

CHAPTER IV

TNCs IN EXTRACTIVE INDUSTRIES

TNCs are prominent players in both the metal mining and the oil and gas industries. With new global players emerging, not least from developing and transition economies, the universe of these extractive-industry TNCs is being transformed. It now encompasses both the traditional, privately owned firms, mostly headquartered in developed countries, and a growing number of State-owned firms.¹ The way in which TNCs engage in overseas investments has evolved differently over time in different extractive industries. Drawing on unique sets of data,² this chapter starts by examining global FDI trends in these industries and the importance of such investments for individual home and host countries. The chapter then goes on to analyse how the universe of extractive-industry TNCs is evolving (section B). Section C examines the main drivers and determinants of related TNC investment. Section D concludes by summarizing the main findings.

A. Global trends in FDI and other forms of TNC participation in extractive industries

1. FDI trends

Extractive industries account for a small share of global FDI flows, though this has not always been the case. In the early twentieth century, FDI went mostly into these industries, reflecting the international expansion of firms that originated largely from the colonial powers. The objective of TNCs in the extractive industries was to gain direct control over the mineral resources required as inputs

for their growing manufacturing and infrastructure-related industries.³ During the Great Depression (1929-1933), the international expansion of oil companies continued unabated despite the crisis in other overseas investments (Graham, 1996: 26). As former colonies gained independence after the Second World War, and with the creation of the Organization of the Petroleum Exporting Countries (OPEC), many governments chose to nationalize their extractive industries, resulting in a declining involvement of the TNCs that hitherto had been dominant. For example, by 1970, the share of resource-based industries (by investor industry) in United States outward FDI stock had fallen to less than 40% (from more than half at the beginning of the century) (Graham, 1996: 27).

The share of the extractive industries in global inward FDI stocks declined throughout the 1990s until the start of the current commodity boom in 2003, after which it recovered to about 9% in 2005 (figure IV.1). The decline of the primary sector's share in global FDI has been due to its slower growth compared with FDI in manufacturing and services. In absolute terms, however, FDI in the primary sector has continued to grow: it increased in nominal terms nearly 5 times in the 1970s, 3.5 times in the 1980s, and 4 times from 1990 to 2005 (*WIR03*; *WIR05*; annex table A.I.9). The stock of FDI in extractive industries was estimated at \$755 billion in 2005 (annex table A.I.9).

When analysing FDI data related to extractive industries, a number of limitations should be kept in mind. For example, only 22 countries report data on outward FDI stocks in this area (box IV.1) and some forms of TNC involvement may be poorly covered in official statistics, while cross-border mergers and acquisitions

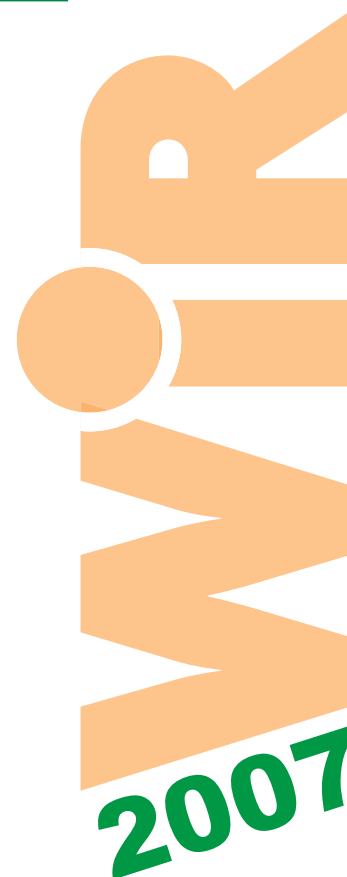
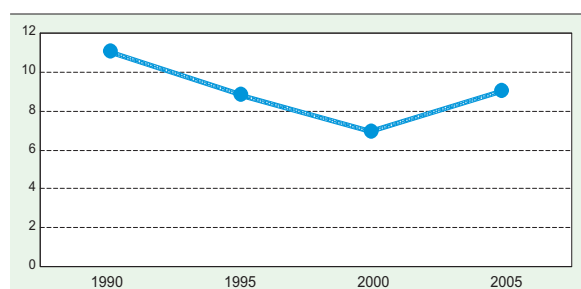


Figure IV.1. Share of extractive industries in world inward FDI stock, 1990, 1995, 2000 and 2005
(Per cent)



Source: UNCTAD estimates, based on annex table A.IV.1 and the FDI/TNC database (www.unctad.org/fdistatistics).

(M&As) can lead to large FDI flows into countries where owners are based but where very limited extraction takes place (box IV.1). It is therefore important to complement FDI data with other statistical information when analysing the extent and nature of TNC involvement.

Developed countries remain the most important sources of outward FDI in extractive industries, although their share in the world total declined somewhat, from 99% in 1990 to 95% in 2005 (annex tables A.I.10 and A.IV.2). Between 1990 and 2005, the Netherlands, the United Kingdom and the United States remained the three largest home countries of outward FDI stock in these industries.⁴

Recently selected developing and transition economies have become significant sources of outward FDI in extraction industries. For example, in 2003 and 2004, the mining industry accounted for 48% and 33%, respectively, of *China's* FDI outflows; and this share fell to 14% in 2005, they still exceeded \$1 billion in absolute terms.⁵ In *India*, oil and gas accounted for an estimated 19% of the total value of overseas acquisitions by its TNCs up to March 2006 (MAPE Advisory Group, 2006). The number of ongoing overseas projects of extractive-industry TNCs from the *Republic of Korea* increased from 141 at the end of 2002 to 218 at the end of 2006, and from \$0.5 billion to \$2.1 billion in value terms, most of which (\$1.9 billion) was accounted for by oil and gas field development (Republic of Korea, 2007).⁶

Owing to the noted lack of comprehensive data on extractive-industry FDI, it is difficult to make comparisons between individual countries and regions. The most complete statistics are provided by the United States, which also distinguishes between different subsectors of the extractive industries. According to these data, FDI in oil and gas is considerably larger than in metal mining. Oil and gas accounted for 71% of United States outward FDI stock in extractive industries in 2005 (and for 84% if FDI in extraction supporting activities is included)

(figure IV.2). Within mining, non-precious metals were the most important target industries for outward FDI from the United States, together accounting for 36% of FDI stocks in such mining.

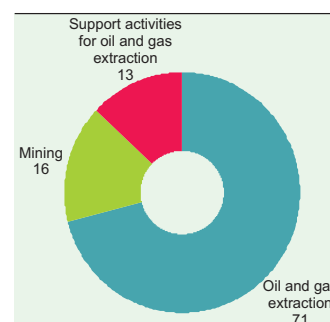
This sectoral distribution is largely confirmed by data on worldwide cross-border M&As. During the period 1990-

2006, oil and gas accounted for almost three quarters of all such deals in extractive industries (annex table A.IV.3). Within the *oil and gas industry*, cross-border M&A purchases have fluctuated significantly (annex table A.IV.3), reaching an all-time high (of more than \$100 billion) in 2005 as a result of the restructuring of Royal Dutch Shell (box IV.1; *WIR06*: 83 and 88). In *mining and quarrying*, cross-border M&A activity has generally been lower, but in 2006, the value of such deals reached a record value of \$55 billion (annex table A.IV.3). Among more than 200 deals recorded in 2006, two were exceptionally large: Companhia Vale do Rio Doce (CVRD, Brazil) acquired Inco (Canada) for about \$17 billion and Xstrata (Switzerland) acquired Falconbridge (Canada) for about the same amount (annex table A.IV.4).⁷ Due to the persistently high mineral prices and profitability of the industry (chapter III), the M&A frenzy is expected to continue, as confirmed, for example, by the takeover bid by Rio Tinto (United Kingdom) for Alcan (Canada) in July 2007 (Berman and Glader, 2007).

2. Developing and transition economies are receiving a growing share of foreign investment

The geographical distribution of inward FDI in extractive industries has fluctuated over time. In the first part of the twentieth century, developing countries were the major destination of FDI in extractive industries. However, nationalizations from the 1950s to the 1970s⁸ triggered a shift towards developed countries (discussed in section B.2), partly due also to discoveries of oil deposits in these countries. Over the long period of low mineral prices, from the 1980s till the early 2000s (chapter III), the mixed (often unsatisfactory) performance of some

Figure IV.2. United States outward FDI stock in extractive industries, 2005
(Per cent)



Source: UNCTAD, based on data from United States, Department of Commerce.

Note: The percentages refer to the industry of the outward investor.

Box IV.1. Complexities of interpreting data on FDI in extractive industries

Difficulties in interpreting data on FDI in the extractive industries arise for four reasons:

- Incomplete reporting (information is available for a limited number of countries, and for varying periods of time);
- Diverging definitions and methodologies used in data collection;
- Imperfect FDI data that fail to capture non-equity-based transactions not registered as FDI flows; and
- Some components of FDI, such as cross-border M&As, may give an inflated picture of real activities.

These four difficulties are interlinked. For instance in 2005, data on FDI in the extractive industries (mining, quarrying and petroleum as defined in the ISIC code) were available for 38–54 economies as inward FDI, but for only 22–29 economies as outward FDI. Even fewer countries break down the extractive industries into oil and gas, on the one hand, and other mining on the other (box table IV.1.1). In addition, data are not available systematically for all years. Another problem is related to differences in the coverage of national data. For example, while the United States explicitly includes “support activities for mining” in its FDI data (that accounts for more than one tenth of its outward FDI stock in this industry), other countries do not show this particular subsector separately. UNCTAD adjusts the United States data by moving this service activity to the services sector. Thus, the data for FDI in the extractive industries should be interpreted with care.

Box table IV.1.1. Number of countries reporting data on FDI in extractive industries, 2005

FDI type	Inward FDI		Outward FDI	
	All extractive industries	Of which, oil and gas and other mining are separately available	All extractive industries	Of which, oil and gas and other mining are separately available
Flows	54	17	29	12
Stocks	38	13	22	8

Source: UNCTAD, FDI/TNC database (www.unctad.org/fdistatistics).

Note: Data for most countries are not available for all years.

There are established international rules on how FDI, including in extractive industries, should be recorded (IMF, 1993). FDI covers not only affiliates incorporated in a host country but also unincorporated branches. These branches may include both unmovable equipment and objects (such as oil pipelines and structures, except when owned by foreign government entities) and mobile equipment (such as gas and oil drilling rigs). All of these items are considered to be direct investment according to the balance-of-payments methodology, provided they exist for at least one year and that they are accounted for separately by the operator, and so recognized by the tax authorities of a host country (IMF, 1993). However, in practice, individual countries differ in how they interpret and apply these rules in statistical data collection, resulting in uneven reporting, which makes international comparisons difficult.

FDI statistics may fail to capture fully the activities of extractive-industry TNCs in a country, even if they follow the international guidelines on data collection. If a TNC has a concession to extract natural resources, it owns the equipment and installations used in its operations. Hence cross-border flows aimed at financing such capital expenditures should be registered as FDI. On the other hand, in the case of production-sharing agreements, equipment and installations typically are the property of the host country, either at the outset of production or progressively. Where local governments or companies rent such equipment and installations from abroad, rental payments should be recorded under services in the current account, not in the capital account (that includes FDI components) of the balance of payments. Hence the full capital expenditure is not necessarily registered under FDI. Moreover, in the case of a service contract, it is only the establishment of the branch servicing that agreement and its capital expenditures financed by parent firms that are recorded as FDI. The subsequent activities of that branch are then recorded as sales of services, such as providing trained personnel or technical advice to the State-owned local oil company. It is recommended that the data on these activities be collected as part of foreign affiliates' trade in services statistics, which are different from the balance of payments that cover essentially financial transactions between residents and non-residents.

Finally, large cross-border M&As may inflate the FDI inflows of countries whose extractive-industry firms are sold to foreign acquirers in the year for which data were collected, without any major change in exploration and extraction activities. For example, the reorganization of Royal Dutch Shell in 2005 resulted in a \$74 billion merger (annex table A.IV.4), and major FDI inflows to the United Kingdom without expanding extractive activities in that country. Moreover, some extractive-industry TNCs may select a location of convenience for their headquarters different from the country in which the activities are taking place. In those cases, related cross-border M&As are recorded under the FDI inflows from the immediate transaction country.

Source: UNCTAD.

State-owned companies (Radetzki, forthcoming) and the need to service foreign debt, led many developing countries to once again allow FDI in metal mining, including through privatizations.⁹ However, few developing and transition economies have chosen to privatize their national oil and gas companies, for example, of Argentina, Bolivia and Peru. Others have allowed the participation of TNCs in the exploration and exploitation of oil through a variety of contracts (see below).

Nevertheless, the importance of developing and transition economies as destinations for TNC investments in extractive industries has increased over the past two decades. Between 1990 and 2000, the estimated stock of inward FDI in extractive industries in these countries rose by nine times, and between 2000 and 2005 it increased again by more than 50% (annex table A.IV.1). The share of developed countries fell from 86% in 1990 to 71% in 2005 (annex table A.I.9).¹⁰ The share of developing countries in the United States' outward FDI stock in extractive industries increased from 31% in 1985 to 44% in 2005 (table IV.1). Between 1995 and 2005, FDI stocks were particularly fast in Africa and Latin America. The Russian Federation and other CIS countries also emerged as important destinations.¹¹

United States outward FDI in extractive industries was fairly evenly distributed among Africa, developing Asia and Latin America and the Caribbean, each accounting for 13-15% in 2005 of the total. In developing Asia, Indonesia received by far the largest share in 2005. In Latin America, excluding the financial centres, Brazil, Mexico and Peru, three countries with large mining potential, were the main recipients, while in Africa, where detailed destinations are not fully given, Egypt was one of the main recipients specified in 2005. Finally, of the transition economies, the Russian Federation was the leading host country of such FDI (table IV.1).

The importance of extractive industries in inward FDI varies greatly by host economy. In all major regional groups, there are countries in which they account for a significant share of the total inward FDI stock. This applies, for example, to Australia, Canada and Norway among developed countries, Botswana, Nigeria and South Africa in Africa, Bolivia, Chile and Venezuela in Latin America and the Caribbean, and Kazakhstan in South-East Europe and the CIS (figure IV.3). Moreover, extractive industries account for the bulk of inward FDI of many low-income, mineral-rich countries. Due to their small domestic markets and weak productive capabilities, they tend to have few other areas into which they can attract FDI.

The recent boom in commodity prices has aroused growing investor interest in opportunities for mineral extraction in low-income countries.

For example, the record inflows of FDI into Africa in 2004-2006 were mostly driven by projects in extractive industries, notably in oil and gas (chapter II; *WIR05*: 41, *WIR06*: 45).¹² Most of the largest FDI-recipient countries in Africa in 2006 were rich in oil or metallic minerals. Similar developments have been observed in Latin America, where most countries with mineral resources have seen increases in FDI in related industries in recent years.¹³ Following new discoveries, a number of new FDI recipients have emerged among developing countries and economies in transition. In oil and gas, Chad and Equatorial Guinea have received large FDI inflows. In Kazakhstan, during the period 1993-2006, oil and natural gas extraction activities attracted cumulative FDI inflows of \$35 billion (National Bank of Kazakhstan, 2007). In addition, Kazakhstan, Mali, Mongolia and Papua New Guinea are among the countries that have emerged as major recipients of FDI in metal mining.

Foreign companies account for varying shares of metallic mineral and diamond production in individual host countries. Based on the value of production at the mining stage, of 33 major mining countries of the world, foreign affiliates were responsible for virtually all production in 2005 in some LDCs, such as Guinea, Mali, the United Republic of Tanzania and Zambia, as well as in Argentina, Botswana, Gabon, Ghana, Mongolia, Namibia and Papua New Guinea (figure IV.4). In another 10 major mining countries – a mix of developed, developing and transition economies – foreign affiliates accounted for between 50% and 86% of all production. In contrast, in the Islamic Republic of Iran, Poland and the Russian Federation, the share of foreign affiliates was very small or negligible (figure IV.4).

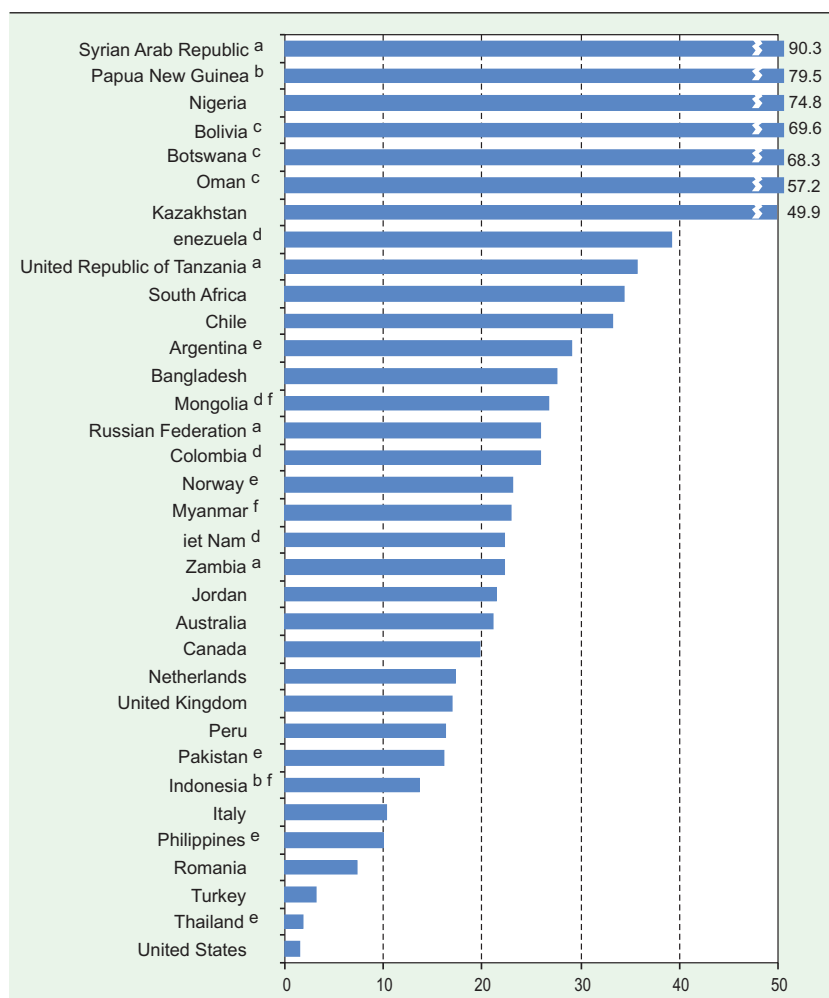
In oil and gas, the share of foreign companies is generally lower than in metal mining. At the global level, foreign companies accounted for an estimated 22% of total oil and gas production in 2005 (table IV.2). The average share was higher in developed countries (36%) than in developing countries (19%) and the transition economies of South-East Europe and the CIS (11%). Moreover, there were wide variations among the various country groups. In West Asia, which was responsible for almost a quarter of the world production of oil and gas in 2005, foreign companies accounted for only 3% of production, whereas in sub-Saharan Africa they accounted for 57% on average. By individual country, foreign companies were responsible for more than half of production in Angola, Argentina, Equatorial Guinea, Indonesia, Sudan and the United Kingdom. At the other end of the spectrum were Iraq, Kuwait, Mexico and Saudi Arabia, in which no production was attributed to foreign firms (figure IV.5).

Table IV.1. United States outward FDI stock in extractive industries, 1985, 1990, 1995, 2000 and 2005
(Millions of dollars)

Host region/economy	1985	1990	1995	2000	2005
Total world	58 724	52 826	68 632	72 111	114 386
Developed countries	33 360	34 261	41 865	33 398	55 802
EU	16 357	12 495	18 573	10 948	11 052
Netherlands	1 928	1 429	1 449	2 218	4 018
United Kingdom	9 231	10 347	12 061	8 135	5 995
Other developed countries	17 003	21 766	23 292	22 450	44 750
Norway	2 695	3 537	3 257	2 463	5 331
Canada	10 443	10 494	9 875	13 629	33 718
Australia	1 681	2 801	2 628	6 222	5 059
Developing economies	17 997	12 627	21 839	37 045	49 835
Africa	4 072	2 054	2 167	7 204	15 305
Botswana	..	2	5	..	..
Cameroon	..	..	158	..	..
Chad	..	..	106	..	..
Congo	..	21	..	..	..
Congo, Democratic Republic of	..	12	69	..	..
Côte d'Ivoire	..	36	42	..	..
Egypt	1 640	1 073	899	1 424	4 085
Gabon	..	324	108	..	..
Kenya	..	42	63	..	..
Nigeria	..	..	578	452	278
South Africa	..	..	..	2	-5
Sudan	..	5	9	..	..
Unspecified Africa	2 432	434	..	5 326	10 947
Latin America and the Caribbean	5 042	4 196	6 056	16 533	17 225
Argentina	466	471	707	580	508
Bahamas	845	345	62	..	..
Bermuda	-168	..	..	..	118
Bolivia	..	168	102	..	..
Brazil	381	507	1 092	680	2 040
British Virgin Islands	14	..	123	1 249	2 461
Chile	60	..	..	3 248	1 040
Colombia	1 053	461	1 255	695	630
Ecuador	..	102	657	464	557
El Salvador	..	..	76	..	..
Guatemala	47	49	79	..	..
Mexico	53	..	61	327	2 082
Panama	515	682	707	..	95
Peru	579	..	81	1 544	2 082
Trinidad and Tobago	399	..	350	..	..
Venezuela	66	113	398	3 379	1 378
Unspecified Latin America and the Caribbean	643	1 199	393	4 367	4 230
Asia and Oceania	8 883	6 377	13 616	13 308	17 305
West Asia	2 208	1 317	2 667	2 179	5 665
Bahrain	..	-88	-130	..	..
Iran, Islamic Republic of	..	..	310	..	..
Oman	..	..	82	..	..
Qatar	..	..	472	..	..
Saudi Arabia	852	..	176	107	..
Turkey	111	..	124	16	48
United Arab Emirates	664	299	230	..	1 064
Unspecified West Asia	581	1 105	482	2 056	4 553
South, East and South-East Asia	6 675	5 071	10 949	11 129	9 602
China	211	114	951	1 404	1 717
India	28	..	26	-343	134
Indonesia	3 895	2 751	4 449	7 212	6 003
Malaysia	605	402	639	..	1 493
Philippines	109	..	326	..	414
Singapore	354	650	2 408	15	-160
Thailand	803	626	1 374	1 111	..
Unspecified South, East and South-East Asia	319	135	..	1 729	..
Unspecified Asia and the Pacific	..	..	..	..	2 038
South-East Europe and CIS	..	1	692	1 670	3 148
Azerbaijan	..	..	206	..	..
Kazakhstan	..	..	-54	..	..
Russian Federation	..	1	392	79	3 148
Unspecified South-East Europe and CIS	..	..	152	1 591	..
Unspecified	7 367	5 937	4 236	-2	5 601

Source: UNCTAD, FDI/TNC database (www.unctad.org/fdistatistics), based on data from the United States Department of Commerce.

Figure IV.3. Share of extractive industries in the inward FDI stock of selected economies, 2005
(Per cent)



Source: UNCTAD estimates, based on data from the UNCTAD FDI/TNC database (www.unctad.org/fdistatistics).

^a 2001.

^b 1997.

^c 2003.

^d 2002.

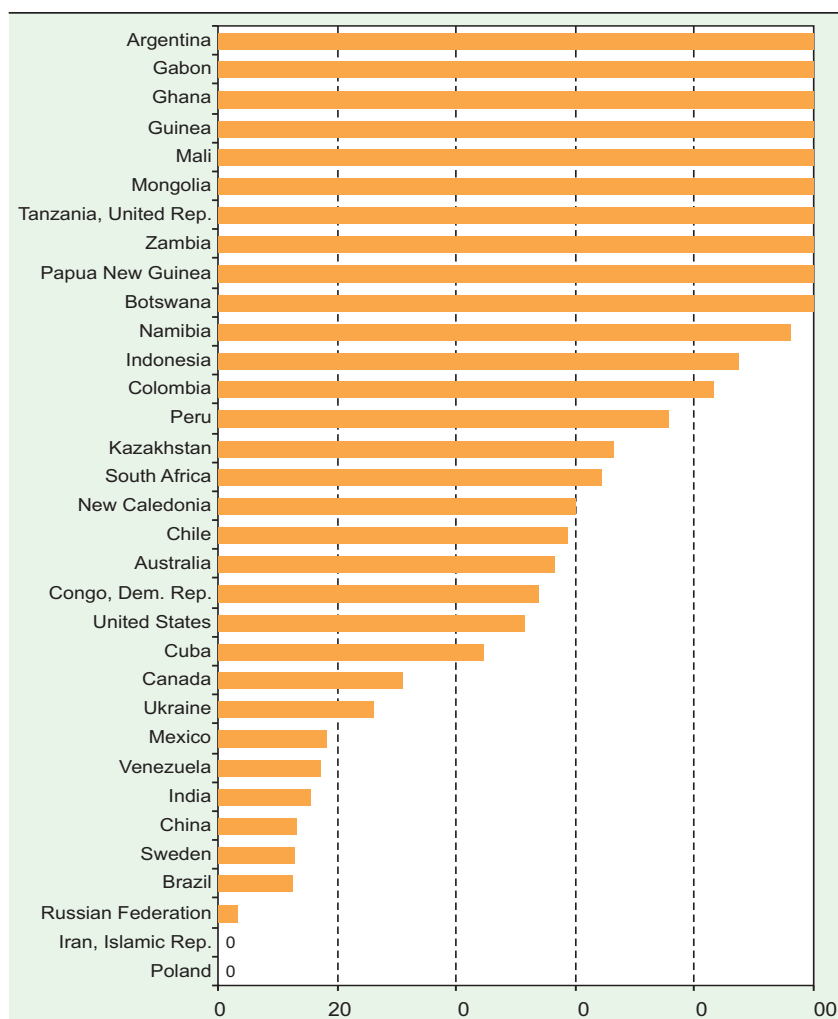
^e 2004.

^f On an approval basis.

During the period 1995-2005, the share of foreign companies in oil and gas extraction evolved differently in various regions and countries. In Europe, it declined from 47% to 36% (table IV.2). Within developing countries, a stable overall average share masked diverging trends. In Africa and Latin America, the shares of foreign companies increased to 41% and 18%, respectively, whereas in developing Asia, their share fell from 19% to 12% on average. In South-East Europe and the CIS, their share increased from 3% to 11%. Foreign companies' share rose particularly fast in Angola, Argentina, Kazakhstan, the Libyan Arab Jamahiriya and Nigeria, and declined the most in Indonesia and Malaysia, as well as in Norway and the United Kingdom among the developed countries.

The involvement of TNCs in the exploration and extraction of oil and gas takes various contractual forms, such as concessions, joint ventures, production-sharing agreements (PSAs) and service contracts (table IV.3; chapter VI), each of which has different implications for recording data on the amount of related FDI and non-FDI flows (box IV.1). Overall, as of June 2007, PSAs were the most frequently used contractual form, accounting for more than 50% of all contracts involving foreign TNCs in the most important oil- and gas-producing developing economies. Such agreements were the main form of TNC participation in countries such as China, Equatorial Guinea, Indonesia, Iraq, the Libyan Arab Jamahiriya, Qatar, Sudan and Viet Nam. Concessions and joint ventures were the next most frequently

**Figure IV.4. Foreign affiliates^a share in metal mining production^b of selected host countries with notable deposits of minerals,^c 2006
(Per cent)**



Source: UNCTAD, based on data from the Raw Materials Group.

^a The share of foreign affiliates includes all firms with foreign ownership of at least 10%.

^b Measured by value of production.

^c Including diamonds, and excluding artisanal mining.

used contractual forms, and the dominant forms in Algeria, Angola, Brazil, Kazakhstan and the Russian Federation (table IV.3). Service contracts were less numerous but nevertheless important, for example, in the Islamic Republic of Iran and Kuwait.¹⁴

It is not straightforward to establish a link between the number and types of contracts with the size of FDI flows. First of all, the average size of contract areas varies considerably, from very large in Saudi Arabia¹⁵ and Sudan to relatively small in Brazil, Kuwait and the Russian Federation (table IV.3). Secondly, different countries of the same region or group could take divergent approaches to legal forms. In Africa, for example, Angola uses mostly concessions, Equatorial Guinea and Sudan mostly PSAs. Thirdly, each contract has its own

terms, resulting in widely varying FDI and non-FDI flows as well as implications for development (chapter VI).

B. The changing universe of TNCs in extractive industries

TNCs have been present in metal mining since the sixteenth century (Harvey and Press, 1990; McKern, 1976), and in the oil industry since the discovery of oil in the late nineteenth century (Yergin, 1991). In colonial times and the early post-colonial decades of the 1950s and 1960s, TNCs from developed countries dominated the extractive industries in developing countries. Since then, their

Table IV.2. Oil and gas production, total and by foreign companies, by region and selected economy,^a 1995 and 2005
(Million barrels of oil equivalent)

Region/economy	1995			2005		
	Total production	Production by foreign companies	Share of foreign companies (%)	Total production	Production by foreign companies	Share of foreign companies (%)
World	37 952	..	..	47 001	10 550	22.4
World excluding North America	30 242	5 572	18.4	39 331	7 941	20.2
Developed economies	11 968	..	..	12 056	4 341	36.0
Europe	3 839	1 795	46.8	3 926	1 409	35.9
European Union	2 619	1 268	48.4	2 357	937	39.8
Of which:						
Netherlands	488	69	14.2	448	51	11.4
United Kingdom	1 547	999	64.6	1 325	666	50.3
Other developed Europe	1 220	527	43.2	1 569	472	30.1
Of which:						
Norway	1 220	527	43.2	1 569	472	30.1
North America	7 710	..	..	7 670	2 609	34.0
Of which:						
Canada	1 712	..	..	2 072	370	17.9
United States	5 998	..	..	5 597	2 239	40.0
Other developed countries	420	203	48.4	461	323	70.1
Developing economies	19 160	3 406	17.8	25 851	4 877	18.9
Africa	3 483	770	22.1	5 049	2 054	40.7
North Africa	1 974	236	12.0	2 706	713	26.4
Of which:						
Algeria	925	3	0.3	1 313	162	12.4
Egypt	420	127	30.2	497	194	39.1
Libyan Arab Jamahiriya	591	86	14.5	735	255	34.7
Sub-Saharan Africa	1 509	534	35.4	2 344	1 340	57.2
Of which:						
Angola	254	159	62.4	507	370	73.0
Equatorial Guinea	..	..	..	160	146	91.5
Nigeria	943	182	19.3	1 301	536	41.2
Sudan	..	..	..	120	77	64.2
Latin America and the Caribbean	3 872	415	10.7	5 215	960	18.4
Latin America	3 759	345	9.2	4 946	871	17.6
Of which:						
Argentina	410	77	18.9	549	444	80.9
Brazil	298	4	1.4	712	14	2.0
Mexico	1 307	-	-	1 665	-	-
Venezuela	1 246	77	6.2	1 417	60	4.2
The Caribbean	113	70	62.0	268	90	33.4
Developing Asia	11 768	2 196	18.7	15 569	1 847	11.9
West Asia	8 263	778	9.4	11 028	389	3.5
Of which:						
Iran, Islamic Republic	1 689	-	-	1 985	47	2.4
Iraq	287	-	-	773	..	..
Kuwait	683	-	-	1 036	..	..
Qatar	256	63	24.4	656	149	22.8
Saudi Arabia	3 364	-	-	4 188	-	-
United Arab Emirates ^b	811	89	11.0	1 226	173	14.1
South, East and South-East Asia	3 504	1 418	40.5	4 541	1 458	32.1
Of which:						
China	1 186	38	3.2	1 604	54	3.4
Indonesia	986	886	89.8	869	659	75.8
Malaysia	445	263	59.2	628	273	43.5
Oceania	37	26	70.7	18	17	93.9
South-East Europe and CIS	6 824	168	2.5	9 093	987	10.8
Of which:						
Kazakhstan	188	45	24.0	626	302	48.2
Russian Federation	5 659	107	1.9	7 125	531	7.5
Uzbekistan	..	..	..	393	21	5.4

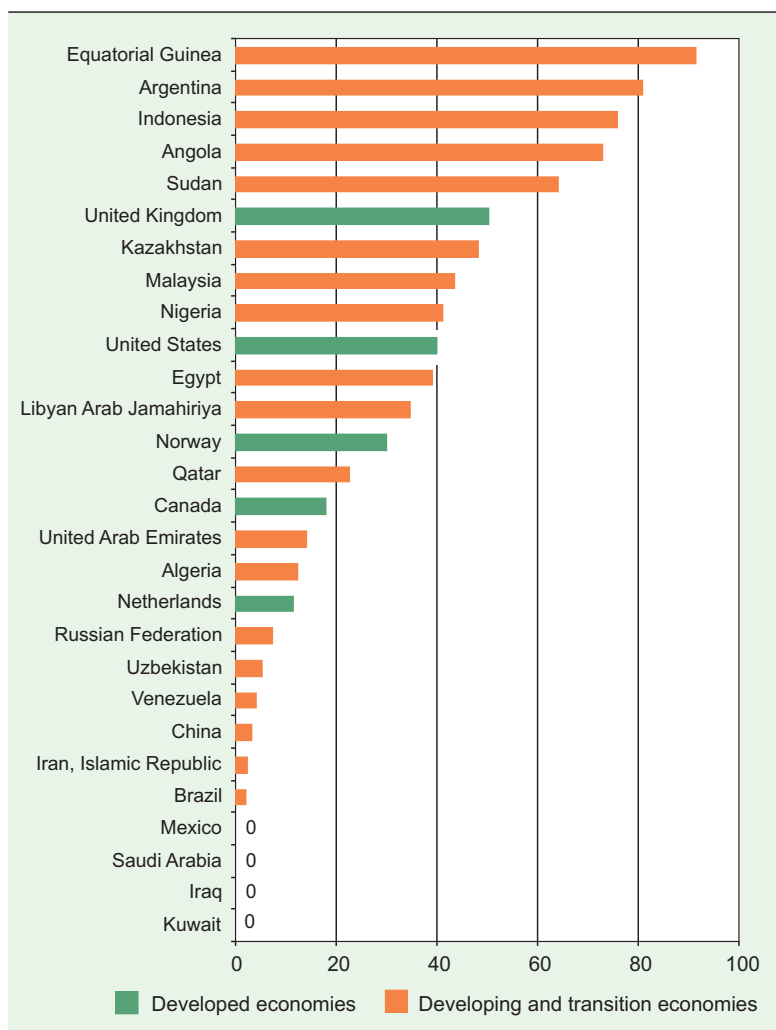
Source: UNCTAD, based on data from IHS.

^a The table lists 28 major producer economies.

^b Abu Dhabi only.

Note: Oil and gas production by foreign companies includes extraction carried out by majority foreign-owned firms and attributed to them under PSAs, concessions, joint ventures, or other contractual forms. Foreign company participation through pure service contracts is not included. For each block or field of production worldwide, annual production has been split between the firms involved according to their net percentage share of the output.

Figure IV.5. Share of foreign companies in the oil and gas production^a of selected major oil- and gas-producing economies, 2005
(Per cent)



Source: UNCTAD, based on data from IHS.

^a Measured by million barrels of oil equivalent.

Note: See note to table IV.2.

relative importance has evolved differently in metal mining on the one hand and the oil and gas industry on the other. In general, the major metal mining TNCs are smaller than their oil and gas peers, but TNCs play a more dominant role in the former industry than in the latter.

1. TNCs in the metal mining industry

In the metal mining industry, privately owned TNCs remain the dominant producers. At the same time, significant changes are taking place in the way companies position themselves, and the strategies of newcomer firms from developing and transition economies tend to differ in some ways from those

of the more established players. As in many other industries, there are conflicting tendencies between efforts at consolidating operations and those aimed at focusing on core activities while relying more on specialized service providers. However, following a series of recent M&As, concentration is rising.

a. Continued dominance of private firms

In the 1960s and 1970s, the metal mining industry was affected by widespread nationalizations, leading to more State ownership (box IV.2). For example, the share of the seven largest TNCs in copper mining outside the centrally planned economies fell from 60% in 1960 to 23% in 1981 as a result of

Table IV.3. Main forms of TNC contracts in the oil and gas industry of selected developing and transition host economies, June 2007

(Number of contracts and percentage share)

Host economy	Distribution of foreign TNCs' contracts by main type										Average size of contract territory (km ²)
	Production sharing		Service or risk service		Concession or joint venture		Other and unspecified		Total		
	Number	Share (%)	Number	Share (%)	Number	Share (%)	Number	Share (%)	Number	Share (%)	
Algeria	25	22.9	4	3.7	66	60.6	1	0.9	109	100.0	2 357
Angola	21	19.1	-	-	89	80.9	-	-	110	100.0	640
Brazil	-	-	-	-	189	100.0	-	-	189	100.0	283
China	74	97.4	-	-	-	-	2	2.6	76	100.0	2 973
Equatorial Guinea	20	100.0	-	-	-	-	-	-	20	100.0	1 333
Indonesia	155	100.0	-	-	-	-	-	-	155	100.0	2 902
Iran, Islamic Republic	-	-	16	80.0	-	-	4	20.0	20	100.0	3 575
Iraq	7	87.5	1	12.5	-	-	-	-	8	100.0	625
Kazakhstan	9	9.7	-	-	84	90.3	-	-	93	100.0	1 558
Kuwait	-	-	3	100.0	-	-	-	-	3	100.0	120
Libyan Arab Jamahiriya	107	80.5	-	-	26	19.5	-	-	133	100.0	4 497
Nigeria	81	58.3	-	-	57	41.0	1	0.7	139	100.0	579
Qatar	26	100.0	-	-	-	-	-	-	26	100.0	833
Russian Federation	5	1.1	-	-	470	98.9	-	-	475	100.0	343
Saudi Arabia	-	-	-	-	-	-	3	100.0	3	100.0	75 056
Sudan	14	77.8	-	-	4	22.2	-	-	18	100.0	50 770
United Arab Emirates	-	-	-	-	-	-	12	100.0	12	100.0	375
Uzbekistan	14	43.8	-	-	-	-	18	56.3	32	100.0	3 562
Venezuela	19	38.0	-	-	20	40.0	10	20.0	50	100.0	597
Viet Nam	1	100.0	-	-	-	-	-	-	1	100.0	554
Total	578	34.6	24	1.4	1 005	60.1	51	3.1	1 672	100.0	2 067
Total excluding CIS	564	51.1	21	1.9	451	40.9	51	4.6	1 104	100.0	2 852

Source: UNCTAD, based on data from IHS.

nationalizations (UNCTC, 1983: 208). By the early 1980s, the participation of TNCs in many developing countries had become limited to minority holdings and non-equity agreements with State-owned enterprises. However, many of the nationalizations undertaken in Africa and Latin America in the metal mining industry turned out to be failures (Radetzki, forthcoming). The subsequent 30 years witnessed a continuous decline in the industry, with falling

metal prices and profits. In response, during the 1990s, several countries began reopening their metal mining industries to FDI and privatized their State-owned mining enterprises. By the early 2000s, the privatization process in the industry worldwide, apart from China, had been more or less completed.¹⁶

Worldwide, there are today more than 4,000 metal mining firms, mostly engaged in exploration and extraction (figure IV.6). Most of the 149

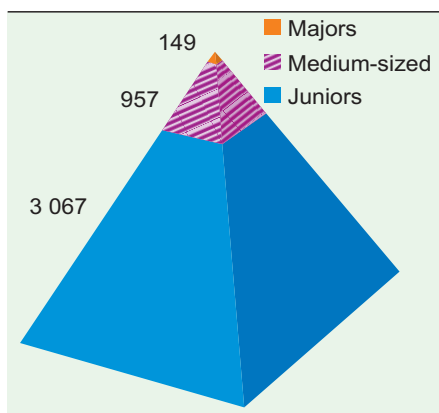
Box IV.2. Nationalizations in metal mining, 1960-1976

In the 1960s and 1970s, governments placed high hopes on the socio-economic development potential of metal mining, based on the industry's strong economic performance following the end of the Second World War. Most government acquisitions of companies or shares in them were made when the market was at its peak. The number of expropriations of foreign mining enterprises increased from 32 between 1960 and 1969 to 48 between 1970 and 1976.

- During the first period, copper mines were nationalized in Chile, Peru, Zaire (now the Democratic Republic of the Congo) and Zambia. Bauxite production in Guinea was also expropriated.
- During the second period, the Government of Jamaica purchased a 51% stake in three previously fully foreign-owned bauxite mines, while it retained the foreign investors as mine operators; Madagascar nationalized its chromite mines; and in Brazil, Chile, India, Mauritania and Venezuela iron ore production was partially taken over by their Governments. The Government of Morocco undertook the production and marketing of phosphate, and the Governments of Indonesia and Bolivia took over control of tin production.

Source: UNCTC, 1978: 14-18.

Figure IV.6. The pyramid of metal mining companies, 2006
(Number of companies)



Source: UNCTAD, based on data from the Raw Materials Group.

“majors”¹⁷ are TNCs, the majority of which have production facilities covering mining, smelting as well as refining. These companies account for some 60% of the total value at the mining stage of all non-energy minerals produced.¹⁸ About 950 medium-sized companies account for almost 40% of the value of production. “Junior” companies include all non-producing companies, notably specialized exploration companies. Much like high-tech companies in the information and communications technology and biotechnology industries, they engage in high-risk investments that can sometimes prove very profitable. If they do find a deposit, it is typically sold to a major mining company with the necessary capital, experience and competence to invest in production. In addition to these 4,000 plus companies, there are a number of unidentified small and medium-sized mining enterprises all over the world, including those engaged in artisanal mining (box III.2).

In 2005, of the 25 leading metal mining companies (ranked by their share in the value of world production), 15 were headquartered in developed countries (table IV.4), 8 were from developing countries and the two remaining were from the Russian Federation.¹⁹ In contrast to the situation in the oil industry (section B.2), State-owned companies occupy a modest place in the list, with the exception of the Corporación Nacional del Cobre de Chile (Codelco), Alrosa (Russian Federation) and KGHM Polska Miedz (Poland). Collectively these latter companies accounted for approximately 14% of the value of all non-energy minerals produced

Table IV.4. Top 25 metal mining companies, 2005^a

Rank 2005	Rank 1995	Company name	Country	State ownership (%)	Share in the value of world production (%)	Cumulative (%)
1	4	BHP Billiton	Australia	-	4.8	4.8
2	2	Rio Tinto	United Kingdom	-	4.6	9.4
3	6	CVRD	Brazil	12	4.4	13.8
4	1	Anglo American	United Kingdom	-	4.3	18.1
5	5	Codelco	Chile	100	3.2	21.3
6	7	Norilsk Nickel	Russian Federation	-	2.2	23.5
7	9	Phelps Dodge	United States	-	2.0	25.5
8	22	Grupo México	Mexico	-	1.6	27.1
9	26	Newmont Mining	United States	-	1.3	28.4
10	11	Freeport McMoran	United States	-	1.3	29.7
11	13	Falconbridge	Canada	-	1.2	30.9
12	53	Anglogold Ashanti	South Africa	3	1.1	32.0
13	15	Inco	Canada	-	1.0	33.0
14	.. ^b	Xstrata	Switzerland	-	1.0	34.0
15	14	Barrick Gold	Canada	-	1.0	35.0
16	.. ^c	Alrosa	Russian Federation	69	0.9	35.9
17	18	Placer Dome	Canada	-	0.9	36.8
18	31	Teck Cominco	Canada	-	0.8	37.6
19	10	Gold Fields	South Africa	10	0.8	38.4
20	19	KGHM Polska Miedz	Poland	44	0.7	39.1
21	88	Antofagasta	United Kingdom	-	0.7	39.8
22	8 ^d	Impala Platinum	South Africa	-	0.7	40.5
23	113	Glencore	Switzerland	-	0.6	41.1
24	.. ^e	Harmony Gold Mining	South Africa	-	0.6	41.7
25	37	Debswana	Botswana	50	0.6	42.3

Source: UNCTAD, based on data from the Raw Materials Group.

^a The ranking is based on the value of total production, including diamond.

^b Glencore had not formed Xstrata in 1995 (MIM, a recent acquisition of Xstrata, was ranked 33).

^c No production data are available for this year.

^d In 2000, Impala was controlled by Gencor Ltd.

^e The company did not exist in 1995.

in the world.²⁰ The top four are global players with worldwide operations, and they produce a variety of metals.²¹ The following six are all more or less single commodity producers with the exception of Grupo México. A decade before, in 1995, there were 17 leading metal mining companies headquartered in developed countries – two more than in 2005 (annex table A.IV.5); and there were one less each of developing-country firms and Russian firms (7 and 1 respectively). In addition, with its acquisition of Inco (a Canadian nickel producer) CVRD was estimated to emerge as the top metallic mineral producer in the world in 2006, the first time that a Latin American-based company would occupy that position.

The degree of concentration in the metal mining industries increased significantly between 1995 and 2005. Following a series of cross-border M&As (section IV.A), the 10 largest metal mining companies in 2005 controlled about 30% of the total value of all non-energy minerals produced globally – up from 26% in 1995 (table IV.4 and

Table IV.5. Host countries in which top 25 metal mining companies are involved in exploration projects, 2006

Company	Home country	Number of foreign locations	Host developed countries		Host developing and transition economies																															
			North America	Western Europe	Other developed countries	Peru	Chile	Indonesia	Tanzania, United Rep.	Brazil	Ghana	Philippines	Kazakhstan	Mexico	New Caledonia	Papua New Guinea	South Africa	Turkey	Zimbabwe	Argentina	Botswana	Congo, Democratic Republic of	Côte d'Ivoire	Cuba	Guatemala	Iran, Islamic Rep. of	Mali	Mongolia	Mozambique	Namibia	Pakistan	Russian Federation	Senegal	Venezuela		
BHP Billiton	Australia	7	1	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rio Tinto	United Kingdom	5	-	1	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CVRD	Brazil	3	1	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anglo American	United Kingdom	14	1	1	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Codelco	Chile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norilsk Nickel	Russian Federation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phelps Dodge Corp	United States	3	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grupo México	Mexico	3	1	-	1	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Newmont Mining Corp	United States	6	-	1	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freeport McMoran	United States	1	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Falconbridge ^a	Canada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anglogold Ashanti	South Africa	7	1	-	1	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inco ^b	Canada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xstrata plc	Switzerland	14	1	1	1	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Barrick Gold Corp	Canada	5	1	-	1	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Placer Dome ^c	Russian Federation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alrosa Co	Canada	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Teck Cominco	Canada	6	1	-	1	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KGHM Polska Miedz	South Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gold Fields	Poland	4	-	1	1	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antofagasta	United Kingdom	3	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glencore International	South Africa	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Impala Platinum Holdings	Switzerland	1	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harmony Gold Mining Co	South Africa	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debswana Diamond	Botswana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of companies that have projects in host country			12	6	4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: UNCTAD, based on data from the Raw Materials Group.

^a See Xstrata.^b See CVRD.^c See Barrick Gold.

Note: The number indicates the number of host countries in the region (North America, Western Europe and Other developed countries) in which the respective company has projects.

annex table A.IV.5). This share reached an estimated 33% in 2006. In all metals, the share of the top 10 production companies increased between 1995 and 2005. This degree of concentration rose the fastest in gold mining (from 38% to 47%), followed by iron ore (from 44% to 52%), copper (from 51% to 58%) and zinc production (from 38% to 43%).

b. Varying degrees of internationalization

The level of internationalization of the world's top metal mining companies varies substantially. While some of them are present in a large number of foreign locations, others are at an early stage in terms of internationalization, and a few do not have any foreign exploration or production at all.

In *exploration*, the activities of certain TNCs, such as Anglo American and Xstrata (present in 14 countries each), were widely spread in 2006 (table IV.5). All but four of the top-25 producers (Codelco, Debswana, KGHM Polska Miedz and Norilsk Nickel) were involved in exploration activities in at least one foreign country. In terms of *mining production*, Rio Tinto was the company with activities in the largest number (10) of host countries in 2005, followed by Anglo American and Anglogold Ashanti, both present in nine host countries (table IV.6). On the other hand, as in the case of exploration, large producers from developing countries like Codelco, CVRD and Debswana (and KGHM Polska Miedz of Poland) did not have any overseas mining production in that year.²² In *smelting and refining*, Glencore was the most internationalized top metal mining company, with a presence in 13 host countries, followed by BHP Billiton (9) (table IV.7). Leading firms appear to be more internationalized in exploration and mining production than in smelting and refining. Of the 25 top companies, 21 had overseas mining production activities, whereas just over half of them (13) had foreign refining capacities.

Internationalization of production also varies by metal. For example, in iron ore mining, only half of the top 10 producer companies had overseas production activities in 2005 (annex table A.IV.6). In fact, CVRD, the largest iron ore producer, did not have foreign activities (until 2006) while the production of the second largest firm, Rio Tinto, was 100% abroad. Copper, nickel and zinc production is more internationalized. In each of these metals, 7 of the top 10 producers had foreign production activities in 2005. However, in copper and nickel, the largest company by volume had no production abroad: Codelco and Norilsk Nickel.²³ In zinc, in turn, the largest producer, Teck Cominco, was highly internationalized.

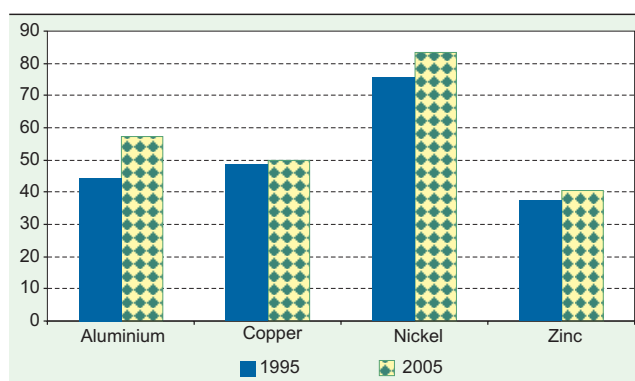
Finally, gold production appears to be the most internationalized, with 8 of the 10 largest firms having production abroad, including the three largest ones (annex table IV.6).²⁴

Of developing host economies of metal mining TNCs, the largest number of *exploration* projects was located in Peru, followed by Chile, Indonesia and the United Republic of Tanzania (table IV.5). As far as *mining production* is concerned, in 2006, Chile and Peru hosted the largest number of top 25 mining companies (table IV.6). As for refineries, Chile was host to the largest number of companies, followed by South Africa and Peru (table IV.7).

The degree of forward (downstream) *vertical integration* along the production/value chain within firms in the metal mining industries varies both by metal and over time. Traditionally, mining and smelting activities have often been integrated within the same company. A snapshot of the situation in 1995 compared to 2005, for aluminium, copper, nickel and zinc, suggests that control over refineries by the top 20 mining companies has increased (figure IV.7). Similarly, the leading refiners have taken steps to gain greater control over the mining production stages. The overall trend is of increasing vertical integration in international (as well as national) production in the industries, which is most clearly seen in the movement of nickel miners downstream into refining.²⁵

Firms in the *aluminium* industry have traditionally been strongly vertically integrated, with mining and smelting activities located in close proximity. In some cases, smelters have been set up in countries where cheap electricity is available, as in Bahrain, Mozambique (Mozal project) and Norway. On the other hand, the level of vertical integration in *zinc* production is lower (figure IV.7). A number of smelters in both Europe and North America have

Figure IV.7. Top 20 mining companies' share in the value of refined production, 1995 and 2005 (Per cent)



Source: UNCTAD, based on data from the Raw Materials Group.

Table IV.6. Host countries in which top 25 metal mining companies are involved in mining production projects, 2005

Company	Home country	Number of foreign locations	Host developed countries			Host developing and transition economies																															
			North America	Western Europe	Other developed countries	Peru	Chile	South Africa	Argentina	Brazil	Indonesia	Tanzania, United Rep. of	Namibia	Bolivia	China	Ghana	Jamaica	Zimbabwe	Angola	Botswana	Dominican Rep.	Guinea	India	Kazakhstan	Jordan	Mali	Mexico	Papua New Guinea	Russian Federation	Suriname	Uzbekistan	Venezuela	Zambia				
																																		2	1	1	X
BHP Billiton	Australia	7				X																															
Rio Tinto	United Kingdom	10	2	1	1	X	X	X	X																												
CVRD	Brazil	-																																			
Anglo American	United Kingdom	9		1	1	X	X	X																													
Codeco	Chile	-																																			
Norilsk Nickel	Russian Federation	1	1																																		
Phelps Dodge Corp	United States	2				X																															
Grupo México	Mexico	2	1			X																															
Newmont Mining Corp	United States	7	1	2		X																															
Freeport McMoran	United States	1				X																															
Falconbridge	Canada	4				X																															
Anglogold Ashanti	South Africa	9	1	1	1	X	X	X															X														
Inco	Canada	1								X																											
Xstrata plc	Switzerland	3		1																																	
Barrick Gold Corp	Canada	5	1	1		X					X																										
Placer Dome	Russian Federation	6	1	1	1	X		X																													
Airosa Co	Canada	1																																			
Teck Cominco	Canada	2	1			X																															
KGHM Polska Miedz	South Africa	-																																			
Gold Fields	Poland	2			1											X																					
Antofagasta	United Kingdom	1																																			
Glencore International	South Africa	8		1		X										X									X												
Impala Platinum Holdings	Switzerland	1																																			
Harmony Gold Mining Co	South Africa	1		1																																	
Debswana Diamond	Botswana	-																																			
Number of companies present in host country			8	7	5	4	4	4	4	4	4	4	3	2	2	1	2	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: UNCTAD, based on data from the Raw Materials Group.

Note: Data include diamond production.

been buying their concentrate inputs from various sources all over the world. Rising energy prices have made integrated production a more attractive option, however. *Copper* exhibits a relatively stable level of vertical integration, between those of aluminium and zinc. In the *iron ore industry*, vertical integration has seen an upswing since the late 1990s with the entry of new major global steel companies with roots in India (Mittal Steel and Tata Steel)²⁶ and the Russian Federation (Severstal).²⁷ These companies have integrated iron and steel works based on a fully controlled supply of raw materials. Posco (Republic of Korea) follows a similar integrated approach. For example, it is building its next integrated steelworks in India, close to the location of iron ore deposits.²⁸

While there appears to be a trend towards higher levels of vertical integration between the mining and refining stages of production, the opposite has been observed between exploration and production:

upstream integration with exploration is declining as mining companies develop strategic relationships with junior, specialized exploration companies. Exploration expenditure data show that the juniors now account for a larger proportion of such activities (figure IV.8). More generally, specialized mining suppliers play an important role in the metal mining industry (box IV.3).

2. TNCs in oil and gas

a. The Seven Sisters have given way to State-owned companies

Until the 1970s, a few major TNCs from the United States and Europe dominated the international oil industry. In 1972, 8 of the top 10 oil producers were privately owned TNCs (Clarke, 2006), including

Box IV.3. The role of mining suppliers

Specialized suppliers of equipment and services are important players in metal mining. Many of them are also increasingly transnational. Suppliers to the mining industry can be grouped according to the markets they address in each of the main stages of mining. Highly knowledge-intensive inputs are required in the production of both equipment and services. Design and technology are embedded in the capital equipment used in the mining industry as well as in the services, which require customization for the unique conditions of each mine. Some firms operate across several markets, providing mining and mineral processing equipment with the associated services.

The growing role of such suppliers is being driven by the reorganization of global mining production and technological rejuvenation of the industry, with continued improvements in exploration, mining and mineral processing.^a Suppliers are focused on specific niches in which they have a globally dominant position.

For some types of mining equipment there is a high level of international specialization of suppliers. Most of these companies are headquartered in the United States or the Nordic countries (box table IV.3.1). However, there are also some examples of equipment suppliers from emerging market economies, such as Belarus, Chile and South Africa.

Examples of some knowledge-intensive service suppliers include large international consulting firms that integrate engineering, project management, procurement and construction activities, such as Kvaerner (Norway), Hatch (Canada), and Bechtel Group (United States); medium-sized specialized engineering consulting companies, such as Bateman (South Africa) SRK Consulting (South Africa), and AMC Consultants (Australia); and small- to medium-sized mining and geological software providers, such as Maptek (Australia).

Box table IV.3.1. Leading suppliers of mining equipment, 2007

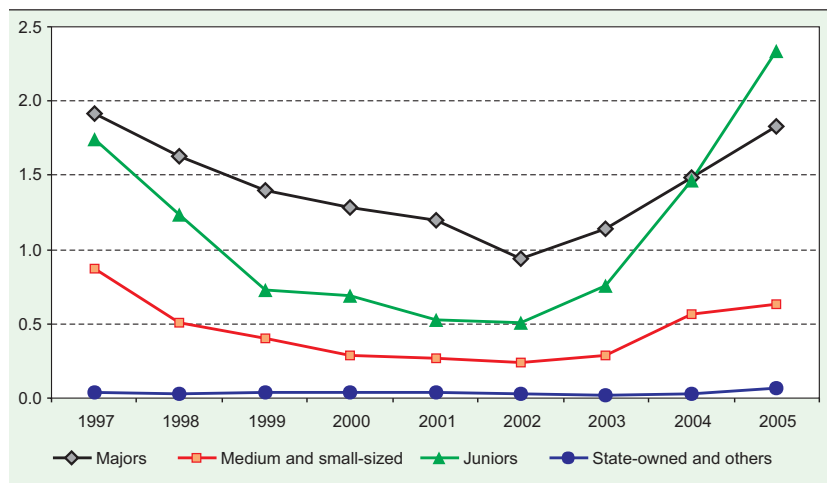
Type of equipment	Lead suppliers	Home country
Exploration drilling equipment	Boart Longyear Atlas Copco, Sandvik	United States Sweden
Drilling equipment, underground	Atlas Copco, Sandvik	Sweden
Drilling equipment, open pit	Atlas Copco, Sandvik Bucyrus, P&H, Terex/ Reeddrill	Sweden United States
Draglines	Bucyrus, P&H	United States
Load haul dump, underground	Atlas Copco, Sandvik Caterpillar	Sweden United States
Explosives	Orica, Dyno Nobel AEL Enaex	Australia South Africa Chile
Trucks, open pit	Caterpillar Hitachi Construction Machinery, Komatsu (Haulpak) Liebherr Terex/Unit Rig Belaz	United States Japan Germany United States Belarus
Articulated dump trucks	Komatsu Caterpillar, Le Tourneau Bell Volvo Astra	Japan United States South Africa Sweden Italy
Shovels	Caterpillar, Bucyrus, P&H Hitachi Construction Machinery, Komatsu Liebherr, Terex	United States Japan Germany
Pumps	ITT/Flygt Weir Group Grindex	United States United Kingdom Sweden
Crushers	Metso FLSmidth Minerals Terex, PR Engineering	Finland Denmark United States
Mills	Metso, Outotech Polysius	Finland Germany

Source: UNCTAD, based on data from the Raw Materials Group.

Source: UNCTAD, based on Urzúa, 2007, and data from the Raw Materials Group.

^a Automation and improvements in underground communication and control systems is leading to the introduction of remote-controlled drilling, roof support and hauling equipment with benefits in terms of productivity and workers' safety as people are removed from high-risk work.

Figure IV.8. Global exploration expenditure, by type of company, 1997-2005
(Billions of dollars)



Source: Metals Economics Group, 2006.

the so-called Seven Sisters (chapter III). These were fully integrated oil companies, active in the extraction and transportation of oil as well as in the production and marketing of petroleum products. In the 1960s, they started to face competition from some developed-country State-owned companies – such as the Compagnie Française des Pétroles (France) (predecessor of today's Total) and ENI (Italy). Subsequently, in the early 1970s, with the emergence of OPEC and the wave of oil nationalizations in developing countries, the ownership picture in the oil industry changed permanently, with State-owned national oil companies replacing the dominance of the

private TNCs (Yergin, 1991; box IV.4). For example, the share of TNCs in crude oil production plummeted from 94% in 1970 to 45% in 1979 (UNCTC, 1983: 197).

The major oil companies remain giant corporations in terms of their foreign assets; they ranked in the top 10 in UNCTAD's ranking of the world's 100 largest TNCs in 2005 (chapter I).²⁹ But these large, privately owned TNCs from developed countries no longer control the bulk of the world's oil and gas reserves, and are no longer the leading oil and gas producers. In 2005, the top 10 oil-reserve-holding firms of the world were all State-owned

Box IV.4. Nationalizations in the oil industry

From the beginning of industrial activities in the 1850s till the First World War, petroleum extraction had been 100% privately owned (Yergin, 1991). Since then, the involvement of governments in the management and control of the industry has risen almost constantly. Two major forces have motivated home and host governments to intervene more, and to increase their share in the ownership and management of their oil and gas resources: the strategic importance of these resources for military and other industrial uses, and the considerable rents involved.

Outright nationalization of oil and gas firms, defined as the compulsory transfer of the ownership of the whole industry to the State (UNCTAD, 2000: 4),^a first took place in the context of the Russian Revolution in 1917. This was followed by nationalizations in Bolivia (1937, 1969), Mexico (1938), Venezuela (1943), Iran (1951), and Argentina, Burma, Egypt, Indonesia and Peru in the 1960s (Kobrin, 1985). In the 1970s, nationalizations occurred in Algeria, Iraq, Kuwait, Libya and Nigeria, and there was a gradual increase in Saudi ownership of Aramco (Yergin, 1991). More recent examples of moves towards nationalizations are the Russian Government's bid to increase shares in petroleum companies and in extraction projects (chapter II), and Venezuela's push to reduce foreign TNCs' shares in individual projects.^b

Nationalizations in the oil and gas industry have taken place in periods of favourable market conditions (high international demand and prices), domestic conditions (social consensus in support of nationalizations) and international political conditions. They have changed the global landscape of petroleum extraction, and contributed to the emergence and subsequent strengthening of State-owned firms.

Source: UNCTAD.

^a Nationalizations differ from ordinary expropriations because they apply to the whole industry or the whole economy, and because they always result in a transfer of ownership to the State (ordinary expropriations can also lead to a transfer to a third, private party).

^b It is debatable whether the increase in taxation in Bolivia is a case of nationalization or only a regulatory change.

companies from developing countries, accounting for an estimated 77% of the total, whereas Russian petroleum firms controlled an additional 6%, leaving only about 10% for privately owned developed-country TNCs such as ExxonMobil, BP, Chevron and the Royal Dutch Shell Group.³⁰ The remaining 7% was controlled by joint ventures between developed-country TNCs and developing-country State-owned oil companies (Baker Institute, 2007: 1).

In 2005, three State-owned enterprises topped the list of the world's 50 largest oil and gas producers: Saudi Aramco (Saudi Arabia), Gazprom (Russian Federation) and the National Iranian Oil Company (NIOC) (table IV.8). Saudi Aramco's annual production in 2005 was more than twice as large as that of the largest privately owned oil and gas producer: ExxonMobil (United States). Of the top 50 companies, more than half were majority State-owned, 23 were based in developing countries, 12 were based in South-East Europe and the CIS, and only 15 were from developed countries (table IV.8).³¹

A number of oil and gas firms from developing and transition economies have evolved into TNCs and matured in the past few years. Many, but not all of them are partly or fully State-owned.³² Moreover, some of them, such as CNOOC (China), Pertamina (Indonesia), Petrobras (Brazil), PetroChina (an affiliate of CNPC),³³ and Sinopec³⁴ are listed on the New York Stock Exchange (Baker Institute, 2007). Some State-owned oil companies are run semi-independently or autonomously of their government owners, at least in some respects. For example, while Saudi Aramco is 100% State-owned, it has an independent board and decision-making capabilities.³⁵

The concentration of the industry among the top 10 companies remained unchanged between 1995³⁶ and 2005 (41% of global production), but rose from 59% to 63% among the top 25. A worldwide review of oil and gas firms in 2006 identified five privately owned major TNCs emerging from a wave of consolidations in the industry (ExxonMobil, BP, Shell, Chevron, Total), more than a dozen large independent oil and gas companies (i.e. Repsol YPF, BG, BHP Billiton's oil and gas division, COP, Devon, Oxy, Apache, EnCana, Anadarko/Kerr McGee, PetroCanada, Woodside), about 750 smaller oil firms (most of which are also transnational) (Clarke, 2006), as well as various transnationalized service firms, mostly from North America and Western Europe (table IV.9). At the same time, a number of State-owned enterprises from developing and transition economies have become outward investors, the largest of which have been referred to as the new Seven Sisters (Hoyos, 2007).³⁷

b. TNCs from developing and transition economies are expanding overseas

Whereas companies from developing and transition economies now control most of the global production of oil and gas, their degree of internationalization, although growing fast, is still relatively modest compared to that of the top privately owned oil TNCs (figure IV.9). Indeed, developed-country companies in the top 50 list undertook most of their production overseas (which corresponded to 17% of world production in 2005) (figure IV.9). On the other hand, of the 54% of global oil and gas production that was controlled by companies in developing and transition economies, only a fraction was produced abroad (figure IV.9).

Nevertheless, some of the oil and gas companies from developing and transition economies are rapidly expanding their overseas interests. In 2005, the combined foreign production of CNOOC, CNPC/PetroChina, Lukoil, ONGC, Petrobras, Petronas and Sinopec amounted to 528 million barrels of oil equivalent. This was more than the foreign production of ConocoPhillips, one of the large majors, that year (figure IV.10).

A country-by-country review of the outward expansion of State-owned TNCs reveals a common push to global status (table IV.10, box IV.5). Both CNPC and Petronas are involved in oil and gas production in more than 10 foreign countries, and Kuwait Petroleum Corporation, Petrobras and Sinopec in more than 5 foreign countries. Between 1995 and 2005, the number of foreign economies in which Petronas and CNPC/PetroChina extracted oil and gas increased by 10, Sinopec by 6 and ONGC by 5. The expanding overseas upstream production presence of selected developing- and transition-country TNCs is illustrated in figure IV.11.

Some developing- and transition-economy TNCs have invested large sums in oil and gas production deals around the world during the past two years, sometimes as part of larger consortia. In Uzbekistan, for example, a consortium of CNPC, the Korea National Oil Corporation (KNOC), Lukoil, Petronas and local Uzbekneftegaz has been formed to develop gas fields in the northwest of the country.³⁸ In Peru, the largest oil production field is being exploited by a consortium of CNPC (45%) and Pluspetrol (Argentina, 55%).

Emerging oil and gas TNCs have sometimes formed alliances to compete. For example, CNPC and Sinopec (China) are producing oil and gas in CIS countries such as Azerbaijan, Kazakhstan and Turkmenistan, and in Latin American countries such

**Table IV.8. The world's largest oil and gas extraction companies, ranked by total production,^a
2005**
(Per cent and million barrels of oil equivalent)

Rank in world production	Rank in 1995	Company	Home country	State ownership (%)	Production abroad	Total production	Foreign/total production (%)	Number of host economies with production	Change in number of host economies with production since 1995
1	1	Saudi Aramco	Saudi Arabia	100	-	4 148.8	-	-	-
2	3	Gazprom	Russian Federation	51	5.6	3 608.5	0.2	2	1
3	2	NIOC	Iran, Islamic Republic	100	-	1 810.7	-	-	-
4	5	ExxonMobil	United States	-	1 426.5	1 725.7	82.7	23	4
5	4	Pemex	Mexico	100	-	1 666.2	-	-	-
6	13	BP	United Kingdom	-	1 290.6	1 572.6	82.1	19	2
7	6	Royal Dutch Shell	United Kingdom / Netherlands	-	1 045.2	1 482.7	70.5	25	-1
8	7	CNPC/PetroChina	China	100	188.3	1 119.6	16.8	14	10
9	33	Total	France	-	749.3	997.6	75.1	27	-
10	12	Sonatrach	Algeria	100	1.9	911.8	0.2	1	1
11	8	Petróleos de Venezuela	Venezuela	100	-	902.6	-	-	-
12	9	Kuwait Petroleum Corp	Kuwait	100	20.3	897.3	2.3	8	1
13	16	Chevron	United States	-	550.2	816.9	67.3	24	8
14	23	Abu Dhabi National Oil Co (ADNOC)	United Arab Emirates	100	-	794.9	-	-	-
15	11	Lukoil	Russian Federation	^b	45.8	781.1	5.9	2	-
16	40	ConocoPhillips	United States	-	511.6	755.4	67.7	16	17
17	20	Petrobras	Brazil	56	66.3	749.6	8.8	8	3
18	18	Abu Dhabi Co Onshore Oil Operator	United Arab Emirates	40 ^c	-	710.9	-	-	-
19	22	Nigerian National Petroleum Co	Nigeria	100	-	697.7	-	-	-
20	51	TNK-BP	Russian Federation	^d	-	691.8	-	-	-
21	25	Iraqi Oil Exploration Co	Iraq	100	-	679.7	-	-	-
22	21	ENI	Italy	20	584.4	657.4	88.9	20	9
23	43	Rosneft	Russian Federation	100	-	621.1	-	-	-
24	34	Surgutneftegaz	Russian Federation	-	-	550.7	-	-	-
25	19	National Oil Corp	Libyan Arab Jamahiriya	100	-	491.2	-	-	-
26	-	Petoro	Norway	100	-	483.5	-	-	-
27	14	Statoil	Norway	64	52.8	464.7	11.4	5	2
28	26	ONGC	India	74	34.8	403.7	8.6	5	5
29	-	Uzbekneftegaz	Uzbekistan	100	-	391.7	-	-	-
30	48	Repsol-YPF	Spain	-	365.8	369.5	99.0	9	-1
31	37	Qatar Petroleum	Qatar	100	-	365.3	-	-	-
32	29	Petroleum Development Oman	Oman	60 ^e	-	344.1	-	-	-
33	35	Sibneft	Russian Federation	30.5 ^f	-	343.8	-	-	-
34	-	Sinopec	China	77	48.9	316.6	15.4	6	6
35	-	Turkmengaz	Turkmenistan	100	-	310.3	-	-	-
36	-	Abu Dhabi Petroleum Co	United Arab Emirates	^h	-	284.4	-	-	-
37	46	Norsk Hydro	Norway	44	34.9	248.6	14.0	5	5
38	44	Petronas	Malaysia	100	97.7	242.4	40.3	11	10
39	38	Ecopetrol	Colombia	100	-	221.1	-	-	-
40	32	Egyptian General Petroleum Co	Egypt	100	-	214.0	-	-	-
41	50	CNOOC	China	71	46.1	211.0	21.8	2	1
42	-	Sultanate of Oman	Oman	100	-	206.4	-	-	-
43	28	Nederlandse Aardolie Mij	Netherlands	^j	-	198.8	-	1	1
44	30	Yukos	Russian Federation	-	-	192.4	-	-	-
45	36	Tatneft	Russian Federation	33	-	191.2	-	1	1
46	41	Inpex	Japan	29 ^g	128.8	185.9	69.3	6	2
47	49	Slavneft	Russian Federation	20 ^k	-	182.2	-	-	-
48	45	A.P. Moller-Maersk	Denmark	-	30.4	181.5	16.7	3	2
49	-	BG	United Kingdom	-	114.3	172.8	66.2	8	6
50	39	Sidanco	Russian Federation	^l	-	171.8	-	-	-

Source: UNCTAD, based on data from IHS.

^a Excludes oil sands production. The production of joint ventures is counted under both the partner companies and the joint ventures themselves.

^b ConocoPhillips owns 20% of the shares, its Russian partners 80%.

^c Abu Dhabi National Oil Co (ADNOC) 60%, Abu Dhabi Petroleum Co 40%.

^d BP 50%, other partners 50%.

^e Sultanate of Oman 60%, Partex (Gulbenkian Foundation) 2%, Total 4%, Royal Dutch Shell 34%.

^f Sibneft was acquired by Gazprom in 2005.

^g Itera (Russian Federation) 15.25%, Gazprom 61%, other partners 23.75%.

^h Partex (Gulbenkian Foundation) 5%, ExxonMobil 23.75%, BP 23.75%, Total 23.75%, Royal Dutch Shell 23.75%

ⁱ ExxonMobil 50%, Royal Dutch Shell 50%.

^j Inpex Holdings is owned by the Ministry of Economy, Trade and Industry of Japan (29.3%) and other partners (70.7%).

^k TNK-BP 50%, Gazprom 40%, ENI 10%.

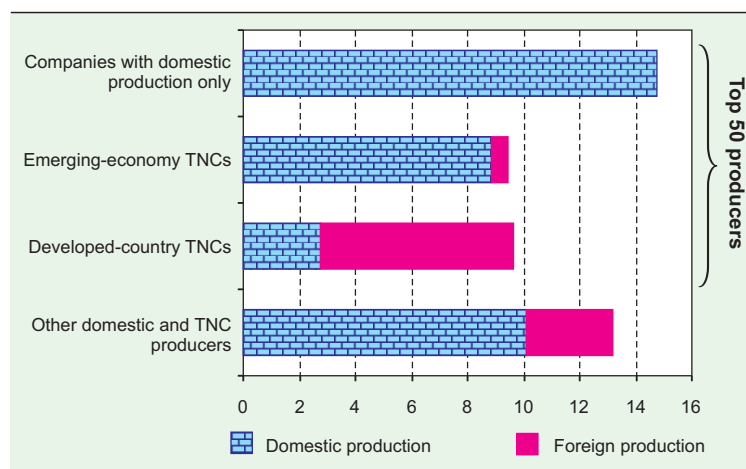
^l TNK-BP 82%, Other partners 18%.

Table IV.9. The world's largest oil and gas service TNCs, ranked by foreign assets, 2005
(Millions of dollars and number of employees)

Rank	Corporation	Country	Foreign assets	Total assets	Foreign sales	Total sales	Number of employees
1	Schlumberger	United States	11 272.0	17 746.0	10 436.0	14 309.0	60 000
2	Halliburton	United States	6 562.4	15 048.0	15 339.0	21 007.0	106 000
3	Aker	Norway	5 159.0	8 131.2	6 297.5	9 172.6	37 000
4	Weatherford International	United States	4 587.9	8 580.3	2 724.0	4 333.2	25 100
5	Transocean	United States	4 437.0	10 457.2	2 244.0	2 891.7	9 600
6	Noble Corp.	United States	3 208.1	4 346.4	1 067.3	1 382.1	5 600
7	Pride International	United States	2 950.9	4 086.5	1 766.9	2 033.3	12 200
8	Globalsantafe Corp.	United States	2 754.6	6 193.9	1 583.7	2 263.5	5 700
9	Nabors Industries	United States	1 755.3	7 230.4	1 169.5	3 459.9	22 599
10	EnSCO International	United States	1 603.6	3 614.1	620.1	1 046.9	3 700
11	Petroleum Geo Services	Norway	1 333.6	1 693.7	850.3	1 142.7	5 130
12	Diamond Offshore Drilling	United States	1 023.9	3 606.9	552.6	1 221.0	4 500
13	Acergy	Luxembourg	903.4	1 377.7	1 386.6	1 396.2	..
14	Prosafe	Norway	886.8	1 058.3	254.2	282.1	665
15	Rowan Companies	United States	627.6	2 975.2	142.9	1 068.8	4 577
16	BJ Services	United States	518.7	3 372.4	1 423.0	3 243.2	13 600
17	Abbot Group	United Kingdom	433.0	966.1	330.5	647.2	4 759
18	Ensign Energy Services	Canada	336.7	1 303.2	516.8	1 301.8	8 500
19	Smith International	United States	312.0	4 055.3	3 058.3	5 579.0	14 697
20	Complete Production Services	United States	92.3	1 121.7	147.8	757.7	..

Source: UNCTAD, largest TNCs database.

Figure IV.9. World production of oil and gas, by types of companies, 2005
(Billion barrels of oil equivalent)



Source: UNCTAD, based on data from IHS.

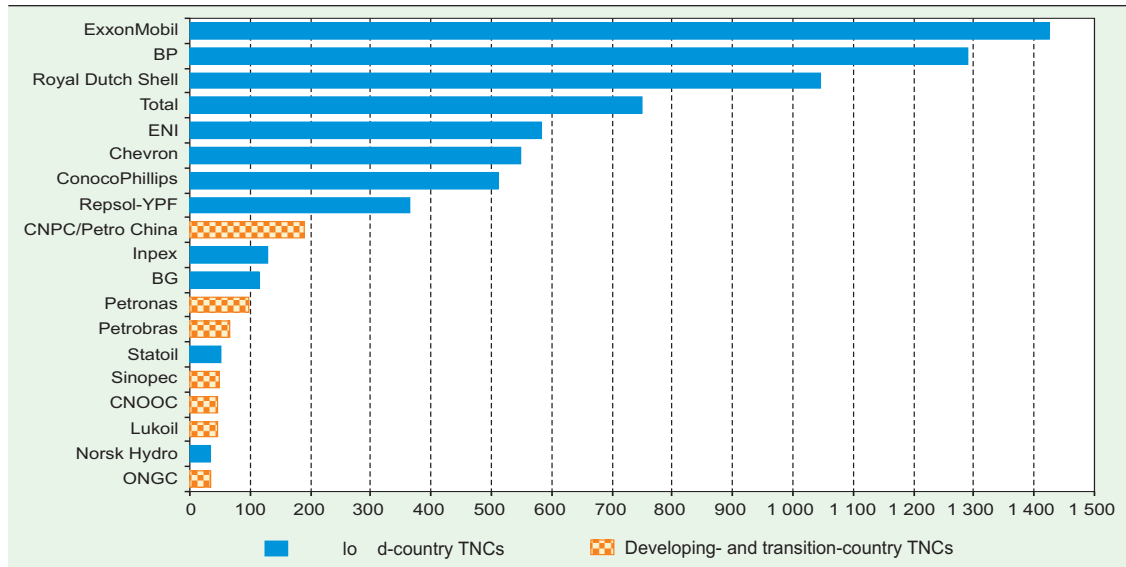
as Ecuador. CNPC has also invested jointly with local firms in countries such as the Islamic Republic of Iran, Sudan and Venezuela, while Sinopec has invested in Colombia and the Russian Federation (table IV.10).³⁹

A few State-owned oil TNCs, in particular from China and India, have invested in some host countries which large private oil companies may have difficulty entering. Such difficulties are due to sanctions imposed on them by individual countries or to other pressures on companies to divest. That is true not only for the above-mentioned projects in Uzbekistan⁴⁰ and the Islamic Republic of Iran,⁴¹ but also in Sudan, which is under United States sanctions

on international human rights grounds due to the conflict in the Darfur region (Canning, 2007: 57).⁴² Sudan accounts for a significant share of the foreign oil reserves exploited by Chinese companies, and CNPC's upstream and refining investments in Sudan are by far the company's largest overseas venture.⁴³ ONGC and Petronas also have extraction operations in Sudan,⁴⁴ whereas CNPC and Petronas, as well as ENI and Total, are present in the Islamic Republic of Iran (table IV.10).

Historically, developed-country TNCs have controlled the value chain, especially due to their dominant position in technology, transportation and distribution networks (Accenture, 2006: 13). However, in the past few years, that situation has changed somewhat. Developed-country TNCs no longer dominate technical project management, which is often outsourced to specialized service companies. That development has helped the local State-owned partners to increase their technological independence in that they can now hire service companies directly, without the intermediation of the traditional majors (Accenture, 2006). Moreover, some transition-economy oil and gas firms, especially Russian TNCs, have invested in several overseas downstream projects with a view to controlling distribution channels linked to those activities. The best-known examples are those of Gazprom's pipeline and distribution projects

Figure IV.10. Oil and gas production of selected TNCs outside their home country, 2005
(Millions of barrels of oil equivalent)



Source: UNCTAD, based on data from IHS.

Box. IV.5. Examples of outward expansion of oil and gas TNCs from developing and transition economies

- Petrobras had production affiliates in 8 host countries in 2005, and exploration and downstream activities in 10 other locations (Ma and Andrews-Speed, 2006).
- Activities of Chinese State-owned oil companies, involving exploration, production, transportation, refining and service contracts, are spread over 46 countries, mostly developing ones (Ma and Andrews-Speed, 2006).^a As for Chinese TNCs, while CNOOC was not successful in its bid for Unocal (United States), it has assured major contracts in other developed countries, such as Australia and Canada (*WIR06*: 58).
- ONGC Videsh (India) has focused especially on oil production in the Russian Federation (Sakhalin 1 project), while Indian Oil Corporation invested in the Libyan Arab Jamahiriya in 2004-2005.^b
- In the Republic of Korea, State-owned KNOC has taken the lead in overseas oilfield development projects. As of June 2006, it was taking part in 26 oilfield development projects in 14 countries. In 2006, it expanded into Australia, Kazakhstan, Nigeria, the Russian Federation and Yemen (Republic of Korea, MOCIE, 2006).
- Petronas' (Malaysia) international expansion began in the 1990s. In its early phase, the company focused more on upstream activities in neighbouring South-East Asian countries. It first moved downstream and outside the region in 1996, when it acquired a South African refiner and player in a petrol station group (Jayasankaran, 1999). Subsequently, since the late 1990s, it has focused its overseas push on explorations in Africa^c and West Asia (Islamic Republic of Iran), as well as being involved in pipeline construction and retailing worldwide (e.g. China, India, Argentina, South Africa, Sudan and the United Kingdom). As of March 2007, Petronas had a presence in 33 countries abroad (Pananond, 2007), including 11 main production locations.
- The overseas expansion of Russian oil and gas TNCs serves to secure access to markets, especially developed-country markets, through downstream integration. They also have important upstream exploration and extraction activities in various members of the CIS or in developing countries with long-standing historical links with the Russian Federation. Many of these exploration and extraction rights have been inherited from the pre-transition period. In 2002, Lukoil, the largest privately owned oil TNC, derived about 5% of its production from fields abroad, including Kazakhstan and Uzbekistan (Vahtra and Liuhto, 2006: 28). State-owned Rosneft participates in foreign upstream ventures via intergovernmental deals in various CIS countries and Afghanistan.
- In the case of Thailand's State-owned PTT, its interest in overseas expansion started only in the late 1990s, and was concentrated mainly in the South-East Asian region, although its exploration affiliate has started to venture into West Asia and Africa. PTT is also taking the lead in a future trans-ASEAN gas pipeline project (Crispin, 2004).

Source: UNCTAD.

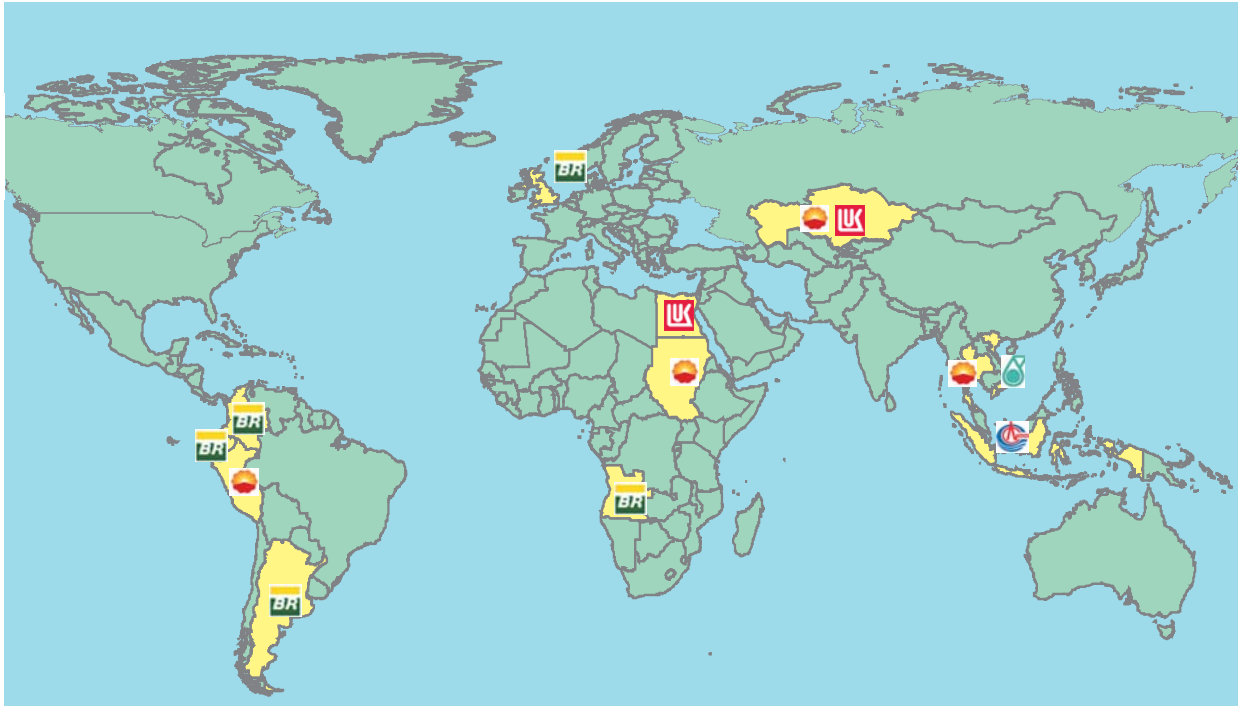
^a By the end of 2005, CNPC alone owned oil and gas assets in 23 countries, including 12 main production locations.

^b In 2005 and 2006, ONGC Videsh made nine acquisitions abroad: in Cuba, Egypt, the Libyan Arab Jamahiriya, Myanmar, Nigeria, Qatar, the Syrian Arab Republic and Viet Nam. With these acquisitions, the company had a presence in 21 projects as of 31 March 2006, including one pipeline project (Jain, 2007).

^c Sudan (1999), Gabon (1999), Chad (2000), Cameroon (2000), Algeria (2001), Mozambique (2002), Ethiopia (2003) and Niger (2005).

Figure IV.11. Selected foreign production locations of oil and gas TNCs, 1995 and 2005

1995



2005



China

India

Brazil

Malaysia

Russian Federation

CNOOC CNPC/PetroChina SINOPEC

ONGC

Petrobras

Petronas

Lukoil

Source: UNCTAD, based on data from IHS.

in Western Europe, as well as Lukoil's expansion into the gas station business in Western Europe and the United States (Vahtra and Liuhto, 2006: 28-29; *WIR99*: 89; *WIR01*: 119).⁴⁵ Developing-country firms that have invested in overseas projects include Saudi and Kuwaiti State-owned oil companies that have partnered with the Chinese firm, Sinopec, in two separate refining and petrochemical ventures in China (Tan, 2006).

C. Drivers and determinants

Although traditional explanations of FDI and international production generally apply also to the extractive industries, at least three special features of resource extraction should be kept in mind (chapter III). First, most investments in extractive industries are capital-intensive and risky, with long gestation periods. Therefore, companies need to be financially strong and able to manage a high degree of risk (Vernon, 1971). Secondly, more than other industrial activities, mineral extraction can engender considerable environmental and social impacts that investors need to address. Thirdly, as some mineral resources, notably oil and gas, are regarded as strategically important to countries, motivations other than purely economic ones often influence investment decisions.

Drivers and determinants of investments by TNCs in extractive industries differ between various stages in the value chain, and between industries and companies. This section discusses the motivations and determinants of FDI and TNC activities in extractive industries, with particular attention to the diverging patterns in the oil and gas and the metal mining industries, and to the rise of extractive-industry TNCs based in developing and transition economies. The analysis is structured according to the factors motivating the internationalization of production by firms, and ownership, internalization and locational advantages that determine whether and where TNCs engage in international production activities.

1. Motivations for internationalization

The motivations for extending production activities in extractive industries across national boundaries can be grouped into resource-seeking, market-seeking, efficiency-seeking and strategic-asset-seeking (Dunning, 1993 and 2000; *WIR98*).

Natural-resource-seeking motives dominate FDI and other forms of TNC involvement in upstream (exploration and extraction) activities. A TNC may seek resources for three reasons: to

meet the needs of its own downstream refining or manufacturing activities, to sell the minerals directly in host, home or international markets, or to secure the strategic requirements of energy or other minerals for its home country (as formulated by the country's government). The first reason has been important historically for petroleum production, but less so after the nationalizations of oil and gas extraction and refining industries and with the development of new commodity exchanges (which provide opportunities for spot transactions, as well as futures and options trade). However, it remains important for vertically integrated TNCs in metallic minerals. The second reason has driven the overseas expansion of most privately owned extractive TNCs and some State-owned oil companies, such as Petrobras, Petronas and Statoil. The third reason explains overseas expansion in extractive activities by both privately owned and State-owned TNCs.

Recently, the growing demand for various minerals has been a key driver of the overseas expansion of State-owned TNCs from Asia (Hoyos, 2007; Gardiner, 2006; Zweig and Bi, 2005). For example, the Government of India has mandated its State-owned oil companies to secure stakes in overseas oil deposits. ONGC Videsh has an objective of acquiring the equivalent of 60 million tonnes of oil per year by 2025, which corresponds to a tenfold growth over its 2006 level (Mitchell and Lahn, 2007: 3). KNOC is expected to increase the share of its foreign production from 4% of the total crude oil imports into its home economy in 2005 to 35% by 2030 (Mitchell and Lahn, 2007: 3). China's "going global" strategy outlined in 2000 is among the most explicit recent policy initiatives taken to boost FDI overseas (*WIR06*: 209-210).⁴⁶

Market-seeking motives are generally of limited importance for exploration and extraction activities, but figure among the drivers of investment in overseas downstream activities. This applies, in particular, to companies based in mineral-rich countries, such as Kuwait, the Russian Federation and Saudi Arabia. These primarily upstream-based firms strengthen their market position largely by moving to downstream markets and capturing the value added associated with the production and sale of finished products (Baker Institute, 2007: 4). Increased control over downstream activities also offers the strategic advantage of securing long-term demand in consumer markets. In addition, since relative profits between upstream and downstream activities may vary over time, vertical integration allows a firm to diversify, which helps mitigate risk.

Efficiency-seeking motives are relevant for investments in the processing or early metal-manufacturing stage, where TNCs seek to exploit

differences in costs of production between countries. They are sometimes combined with market-seeking motives, especially when transportation of the product is difficult or costly. In the case of refining, minimizing the costs of transportation may justify processing close to the source of the minerals, while considerations of access to markets and maximizing the scale of production may prompt locating it closer to the consumer (Tavares et al., 2006).

Strategic-asset-seeking motives can be linked especially to the rise of cross-border M&As by TNCs in the extractive industries. Companies may invest to acquire strategic assets in the form of know-how and technology from other companies or from specialized technology providers, or to speed up their rise to global status by accessing the resources, capabilities and markets of the acquired firms. Such motives may therefore be especially important for new TNCs from emerging market economies that are eager to develop their competitive assets rapidly (Dunning and Narula, 1996; *WIR06*; Jain, 2007). Finally, preemptive motivations may be at play as firms seek to merge with a competitor to eliminate competition and erect barriers against others, and to strengthen their global positioning (Caves, 1971; Vernon, 1971; *WIR00*).⁴⁷

Strategic considerations relating to home economies may play a more direct role in FDI by new TNCs from developing and transition economies – many of which are State-owned – than in FDI by traditional TNCs. In the former cases, home governments may influence corporate motives and strategies, resulting in the extracted raw materials going directly to home countries rather than entering international markets. This may result in implicit restrictions on the end destination imposed by a given home country (Nitzov, 2007). In addition, as in the case of Russian TNCs, the State may encourage a process of international expansion with the aim of increasing control over downstream markets (Vahtra and Liuhto, 2006).

2. Determinants of TNC activity

a. Ownership-specific advantages

As in other economic activities, TNCs in extractive industries rely on some kind of competitive advantages when they undertake FDI or expand internationally by means of other contractual forms (Dunning, 1993 and 2000). These “ownership” advantages may derive from privileged access to capital, technology, superior organization and management know-how, size and/or the common

governance of several parts of the value chain. They may also be linked to such institutional assets as corporate culture, leadership or management diversity, or privileged access to home or host markets, or benefit from having a presence in many different markets. Some ownership advantages may be firm-specific (such as proprietary technology, or management and organizational skills), while others are linked to particular features of the home country (such as access to finance and risk-reducing instruments). Home-country specific advantages can also include physical infrastructure, the innovatory system or educational facilities, which may be unique to a country and internalized by its TNCs.

One of the main firm-specific advantages for both traditional and new TNCs vis-à-vis domestic firms in a host country is their access to finance. For large and capital-intensive extraction projects, financial strength and sheer size are particular assets of major TNCs, which often have internally generated funds to draw upon. For example, in iron ore production for export, only the very largest companies have the potential to invest in the infrastructural installations (e.g. railways, ports and handling systems) needed to compete in the global market. In this segment, the three top companies (CVRD, Rio Tinto and BHP Billiton) control 74% of the world market.⁴⁸ Even with respect to alternative sources of finance, such as borrowing and raising funds through stock markets, traditional TNCs may be in a privileged position in terms of their ability to raise funds. Their long experience with similar projects combined with the expertise required may make lenders and investors more willing to financially support one of their projects, rather than one implemented by firms newly venturing into production abroad.⁴⁹

With some important exceptions, proprietary technology is of limited importance as an ownership-specific advantage for the internationalization of most extractive-industry firms. The technologies used in most oil and gas extraction and metal mining operations are relatively well known today, and can be obtained in the market from specialized providers. However, for certain technologically advanced projects – as in the case of very deep offshore oil-drilling, liquid natural gas extraction, unconventional oil and alternative energy projects – specialized know-how and expertise constitute key firm-specific assets for some TNCs. Some new contenders, including Petrobras and Petronas, have managed to develop world-class capabilities in deep offshore exploration. While proprietary technology may be of limited importance as an ownership-specific advantage for firms in extractive industries, expertise in terms of the ability to manage long-term projects

and associated risks is critical.⁵⁰ Such management and organizational practices and skills are developed within firms, often over long periods of time. Even if, in principle, technology can be acquired from external sources, it takes specialized know-how to make use of it in an effective way.

Access to markets (due to name recognition worldwide and goodwill in home countries) and to transportation and distribution channels are other potentially important ownership advantages, particularly in oil and gas extraction (Accenture, 2006). In the past, it was one factor behind FDI in oil exploration and extraction by some developed-country TNCs that began as distributors of imported oil (Yergin, 1991). Traditional TNCs still have a strong position in downstream industries. Countries with high petroleum demand tend to have large refinery capacities.⁵¹ As of January 2005, 89% of the world's crude oil refinery capacity was located in non-OPEC countries. At the same time, the fastest growing markets for petroleum products are in emerging market economies, thus giving the new contenders (e.g. those from China and India) a potential advantage (Accenture, 2006).

The financial strength of TNCs is sometimes linked to home-country institutional arrangements. For example, large State-owned TNCs, such as those based in China and India, derive advantages from access to subsidized finance and investment insurance when investing abroad (*WIR06*). Financial backing by their home countries can enable them to assume greater risks when investing abroad and they could also be willing to pay more to access mineral resources. A new record in signature bonuses was reached in 2006 when Sinopec, outbid its competitors by paying a \$2.2 billion signature bonus in return for the right to explore for oil in two Angolan blocks.⁵² Chinese oil TNCs have also appeared to be more willing to invest in non-core business to secure control over production. For example, in a licensing round in Nigeria in May 2006, CNPC was awarded four oil exploration and extraction licences in return for agreeing to invest around \$4 billion to revamp a refinery and construct a hydro power plant and a railway line in that country (Mitchell and Lahn, 2007).⁵³

There may be several reasons why these State-owned TNCs are able and willing to pay more than traditional TNCs for access especially to oil and gas reserves abroad (Mitchell and Lahn, 2007).⁵⁴ They may incur lower costs of capital, because interest rates in their home base are lower than in other markets. The State as a shareholder may require fewer or no dividends from them if it places a strong emphasis on energy security. In some cases, there may be direct government participation in financing the projects by

way of export credits, subsidized loans or investment guarantees.

But State ownership can also be a disadvantage. Many State-owned companies in the extractive industries have been used as milking cows by their owners (governments), with too few funds left to undertake reinvestments (Radetzki, forthcoming). Even the world's largest copper producer, Codelco, has at times found it difficult to reconcile the expectations of its owner with the need to develop its production capacities. The policy of transferring all corporate profits to the State has meant that investments by Codelco had to be financed from the depreciation allowance of the company and from debt.⁵⁵ In oil and gas, Mexico's State-owned Pemex was reported to have paid \$54 billion in taxes and royalties in 2006 alone, accounting for nearly 40% of government revenues. As a result, it reported losses (after taxes) over the period 2000-2005, and showed only \$3.9 billion in net profits in 2006 – despite high oil prices – compared with sales of \$97 billion.⁵⁶ Loss-making has led to underinvestment in exploration.⁵⁷ Such cash-stripped companies generally have a slim chance of expanding internationally.

b. Internalization advantages

International vertical integration aimed at controlling the trade or supplies of raw materials has traditionally been a major feature of both oil and gas and metal mining TNCs (Morse 1999; Vernon 1971), especially in times of high demand and high mineral prices (Caves, 1971; Hennart, 2000; Jones, 2005; Williamson, 1990). These strategies have been related to the minimization of transaction costs. However, the degree of internalization has diminished over time, partly as a result of nationalizations (Radetzki, forthcoming). Especially in the oil and gas industry, internalization and vertical integration have been hampered by restrictive host-country policies. Some oil-rich host countries prohibit TNC participation in oil and gas exploration and others allow TNCs to participate only under various contractual arrangements with State-owned local partners (chapter VI). The main reason for these restrictions is the desire of host country governments to control the production of oil and gas, which are perceived to be strategic energy resources, and from which resource rents can be very high.

c. Locational advantages

As in other industries, extractive-industry TNCs decide where to invest abroad based on three broad locational factors: the economic characteristics of a location, the general policy environment of potential host countries, and the extent of business

facilitation versus legal restrictions in the given economic activity (*WIR98*).

The existence and extractability of natural resources are the most important *economic* determinants of where TNCs invest in mineral exploration and extraction. While the (likely) presence of mineral deposits is a necessary requirement to attract resource-seeking investment, it is not a sufficient condition. Many developing countries that are endowed with metallic minerals have traditionally been unable to attract FDI. For companies to be willing to engage in exploration and or extraction, they need to assess whether the volume and quality of minerals are likely to be sufficient to make an investment profitable. This requires, among other things, access to basic geological data. If the chances of finding significant deposits are perceived to be promising, a company will consider the expected risk-return ratio: the higher the risk, the greater the expected return has to be for it to invest. It also takes into account the political, environmental and social risks. However, as noted above, the willingness to take risk and the assessment of risk differ considerably between companies.

In addition to the legal and regulatory systems that determine in particular whether and in what form TNCs are allowed to invest in exploration and extraction. The overall macroeconomic and political environment is also generally of high significance for all forms of investment. The importance of policies and institutions as locational determinants was confirmed in a survey of 39 mining TNCs and factors influencing their investment decisions (Otto, 1992). Out of the 20 highest ranked criteria, all but two (geological potential and measure of profitability) were in one way or another related to government policies or regulatory systems. The top ten among them, ranked by importance attached to them by TNCs, were: security of tenure; ability to repatriate profits; consistency and constancy of mineral policies; management control; mineral ownership; realistic foreign-exchange regulations; stability of exploration and extraction terms; ability to predetermine tax liability; ability to predetermine environment regulations; and the stability of fiscal regime.

Extractive-industry TNCs need to be able to combine the availability of resources with access to good physical infrastructure (ports, roads, power, and telecommunication). The importance of supporting infrastructure varies by project, however. A gold mine may be easier to develop even when basic physical infrastructure is weak, as its output can be transported by air. By contrast, an iron ore mine requires well functioning roads and ports to be economically feasible.

Investments in the processing stage of extractive activities are determined to a lesser extent by the availability of mineral deposits, although some refining and smelting activities may benefit from close proximity to a mine. Access to inputs needed in the refining process play a major role. For example, in the aluminium industry access to cheap energy is valuable and locations that offer opportunities for energy generation (e.g. rivers) are preferred for refining plants. The need for cheap energy is also a factor encouraging integration of TNC activities in the extractive industries with the energy business of host countries (Stuckey, 1983; Whiteway, 1996).

D. Conclusions

This chapter demonstrates that significant changes are under way in the extent and nature of TNC involvement in extractive industries. Some of its findings can be summarized as follows:

- While extractive industries account for a small share of global FDI, they constitute the bulk of inward FDI in a number of low-income countries.
- The boom in mineral prices has fuelled a rise in global investments in both the metal mining and oil and gas industries. Indeed, those industries account largely for the recent increases in FDI in Africa, Latin America and the CIS. The boom has similarly triggered a series of cross-border mega mergers in these industries, resulting in higher levels of market concentration.
- The extent and nature of TNC involvement vary considerably between the metal mining and the oil and gas industries. In the former, widespread nationalizations in the 1960s and 1970s were in most cases subsequently reversed through liberalization and privatizations. As a result, major privately owned TNCs today dominate the global production of metallic minerals. Conversely, the nationalizations of the oil and gas industry permanently changed its structure, and companies with majority State ownership are now the dominant producers. This trend has been accentuated over the past decade.
- Despite the global dominance of majority State-owned companies with a strong focus on domestic production, in a number of countries foreign affiliates of TNCs play a significant role in oil and gas extraction. In several African countries, for example, they account for well over 50% of domestic production. In metal mining, as well, foreign affiliates account for a particularly large proportion of the production of low-income countries.

- A distinct feature of the global extractive industries in the past few years has been the rise of outward FDI from the emerging market economies, a trend that was also highlighted in the *WIR06*. This has been driven particularly by TNCs from selected Asian economies, such as China, India, Malaysia and the Republic of Korea, but also by Brazilian, Kuwaiti and Russian companies. Whereas the trend towards more South-South investment is the most visible in oil and gas, similar developments have also been observed in metal mining.
 - With few exceptions, these new TNCs remain under State control. Although their level of internationalization is understandably much lower than the traditional, privately owned oil and gas majors, a number of them are moving rapidly to gain an international foothold in different oil and gas projects.
 - The expansion of State-owned TNCs from China and India stems from the rising energy demands of their fast growing economies. They are actively seeking to secure access to foreign energy supplies through equity investments in oil and gas extraction projects. Backed financially as well as politically by their respective governments, a key objective for them is to expand production for export to their home economies.
 - In both the oil and gas and the metal mining industries, a number of specialized service providers have emerged. For example, in metal mining in 2005, specialized “junior” exploration companies for the first time reported greater exploration expenditures than the major mining companies. Similar developments have occurred in oil and gas. As a result of greater specialization, there are new opportunities to source services from specialized companies. Nevertheless, many countries prefer to involve TNCs in exploration projects, especially in metal mining, but also for technologically difficult oil and gas projects. TNCs remain a major source of financial resources, management skills and sometimes technology, besides providing access to markets.
 - The interaction of TNC strategies and government policies is instrumental in shaping the ownership and production structures in the extractive industries (chapter VI). Given the continued high levels of mineral prices (chapter III), it is likely that the intense investment activity will be sustained for some time as companies seek to meet the high level of demand.
 - TNCs in extractive-industries invest overseas for the same three broad reasons as TNCs in other industries: the economic characteristics of the location, the policy and institutional framework of the potential host country, and the impact of either legal restrictions or business facilitation on the conditions of entry and operations. In the exploration and production stages, such locational decisions are determined first and foremost by the availability of extractable resources, and the quality of the physical infrastructure such as ports, roads, power and telecommunications. In processing activities, investments are more market-seeking and efficiency-seeking, and depend less on the location of natural resources and the evolution of their prices. The locational decisions of such firms, like those of firms in manufacturing or services, are influenced more by factors such as availability of infrastructure, cheap energy and human resources, as well as proximity and access to markets. In all stages of natural-resource-based activities, government policies and institutions have a major influence on locational decisions (chapter VI).
- Taken together, the recent changes in extractive industries have resulted in a more multifaceted TNC universe that continues to change in dynamic ways and on different trajectories, depending on the mineral, region and country. These dynamics raise questions about their impact on developing countries – an issue addressed in the next chapter.

Notes

- ¹ In oil and gas, majority State-owned firms are commonly referred to as “national oil companies”. In line with the definitions of FDI and TNCs, “national oil companies” that invest abroad are thus included in the universe of TNCs.
- ² This Report draws on statistics from UNCTAD’s FDI/TNC and cross-border M&A databases (www.unctad.org/fdistatistics), as well as unpublished data provided by IHS (<http://www.ihs.com>) and the Raw Materials Group (<http://www.rmg.se>) (on oil and gas, and metal mining, respectively).
- ³ In 1914, more than half of the outward FDI stock of the United Kingdom was reported to be in resource-based industries (Houston and Dunning, 1976), mainly extractive, of which most was located in developing countries (Corley, 1994). Similarly, more than half of the United States FDI stock was concentrated in resource-based industries in developing countries (Wilkins, 1970).
- ⁴ In 2005 the Netherlands replaced the United Kingdom as the number one source of extractive-industry FDI. This change in ranking was prompted partly by the reorganization of Royal Dutch Shell, mentioned in box IV.1.
- ⁵ At the end of 2005, 15% of China’s outward FDI stock (\$9 billion) was in mining (UNCTAD, FDI/TNC database (www.unctad.org/fdistatistics)).
- ⁶ In oil and gas, as of June 2006, companies from the Republic of Korea were involved in 72 projects in 28 countries worldwide. Asia and Oceania (excluding West Asia) were the leading destinations (22%), followed by North America (21%) and Latin America and the Caribbean (21%). A survey of 35 mineral-resource-related companies in the Republic of Korea forecasts that their investments in overseas mineral resource development will reach \$3.7 billion in 2007 (Republic of Korea, MOCIE, 2006).
- ⁷ Other large-scale acquisitions included Goldcorp’s (Canada) purchase of Glamis Gold (United States), Sinopec’s 49.9% stake in Udmurtneft, CNOOC’s investment in Nigeria, Royal Dutch Shell’s acquisition of BlackRock Ventures (Canada), and CITIC’s (China) acquisition of Nations Energy (Canada) (annex table A.IV.4).
- ⁸ In the period 1960-1969, petroleum and other mining together represented an average of 45% of the total number of expropriations by developing-country States. This proportion rose to 62% in 1970-1976 (UNCTC, 1978: 14-18).
- ⁹ Examples include Zambia (copper), Ghana (gold), Peru (base metals and oil), Argentina and Bolivia (base metals and oil) and the Russian Federation (oil in the early 1990s).
- ¹⁰ In terms of inflows, the share of developed countries fell somewhat: from 74% in 1989-1991 to 78% in 2003-2005 (annex table A.I.11).
- ¹¹ For example, in 2005, the FDI stock in the extractive industries of those countries was \$36 billion, higher than the stock in a traditional mining country, South Africa (\$27 billion) (annex table A.I.9).
- ¹² In 2004, the share of oil and gas exceeded 60% of total FDI inflows in Angola, Egypt, Equatorial Guinea and Nigeria and that industry has also accounted for the largest share of FDI in Algeria, the Libyan Arab Jamahiriya and Sudan in recent years (*WIR05*).
- ¹³ FDI in oil and gas increased sharply in Colombia and Ecuador in 2005; and in Venezuela, it amounted to \$1 billion. It also increased in Argentina and Trinidad and Tobago in 2004 (the most recent year for which their data are available). FDI in metal mining was buoyant in Argentina, Chile, Colombia and Peru (*WIR06*). In Bolivia, uncertainties surrounding the implementation of its restrictive new 2005 law relating to oil and gas led to a fall in FDI (*WIR06*: 71-72).
- ¹⁴ In Venezuela in 2006, the Government transformed the risk service contracts of foreign companies into joint ventures with its State-owned petroleum company, *Petróleos de Venezuela* (chapter VI).
- ¹⁵ In Saudi Arabia, the three contracts with foreign firms have been signed under the Gas Investment Law of 19 September 2003. These contracts are currently categorized as “surface exploration” rights (information provided by IHS).
- ¹⁶ Only a few world-class State-owned companies remain today, such as Codelco (Chile) and LKAB (Sweden), or risky assets with only long-term potential, such as the remainder of Gécamines (the multi-metal mining company founded in the early twentieth century in the Democratic Republic of Congo), the aluminium industry of Venezuela and some Indian State-owned metal mining companies. In the CIS, only a limited production capacity remains under State control. In China, mining activities continue to be largely under the control of the central Government or regional or local public authorities. However, several partial privatizations and initial public offerings have successfully been carried out in Chinese metal mining firms in recent years.
- ¹⁷ The distinction between these companies and the medium-sized companies is somewhat arbitrary, mainly based on the fact that the latter usually focus on production at the mining stage only.
- ¹⁸ Data from the Raw Materials Group.
- ¹⁹ BHP Billiton and Anglo American are currently headquartered in developed countries. However, they have their roots in South Africa, where they were originally established and headquartered.
- ²⁰ State ownership in 1995 played a more important role than in 2005 as governments at that time still held majority ownership in CVRD and KGHM Polska Miedz – shares that were reduced to minority holdings by 2005 – and the Russian Government owned 49% of Norilsk Nickel, a participation that was subsequently sold (see annex table A.IV.5).
- ²¹ For example, Anglo American is active in coal, copper, gold and nickel production, and BHP Billiton has interests in coal, copper, iron and nickel, as well as oil.
- ²² With the acquisition of Inco (Canada) in 2006, CVRD owns now foreign metal mining production, however.
- ²³ Norilsk Nickel has however foreign production in gold.
- ²⁴ Large internationalized firms figure in more than one top list: Anglo American is on the iron ore, copper, nickel and zinc top lists, BHP Billiton on the iron ore, copper and nickel top lists, and Rio Tinto on the iron ore, copper and gold lists. In turn, firms with no investment abroad such as CVRD and Codelco are single-metal specialists.
- ²⁵ Over the period 1995 to 2005, *Norilsk Nickel* moved from a strong focus on mining to a vertically integrated approach. The capacity of the Norilsk nickel/copper refinery was increased from 93.8 to 127 kilotonnes, and that of Monchegorsk nickel/copper refinery from 86.3 to 116 kilotonnes. *BHP Billiton* started moving into vertical integration in 1995 with no control over mines or refineries. By 2005, it had vertically integrated 152 kilotonnes of mine production and 144 kilotonnes of refined production into its nickel value chain. This was achieved through the acquisition of Montelibano Nickel Complex (Colombia) and of WMC’s assets, including the Kwinana nickel refinery (Australia) and the Yabulu nickel refinery (Australia) (information from the Raw Materials Group).
- ²⁶ Mittal Steel, which merged with Arcelor in early 2006, has gradually built a position among the top 10 iron ore producers by taking over fully integrated (often loss-making) steelworks. The company made acquisitions of this type over the period 2005-2006 in Algeria, Bosnia, Kazakhstan, Mexico, Ukraine and the United States. In South Africa, Mittal did not acquire ownership of the former Iscor mines, but made sure it had access to iron ore on a cost-plus basis. During 2006, Mittal also made its first investments into pure iron ore mines in Liberia and Senegal, although the latter transaction is being contested.
- ²⁷ Severstal has integrated upstream into coal and iron ore mining within the Russian Federation, and is planning similar investments abroad.
- ²⁸ “Steel mills trying to regain some control of input costs”, *MEPS Steel News*, 23 June 2006 (Sheffield, MEPS (International) Ltd.; accessible at: www.meps.co.uk/viewpoint6-05.htm).
- ²⁹ Over the decade 1996-2005, their number fluctuated between 8 and 12, as some of the large oil and gas TNCs merged (reducing their number) and new ones entered the list.

- ³⁰ According to Bakes Institute, 2007, they ranked 14th, 17th, 19th and 25th respectively among the oil and gas firms with the largest reserves worldwide.
- ³¹ In the Russian Federation between 1995 and 2005, State ownership increased from minority to majority in Gazprom, and decreased from majority to minority in Sibneft, Slavneft and Tatneft. It also decreased from a majority to a minority share in ENI (Italy) and Abu Dhabi Co Onshore Operator (United Arab Emirates).
- ³² Lukoil (Russian Federation), for example, is 100% privately owned.
- ³³ "PetroChina announces A-share listing, boosts shares", *Interfax-China* (Shanghai), 20 June 2007.
- ³⁴ "Monthly Energy Chronology - 2000" (Washington, DC, Energy Information Administration; available at: www.eia.doe.gov/emeu/cabs/chrn2000.html).
- ³⁵ In Saudi Arabia, policy-making and regulation are the prerogatives of the Ministry of Petroleum and Minerals, while operations are left to Aramco. Aramco has an independent financial structure, paying royalties and taxes to the State Treasury and dividends to its shareholders. It has been observed that this kind of independence of the financial and managerial structures increases the company's efficiency, allowing it to focus on its long-term goals without the risk that its strategy will be disrupted by a change of chief executive officer every time there is a change of government (Al-Naimi, 2004).
- ³⁶ Excluding North America.
- ³⁷ The new Seven Sisters are considered to be: Saudi Aramco (Saudi Arabia), Gazprom (Russian Federation), CNPC (China), NIOC (Islamic Republic of Iran), Petróleos de Venezuela (Venezuela), Petrobras (Brazil) and Petronas (Malaysia) (Hoyos, 2007).
- ³⁸ Asian Development Bank, "Central Asia Regional News", *December 2005 Monthly Digest* (<http://adb.org/Carec/Central-Asia-News-Digest/2005/December-2005.pdf>).
- ³⁹ ONGC (India) and Sinopec (China) in August 2006 jointly acquired a stake in Omimex de Colombia, owned by Omimex Resources (United States) ("ONGC, Sinopec buy half of Colombian oil company" (Houston, TX, Rigzone; accessible at: www.rigzone.com/news/article.asp?a_id=35185). The joint purchase of the Syrian Al Furat Petroleum Co. and the joint Sino-Indian development of the Yahavaran oilfield in the Islamic Republic of Iran are two additional examples of partnerships (*Financial Times*, 13 January 2006; "BBC interviews CK on China-India trade talks, oil exploration," *China Knowledge*, 17 March 2006, <http://chinaknowledge.com/news-detail.aspx?id=2418>).
- ⁴⁰ In 2005, the EU imposed sanctions on Uzbekistan due to human rights violations. These sanctions affect the arms trade directly, but all business transactions of European firms indirectly. See "Europeans set arms embargo to protest Uzbeks' crackdown", *New York Times*, 4 October 2005: A6.
- ⁴¹ Under the Iran-Libya Sanctions Act passed in 1996, the United States imposes sanctions on firms that invest \$20 million or more annually in oil and gas projects in the Islamic Republic of Iran (Katzmann, 2001). It thus hinders investments not just by United States TNCs, but also by companies with major business interests in the United States (Canning, 2007: 57).
- ⁴² The United States Executive Order 13067 "Blocking Sudanese Government Property and Prohibiting Transactions with Sudan" was issued on 4 November 1997 (see www.clintonfoundation.org/legacy/110397-executive-order-13067-on-imposing-sanctions-on-sudan.htm for the full text).
- ⁴³ The company holds a 40% stake in the Greater Nile Petroleum Operating Corporation, the biggest extractive venture in Sudan and has also invested in downstream operations.
- ⁴⁴ "Oil-hungry China takes Sudan under its wing," *Telegraph online edition*, 23 April 2005, <http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2005/04/23/wsud23.xml&sSheet=/news/2005/04/23/ixworld.html>; and Hoyos, 2006.
- ⁴⁵ Gazprom has downstream equity investments in over 20 countries, including several EU member States, Turkey, and members of the CIS. In the CIS, the company is practically the sole supplier of natural gas (Vahtra and Liuhto, 2006: 28-29). Lukoil owns refineries in Bulgaria, Romania and Ukraine. It also possesses a retail network of some 1,000 gas stations in the CIS and Central and Eastern Europe. In addition to its acquisitions of firms in transition economies, Lukoil acquired Getty Petroleum Marketing in 2000, which controls 1,300 gas stations in the United States, and in 2004 it acquired an additional 800 stations from ConocoPhillips.
- ⁴⁶ In October 2004, the National Development and Reform Commission and the Export-Import Bank of China issued a circular which established, as one of four priorities, the promotion of resource exploration projects to mitigate the domestic shortage of natural resources.
- ⁴⁷ Gaining advantages of size and scale is one of the main drivers of M&As. In the oil industry the fluctuations in oil prices can be an added driver, leading to a wave of "mega mergers" as in the late 1990s (Stonham, 2000). For example, the merger of Exxon with Mobil enhanced the position of the newly formed company in Asia (Gilley, 1998).
- ⁴⁸ Data from the Raw Materials Group.
- ⁴⁹ In recent years, adherence to international social and environmental standards, such as those established by the Equator Principles, has also become a factor that financial institutions consider when financing projects (chapter VI, *WIR06*). In this context, the well-established TNCs may have an advantage over the new contenders.
- ⁵⁰ The cost of off-the-shelf technology sourcing can be another factor holding back overseas expansion. Technologically less developed TNCs have to add the price of purchasing technology from outside providers to the full costs of their overseas expansion.
- ⁵¹ The United States has far more refinery capacity than any other country, with ownership of 149 of the world's 691 refineries (see "Non-OPEC Fact Sheet" (Washington, DC, Energy Information Administration, June 2005; available at: <http://www.eia.doe.gov/emeu/cabs/nonopec.html>).
- ⁵² See <http://www.globalinsight.com/SDA/SDADetail5873.htm>.
- ⁵³ CNPC is involved in similar arrangements also in Algeria and Sudan, while ONGC has entered into similar agreements in Nigeria, and Petronas in Sudan (Mitchell and Lahn, 2007; Accenture, 2006).
- ⁵⁴ See also Global Witness, *Oil Transparency 2007*; available at: www.globalwitness.org.
- ⁵⁵ Of the \$3 billion worth of investment over the period 1994-1999, 66% came from depreciation, and the rest from selling assets and contracting a debt of \$625 million ("Latin America: Beating the oil curse"; *Business Week* online, 4 June 2007; accessible at: www.businessweek.com/magazine/content/07_23/b4037051.htm?campaign_id=nws_insdr_may25&link_position=link2).
- ⁵⁶ Ibid.
- ⁵⁷ It has been estimated that if there is no new discovery of oil by 2017, Mexico may risk becoming a net oil importer (ibid).