!}$$

However, applicant j will be selected for the sample as long as $g_j > 0$. The probability of this is obtained from the above Poisson formula as

Pr (applicant j is selected) =

$$Pr(g_j > 0) = 1 - Pr(g_j = 0) = 1 - e^{-m_j} = 1 - e^{-n^+ \frac{A_j}{A}}$$

Respondents in the sample are therefore given a weight proportional to the number of filings that they made in the base year (A_i), because this number can be considered as the appropriate size of the "vote" contributed from the respondent by his forecasts. (*CI* does in fact already give an increased weight to larger applicants, but this weight is not directly proportional to the number of previous filings.) An appropriate weighting factor is given by dividing A_i by *Pr (applicant i is selected)*, as given by the above expression with i replacing j. This weight will be termed q_i, and can be written as follows.

$$q_i = \frac{A_i}{1 - e^{-n^+ \frac{A_i}{A}}}$$

q_i values for the sample members 1, ... i, ... n, can be used for the construction of a weighted average Index. This will be called the *Q Index*, and can be written

$$Q = \frac{\sum_{i=1}^{n} q_i \, I_i}{\sum_{i=1}^{n} q_i}$$

Pragmatically *Q* should be an improvement over *CI*, because the weighting ensures that the contribution to the Index for an applicant is related to his filings in the base year, and not to his probability of inclusion in the sample. *Q* is in fact asymptotically equivalent to the simple Index (*SI*), because as A -> ∞,

$$1 - e^{-n^+ \frac{A_i}{A}} \rightarrow n^+ \frac{A_i}{A} \quad ; \quad \text{and so} \quad q_i \rightarrow \frac{A}{n^+}$$

Which means that Q ->

$$\frac{\sum_{i=1}^{n} I_i}{n} = SI$$

For the Random Group in the current survey, $n^+ = 3\ 200$ and $n = 2\ 003$. The population that was sampled was that of *Euro-Direct Filings* and *Euro-PCT-RP Filings* in Year 2000, although the questions in the survey related to *Euro-PCT-IP Filings* rather than *Euro-PCT-RP Filings*. This was because, at the time of sampling, the database was not complete with respect to information on *Euro-PCT-IP Filings* in year 2000.

The variance of *Q* can be estimated by

$$Var[Q] = \frac{\sum_{i=1}^{n} (I_i - Q)^2 q_i^2}{\left(\sum_{i=1}^{n} q_i \right)^2}$$

The Standard Error of *Q* is given as $S.E.[Q] = \sqrt{Var[Q]}$.

The estimates and standard errors for future filings for each combination of primordial terms are given by combining values of *Q* and *S.E.[Q]* from the concerned primordial terms (see Annex IV).

Annex IV

Calculation of Forecasts by Combination of Primordial Growth Indices.

Consider a set of Growth indices $\{Q_r\}$ collected over **s** primordial combinations (*Bloc of residence* / *Euro-Direct* vs *Euro-PCT-IP* / *First Filings* vs *Subsequent Filings*)[1]. Say that the number of filings in the Base Year for combination **r** is A_{rb}. Then the forecasts in a later year for the number of filings for combination **r** ($\hat{A}_r$), and for numbers of *Total Filings* ($\hat{A}$), are:

$$\hat{A}_r = A_{rb} \times Q_r \quad ; \qquad \hat{A} = \sum_{r=1}^{s} A_{rb} \times Q_r$$

For the Random Group, where $S.E.[Q_r]$ is also estimated, the standard errors of the forecasts are also available.

$$S.E.[\hat{A}_r] = A_{rb} \times S.E.[Q_r] \; ; \qquad S.E.[\hat{A}] = \sqrt{\sum_{r=1}^{s} (A_{rb})^2 \times (S.E.[Q_r])^2}$$

The expression for $S.E.[\hat{A}]$ is conservative, and so will give approximate 95% confidence limits ($\hat{A} \pm \{2 \times S.E.[\hat{A}]\}$) that are too wide. Reasons for this are:

1. An appreciable proportion of the applications in the population have been sampled (see Annex I), but no finite population correction has yet been included in the expression for calculation of $S.E.[\hat{A}]$.

2. No account has been made of covariances between $\hat{A}_r$ terms in the expression for $S.E.[\hat{A}]$. Such covariances are likely to be negative, for example if the forecasts encompass a period in which companies switch patent route policy from making *Euro-direct Filings* to making *Euro-PCT-IP Filings*.

Conservatism in the estimated $S.E.[\hat{A}]$ values could explain why the 95% confidence limits for the second and third forecasted years (Years 2002 and 2003, as reported in Table 4) remain of comparable width to those reported in the previous survey that used a smaller sample size.

---

[1] Q_r could be *Q* calculated from the Random Group or *CI* calculated from the Biggest Group, although standard errors are not available for *CI*.

Annex V

Kommentare der Teilnehmer des Anmelderpanels 2001

Allgemeine Kommentare zu Teil B

- Bei PCT-Anmeldung Benennung aller Länder

Individuelle Kommentare zu Teil B

- Entscheidung über PCT-Anmeldung nach Recherche-Bericht
- PCT wird verstärkt
- Standardverfahrensweise: Erstanmeldung Europa, korrespondierend PCT
- Nationale Anmeldungen in Ländern mit direkten Konkurrenten
- 2/3 bis 100% der Erstanmeldungen werden nach dem PCT in industriell entwickelten Staaten nachgemeldet
- Umwandlung von PCT in nationale Anmeldungen, wenn dienlich
- Alle Patente werden mehrfach international nachgemeldet
- Meldungen im Ausland laufen über PCT
- European regional filings, wo schnellere Durchführung erwünscht ist

Allgemeine Kommentare zu Teil C

- Werte sind Schätzungen
- Angaben geheim / Betriebsgeheimnis
- Angaben nicht möglich, da Universität/Forschungszentrum
- Aufschlüsselung in Phase vor und Phase nach Patentanmeldung nicht möglich
- Klassifikationen entsprechen nicht Praxis

Individuelle Kommentare zu Teil C

- Detailaufschlüsselung zu zeitaufwendig
- Genaue Spezifikation, was unter F%E-Budget zu verstehen ist, wird verlangt
- Definition der Phase vor Patentanmeldung verlangt
- Keine Angabe möglich, da F&E und Patentwesen zwei unterschiedliche Abteilungen sind / nicht für Budget verantwortlich

Allgemeine Kommentare zu Teil E

- Allgemeine Unzufriedenheit mit Arbeit des EPA
- Unzufrieden mit Dauer des Patentanmeldeverfahrens

- Zu hohe Kosten für Patentanmeldung / Übersetzung / Patentanwalt
- Unzufrieden mit EPA- Recherche
- Patentanmeldung beim EPA lohnt sich nur bei Anmeldung in mehreren EPA-Ländern
- Fragebogen schwer verständlich weil zu kompliziert, unklar
- EU- Gemeinschaftspatent wäre sinnvoll
- Erstanmeldung national, dann innerhalb von 12 Monaten Ausweitung (PCT)

Individuelle Kommentare zu Teil E

- Patentaktivitäten werden eingeschränkt aufgrund beträchtlicher Ausgaben für laufende Anträge, bis patentierte Produkte finanziellen Ertrag einbringen
- EP-Anmeldungen resultieren aus PCT-Anmeldungen in Ländern, in denen EPO die Autorität ist / EPO-Anmeldung via PCT
- Als Erstanmeldung oft Gebrauchsmuster, aus denen DE-, Europa- oder PCT-Patente nachgemeldet werden
- Vorgehensweise ist Erstanmeldung national (US, SE und GB/IT, je nach Forschungsort), dann PCT-Benennung aller Mitgliedstaaten (u. U. auch Anmeldung in Nicht-PCT-Staaten), dann u. U. nach ca. 30 Monaten EPA-Meldung der entsprechenden PCT-Benennungen
- Prozedur: Erstanmeldung DE, dann PCT-Nachanmeldung mit Benennung aller Staaten in voraussichtlich 70% aller Fälle
- Die meisten Fragen sind schwierig zu beantworten, da Betriebsgeheimnisse berührt werden
- Sofern sich Kosten und Verfahrenserleichterungen beim EPA weiterhin positiv entwickeln, wird in Zukunft vermehrt von europäischen Erstanmeldungen Gebrauch gemacht
- Fragebogen sollte an Fälle angepaßt werden, in denen Miteigentum verschiedener Gesellschaften einer selben Gruppe an der Patenteinbringungen aufgrund gemeinsamer F&E-Programme besteht
- Vorgehensweise: zunächst Erstanmeldung über EPA, ein Jahr später Einbringung von 80 - 90% in PCT-Phase unter Benennung aller Länder und Aufgabe der EP-Erstanmeldungen, dann meist 30 Monate später Einbringung von ca. 2/3 der PCT-Anmeldungen in die nationale Phase
- Wunsch nach Veröffentlichung der Patente auf der Web-site des EPA in downloadbarer Form
- Re PCT applications: "EPO search and opinion"- Option wird als sehr professionell angesehen
- Erstanmeldung national, dann Nachmeldung national in den Ländern der Europäischen Gemeinschaft und Meldung PCT in 80% der Fälle unter Benennung aller Staaten
- Wichtige Information, wie viele Länder nach PCT-Benennung später nationalisiert werden, wird nicht abgefragt
- Fragebogen von 1999 war sinnvoller und aussagekräftiger, da allgemeine Zahlen gefragt (->verlangte Prognosen schwierig)

ANNEX VI

European Patent Office

«NAME»
«ADDRESS1»
«ADDRESS2»
«ADDRESS3»

«ADDRESS4»
«ADDRESS5»

«APPR»

Questionnaire

for Applicant Panel Survey on Patent Filings

A. Company Details

Should the information given above on your company details be incorrect, please provide us with corrected information below:

Contact Name: _____

Phone Number: _____

Organisation Name: _____

Organisation Address: _____

_____

_____

_____

If you or your company is a branch or subsidiary of another organisation, please complete the questionnaire for your part of the organisation **only**.

Should you nevertheless decide to submit information on related companies registered under one or more other names and addresses, please indicate them below:

Organisation Name:: _____

Organisation Address: _____

_____

Organisation Name: _____

Organisation Address: _____

_____

_____

«APPR» «NAME»

B. Estimation of levels of patenting activity

1 Numbers of first and subsequent filings

Please indicate the numbers of **first filings** (priority forming) and **subsequent filings** (claiming priority of an earlier application) with break downs by patent types and countries, that you filed last year and that you expect to file in present and future years.

ONLY if you are not able to give actual numbers, please give anticipated yearly growth rates using year 2000 as the base year (e.g. 3% in 2003 indicates 3% more than in 2000).

		Filed		Expected		Expected		Expected	
		2000		2001		2002		2003	
		First filings	Sub-sequent filings	First filings	Sub-sequent filings	First filings	Sub-sequent filings	First filings	Sub-sequent filings
Distinct patents requested [1]									
Patent applications under the EPC (excluding PCT)									
Patent applications under the PCT									
of which	Designating EPO								
	Designating United States								
	Designating Japan								
	Designating Germany								
	Designating United Kingdom								
	Designating other countries	Please give details on separate sheets (see part D)							
National applications (excluding PCT) in	Germany								
	United Kingdom								
	France								
	Italy								
	Japan								
	United States [2]								
	Other countries	Please give details on separate sheets (see part D)							

[1] Counting multiple requests to different offices only once.

[2] Including provisional filings under the columns for first filings.

Do you have any specific comments to make regarding the above section B of the questionnaire?

«APPR» «NAME»

C. Your activities in the various main sectors of research and development.

	Please indicate the approximate size of your **R&D budget** in each area mentioned below (in your national currency).		Please, if possible, indicate the percentage of your R&D budget in each of the below mentioned areas for **2000** in the **pre-patent application phase** of your work.	Please indicate the number of **first filings** made in each of the below mentioned areas in **2000**.
	Actual 2000	Expected 2001		
1. Agriculture				
2. Foodstuffs; tobacco				
3. Personal or domestic				
4. Health				
5. Amusement				
6. Preparations for medical, dental or toilet purposes				
7. Separating; mixing				
8. Shaping				
9. Printing				
10. Transporting				
11. Inorganic chemistry				
12. Organic chemistry				
13. Organic macromolecular compounds				
14. Dyes, petroleum, animal and vegetable oils				
15. Fermentation, sugar, skins				
16. Metallurgy				
17. Textiles or flexible materials				
18. Paper				
19. Building				
20. Earth drilling; mining				
21. Machines or pumps				
22. Engineering in general				
23. Lighting; heating				
24. Weapons; blasting				
25. Instruments				
26. Nucleonics				
27. Electricity				
28. Electronics and electric communication technique				
29. Others, please specify				
Total				

Do you have any specific comments to make regarding the above section C of the questionnaire?

«APPR» «NAME»

D. Estimation of levels of patenting activity - additional reporting sheet

1 **Number of first and subsequent filings in "Designating other countries" (PCT) and "Other countries" (National applications)**

Please make use of the following table when reporting on "Designating other countries" and "Other countries". Use several copies of this sheet if necessary

	Please indicate the two-letter international country code or full country name:	Filed		Expected		Expected		Expected	
		2000		2001		2002		2003	
		First filings	Sub-sequent filings	First filings	Sub-sequent filings	First filings	Sub-sequent filings	First filings	Sub-sequent filings
Patent applications under the PCT (please specify designated countries)	Designations:								
	Designations:								
	Designations:								
	Designations:								
	Designations:								
	Designations:								
	Designations:								
	Designations:								
National applications (excluding PCT) in (please specify countries)	Country:								
	Country:								
	Country:								
	Country:								
	Country:								
	Country:								
	Country:								
	Country:								
	Country:								
	Country:								
	Country:								

«NAME» «APPR»
«ADDRESS1»
«ADDRESS2»
«ADDRESS3»

«ADDRESS4»
«ADDRESS5»

E. General comments and results of the survey

Please comment further on general matters arising from this questionnaire. Use a separate sheet for extended comments

It is intended to distribute a short summary of the results of the survey in the beginning of year 2002.