

Table 5.1

Average quantities of the PGM traded in the world,
and the average annual percentage trends, 1985-1989

Country/ region	Imports		Exports		Balance kg	Users %	Exports %
	Average kg	Trend %	Average kg	Trend %			
Australia	2 226	- 72,86	1 777	- 70,04	+ 449	0,18	-
Austria	1 987	+ 21,62	717	+ 24,36	+ 1 270	0,52	4,85
Benelux	1 973	+ 2,46	12 972	+ 16,85	- 10 999	-	0,17
Canada	5 325	+ 37,02	5 722	+ 12,87	- 397	-	-
China, PR	2 274	+ 66,42	581	+ 16,92	+ 1 693	0,69	0,22
Colombia	-	-	489	- 88,30	- 489	-	-
Denmark	633	- 3,87	121	+ 11,15	+ 512	0,21	-
Finland	328	+ 31,20	118	- 42,26	+ 210	0,08	-
France	11 737	+ 1,76	10 583	+ 8,37	+ 1 154	0,47	-
Germany W	46 602	+ 5,26	23 436	+ 11,36	+ 23 166	9,44	-
Hong Kong	1 808	+ 29,39	1 452	+ 19,40	+ 356	0,14	-
Irish Republic	1 518	+ 27,12	928	+ 21,56	+ 590	0,24	-
Italy	7 342	- 81,20	2 319	- 80,63	+ 5 023	2,05	-
Japan	101 361	+ 12,85	4 449	+ 17,74	+ 96 912	39,48	-
Korea, Republic	678	+ 27,02	-	-	+ 678	0,28	-
Netherlands	2 742	+ 11,24	2 011	+ 0,68	+ 731	0,30	-
Norway	691	- 1,78	1 834	+ 9,58	- 1 143	-	0,50
Portugal	391	- 65,19	381	+ 2,61	+ 10	0,00	-
South Africa*	832	- 32,09	115 480	+ 11,46	- 114 648	-	50,58
Spain	1 397	+ 32,09	175	- 8,08	+ 1 222	0,50	-
Switzerland	35 796	- 5,96	40 568	+ 15,20	+ 4 772	-	2,11
United Kingdom	37 390	+ 27,34	63 557	+ 8,27	- 26 167	-	11,54
USA	109 368	Level	22 349	+ 11,92	+ 87 019	35,45	-
USSR*	-	-	68 060	+ 13,65	- 68 060	-	30,03
Comecon	4 500	+ 3,85	-	-	+ 4 500	1,83	-
Other Western	19 980	+ 3,06	-	-	+ 19 880	8,14	-
Totals	398 879	+ 6,61	380 079	+ 11,45	+ 18 800	100,00	100,00

*Estimate. Note that platinum-group metals refer to all forms — pure, wrought, unwrought, partly worked and alloys. Comecon countries refer to Bulgaria, Czechoslovakia, German Democratic Republic, Poland, and Romania. Other Western countries include Algeria, Argentina, Brazil, Costa Rica, India, Indonesia, Jordan, Malaysia, Mexico, New Zealand, Qatar, Singapore, Sweden (imports), Taiwan, Thailand and Turkey. For the following countries, quantities were provided in British currencies: Benelux (all waste and scrap), Iran, Israel, Sweden (exports) and Yugoslavia, and were thus omitted from these tables.

of a disadvantage. Their relatively high prices render their recovery by recycling economically feasible, and the metals recovered are crucial to the economics of the PGM industry, especially on the demand side.

Because PGM-bearing scrap, waste, and residues vary widely in value and grade, proper sampling and assaying are vital to the recycling industry. Fire-assay techniques have long been used to determine the PGM in ores and plant products, and are equally valuable in this instance. The PGM can, however, also be determined by chemical and instrumental methods, such as X-ray fluorescence and spectrochemical methods.

The materials that constitute valuable feedstocks in the production of secondary PGM are derived from three sectors. The industrial sector produces materials in the form of slimes, sludges, machining chips, ingot scalpings, grindings, skimmings, drosses, sweepings, and other discard materials. Commercial institutions

produce discard petroleum, chemical, and automotive catalysts; glass-fibre bushings, jewellery and selected electronic scrap, laboratory crucibles and equipment, dental materials, and many others. Even the military sector, particularly in the USA, produce PGM scrap in the form of wires, batteries, electrical and circuit-board scrap, 'black boxes', films and photographic solutions — the refining is done by the military in the USA, but would be included in the typical waste and scrap in other countries.

It has been estimated that, for petroleum-industry scrap, some 95 per cent of the PGM are recovered, and 85 per cent in the case of chemical and pharmaceutical scrap. Automotive catalysts generally constitute the lowest-grade source of scrap, while the recycling of PGM from all electronic sources is not regarded as being feasible. A number of categories of feedstock for producing secondary PGM are distinguished.

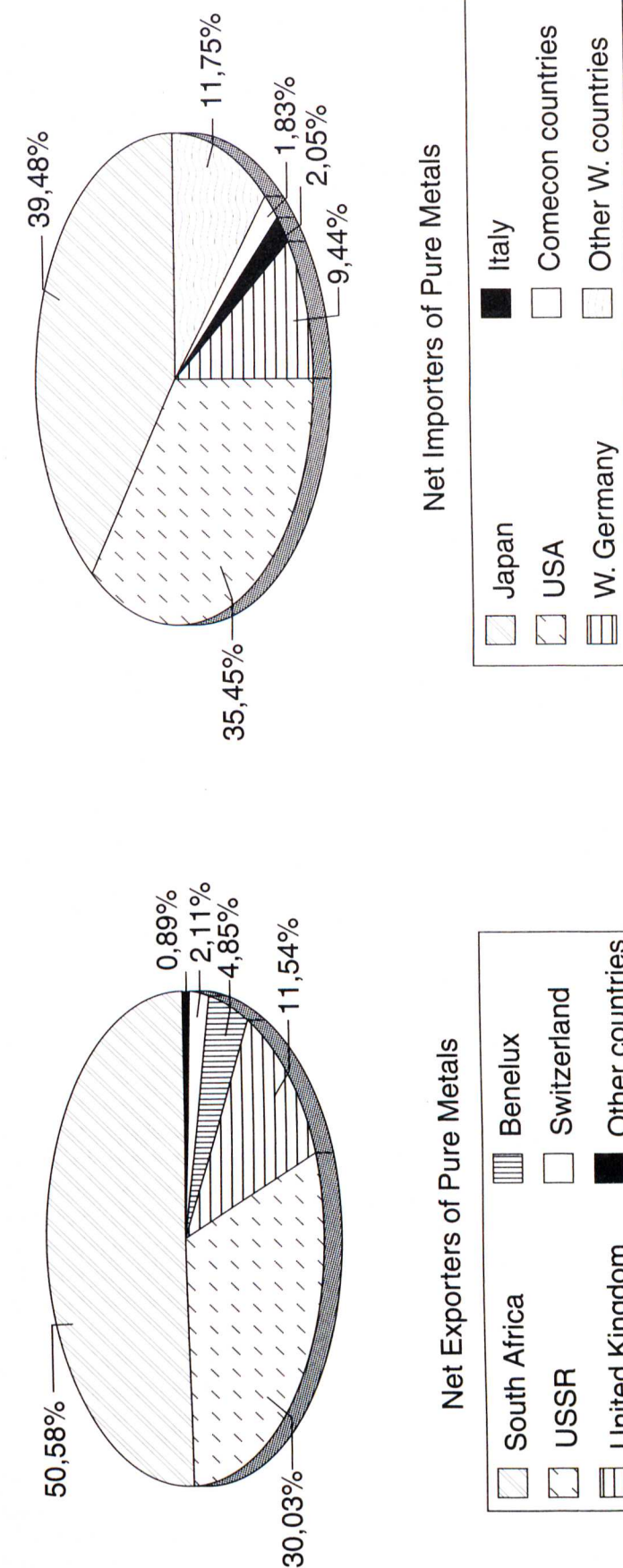


FIGURE 5.1. Average distribution of international trade in the PGM, 1985-1989