CHAPTER V

DEVELOPMENT IMPLICATIONS FOR HOST COUNTRIES

Mineral endowments provide opportunities for economic development and poverty alleviation in the countries where they are located. As noted in chapter III, some of today's developed and developing countries have successfully leveraged their mineral resources for accelerating their development process. In other cases, the development impact of extractive activities has been and remains disappointing. In many developing and transition economies, TNCs play an important role in mineral extraction and related activities (chapter IV), and can therefore have a significant impact on the development of those countries. This chapter draws on available evidence to analyse their economic, environmental and social impacts on those countries. Although the different determining factors are intertwined, and counterfactuals are hard to construct, the chapter seeks to isolate TNC-specific impacts wherever possible. The analysis concentrates on upstream activities (i.e. exploration and extraction), but other parts of the value chain are also considered, as appropriate.

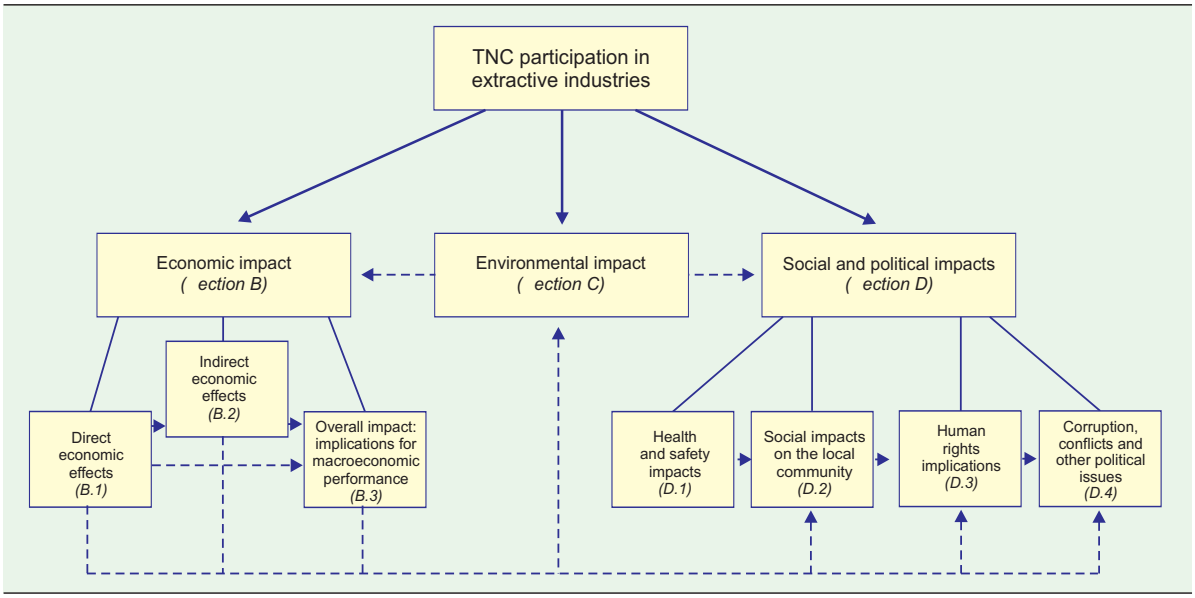
A. A framework for assessing implications for host countries of TNC involvement in extractive industries

TNC involvement in extractive industries may have both positive and negative effects on a host developing economy. In exploiting their mineral resources, developing countries often face constraints, for example, with respect to capital and foreign exchange, technical and managerial capabilities, and access to markets and distribution channels. TNC involvement may be a way for a country to at least partly overcome these constraints, leading to both direct and indirect economic gains. In addition, TNCs may contribute to higher levels of efficiency, productivity and innovation in the industries concerned. On the other hand, their activities may also generate or increase economic, environmental and social costs. By definition, foreign investment implies that a part of the value created will be allocated to the TNCs involved, and, by extension, to their home countries. Unequal bargaining power between large TNCs and governments may lead to less than optimal outcomes of negotiations for a host country, especially since the short-term profit maximization motives of the TNCs do not necessarily coincide with the longer term development objectives of a host country.

Figure V.1 sets out an analytical framework for assessing whether, and under what circumstances, TNC involvement may help developing countries exploit their natural resources in a way that promotes sustainable development. The economic, environmental and social benefits and costs are interdependent and mutually reinforcing.

Development impacts are context-specific and their assessment calls for a dynamic, historical perspective. The factors determining the impacts of an extractive-industry project, with or without TNC participation, can be specific to the industry, country or company. Many underlying causes of the net results are related to the nature of the extractive industries (chapter III); and there are significant differences between various types of extractive industries as well as between various stages in the value chain.

Figure V.1. Development implications of TNC participation in extractive industries: an analytical framework



Source: UNCTAD.

Country-specific factors include the magnitude and quality of mineral endowments, the size of the economy, the institutional environment, government policies and domestic capabilities. Firm-specific factors are related to the characteristics and activities of TNCs. The analyses in the sections below consider not only the effects on the host economy as a whole, but also the interests and concerns of various stakeholders, including central and local governments, local communities (including, in certain cases, indigenous peoples), labour and suppliers. Throughout, wherever possible, it seeks to consider different counterfactuals: extraction with TNC participation or no extraction; and extraction by TNCs or by domestic enterprises, as well as by different types of TNCs.

B. Economic impact

TNC involvement in the extractive industries can have an economic impact at local and national levels. TNCs invest and participate in business activities at various stages along the value chain and in different forms (chapter IV). Their participation can make direct economic contributions (section B.1) and indirect ones (section B.2), and may also have significant implications for the overall macroeconomic performance of a host country (section B.3).

TNCs may help create value in the host economy directly through various equity or non-equity forms of involvement, and indirectly via linkages with, and spillovers to, other economic entities. Where local financial resources and capabilities for undertaking the investment are lacking, TNC production represents a direct addition to output and income for the host economy; the significance of this depends on the size and nature of TNCs' local value-creating activities and their positioning along the value chain. Indirect effects depend on the extent of local procurement, forward linkages and various spillovers, as well as the multiplier effects of the income generated. Where domestic enterprises exist, the net outcome is also influenced by the impact on competition: whether domestic enterprises benefit from or are crowded out by the entry of TNCs. Compared with FDI in other industries, the limited scope for linkages between foreign affiliates and local firms in extractive industries may constrain TNCs' indirect contribution to local value creation. Thus the volume of value added and income created by foreign affiliates themselves strongly influence the overall economic impact. Equally, if not more important, the extent to which the value created is captured locally through taxes, wages and sometimes shared profits affects the net results of TNC involvement. For many developing countries, potentially the most important economic benefit of TNC activities in extractive industries is the generation of government revenues.

It is difficult to make generalizations about the economic impacts. They depend on the characteristics of the TNCs involved, as well as on the forms of TNC involvement – equity participation or a contractual arrangement, greenfield investments or cross-border M&As. Furthermore, there are significant differences between oil and gas and metal mining activities, between various minerals, and between investments at different stages of

the value chain. The scope for benefits is also influenced by various host-country factors. In terms of markets, increased production of minerals can either serve domestic markets, as in large emerging economies, such as China and India,[1] or it can target foreign markets, which is largely the case for other developing economies. The economic impacts at any given point in time are also affected by the international economic environment, notably global market conditions and commodity prices.

1. Direct economic effects

As in other industries, TNC participation in the extractive industries can increase financial resources for investment, improve management, transfer technology and enhance technological capabilities, generate employment and skills, and increase production and income in the host economy. It may also accelerate modernization and enhance the competitiveness of domestic industries. Moreover, often the most important direct economic contributions of FDI in extractive industries – more so than in other industries – are its promotion of exports and generation of government revenues. However, foreign participation implies that part of the total income generated will be captured by the TNCs involved; in some cases, their relatively strong bargaining power enables them to receive a significant share of this income (by negotiating particularly favourable contractual arrangements), and sometimes they may use transfer prices to reduce or avoid taxation.

a. Financial contributions

Large-scale extractive activities are highly capital-intensive (chapters III). At the project level, for example, investment in Minera Escondida in Northern Chile totalled $4 billion between 1991 and 2004 (ICMM/World Bank/UNCTAD, 2006),[2] and Petrobras' planned investments in offshore oil fields in the Gulf of Mexico over the next decade are expected to amount to $15 billion.[3] At the country level, building an oil and gas industry or revitalizing a mining industry can cost many billions of dollars.[4] Only a limited number of companies in developing countries have the financial resources necessary to undertake such investments. Lack of funds can therefore constitute a substantial barrier to exploiting a mineral deposit. The participation of TNCs, with access to large-scale funding from internal or external sources, represents one way to overcome such financial constraints. Of course there may be other alternatives for accessing funds, such as borrowing in international financial markets or from intergovernmental development-finance institutions, but funding from such sources may not be available to domestic enterprises in all countries.

The importance of TNC participation for raising the necessary financial resources and undertaking investment varies among extractive industries and countries. In the metal mining industry, years of underinvestment by State-owned enterprises following a wave of nationalizations in the 1960s and 1970s led many developing countries to return to a policy of attracting TNCs in order to halt a further decline of production and exports (chapter IV). This reopening to FDI has helped boost investment in a number of extraction activities. In Zambia, for example, FDI has been instrumental in rehabilitating the declining copper industry, initially through TNC takeovers of State-owned mines, and later through greenfield investments in new mines and post-privatization investments in acquired mines (UNCTAD, 2007m). In Ghana, foreign companies have invested over $5 billion in new gold-mining projects since 1986. Similarly, in Peru, the FDI stock in metal mining rose from practically none in 1992 to $3 billion in 2005, and 90% of the $10 billion investment in the country's mining industry during the past 15 years has been by foreign TNCs.[5] The country's ranking in terms of reserves and production of a number of minerals, such as zinc and silver, has improved as a result of the increasing investment in exploration operations and production activities by TNCs.

In the oil and gas industry, State-owned oil companies have dominated investment and production in most oil-producing developing countries in West Asia since the oil nationalizations of the early 1970s (chapter IV). In other developing and transition economies, TNCs have been actively involved over the past decade, through concessions, joint ventures, production-sharing agreements and service contracts (chapters IV and VI). In countries such as Azerbaijan and Kazakhstan in the CIS, Angola, Equatorial Guinea and Egypt in Africa, Indonesia and Myanmar in Asia, and Ecuador and Peru in Latin America, foreign capital injected by TNCs has helped in the undertaking of various extractive projects. In Bolivia, during the 1990s, the lack of domestic funding was a major reason for the Government to privatize its national oil company, Yacimientos Petrolíferos Fiscales Bolivianos, which allowed the country to exploit deposits discovered earlier.[6] TNC investment in distribution infrastructure, such as pipelines, has also enabled developing and transition economies to enhance their exports of oil and gas.

In the past decade, the international expansion of TNCs from a number of developing countries has opened a new source of finance for extractive projects in other developing countries (chapter

IV). Many of these TNCs are State-owned, and are financially supported by their home-country governments, for example through export-import banks.

Financial constraints may be less of a problem for developing countries where State-owned mining enterprises have access to funds from their respective governments, and some of which have large and successful operations that generate profits, enabling reinvestment. A number of State-owned oil companies from developing countries and transition economies, such as CNPC and CNOOC (China), Petrobras (Brazil), PDVSA (Venezuela) and Rosneft (Russian Federation), have been successful in raising capital in international capital markets through bank loans or initial public offerings (IPOs).[7] However, significant technological and managerial capabilities and success in running profitable operations are necessary for such access to financial markets. In the case of Petrobras, for example, its excellence in offshore oil and gas exploitation technology opened the door to private financing for the development of a deposit in Brazil at the cost of $4 billion (ECLAC, 2002: 155).

For poorer countries, the main alternative to turning to TNCs for capital has been to borrow from a development finance institution that is prepared to accept high-risk investments. As such opportunities are limited, many low-income developing countries that have used them to finance exploration (e.g. Equatorial Guinea, Guinea-Bissau and the United Republic of Tanzania) or midstream activities (e.g. an oil pipeline in Chad) have subsequently turned to TNCs for investment. In Latin America, the planned creation of Banco del Sur, a regionally controlled multilateral lender, may become a new source of finance for regional development, including for extractive industries.[8]

Large-scale extractive projects are today frequently based on multinational public-private partnerships, in which a group of governments and companies share varying degrees of control over the financing, exploration, production and marketing of mineral resources (Likosky, 2006). A foreign government may become involved in a project through an export credit agency which advances loans to a project company, as in the case of the Camisea project in Peru, the Baku-Tbilisi-Ceyhan project and the Chad-Cameroon pipeline project.[9] Intergovernmental organizations may also sometimes participate. For example, the Inter-American Development Bank is involved in the Camisea project, and the International Finance Corporation (IFC) is providing part of the financing for the Baku-Tbilisi-Ceyhan project and the Chad-Cameroon pipeline as well as for the Ahafo gold mine in Ghana. Sometimes the customers of extracted minerals are also willing to participate in such consortia.

Different types of financing have different implications for economic development. In general, the greater the capabilities and competitive strength of a country's enterprises, private or State-owned, the more choice they have in accessing project financing. Developing countries with relatively strong domestic technological and managerial capabilities and a robust institutional structure can draw on national and international capital markets for funds to exploit their mineral resources, which allows them greater control. For countries with lower capabilities, an alternative is for the governments to borrow from development institutions. One feature of TNC-based financing is that it does not generate foreign debt for host-country governments. Instead, countries have to offer part of the resource rents in exchange for the participation of the TNCs. Such financing is usually more expensive than that from other sources, as the rate of profits of foreign firms normally exceeds the rate of interest on international loans (*WIR99*: 161). Meanwhile, a key advantage of TNC involvement in the financing of a mining project is that TNCs bring not only capital, but a bundle of additional assets, in the form of technology, management and other know-how, which are of particular value when domestic capabilities are scarce, and they can share the risks associated with various extraction-related activities.

b. Technology contributions

For some extraction projects, access to technology and know-how can be a major reason for countries to rely on TNCs. While many metal mining projects involve mature technologies that are obtainable in the open market, not all countries possess the necessary skills and capabilities to make good use of them. Moreover, some projects – such as deep-water oil extraction or the production of liquefied natural gas – are technically challenging. This may explain why TNCs play a more important role in developing countries in the development of deep-water oil and gas deposits, while the richest, most easily accessible and profitable oil deposits – such as those in West Asia – tend to remain in the hands of State-owned oil companies (chapter IV). In addition, the transfer of technology – including proprietary technology that TNCs are often willing to provide only to their affiliates – and the strengthening of domestic technological capabilities are reasons why many countries seek to attract FDI into their extractive industries.

As in other industries, most of the innovation and technological development in the extractive

industries are undertaken by developed-country TNCs, generally in their home countries (*WIR05*). Because of their ownership-specific advantages (chapter IV), such TNCs bring knowledge and improvements in exploration and extraction techniques that may not otherwise be locally available. Developing countries that possess sufficient engineering expertise and technically competent State-owned oil companies (such as for example Saudi Aramco or Petrobras) have mostly relied on arm's length transactions for the acquisition of technology. Some of them have successfully developed the skills and knowledge required for the effective exploitation of their natural resources.

Even countries with sufficient expertise in the oil industry sometimes turn to TNCs for certain projects. State-owned companies often cooperate with TNCs in the development of oil and gas fields that are difficult to access, and for the extraction of heavy crude oil.[10] For instance, Kuwait turned to such firms for the development of oilfields in its northern region, which requires advanced technology and highly qualified personnel (Bahgat, 2000: 28). The Russian Federation, where indigenous enterprises have developed and applied many modern technologies, still relies on foreign expertise for the long-distance horizontal drilling capabilities needed to exploit the huge oil and gas reserves off Sakhalin Island. In Venezuela, the Government has involved TNCs in order to maximize production of the abundant deposits of extra-heavy crude oil in the Orinoco River basin.[11]

By bringing in advanced technology and managerial expertise, TNCs can potentially contribute not only to the establishment of new industries or activities that might not otherwise be developed, but also to improving efficiency in the short and long run in extractive and related activities. Technology spillovers from foreign affiliates to domestic companies are potentially important for the development of developing countries' indigenous technological capabilities. However, due to a lack of human, physical and institutional capacities to absorb them, such spillover effects often tend to be very limited in low-income countries, as are backward and forward linkages (*WIR99*; *WIR01*; section B.2.a). Where such deficiencies can be overcome, technology and managerial know-how can eventually spread to domestic companies through various channels. In China, for example, the development of CNOOC's technological capability in offshore oil exploration has been largely based on its cooperation with TNC affiliates in the country.[12]

TNCs from developed countries are still the technology leaders in the world's extractive industries. However, some oil companies from developing countries – such as Petrobras (Brazil) and Petronas (Malaysia) – are now as operationally competitive as their counterparts from developed countries (chapter IV). In addition, there is a view among State-owned oil companies in some developing countries that TNCs from other developing countries may "understand their requirements better" than TNCs from developed countries (Accenture, 2006: 13; *WIR06*).

International service providers – TNCs that specialize in activities related to particular stages of the value chain – have increasingly become important sources of technology and know-how (chapter IV). Their emergence in both the oil and gas industry and the metal mining industry provides new opportunities for the unbundling of the production process. This might make it easier for developing countries to acquire the specific knowledge they need at various stages, particularly expertise in managing long-term, high-risk and capital-intensive projects. However, the effective use of unbundled assets and specialized contractors requires the host country to have a trained and experienced cadre of technical and management personnel with sufficient expertise and practical experience necessary to bring together and coordinate a variety of suppliers of technology, engineering firms and construction companies.

c. Employment impacts

Extractive industries generally make only a limited contribution to employment at the macro level (table V.1).[13] This applies to both oil and gas and metal mining, and especially to projects involving TNCs, as they tend to use more capital-intensive technologies than domestic companies in developing countries.[14] Advances in technology brought into a host country by TNCs may reduce labour intensity in exploration and production activities as the new machinery and processes increase labour productivity.[15] In addition, large numbers of expatriates are sometimes involved. Nevertheless, while the overall impact on host-country employment tends to be small, large-scale extractive projects can have significant employment effects at the local level. Moreover, TNCs' contributions in terms of training and skills upgrading may be important for developing countries.

The small direct contribution to employment creation by the mining industry is in sharp contrast to its often significant contributions to revenue and income (section B.1.e).[16] For example, in Botswana, where the mining industry accounts for 40% of GDP, 90% of exports and 50% of government

Table V.1. Total employment and employment in extractive industries, selected developing countries, latest year

Item	Indonesia[a]	Malaysia[b]	United Rep. of Tanzania[c]	Viet Nam[a]
Total employment (thousand)	85 702	6 391	16 915	35 386
Total employment in extractive industries (thousand)	774	33	29	110
Employment in extractive industries as % of the total employment	0.9	0.5	0.2	0.3
Employment by foreign affiliates in extractive industries (thousand)	66	6	1	8

Source: ILO and UNCTAD.

[a] Data for 1996.

[b] Data for 1989.

[c] Total data for 2001; foreign-affiliate data for 2000.

revenues, it employed only 9,200 people, or around 3% of the total labour force (UNCTAD, 2007i).[17] In Chile, the contribution of mining to national employment fell from 2% to 0.84% between 1986 and 2005, with employment in copper production declining from 1.03% to 0.76% (UNCTAD, 2007j). In contrast, the contribution of mining to GDP rose from about 8% in the 1980s to 16% in 2005. In Peru, the mining industry employed 101,200 people in 2006, accounting for only 0.7% of the working population of the country. Of these, 35,870 were employed by foreign affiliates: 14,430 directly and 21,440 indirectly.[18] Yet the share of the mining industry in the country's GDP has been about 7% in recent years.

The use of advanced technologies and modern exploration and production techniques by TNCs may sometimes reduce overall employment in the extractive industries as a result of productivity improvements. The employment of semi-skilled local people in particular may be jeopardized further as the industry moves towards ever higher levels of automation, and smaller and more specialized labour (MMSD, 2002). In Ghana, for example, there was a gradual reduction in the levels of local employment in the country's mining industry during the period 1995-2005, when foreign companies' share of mining production increased rapidly, leading to a net loss of more than 7,000 jobs (table V.2). One reason was technical, as all post-reform mining projects have been capital-intensive surface operations, where more sophisticated techniques have enhanced labour productivity. Another reason was that former State-owned mines had to be restructured (MMSD, 2002).

The contribution of the oil and gas industry to total national employment is also generally small, with or without TNC involvement. Many OPEC countries rely on oil for the bulk of their income and exports, but the direct employment generated by the industry is limited. In Saudi Arabia, for example, less than 1.5% of the working population is employed in this industry (Accenture, 2006), yet it accounts for 45% of GDP, 90% of exports and 75% of government revenues. A similar situation exists in oil-rich countries where TNCs play an important role in oil and gas production. In Equatorial Guinea, for example, where foreign companies account for more than 92% of oil production (figure IV.5), the number of people directly employed in the oil and gas industry has been estimated at less than 10,000 (or about 4% of the working population), and these are mainly expatriate workers (Frynas, 2004), while it accounts for 86% of the country's GDP.

In low-income countries, especially in Africa, the proportion of expatriate workers involved in extractive industries can be very high. In the United Republic of Tanzania, much of the labour recruitment by TNCs takes place in the commercial capital, Dar es Salaam, or in countries with a long tradition of skilled labour in mining such as Australia, Canada, Ghana, Namibia and South Africa (Mwalyosi, 2004). Local managers and professionals may be particularly difficult to recruit locally, as in Ghana where expatriates are mainly at the senior level.

Table V.2. Employment in Ghana's mining industry, 1995-2005

Item	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total employment in the mining industry	22 519	21 030	20 343	21 261	17 858	16 537	16 340	14 311	16 056	15 525	15 396
Expatriate staff (A)	234	229	221	261	242	233	205	242	188	166	181
Ghanaian senior staff (B)	2 511	3 143	2 862	2 804	2 442	1 697	1 807	1 813	1 901	1 736	1 905
Ghanaian junior staff	19 774	17 658	17 260	18 196	15 174	14 607	14 328	12 257	13 968	13 622	13 310
Ratio of A to B (%)	9.3	7.3	7.7	9.3	9.9	13.7	11.3	13.3	9.9	9.6	9.5

Source: Minerals Commission of Ghana.

As noted, despite their low labour intensity, large-scale extractive projects can have a significant employment effect at the local level (especially if there are few other employment opportunities). For example, in metal mining, the Obuasi mine (Ghana), owned by AngloGold Ashanti, employs about 6,700 local staff (ICMM/World Bank/UNCTAD, 2006), and in oil and gas, the Sakhalin-2 project employs nearly 17,000 people, over two thirds of them Russians. In its next operational phase, the Sakhalin-2 consortium will create 2,400 permanent jobs, of which a similar share is likely to be taken by Russians. Foreign investments in oil and gas extraction in the region have contributed to reducing unemployment in Sakhalin to the lowest rate (0.2%) among the different regions of the Russian Federation.[19]

The overall impact of TNC activities in extractive industries on local employment can be significantly enhanced by multiplier effects, as indirect employment may occur at different stages of the value chain. According to some estimates, the Obuasi mine has created some 30,000 indirect jobs (ICMM/World Bank/UNCTAD, 2006). In Mali, three gold mines (Morila, Sadiola and Yatéla) employed some 1,000 workers each, with a multiplier effect of six to eight (Cole-Baker, 2007). While the direct employment created by Minera Escondida in Chile was about 2,800 people in 2004, the total employment, including contractors and other induced employment may have been as much as 15,000 people (Dietsche et al., 2007a: 40–41).

The net impact on the local employment depends partly on how large-scale extraction activities affect employment in pre-existing activities in mining areas (e.g. artisanal and small-scale mining or agriculture). In the metal mining industry, the entry of TNCs may displace or diminish such activities, with adverse effects on employment in artisanal and small-scale mining. For example, the rapid rise in exploration and excavation activities by TNCs in Ghana since the implementation of the structural adjustment programme has displaced thousands of artisanal gold miners (Hilson and Potter, 2005).[20] Finding a solution to the potential conflict between small-scale mining, which is more labour-intensive, and industrial mining, which is safer and more efficient but less labour-intensive, is an important issue in many developing countries (chapters III and VI).

A number of extractive-industry TNCs invest in human resource development by offering training and skills upgrading to their workers (UNCTAD, 2002). In 1999, Minera Escondida in Chile established a specialized training centre that helps develop the occupational skills required in various mining operations (box V.1). In Botswana, Debswana – a joint venture between the Government and De Beers – has established an intensive training and apprenticeship programme. It also offers its employees scholarships for advanced training both within and outside the country (UNCTAD, 2007i). In the oil industry as well, TNC contributions have helped create the general oil and gas workforce as well as skilled engineers (Accenture, 2006). For some developing countries, engineers trained by TNCs in sophisticated technologies are particularly valuable. In China, since the 1980s, international oil companies such as ConocoPhillips, ExxonMobil and Shell have helped produce qualified local engineers for offshore oil exploration.[21] While TNCs themselves benefit from such training, as it eliminates the need to hire more expensive expatriate engineers from their home countries, it can constitute a valuable contribution to human resource development for the industry in the host country.

d. Enhancement of exports

Exports are an important means for a country to allocate resources efficiently based on its comparative advantages. They also help generate the foreign exchange required to finance its imports

Box V.1. Fostering skills in the mining industry: the case of CEIM in Chile

The Centro de Entrenamiento Industrial y Minero (CEIM), the industrial and mining training centre founded in 1999, belongs to the Escondida Educational Foundation[a] and is a non-profit organization. Its main mission is to foster excellence in the mining industry. The Centre has developed several programmes to improve employment opportunities for local workers within a particular region (Region II) in Chile. It has an alliance with the British Columbia Technological Institute of Vancouver, Canada, which allows the Centre to manage, develop and certify its skills training programmes under an international certification scheme (CEIM-BCTI). Another alliance with Minera Escondida and 20 other companies has further strengthened the Centre. It is expected to train 350 technicians in electronics, electrical engineering, heavy machinery and industrial machinery every year, beginning in December 2006.

Source: Dietsche et al., 2007a.

[a] The Minera Escondida Foundation is a non-profit organization created in 1999 to develop projects in support of education, health, youth and indigenous people (see www.bhpbilliton.com).

of goods and services, including those needed for industrialization, and thereby, to promote economic growth. While most countries' extractive industries are export-oriented, TNCs can help boost mineral exports by facilitating an expansion of production and through their access to global markets.[22] At the same time, the involvement of TNCs in trading, including intra-firm trading activities, has sometimes given rise to concerns about the limited value added to minerals before exporting, and the use of transfer pricing.

For a number of developing countries, revenues from a single mineral account for a large share of their total export earnings (chapter III).[23] In recent years, high mineral prices have reinforced this pattern. In Chile, for example, the share of copper in the total exports of goods rose from an average of 38% in 1991-2003 to 61% in 2006.[24] Evidence from countries in which TNCs dominate mineral production (chapter IV) suggests that their entry has led to significant export growth:

- In Ghana, after the entry of FDI on a large scale, gold exports, mainly by TNCs, rose threefold from 1990 to 2004, increasing their share of the total exports of the country from a quarter to 37% (UNCTAD, 2005b: 48-50).
- In Zambia, the production and exports of copper have grown significantly since the late 1990s. This has been a direct result of FDI that revived the industry (UNCTAD, 2007m). In 2006, exports of copper and cobalt by TNCs were $3.2 billion, about four fifths of the country's total exports.[25]
- In the United Republic of Tanzania, since gold mining was opened up to FDI in the 1990s and TNCs assumed a dominant role in gold production, it has emerged as an important export-oriented industry (UNCTAD, 2002). From no export earnings prior to 1990, gold exports earned $640 million by 2005, and TNCs' total mineral exports reached $693 million in 2005, accounting for 43% of the total exports of the country.[26]
- FDI has played a major role in enhancing Peru's export performance. Between 1990 and 2006, exports of metallic minerals surged from about $1.5 billion to $15 billion, with their share in total exports rising from 42% to 62% (UNCTAD, 2007k).

In the oil and gas industry, TNCs have similarly helped countries such as Angola, Argentina, Azerbaijan, Ecuador, Indonesia, Kazakhstan and Peru increase production and exports over the long term. In Ecuador, an oil pipeline constructed by a consortium of TNCs during the period 2001-2003 facilitated increased exports of crude oil by adding transport capacity for 400,000 barrels per day (ECLAC, 2004: 48). In many other developing countries, such as the oil-producing countries in West Asia, it is the State-owned companies that are controlled and managed without TNC participation that have successfully expanded oil exports.

Compared to exports of manufactured goods, which can help firms from developing countries obtain economies of scale, expand scope of production, and learn from their experience in export markets (*WIR02*), exports of unprocessed minerals yield much fewer potential benefits of these kinds. If countries could add value to the minerals extracted before they are exported, export revenues as well as the potential for learning could increase significantly. However, in many developing countries, most minerals are exported in unprocessed form (section B.2.a).

While TNC participation is likely to boost the export revenues of host countries, their affiliates may also have a higher propensity to import various inputs from foreign suppliers. Foreign affiliates may also repatriate their profits, thereby reducing the positive effects of the increased export revenues their participation may generate. This could also reduce the effects from improvements in the terms-of-trade (as a result of the recent increase in mineral prices) on the national income of a host country (section B.3; UNCTAD, 2005c). Reflecting the complex relationship between trade and investment, a rapid growth of exports is likely to influence the balance of payments, and possibly also the real exchange rate. Such an effect underlines the importance of well-conceived macroeconomic policies for mineral-exporting countries (section B.3, chapter III, chapter VI).

e. Generation of government revenue

For many mineral-exporting developing countries, the most important direct contribution of mineral extraction is increased income for the host country, much of which takes the form of government revenues. When extraction involves TNC participation, the income accruing to the host country depends both on the amount of the value created, and on how that value is shared between the host-country recipients (i.e. labour, other input providers and the government) and the TNC. Capturing the maximum value created by TNCs is a major concern of host countries with regard to TNC participation (chapter VI). It assumes particular significance in the extractive industries, especially when a sizeable proportion of the value of minerals sold consists of resource rents.[27] Their distribution between the TNC and the host country

is negotiated as part of the terms and conditions for TNC participation. Although salaries and wages paid to local employees and inputs purchased from local suppliers generate incomes to varying degrees in different extractive industries, capturing a significant share of the mineral rents through taxes and other payments to the government is particularly important for host countries.

Increased production and exports due to TNC involvement in extractive industries do not automatically generate large government revenues. The fact that TNCs are involved means, by definition, that a certain proportion of the revenues will go to them rather than to the host economy. However, if the participation of TNCs helps expand the scale of production and, by extension, the overall size of the revenues, then, depending on the terms and conditions governing TNC participation, the amount of the government's revenue may still be greater than if no TNCs had been involved.

Governments raise revenues from extractive industries through direct ownership (wholly State-owned companies or joint ventures), taxes, levies, royalties and/or other payments under various contractual arrangements (including production-sharing agreements). The approach chosen differs between the oil and gas and metal mining industries (chapters IV and VI). Data on the distribution of revenue between host developing countries and TNCs are generally scarce, which complicates international comparisons and assessments. Various studies of fiscal regimes suggest that the government's take in revenues generated from oil and gas activities over the lifetime of a project vary widely (between 25% and 90%);[28] the corresponding range in metal mining is between 25% and 60% (Land, 2007; Otto, Batarseh and Cordes, 2000).

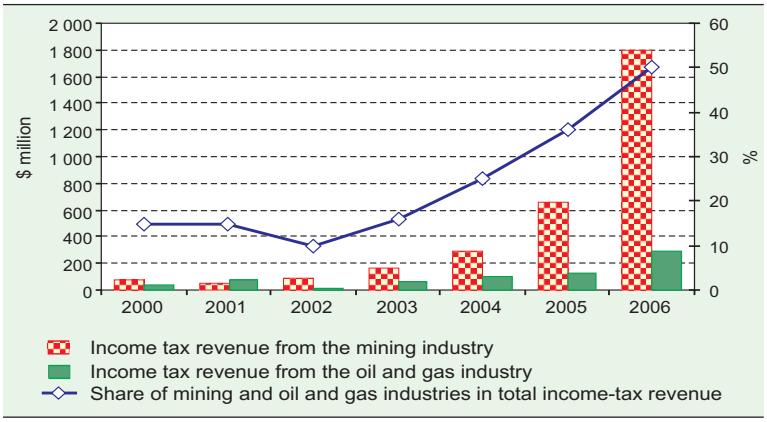
Government revenues collected from projects undertaken by TNCs can be compared to the companies' revenues or profits. In Mali, for example, the total income tax paid by the Sadiola mine was $20 million during 2000–2003, accounting for 3% of its gross revenue and 10% of its income before tax; and the mines of Morila and Yatéla in the same country did not pay any income taxes during that period because of tax holidays (Cole-Baker, 2007).[29] Such firm-level data on profitability and tax payments are generally hard to obtain.[30] Comparisons are often made instead between a government's revenue and the country's mineral exports.[31] In Chile, the total copper exports of the 10 largest private mining companies (nine of which are foreign-owned) during the period 1991-2003 were estimated at some $33 billion, while their tax payments were $2.1 billion (6.5% of their copper export revenues).[32] This share increased to 16.3% over the next two years.[33] During 2004-2006, foreign mining companies in Peru paid $3.5 billion in income taxes, equivalent to 14% of their export revenues.[34] In the United Republic of Tanzania, out of earnings of $2.8 billion from mineral exports during 1999–2005, the Government received some $252 million (9% of export revenues) in the form of various tax payments and royalties. In 2005, this contribution accounted for 4% of total government revenues.[35] In Zambia, the $75 million in government revenues from copper mining corresponded to less than 5% of the value of copper and cobalt exports in 2005.[36] In these and other developing countries, various stakeholders have expressed dissatisfaction with the share of revenues remaining in the country, and a number of countries have taken steps to increase the government's take (chapter VI).[37]

Low taxes and royalty payments as a share of export revenues are not the same as low shares in mining profits. The latter are the difference between total revenues and costs and may be low in the early years of mining projects as firms try to recover their fixed costs. It often takes time for an extractive-industry project to generate significant government revenues. This is partly because most countries offer accelerated depreciation and other incentives to investors to allow them to recover, over a period of time, the significant cost outlays involved in such projects so as to reduce risk and encourage investments.[38] Thus tax payments may not become due until several years after a project begins to generate export revenues.

In Peru, for example, income taxes from the mining industry were very small during the entire decade of the 1990s (UNCTAD, 2007k). As late as in 1998–1999, they amounted to well below $100 million per year, or about 7% of total government revenues. As the benefits to companies from accelerated depreciation gradually declined, and as metal prices increased, the picture changed dramatically. Between 2000 and 2006, the annual income tax revenue from mining companies rose from $70 million to $1.8 billion (figure V.2), and from 10% to 43% of total government revenue.[39] During the same period, the annual income tax revenue from the oil and gas industry rose from $35 million to $296 million, corresponding to 5%-7% of total government revenue (figure V.2).

The sharing of mineral rents is also influenced by TNCs' accounting practices, financial behaviour and possible transfer-pricing activities. By manipulating transactions that are internal to them, TNCs may, to some extent, choose where to declare profits to minimize their tax burden (*WIR99*). In Chile, it took considerable time before

Figure V.2. Income tax revenue from mining and oil and gas industries, Peru, 2000-2006



Source: Superintendencia de Administración Tributaria, Peru.

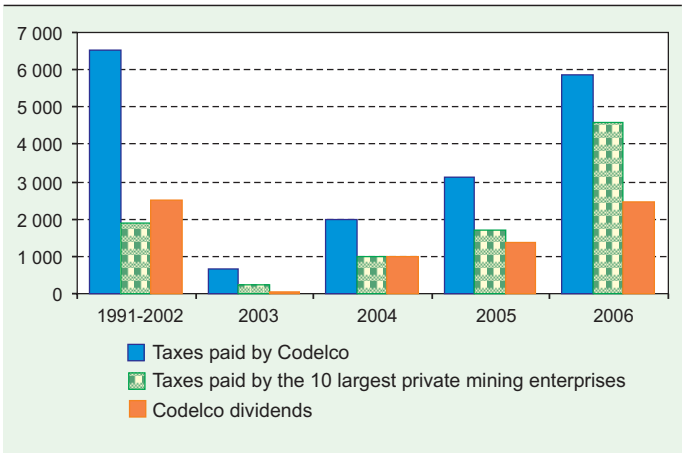
the affiliates of foreign mining companies started to pay any taxes, with the exception of Minera Escondida. While the accelerated depreciation allowance explained part of this, the tax system was also designed in a way that encouraged companies to finance their investment through intra-company loans, the repayment of which reduced their net revenues for several years (UNRISD, 2005). These factors help explain why in Chile, following the FDI boom in mining, the share of the State-owned company, Codelco, in the country's total copper production fell from 85% in 1980 to around 32% in 2005,[40] while its contribution to the Government was substantially higher than that of the foreign affiliates (figure V.3), and despite this it showed greater profitability. Since 2003, tax revenues from foreign affiliates have started to rise, but they were still below those from Codelco in 2006.

The issue of retained value through tax revenues, long a concern of developing countries that host TNCs in extractive industries, has attracted renewed attention during the recent price boom which has contributed to increased corporate profits and higher tax revenues, as highlighted in the case of Peru (figure V.2). Between 2002 and 2006, the net profits of 40 of the world's largest mining companies[41] rose from $4 billion to $67 billion (PricewaterhouseCoopers, 2007b). At the same time, the total income taxes paid by these companies rose from $2 billion to $27 billion (Ibid.).[42] However, data on the allocation of the taxes by country are not available. It seems that a significant proportion may have gone to the home countries of the TNCs.[43]

This has prompted criticism that the conditions offered by some developing countries for FDI projects in extractive industries have been overly generous, resulting in a disproportionately low share of government revenues in the total rents.[44] Against the backdrop of high mineral prices, several countries have made changes in their fiscal regimes related to the extractive industries (chapter VI). The recent price boom has also led various stakeholders, such as local communities and workers, to demand a larger share of the revenues from mining. The increasing number of strikes following the price boom shows that workers are anxious to increase their share of the revenues (PricewaterhouseCoopers, 2006; chapter VI).[45]

As already noted, governments can also secure a share of the resource rent through equity ownership; State ownership or joint ventures with TNCs are commonly used modes, especially in the oil and gas industry (chapters IV and VI). Some examples also exist in metal mining. In Chile, for example, State-owned Codelco has entered into a joint venture with Phelps Dodge Mining Co. (now part of Freeport-McMoRan Copper & Gold).[46] In Botswana, diamonds are mined by Debswana, a 50-50 joint venture between the Government of Botswana and De Beers, through which Botswana

Figure V.3. Contributions to fiscal revenues by Codelco and the 10 largest private mining enterprises[a] in Chile, total of 1991-2002, 2003-2006
(Millions of dollars)



Source: The Chilean Copper Commission, Ministry of Finance of Chile and Codelco.

[a] Data on taxes in 2005 and 2006 correspond to all private mining enterprises (including the 10 largest).

receives a large share of the rents. The Government of Botswana also has significant ownership shares in some other mining companies, many of which are listed on the Botswana Stock Exchange (as dual listings given that their primary listings are in London, Toronto or Australia) (table V.3). This gives the Botswana public, particularly institutional investors, an opportunity to take an ownership stake in these mining projects, and, accordingly, a share in the rents.

The sharing of revenue from a particular mining project between a TNC and a host country partly reflects their relative bargaining power (Vernon, 1971; Moran, 1974).[47] Countries that have rich deposits and considerable domestic capabilities to exploit them are in a better position to reap a larger share of the rents through advantageous ownership and tax arrangements. The evolving balance of bargaining power between TNCs and host-country governments may explain the dynamics of rent sharing over time and the changes in tax regimes and ownership arrangements in many developing countries. In Botswana, for example, the Government's shareholding in Debswana was initially 15%, but later increased to 50%. The volatile nature of mineral prices influences the relative bargaining power. In periods of low prices, the profitability of resource extraction projects tends to decline, reducing the bargaining position of a country in its efforts to attract investment, and vice versa.

To conclude, the net flow of revenue and income generated for a host country from TNC operations in the extractive industries depends on how TNC participation affects the overall size of the value created, the nature of the revenue-sharing (or capturing) mechanisms in place, and the extent to which they can be adapted to changing conditions in the industries and markets. Ultimately, the development implications of the government revenues generated from mineral extraction (with or without TNCs) will be determined by how the funds are managed and used vis-à-vis the country's development objectives and the needs of both current and future generations (chapter III). Governments may need to neutralize the impact of large windfall revenues on greater aggregate demand, inflation and exchange rate appreciation. This requires prudent fiscal management aimed at revenue sterilization for example, by accumulating budget surpluses, paying off debt, and/or channelling revenues into a stabilization fund[48] that could be used to prop up the budget when aggregate demand is insufficient and output and real incomes are falling.[49] Without appropriate policies and institutions in place, there is an increased risk that the government revenues will do little to promote sustainable development (chapter VI).

2. Indirect economic effects

In addition to their direct effects on the host economy through the various channels discussed above, TNC activities in extractive industries can indirectly affect host countries, for instance through their impact on business linkages and infrastructure development. In addition, by participating in extractive industries in host countries, TNCs can inject competition into these industries, and in so doing help boost economic efficiency through reduced production costs, innovation and technological change.[50] However, in countries with weaker domestic capabilities, the participation of TNCs may drive existing domestic enterprises, and particularly artisanal and small-scale mining firms, out of business. Such crowding out could

Table V.3. Ownership structure of major mining companies in Botswana, 2005

Company	Mineral	Main mines	Ownership	Listings
BCL	Nickel, copper, cobalt	Selebi-Phikwe	Public & misc. 38%; LionOre (Canada) 29%; Government of Botswana (GoB) 33%	Toronto Stock Exchange (TSE) Botswana Stock Exchange (BSE)
Botswana Ash	Soda ash & salt	Sua Pan	Anglo American (21%); De Beers (21%); GoB (50%); banks (8%)	
Debswana	Diamonds and coal	Orapa, Jwaneng, Letlhakane, Damtshaa, Morupule	De Beers (private)[a] 50%; GoB 50%	
Diamonex	Diamonds	Lerala	Diamonex (Australia) 100%	Australian Stock Exchange BSE
Mupane Gold	Gold	Mupane	Iamgold (Canada) 100%	TSE BSE
Tati Nickel	Nickel, copper, cobalt	Phoenix	LionOre (Canada) 85%; GoB 15%	TSE BSE

Source: UNCTAD.

[a] Owned by Anglo American (United Kingdom) (45%), Central Holdings (South Africa) (40%) and Government of Botswana (15%).

affect host-country enterprise development in extractive industries; it may also have adverse impacts on employment (section B.1.c) and trigger conflicts between foreign companies and domestic stakeholders (section D.2).

a. Linkages

Through linkages between foreign affiliates and domestic enterprises, TNC participation may play a catalytic role in the development of related industries (*WIR01*) and, under certain conditions, of an extractive industry cluster. Linkages can take place along and beyond the extractive-industry value chain. Backward linkages occur when foreign affiliates acquire inputs (goods or services) from local suppliers, and forward linkages occur when foreign affiliates sell outputs (minerals) to domestic buyers. Linkages can be developed with domestic firms or with other foreign affiliates in the host country. Linkages with the latter may generate a lower degree of local value added than those with the former, but they can nevertheless be important especially in countries where domestic capabilities are at a nascent stage.

However, a common feature of the extractive industries, especially when TNCs are involved, is the relatively limited incidence of linkages with domestic suppliers, particularly as compared with manufacturing and services sectors (chapter III). In Africa, where the extractive industries still account for the largest proportion of FDI (chapter IV), "the tendency of FDI to reinforce enclave-type development appears to be a real danger, with external integration privileged over the internal integration of the local economy" (UNCTAD, 2005b: 35). Similar concerns exist in Latin America. According to one study, "extractive activity carried out by TNCs […] mainly uses imported inputs […], with the result that it is poorly integrated into local productive structures (except in the case of natural gas), and gives rise to very few productive linkages" (ECLAC, 2004: 48).

While a booming *metal mining industry* can help promote supplier-buyer relationships in various related services, manufacturing and other activities that produce inputs for exploration, most equipment used by exploration projects tends to be imported (Otto et al., 2006). In Chile, for example, backward linkages of the copper mining industry with domestic manufacturing have generally been weak: most of the machinery, trucks and sophisticated inputs are imported (UNCTAD, 2007j). Although supplies of services such as construction, transportation, catering and cleaning are more likely to be sourced locally, linkages with domestic providers of knowledge-intensive and high value-added services are often weak. The experience of low-income developing countries in building up their domestic capabilities in these areas has generally been disappointing. In most of them, international suppliers meet the growing demand for such services, sometimes through locally established affiliates. In Ghana, for example, 60 mining support service companies, mostly foreign-owned, had been established by 1998, providing various services (including geological, engineering and drilling) to the foreign-invested mines. Services such as haulage and construction were dominated by local firms (Aryee, 2001).

Forward linkages in metal mining can involve the development of processing and various manufacturing activities. TNC participation can help provide inputs that encourage the emergence of refining, smelting or manufacturing activities, and contribute to the creation of industrial clusters (Ramos, 1998). Foreign investment in gold mining, for example, has fostered the development of a jewellery manufacturing industry in Indonesia (Leyland, 2005). In many other mineral-rich developing countries, however, little processing and manufacturing have emerged. Small, low-income developing economies typically do not have the capacity to enter into the smelting and refining stages of the value chain, which are capital-intensive and tend to have larger economies of scale (Mintek, 2007). Although some developing countries succeeded in establishing capacities for smelting or other types of processing of metallic minerals decades ago (Radetzki, 1993), divergent views between TNCs and host-country governments about the location of such activities are likely to persist.

In *the oil and gas industry,* oilfield services now account for the bulk of the total cost of oil production (chapter IV).[51] The size of the oilfield services market in Africa alone has been estimated at about $30 billion per year (UNCTAD, 2006d), the bulk of which is served by large services TNCs (table IV.9). The value of the oilfield services market in Nigeria, for example, was about $8-10 billion (Kupolokun, 2004), yet only one tenth of these services were contracted to local companies. This suggests a high potential for enhancing the participation of local contractors in the supply chain (UNCTAD, 2006d). Moreover, the share of local content in the country is very low in comparison with some other oil-producing developing countries such as Brazil and Malaysia (table V.4). In developing and transition economies with stronger domestic capabilities, there is greater scope for backward linkages. The Sakhalin-2 project in the Russian Federation has awarded $8.3 billion worth

Table V.4. Local content in supplies to upstream oil and gas activities, and GDP, selected oil-producing countries, various years

Item	Brazil	Indonesia	Malaysia	Mexico	Nigeria
Local content in supplies to upstream oil and gas activities (%), 2000	70	25	70	Largely local	5
GDP ($ million), 2005	799 413	281 276	130 770	768 437	113 461
GDP per capita ($), 2005	4 289	1 263	5 159	7 180	863

Source: UNCTAD and Heum et al., 2003: 21.

of contracts to Russian companies (UNCTAD, 2007l). The proportion of contracts awarded to Russian firms, above 50% in 2006, is expected to grow further during the operational phase (Ibid.). Indonesia has managed to achieve 25% local content, while other developing countries such as Brazil, Malaysia and Mexico have performed much better (table V.4).

Crude output in the oil and gas industry can feed into the rest of the economy as intermediate inputs: crude oil for the petroleum refining industry and gas and its liquid feedstocks for the petrochemical industry. Such forward linkages have helped the development of the manufacturing sector not only in some developed countries but also in a number of developing and transition economies. Although domestic efforts are crucial in this process, TNC presence may also play a role. Newcomer TNCs in the global oil and gas industry seem to be more willing to invest in downstream activities. For example, CNPC (China) built the Khartoum Refinery in Sudan, with an annual oil refining capacity of 2.5 million tons in 2003. In Nigeria, the development of downstream capacities was a key criterion in the recent bidding rounds for licences, and Chinese oil companies were willing to invest in downstream activities (Accenture, 2006; Mitchell and Lahn, 2007). In oil-producing countries in West Asia, domestic State-owned oil companies have successfully expanded from upstream exploration and production to downstream manufacturing activities, particularly petrochemicals, often through alliances with TNCs with a global marketing presence (Al-Moneef, 2006).

There are several reasons for the frequently low incidence of linkages between foreign affiliates and local firms in extractive industries. Some are related to constraints regarding the availability, quality and cost of local inputs, economies of scale that inhibit processing activities, and the lack of efficiency and competitiveness of domestic firms. In addition, foreign affiliates may prefer to source inputs from non-resident suppliers with whom they have long-established relationships. In low-income countries, a lack of suppliers with the required capabilities and a shortage of appropriate skills in the local work force can make it difficult to source locally or expand activities downstream. For example, in Mongolia significant organizational development and capacity-building of local firms is needed in order for them to meet new demand by the emerging mining industries and for those industries to create significant multiplier effects (Slowey and Lewis, 2004). Limited linkages also exist in the oil and gas industry in developing countries, particularly in LDCs (Nordås, Vatne and Heum, 2003).

While data limitation makes it difficult to directly compare TNCs and domestic companies, the available evidence suggests that domestically owned mining or oil companies tend to have stronger local linkages. In Chile, for example, a relatively high level of local refining activities were recorded when the State-owned enterprises dominated the value chain of copper production. In the 1980s, when Codelco was the principal producer of copper, the share of refined output in the country's total copper exports was nearly 70%. Since 1989, that percentage has been declining, to 58% in 1995 and 53% in 2005, largely due to the impact of foreign investment, mainly in Minera Escondida.[52] In the oil and gas industry as well, the links and stimulating effects of extractive industries on the domestic economy seem to be stronger in countries where State-owned oil companies dominate oil and gas production (table V.4). In oil-producing countries in West Asia, for instance, the inputs of goods and services provided to the oil and gas industry by local sources rose significantly after nationalization of that industry (Al-Moneef, 2006). It was also after nationalization that oil and gas production led to the development of refining and petrochemical industries in those countries.

To accelerate development and improve the long-term welfare of a country and its people, its non-renewable natural resource wealth needs to be transformed into a broader industrial base. TNCs can be a driving force behind the emergence of independent domestic suppliers and industrial clusters only if host countries are able to develop their domestic capabilities. Proactive policies and supporting institutions can play an important role in this respect (chapter VI).

b. Infrastructure development

TNC activities in extractive industries are often associated with the development of public utilities including electricity and water supply in a region, and of transportation infrastructure like roads, railways and ports. Such facilities are often necessary for the extraction, transport and export of some minerals.[53]

There are many such examples. For the operations of Minera Escondida in Chile considerable investments for the supply of power and water were required, as well as an extensive road development programme (Dietsche et al., 2007a). The privatization of Zambia Consolidated Copper Mines Limited (ZCCM) in the late 1990s was followed by significant investments by TNCs in Zambia's infrastructure and urban development.[54] In the United Republic of Tanzania, there have been steady infrastructural developments in the Mwanza region as a result of the development of the Lake Victoria Goldfields over the past decade. The improved roads, airport facilities, hotels and ancillary services have contributed to an increase in tourism in the northern part of the country.[55] Large foreign-invested oil and gas projects may also lead to the development of local infrastructure. For example, the Sakhalin-1 and Sakhalin-2 projects in the Russian Federation required the improvement of roads, bridges, airport and seaport facilities, railways, public medical facilities, waste management, telecommunications and other forms of infrastructure. The Sakhalin-2 project alone involves a $390-million infrastructure upgrade programme.[56]

Such investments can be important for low-income countries, particularly LDCs, where the lack of infrastructure is a major obstacle to economic and social development. TNCs may play an important role in this respect, but their contributions to infrastructure can also be controversial. The extent to which new infrastructure brings broader benefits to a host economy depends, among other things, on the specificity of the assets and infrastructure developed and the project's location. Specialized transportation infrastructure, such as pipelines for long-distance oil and gas transportation and helicopter services for transporting gold and diamonds, may be confined to the extractive projects with few benefits for the country. By contrast, the building of roads, railways and harbours for transporting copper or iron ore can benefit the economy as a whole. The scope for broader benefits also depends on the location of a project. If a mine is located in a remote area, as in the cases of Minera Escondida and the Sakhalin projects, benefits to surrounding areas may be marginal.[57] Conversely, if the mineral extraction takes place in more populated areas, new infrastructure may benefit more people. Finally, benefits may be linked to the life cycle of a project, as the infrastructure created to support the project may not be maintained once it closes.

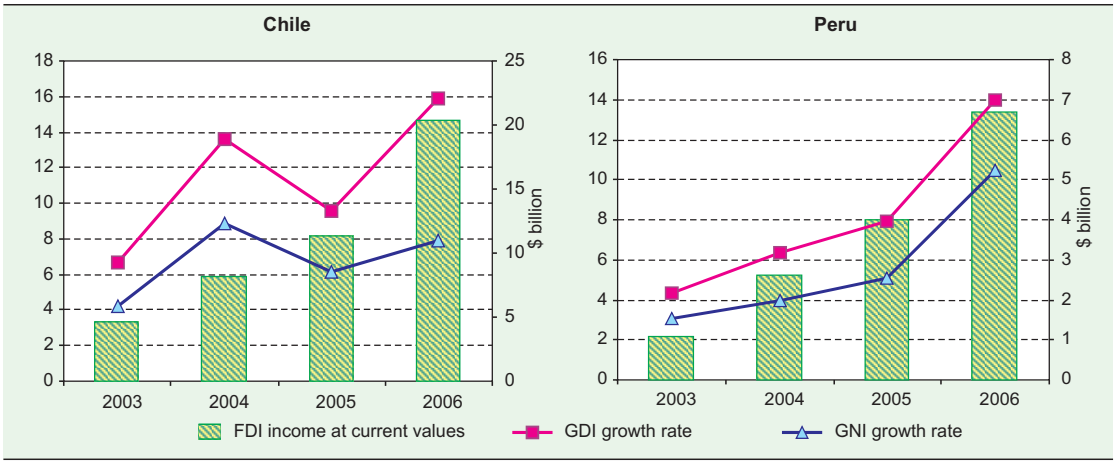
3. Overall impact: implications for macroeconomic performance

What are the implications of the direct and indirect effects of TNC activities in extractive industries for the overall economic performance of a host developing country? The TNC participation may significantly influence the economic performance of host countries at the macro level, in terms of macroeconomic stability, economic growth and income distribution. Much of the impact relates to the development of the extractive activities in general (chapter III), but TNCs can play a specific role.

In terms of macroeconomic stability, arguably the most important effects from TNC activities in extractive industries arise from their influence on the balance of payments of a host country, with potential implications for inflation and the real exchange rate (chapter III). On the one hand, both capital inflows in the investment phase and export revenues in the operation phase can have a positive impact on a country's balance of payments. In Botswana, for example, mineral exports by TNCs have enabled the country to run current account surpluses and to accumulate substantial foreign exchange reserves, which have helped it earn the highest credit rating in Africa.[58] On the other hand, during the construction of a large mining project, imports of equipment and services may have the opposite effects, as will the subsequent repatriation of profits. In Chile, for example, the recent commodity price boom has led not only to a surge in the share of FDI financed through reinvested earnings but also to an increase in the repatriation of profits by foreign affiliates (chapter II). Between 2003 and 2006, the latter grew from $2 billion to $13 billion.[59]

In terms of economic growth performance, TNC involvement in extractive industries generates income in the forms of wages and other payments for host-country inputs and, most importantly, government revenues (section B.1.e). The latter may help developing countries overcome initial constraints on their economic growth, such as low levels of saving and investment, and provide financial resources for investment in infrastructure and human capital. Provided the revenues are appropriately used, this can give a "big push" to the growth of a host economy.[60] At the same time, resource extraction may also have a negative effect

Figure V.4. Growth rates of GDI and GNI, and FDI income, Chile and Peru, 2003-2006



Source: UNCTAD.

on industrialization and long-term economic growth by strengthening various distorting effects.[61] The manner and extent of revenue sharing between TNCs and the host country significantly influence the extent to which extractive industries contribute to economic growth. Also, high FDI income may reduce the positive impacts of any terms of trade improvements on national income. This has been apparent in Chile and Peru in recent years, as highlighted by the gap between the growth rates of gross *domestic* income (GDI) and gross *national* income (GNI) (figure V.4).[62] Furthermore, foreign companies may have a greater propensity to use foreign suppliers of various inputs, thereby limiting TNCs' indirect contributions to domestic value creation through local procurement and other linkages to domestic enterprises (section B.2.a).

Positive contributions to the economic growth of TNC-led extractive industries have been observed in some low-income countries. In Ghana, for example, the share of mining in GDP rose from 1.5% in the mid-1980 to 5.7% in the second half of the 1990s, despite generally low gold prices during that period. GDP per capita, after declining in 1980–1989 by 0.6% annually, started growing again, reaching an average growth rate of 1.9% in 1990–2004, and accelerating to 3% in 2003–2004 (UNCTAD, 2005d: 329). Botswana's abundance of diamonds, exploited jointly with TNCs, has contributed to the country's strong economic growth (box V.2). These and other successful examples notwithstanding, it has been argued that resource-rich economies have tended to grow less rapidly than resource-poor economies (box III.2), though the specific role of TNCs, if any, in this context has not been much studied. However, it is a fact that the growth performance of a number of host countries in which TNCs play a significant role in extractive industries has generally been poor, as highlighted in the case of Nigeria (box V.3).

In addition, even if TNC participation in extractive industries contributes to economic growth in the host country as a whole, the benefits may not be well distributed and the well-being of most of the citizens may not improve. For example, in Equatorial Guinea, where TNCs dominate oil production (chapter IV), the rapid growth of GDP since the early 1990s has not been accompanied by an improvement in the economic and social welfare of the majority of the people. Although GDP per capita reached $4,100 in 2004, the country ranks 120 in the Human Development Index: 57% of its people have no sustainable access to potable water, the majority of the people live on less than a dollar a day, and the average life expectancy is 43 years (UNDP, 2006a). This situation is attributed to a lack of transparency and accountability in the management and deployment of the country's mineral wealth (World Bank, 2002).

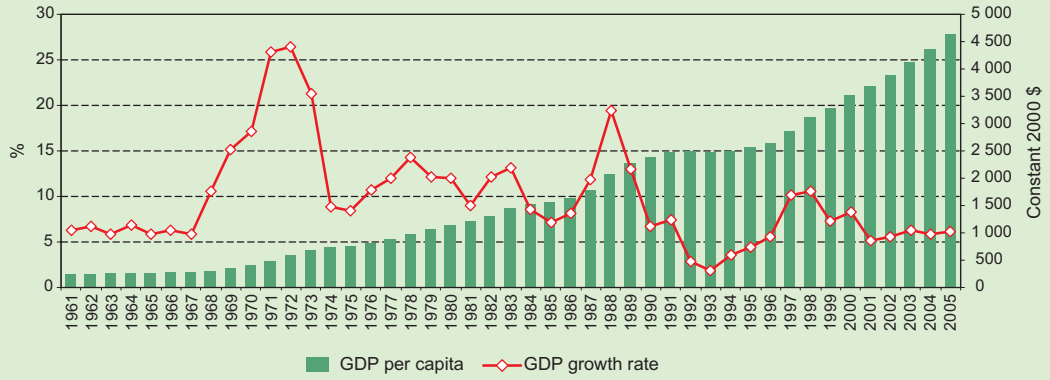
Similar problems prevail in several other host developing countries, especially in Africa. Indeed, the way government revenues are managed and used significantly influences the distribution of income. While resource revenues can be used to improve the welfare of the host-country population and for long-term economic growth, under certain circumstances they may be appropriated by small groups, and consumed rather than invested. If this occurs, capital accumulation and productivity growth, which are crucial for economic development, cannot be realized, and the country (or at least the majority of its population) may end up worse off.

To sum up, the extent to which TNC participation promotes the overall economic performance of a host country depends on many factors, including the scale of TNCs' value-

Box V.2. TNC activities in extractive industries and host-country economic development: the experience of Botswana

Over the 30-year period from 1970 to 2000, Botswana was the fastest-growing economy in the world (box figure V.2.1) and the structure of its economy was transformed. At the time of the country's independence in 1966, agriculture accounted for 40% of GDP, while mining was virtually non-existent; by 2006 agriculture accounted for 2% of GDP and mining for 40%. As a result of mineral-led economic growth, the country has progressed from being one of the poorest countries in the world to becoming an upper-middle-income developing country, and it is the only country ever to have graduated from LDC status.[a]

Box figure V.2.1. GDP growth and GDP per capita, Botswana, 1961-2005



Source: UNCTAD.

The impact of TNCs on Botswana's economy has been integrally linked with that of the mining industry as a whole, as almost all the mining companies are either wholly owned by TNCs or are operated as joint ventures with the Government. Over the period 1975-2006, the industry directly contributed to 46% of total GDP growth, with a particularly strong impact in the early part of the period (box table V.2.1).

Diamonds accounted for about four fifths of Botswana's total exports during the period 2001-2005,[b] which made the country the world's largest producer and exporter of diamonds in value terms. Through its joint venture with De Beers, the main TNC involved in its diamond mining, Botswana has exploited its key natural resource and gained a significant share of the profits.[c] A combination of mineral wealth and foreign investment has yielded considerable development benefits for Botswana, in terms of rapid growth, rising living standards and extensive investment in social and economic infrastructure, along with healthy fiscal and balance-of-payments positions.

Box table V.2.1. Contribution of mining and other industries to GDP growth in Botswana, 1975-2006
(Per cent)

Period	1975-1985	1986-1995	1996-2006	1975-2006
Mining	73.6	20.4	49.0	45.6
Other industries	26.4	79.6	51.0	54.4

Source: Central Statistical Office of Botswana.

The contributions of TNCs to Botswana's economic development have taken place in the context of an open and transparent mineral licensing and taxation regime, and a competent institutional structure. Foreign investment in mining has been encouraged. Leveraging its strong bargaining position, the Government has negotiated favourable rent-sharing arrangements with TNCs.[d] Although the Government has an ownership stake of 15%-50% in major mining projects, it has not assumed a direct operational role in the mining ventures.

Source: UNCTAD.

[a] Income per capita has risen from $76 at independence in 1966 to $5,500 in 2005/06.

[b] Other important mineral exports include copper and nickel. Their share in Botswana's total exports during 2001-2005 was 8%.

[c] De Beers' origins lie in the South African diamond industry. Over time, the company dominated the global diamond industry worldwide. At its peak, De Beers was responsible for marketing more than two thirds of global rough diamond production, and exerted significant control over pricing.

[d] In the mid-1970s, the Government used the opportunity provided by De Beers' applications for further mining licences to reopen negotiations on the terms of the agreement between them. It was criticized for driving too hard a bargain, which it was claimed would discourage further FDI (Hartland-Thunberg, 1978). However, despite the less favourable agreement, De Beers expanded its operation in Botswana. In the mid-1980s, Debswana gained a 5% stake in De Beers, which gave the Government indirect ownership of the TNC. More recently, the Government has again negotiated with De Beers. In return for renewing its licences, the Government has secured commitments from the company to undertake downstream activities in Botswana.

Box V.3. TNC activities in extractive industries and economic development in Nigeria

Nigeria started oil production in 1958. In spite of having been a significant oil producer for decades, the country has not been able to transform its oil resources into economic growth. Its growth performance has been slower than that of most other oil-producing countries, and many other sub-Saharan African countries (Heum et al., 2003).

Nigeria's oil extraction and production has long involved the participation of Shell.[a] The TNC began operating in Nigeria's oil industry well before that country's independence, and is still the leading oil-producing company in the country.[b] Indeed its operations have contributed significantly to increasing Nigeria's exports – total oil revenues were roughly $350 billion during the period 1965-2000 (Sala-i-Martin and Subramanian, 2003). Historical data on government revenues from Shell's operations in Nigeria are not available; in 2005 and 2006, they amounted to $4.3 billion and $3.5 billion , respectively, in the form of taxes and royalties.[c]

GDP growth in Nigeria has been lower than that of its non-oil-producing neighbouring countries, and more than half of Nigerians still live below the poverty line. The country's poor economic performance can be explained largely by its inability to develop its human resources and build a broader industrial base (Heum et al., 2003). The share of manufacturing in GDP had remained at a very low level during the period 1960-2000, and the industrial base continues to remain extremely narrow and heavily dependent on oil. The windfall revenues from oil have had only a minor impact on non-oil value creation and private consumption (Bevan, Collier and Gunning, 1999). Moreover, the inequitable allocation of revenues from oil and gas continues to adversely affect development (UNDP, 2006b). Indeed, despite its oil wealth, Nigeria ranks 159 among 177 countries in the Human Development Index (UNDP, 2006a).

Source: UNCTAD.

[a] In 1937, the company was granted an oil exploration licence covering the entire country.

[b] Shell Petroleum Development Company of Nigeria Limited (SPDC) is a joint venture operated by Shell which accounts for more than 40% of Nigeria's total oil production. The joint venture is owned by Nigerian National Petroleum Corporation (55%), Shell (30%), TotalFinaElf (10%) and Agip (5%).

[c] The Shell Sustainability Reports 2005 and 2006 (www.shell.com/nigeria).

creation activities in the host country, the sharing of revenues between TNCs and the host country, and the capabilities of domestic enterprises and institutions. Whether inputs are sourced locally or imported from abroad will also influence the degree of TNC contribution to local value creation. Most importantly, appropriate institutions and policies can help eliminate or mitigate various distorting effects and leverage TNC participation in extractive industries for economic development. In particular, how government revenues are managed and used considerably influences the final impact. This in turn depends, among other things, on the overall institutional and policy environment of the host economy (chapter VI)

C. Environmental impact

Extractive activities, regardless of who performs them, incur environmental costs. Metal mining has been identified as a highly polluting industry, and oil and gas extraction is also associated with a variety of environmental risks (chapter III). Given that certain negative environmental consequences are unavoidable, the question is to what extent TNC participation contributes to reducing or accentuating them. Clearly, when TNCs are the only firms capable of undertaking extraction activities owing to the lack of domestic firms with the appropriate capabilities and resources, they will be responsible for any environmental degradation.[63] On the other hand, some TNCs may use more advanced and environmentally friendly production technologies and techniques than their domestic counterparts and may also employ and diffuse higher standards of environmental management.

The environmental impacts of extraction projects are influenced by the type of minerals extracted, the technology used, the scale of the extraction activities and the location of the projects, all of which are partly determined by the strategies and activities of TNCs. The larger a mine or an oil field, the greater is its potential environmental impact on the surrounding area and even beyond. The environmental impacts also depend on the geological structures and the techniques of extraction.[64] Furthermore, risks increase when mining is undertaken in the proximity of other economic activities, such as agriculture and fishing, and especially if there is a risk of water contamination. Many mineral deposits are found in environmentally protected areas (usually protected forests), which serve to regulate water flows, prevent floods, control soil erosion, prevent intrusion of sea water, maintain soil fertility and help protect the surrounding ecosystem. If badly managed, the extraction of such deposits can therefore have disastrous environmental impacts. Government

policies and environmental regulations in the host country – including their effective implementation and enforcement – as well as pressures from various stakeholders, such as shareholders, lenders, NGOs and local communities, can influence the environmental practices of TNCs.

In the metal mining industry, fears of adverse environmental consequences often trigger opposition to foreign-invested mining projects, particularly by environmentalists and local communities, who are among the first to be affected. This has been the case, for example, in Ecuador and Peru (ECLAC, 2004: 49).[65] However, in some instances, the pressure to achieve high economic growth rates, create employment and attract FDI has tempted developing countries to accept foreign-invested mining projects that are particularly environmentally risky. In Indonesia, for example, the Government under the New Order regime (1966–1998) legally allowed foreign investment in mining in protected areas, which prompted criticism from various stakeholders, including indigenous peoples and NGOs, both within and outside the country (Erman and Aminullah, 2007).[66] Environmental problems resulting from the dumping of tailings into the sea and rivers by Newmont Mining (United States) in North Sulawesi and Freeport-McMoRan (United States) in Papua badly damaged the image of TNCs in extractive industries in Indonesia (Ibid.). The environmental impacts of mining by TNCs in some sub-Saharan African countries have been mixed (box V.4; Extractive Industries Review Secretariat, 2003).

Once the minerals have been extracted, the mine and its surrounding environment should be restored to its previous state.[67] Traditionally, however, it has been common to abandon a mine

Box V.4. Environmental impacts of FDI in the metal mining industry in selected African countries

In mineral-rich sub-Saharan African countries such as Ghana, the United Republic of Tanzania and Zambia, the environmental impact of TNC activities in the metal mining industry has been mixed. Whereas significant negative consequences in terms of deforestation and air and water pollution have been observed, TNCs have also introduced more environment-friendly technologies and higher standards of environmental protection compared to those of the local artisanal miners.

Ghana. Mineral extraction and processing are estimated to account for some 10% of Ghana's industrial pollution (Boocock, 2002). Exploration and mining in forest reserves is a major environmental issue in the country. Foreign-invested mines have contributed to air and water pollution, and have been rated poorly in an official assessment of their environmental practices.[a] However, the evidence also shows that improved environmental performance in mining is directly linked to the introduction of new technologies through FDI. For example, emissions of sulphur dioxide and arsenic at the Obuasi mine used to be 1,000 times higher than internationally accepted standards (Aubynn, 1997), but they have been largely reduced with the introduction by TNCs of a new technology for gold extraction. The TNCs were motivated more by conditions attached to loans than by domestic legislation (Warhurst, 1998). Although large-scale mining has also contributed to water pollution, the major problem in gold mining is caused by the use of mercury by artisanal miners (Boocock, 2002).

United Republic of Tanzania. Gold mining activities of TNCs have led to various environmental problems in the country (Kulindwa et al., 2003; George, 2003). Dust pollution in the area around the Geita Gold Mine has contaminated drinking water sources of nearby villages. As a result, the mining firm has had to supply tap water to the local community (George, 2003). TNCs have introduced an environment-friendly technology for gold mining, but at the same time, the large scale of their operations has resulted in significant land clearance and considerable deforestation. For example, the Geita Gold Mine has acquired 110 square kilometres in the Geita Forest Reserve, of which a significant proportion has been cleared (Ibid.).

Zambia. Air and water pollution from copper mining has caused major environmental problems in Zambia (Boocock, 2002). Kabwe, a mining town, is known as one of the world's most polluted places from decades of copper mining.[b] During the privatization of ZCCM in the late 1990s, foreign investors were exempted from the environmental liabilities of the past activities of that company, and compliance with environmental regulations was deferred (Ibid.). After the privatization, the new technologies used by TNCs had positive environmental impacts by reducing sulphur dioxide emissions and the concentration of metals in waste dumps. However, other TNCs continue to cause environmental damage. For example, Chiman, a mine opened by Chinese investors in 2005, had been emitting air pollution beyond the statutory limits, affecting hundreds of residents of nearby townships before the Government shut it down in May 2007.[c]

Source: UNCTAD.

[a] The Ghana Environmental Protection Agency publishes an annual rating of mining companies based on their environmental performance. The rating consists of five categories, from A to E (best to worst). In 2000, only one company received a B rating while others rated from C to E (Boocock, 2002).

[b] See www.blacksmithinstitute.org/site10d.php.

[c] "Zambia closes Chinese mine over air pollution: lack of pollution controls threatens health of area residents", *Agence France Presse*, 15 May 2007 (www.industry.com).

Box V.5. Environmental impact of TNC activities in the Niger Delta

Oil exploration and production by TNCs has had significant impacts on the environment in the Niger Delta in Nigeria. In this area of natural wealth and extremely low income, environmental degradation and poverty are interlinked, as the poorest people of the Delta are often the worst affected by the environmental impacts of TNCs' oil extraction activities, not only in terms of their health, but also their livelihoods.

Major environmental problems include the destruction of freshwater ecosystems from the construction of canals which has caused saltwater to flow into freshwater zones; oil spills, of which some 5,400 incidents were officially recorded between 2000 and 2004;[a] air pollution resulting from most of the gas produced being flared; and the depletion and illegal logging of forests to enable exploration and production activities by TNCs. In addition, unrecycled and untreated waste generated by oil operators has been discharged onto land, mangrove and freshwater swamps as well as into the sea. However, it is not only TNCs that have caused environmental damage; Nigerian oil firms in the region have also been very lax in their environmental practices (Litvin, 2003).

In some respects, the situation has improved over time. Currently, most foreign facilities have been certified under ISO 14001 relating to environmental management standards. Shell Nigeria, for example, has undertaken a series of investments in gas collection and utilization projects, with a view to eliminating gas flaring by 2009.[b] However, it should be pointed out that the date for ending gas flaring in Nigeria's oil industry has repeatedly been postponed (Idemudia, 2007).

Source: UNCTAD.

[a] See "5,400 spills threaten Niger Delta-Ugochukwu", *Daily Champion*, 24 November 2004, http://allafrica.com/stories/printable/200411240494.html.

[b] According to the company, between 2000 and 2005, its gas flaring was reduced by 30%. Shell Nigeria is committed to ending continuous flaring at the Shell Petroleum Development Company of Nigeria joint venture's more than 1,000 wells during 2009 (Shell Sustainability Report 2006, www.shell.com/nigeria).

site (Peck, 2005), which can lead to various environmental problems such as acid mine drainage, surface and groundwater pollution, soil contamination, landslides due to collapse of waste and tailings dumps (Balkau, 1999). Today, most large TNCs have made substantial progress in restoring mine sites following their closure, and it is mainly the artisanal and small-scale miners that now pose a problem in developing countries (OECD, 2002; Peck, 2005).[68] Nevertheless, the environmental legacy left by TNCs' past mining activities still frequently leads to environmental problems (Danielson and Lagos, 2001), sometimes requiring them to share the responsibility for cleaning up.

In the oil and gas industry as well, TNC activities have had negative environmental impacts. In the Niger Delta in Nigeria, for example, oil spills, the flaring of excess gas and deforestation from oil exploration and production activities by TNCs have had damaging effects on the environment (box V.5). In Equatorial Guinea, on the other hand, oil companies appear to be respecting internationally accepted oilfield practices and environmental standards (World Bank, 2002: 8).

The environmental performance of companies varies. Some TNCs are attaching increasing importance to higher environmental standards when undertaking investments, partly in response to external pressure by various stakeholders, and partly out of self-interest. TNC activities have become more visible, and environmental issues today are more closely monitored. As a result, those that cause environmental damage face greater reputational and financial risks (Bond and Weber-Fahr, 2002). Growing environmental awareness among the large, established TNCs in both metal mining and oil and gas extraction can be considered a positive development. Accidents still occur, but their environmental practices have generally improved over the past decade. Nowadays, most large mining TNCs apply their home-country environmental standards to their new projects abroad. Many have also established industry-wide guidelines or codes of conduct covering the performance of subcontractors.[69] However, some new entrants in the global extractive industries have emerged from home countries with relatively weak environmental legislation. It is important for these emerging TNCs to implement good practices and apply higher standards of environmental protection, which will benefit both themselves and the host countries in which they operate (chapter VI).

The environmental performance of large, established TNCs is often superior to that of domestic enterprises, particularly of artisanal and small-scale miners (e.g. Ericsson and Norås, 2005). Chile's mining industry, in which State-owned enterprises, TNCs and joint ventures are involved, enables comparisons of their relative performance. Early studies (e.g. Borregaard, Blanco and Wautiez, 1998) highlighted the gap in environmental performance between foreign and Chilean companies in the 1980s and 1990s. But this

gap narrowed in the 1990s (Borregaard and Dufey, 2002). Most of the remaining differences are related to environmental management skills (Ibid.), while concerns related to TNC-operated extractive projects have more to do with the large scale of their projects and, thereby, their larger environmental footprints.

TNCs may introduce and diffuse higher standards and more advanced technologies for environmental protection. Empirical evidence suggests that "FDI in the mining sector can reduce or increase pressures on the environment, as compared with domestic investment, depending on the geographical location and whether regulatory, technology or scale effects are considered" (OECD, 2002: 10). In Peru, foreign investment has stimulated the use of more environment-friendly technologies and catalysed a technological transformation in the country's mining industry,[70] which has contributed towards a better environmental performance of the whole industry (Pascó-Font, 2000).

The overall environmental impact depends largely on host-country regulations and the institutional competence of governments for implementing them. Given the necessary framework and conditions, favourable effects in terms of improved standards and their diffusion, including through spillovers to domestic firms, could follow. For governments, the challenge is to minimize and manage the environmental stress caused by extractive activities, regardless of whether these are undertaken by domestic firms or by foreign TNCs. Host-country policies and regulatory measures need to be designed and implemented in a way that encourages companies to adopt the highest possible standards of environmental protection and to reduce negative impacts resulting from their activities (chapter VI).

D. Social and political impacts

The social and political impacts of TNC involvement in extractive industries, more than in other industries, have been the focus of considerable attention. Concerns related to health and safety have consistently presented a challenge to the extractive industries (section D.1). Social concerns often also arise from the relationship between TNCs and the local communities residing in the vicinity of their extractive operations, the influx of migrant workers and various related issues (section D.2). Additional risks are associated with human rights abuses, committed directly or indirectly by TNCs (section D.3). Political problems may stem from disputes over the distribution of the resource revenues, corruption, and even armed conflict among different groups seeking to benefit from the revenues generated by extractive activities (section D.4). TNCs can introduce higher standards in dealing with various social issues, but they can also become associated with specific problems.

Generalizations are difficult to make, as the outcome depends largely on the specific host-country situation. Negative social and political effects have been observed mainly in mineral-rich, poor countries with weakly governed States. Problems are often associated with the characteristics of certain minerals, poor governance structures, and weak institutional capacities of host countries in the formulation and implementation of laws and regulations.

1. Health and safety impacts

TNC activities in the extractive industries can have health and safety impacts not only on people working in those industries (occupational health and safety), but also on nearby communities, for example, through air and water pollution resulting from those activities (discussed in the previous section).[71]

Mining in general has been identified as among the most hazardous industries.[72] However, the occupational safety and health implications vary significantly between different mining activities and countries. In the working environment of a surface mine, for example, airborne contaminants (such as rock dust and fumes), excessive noise, vibration and heat stress can create health problems for mineworkers who are subject to a frequent and prolonged exposure to them. In this context, a distinction can be made between industrial and artisanal mining. TNCs' extractive activities belong to the former category, and are usually larger in scale, better regulated and safer (Dreschler, 2001). Informal artisanal mining, on the other hand, takes a particularly heavy toll in terms of death and injuries in countries where large numbers of people are engaged in this hazardous activity, due to the lack of controls and regulations.

Historically, coal mining has been associated with major health and safety risks related to slope failure, the collapse of underground mining roofs, gas explosions and unhealthy air quality. Improvements in mining methods and protection technologies have greatly reduced these risks in modern coal mines, where more than 90% of coal is now produced using mechanical automation techniques. In addition to technical improvements, TNCs have transformed their safety record by making safety a priority (Rui, 2005). Therefore,

Box V.6. Worker safety in coal mines in China

China produces one third of the world's coal output, but accounts for four fifths of the world's coal-mine fatalities. In 2003, the death rate per million tons of coal mined in China was 130 times higher than in the United States, 250 times higher than in Australia and 10 times higher than in the Russian Federation.[a] There has been a significant and widening gap between the safety record of Chinese domestic coal mines and that of coal-mining TNCs worldwide (Rui, 2005 and forthcoming). In the past five years, the situation has improved. However, in 2006, while TNC-operated mines had close to zero deaths per million tons of coal extracted, the average overall rate in China was still more than 2 deaths per million ton, mainly due to a particularly high death rate in township and village enterprises (box table V.6.1).

Box table V.6.1. Safety performance of different types of coal producers in China, 1999-2006
(Deaths per million tons)

Coal producer	1999	2001	2002	2003	2004	2005	2006
Key State-owned enterprises	1.0	1.5	1.3	1.0	0.9	0.9	0.6
Local State-owned enterprises	3.5	4.7	3.7	2.0	2.3	2.0	1.1
Township and village enterprises	11.0	18.5	12.2	13.4	5.6	5.5	4.4
National average	4.5	5.3	4.6	3.6	3.1	2.8	2.0

Source: Rui, 2005 and forthcoming; China National Coal Association, various years.

In 2005, 23,000 privately owned and collective-owned coal mines produced 38% of the coal mined in China, but accounted for 70% of related deaths and accidents. The Government acknowledges that the rates of severe and particularly large accidents "were consistently high" (China National Coal Association, 2005). Officially, the number of deaths has been over 4,700 per year since 2000.[b] Unofficial estimates put the numbers even higher, reflecting the fact that township and village mining enterprises usually do not publish details of accidents and deaths.

Source: UNCTAD, based on Rui, 2005 and forthcoming.
[a] Chinese Academy of Social Science, 2006.
[b] *Source*: State Administration of Work Safety and State Administration of Coal Mine Safety, China (www.chinasafety.gov.cn).

the incidence of multiple fatalities is now rare in the developed world, and relatively uncommon in TNCs' operations in developing countries. By contrast, domestic coal producers in many developing countries have not yet attached the same priority to safety considerations. For example, in China, over 60% of all coal-mining operations still use non-mechanical methods, resulting in a large number of serious accidents (box V.6).

In the oil and gas industry, the frequency of accidents is lower than in mining and many other industries.[73] However, because the products of the industry are combustible and potentially explosive, accidents such as fires and explosions can have serious consequences. In July 1988, for example, 167 workers were killed when the Piper Alpha North Sea rig of Occidental Petroleum (United States) exploded after a gas leak.[74] After this worst oil-rig disaster in the world, TNCs tightened up their safety procedures. Now, they generally attach greater importance to high safety standards; in many cases, these standards are higher than those of indigenous companies in developing and transition economies. The Sakhalin-1 Project, for example, has had an accident rate which is more than four times lower than the average for the Russian oil and gas industry.[75] In spite of the higher health and safety standards being adopted by TNCs, additional efforts are needed to further reduce the health and safety risks posed by their activities.[76]

2. Social impacts on the local community

Local communities are the most directly affected by TNC activities in extractive industries. On the one hand, their well-being can be enhanced by the economic contributions of TNCs, such as job creation and higher incomes, or through improvements to local infrastructure and social services. Such contributions can help reduce local poverty and increase social welfare in absolute terms. On the other hand, there may also be various social costs.[77] These cannot always be attributed to TNCs per se, but to the inherent characteristics of extractive activities. However, given their prominent role in the mineral production of many developing countries (chapter IV), TNCs inevitably become associated with related problems (Ballard and Banks, 2003).

Several factors underlie the social impacts of TNC involvement on the local community. First, adverse social consequences are associated with the relationship between TNCs and local communities within the general area or region where the extractive operations are located. Resource extraction operations are cadastral in that their areas of operation are delineated, which implies that the groups of people living in those areas enter into an economic relationship with the company; they are defined as "landowners" or "mining lease

residents" and gain access to a range of benefits or compensation from the company. The people that reside in the vicinity but outside the lines of demarcation have no such access to benefits and are often marginal in terms of economic relations with the company. Conflicts around the large-scale mining sector that prevail in some developing countries are driven as much by this marginalization, as by the distribution of benefits to the insider groups (Banks, 2007).[78]

There are various sources of potential tension at the community level, including the use and management of land, the relocation of people (including indigenous populations), and accordingly the loss of land and livelihoods.[79] Indeed, the latter has been the main grievance against mining activities in Indonesia. For example, in the construction of the Kelian Mine in Indonesia by Rio Tinto (United Kingdom) and the local PT KEM, the land and assets of the local people were expropriated; some were compensated, but at rates considered unfair by the community (Oxfam Community Aid Abroad, 2001). In the case of the Soroako project in South Sulawesi, Indonesia operated by Inco (Canada), much of the agricultural land adjacent to the mine was requisitioned for the mine's infrastructure, including an airport, a sports oval and a golf course. Local communities were excluded from negotiations regarding the land, and compensation for the acquired land was perceived to be inadequate (Ballard, 2001). When the communities are included, it can spark off internal disputes and questions about identity as people strive for recognition as "landowners" to claim eligibility for compensation (Banks, 2005). Moreover, social problems may erupt as a result of disagreements over compensation. In the cases of the Kelian Mine in Indonesia and the Bulyanhulu Mine in the United Republic of Tanzania, for example, it was alleged that the relocated people experienced a dramatic fall in their living standards due to inadequate compensation (Oxfam Community Aid Abroad, 2001; Extractive Industries Review Secretariat, 2003).

In addition, large mines usually need ample and stable supplies of electricity, water and other utility services. When TNCs' mining operations are in regions where these services are inadequate or unreliable, competition for them may create tensions between the TNCs and the local community. Furthermore, crowding-out effects on artisanal miners may trigger conflicts between foreign and domestic operators. For example, the displacement of artisanal gold miners in the United Republic of Tanzania has exacerbated conflicts between them and those that have displaced them (Hilson and Potter, 2005). For indigenous peoples who usually live in vulnerable environments, TNC activities in extractive industries may threaten their culture and interdependence with biological diversity, disrupt their traditional lifestyles and affect their social welfare (box V.7).

TNC entry may also create tensions between local communities and migrant workers. As noted above, there is often a need to bring in workers from other parts of a host country, or expatriate workers, to operate a large mine. This can lead to a reconfiguration of local social structures, relationships and identities. Some studies suggest that FDI in mining operations in the United Republic of Tanzania is a "successful vehicle for social integration", as the mining firms attract labour from all over the country (Kulindwa et al., 2003), while others have a much less positive assessment of their impact on local communities (George, 2003). With or without TNC involvement, the influx of migrant workers, contractors and others linked to large extractive projects can be socially disruptive for local communities (Banks, forthcoming), sometimes causing them to suffer from various social pathologies, such as increasing levels of alcoholism, prostitution, gambling, violence and lawlessness, as well as diseases, including HIV/AIDS.[80]

Social problems can also be associated with the closure of mines operated by TNCs (e.g. the Misima mine in Papua New Guinea and the Kelian mine in Indonesia). After deposits are exhausted or become uneconomical to extract, and TNCs close their operations and leave, local populations might be left with no alternative employment opportunities, a scaled down infrastructure and destroyed land. For instance, one of the issues for the joint venture involving TNCs at the Porgera gold mine in Papua New Guinea is how to facilitate and improve the scope for small-scale mining once its large-scale operations end (Banks, 2007).

In response to such challenges, more and more TNCs are becoming aware of the social effects of their activities. In the context of responsible investment, they have been focusing on meeting the needs of local communities in order to obtain a social licence – an implicit *de facto* licence for mining from civil society (in addition to an explicit *de jure* licence from the State). Accordingly, extractive-industry TNCs are frequently helping local communities improve roads, health and education facilities and water systems. Some improvements have resulted in limited or only short-term benefits for communities, while others make positive contributions over longer periods:

- In Botswana, two major mining companies (Debswana and BCL) have invested extensively in health and education facilities in local communities. Both companies operate hospitals

Box V.7. Social impacts of extractive-industry TNCs on indigenous peoples: selected cases

Indigenous peoples usually live in vulnerable environments that may also constitute reservoirs of biodiversity. A large number of them still occupy their traditional lands, and rely on subsistence activities such as hunting, fishing, trapping, gathering or herding. Their survival depends on the survival and sustenance of their ecosystems. The land is also at the core of their collective identity and spirituality. Yet many TNC activities in extractive industries take place in areas inhabited by indigenous peoples, and they can have serious environmental impacts on those areas, as noted earlier, affecting the inhabitants' livelihoods and way of life. The loss of biodiversity or alteration of their ecosystems as a result of TNCs' activities can therefore have dramatic consequences.[a] In addition, various cases of abuse and violations of their social, cultural, economic, civil and political rights have been reported.[b]

Ok Tedi mine in Papua New Guinea. The Ok Tedi copper and gold mine[c] is located in the Star Mountains of Papua New Guinea, an area inhabited mainly by indigenous peoples. Since the late 1980s, almost 2,000 square kilometres of downstream lowland rainforest has been flooded and destroyed by tailings and waste rock from the mine. This has caused environmental and social harm to the 50,000 people who live downstream of the mine. Their means of subsistence and activities have been disrupted as a result of heavy water effluents, and air and soil contamination generated by the mining operations. Various indigenous peoples have suffered from chronic illnesses, including rashes and sores caused by pollution. In 1994, 30,000 landowners from Papua New Guinea brought a legal claim against the mining company BHP (now BHP Billiton). A negotiated settlement worth approximately $500 million in compensation and commitments to tailings containment was reached in June 1996, though this may not have been entirely successful in addressing the issues (Kirsch, 2007).

ChevronTexaco's oil operations in Ecuador. From 1964 to 1992, Texaco (now part of Chevron) built and operated oil exploration and production facilities in the northern region of the Ecuadorian Amazon. Before the oil company arrived, an area of more than 400,000 hectares was pristine rainforest, with six indigenous communities and about 30,000 indigenous peoples living in the natural environment. Heavy pollution caused by oil extraction, production and transportation had serious consequences. The construction of exploration roads was followed by an influx of settlers who damaged the surrounding forests through logging, extensive agriculture and the introduction of domestic animals. In addition, the new settlers and foreign workers introduced various diseases among the indigenous communities. The result was an exploding health crisis among the region's indigenous and farming communities, including rising levels of cancer, reproductive problems and birth defects.

The Chad-Cameroon pipeline project and the Bagyéli people. The Chad-Cameroon pipeline project involves a consortium of companies: ExxonMobil (United States) is the operator, with 40% of the private equity, Petronas (Malaysia) has a share of 35% and Chevron (United States) has 25%.[d] The 1,070-kilometre pipeline cuts through some of Africa's old growth tropical rainforest and through the villages of the Bagyéli indigenous communities. These communities depend on the forest and forest products for their subsistence-based lifestyle. Less than 5% of the affected Bagyéli are employed in the pipeline project. However, its impact on their social welfare has been considerable. Increased logging, the loss of water resources, and noise and river pollution have damaged their hunting grounds and fishing areas; while the destruction of the surrounding forest and medicinal plants have caused cultural and health problems.

Source: UNCTAD, based on Kirsch, 2002 and 2007; Forest Peoples Programme, at: www.forestpeoples.org; and AmazonWatch, at: www.amazonwatch.org.

[a] See conclusions of the 2001 OHCHR workshop on indigenous peoples, private sector natural resource, energy and mining companies and human rights (United Nations Document No. E/CN.4/Sub.2/AC.4/2002/3).

[b] See the report of the Special Rapporteur on indigenous people (United Nations Document No. E/CN.4/2003/90)

[c] The Ok Tedi mine is operated by Ok Tedi Mining Ltd (OTML) which is majority-owned by the PNG Sustainable Development Program Limited (PNGSDP). Prior to 2002, it was majority-owned by BHP Billiton. PNGSDP is the result of an agreement between BHP Billiton and the Papua New Guinea Government. Under the agreement, all of the dividends from OTML that would once have gone to BHP Billiton now go to PNGSDP, which has the role of spending profits from the mine wisely on development in Papua New Guinea. As a company "limited by guarantee", PNGSDP does not have shareholders (see http://www.pngsdp.com/companyprofile.html; PNGSDP, Annual Report 2002).

[d] The project also benefited from World Bank and IFC loans.

that are open to both company employees and the general public. Debswana has been actively addressing the HIV/AIDS problem, and was the first company to provide anti-retroviral therapy (ART) to employees and family members free of charge (UNCTAD, 2007i).[81]

- In Chile, Minera Escondida donates 1% of its pre-tax income to corporate social responsibility-related projects in the country (UNCTAD, 2007j).
- In Indonesia, Freeport-McMoRan Copper & Gold has been donating 1% of its gross revenues to support community development projects at the village level. Since 1996, it has contributed $61 million to the Freeport Fund for Papua Development, a programme managed together with an NGO and the leaders of local tribes and churches (Erman and Aminullah, 2007).

- In the United Republic of Tanzania, some mining TNCs have launched specific social investment programmes in various areas such as health and education to increase the well-being of local communities. The total expenditures were $30 million for the period 1999-2005.[82]

TNC involvement in local community development is not without its problems. One issue is whether it causes some States to abdicate some of their core functions, such as providing basic education or health care. A firm's investment in social infrastructure may be motivated by factors other than advancing the best interests of the local community; it may respond to the priorities of specific government officials rather than to those of the wider community. Or their investment may serve to assuage local fears and serve public relations purposes. Community development projects should identify the needs of the local community through a needs assessment exercise conducted prior to the inception of a project. However, this may not always happen. For example, according to one study, some of the schools, hospitals and clinics built in Sudan by Petrodar Operating Company (British Virgin Islands),[83] appeared not to be "primarily designed to serve the needs of the people" and to "remain poorly utilised or even empty" (ECOS, 2006: 23). This might be avoided by linking community development programmes of TNCs to the development planning processes of local governments (Frynas, 2005: 583–587).

3. Human rights implications

TNC participation in extractive industries has been criticized as having a potentially adverse impact on the human rights situation in some host countries. Alleged human rights abuses include the disappearance of people, arbitrary detention and torture, loss of land and livelihoods without negotiation and without adequate compensation, forced resettlement, the destruction of ritually or culturally significant sites without consultation or compensation and labour rights violations. In other instances, the dislocation of local populations has been linked to crimes against humanity.

In a survey of alleged corporate human rights abuses, as many as two thirds of the total of 65 abuses reported by NGOs were related to the extractive industries (United Nations, 2006), and they occurred mainly in poor countries with weakly governed States. As noted by the Special Representative of the Secretary-General of the United Nations on human rights and transnational corporations and other business enterprises: "there is clearly a negative symbiosis between the worst corporate-related human rights abuses and host countries that are characterized by a combination of relatively low national income, current or recent conflict exposure, and weak or corrupt governance" (Ibid., para. 27).

According to the same survey, a variety of the alleged violations of human rights were committed by public (often government-controlled) and private security forces protecting company assets.[84] The use of such forces by some TNCs in weakly governed States or conflict zones has prompted concerns regarding the use of indiscriminate force.[85] There have been many reported abuses by private security forces,[86] as well as a large number of charges against private firms acting on behalf of TNCs.[87] Another problem occurs when TNCs rely on State forces to provide security. While these forces may be under the control of a host-State entity, TNCs might still be held accountable for their behaviour when they support their actions either by paying their salaries, or providing intelligence or other services such as transportation.

4. Corruption, conflict and other political issues

TNCs in extractive industries are more likely than those in other industries to retain a presence in conflict zones, because these areas are often endowed with minerals associated with high rents. TNC participation can reinforce adverse political impacts, often related to the distribution of resource revenues. The quality of governance is a key factor in determining whether a mineral-resource-rich country will succumb to such interrelated political problems as disputes over the resource rent, corruption, or even armed conflict or war.

Corruption is often endemic in societies that rely on extractive industries as their main source of income – with or without TNC involvement (Leite and Weidmann, 2001; Ross, 2001; Sali-i-Martin and Subramanian, 2003: 9). TNCs can add to the problem by adhering to non-transparent business practices, for example in host countries that treat the amount of revenues generated by extractive industries as a State secret (Catholic Relief Services, 2003: 1). TNC participation may not only add to corruption in a country; it can also extend support to authoritarian regimes, for example by providing governing elites with access to funds (Shankleman, 2006: 3).

Many conflict-prone States are desperately poor, despite significant mineral resources (UNDP, 2005: 165). TNCs are often the only avenue for some of them to exploit their resource wealth. But a foreign investor and the resulting inflows of revenue can contribute indirectly to conflict by sustaining regimes that fail to address socio-economic

and political grievances and/or by providing an economic incentive for the conflict. TNCs investing in conflict-prone areas might be confronted by various stakeholders fighting for control of the resource rent. A TNC's decision to support local communities by investing in a particular region might arouse the envy of other groups, thereby unintentionally fuelling secessionist movements and/or providing support to one ethnic group over another. TNC participation may also sustain conflicts by unintentionally financing combatants (International Peace Academy, 2004).

The link between conflicts and extractive-industry TNCs is indirect, with governance failure at the central and local levels being the mediating variable. TNCs might become the target of local turmoil, for example, if promised improvements and contributions are not realized. In the case of Shell in Nigeria, it was agreed between the central and the local governments that an increased share of revenues from oil exploration would flow to the local governments, which in turn would provide local services (Litvin, 2003). However, little of this additional revenue found its way into local development projects. As a result, activists in the Niger Delta targeted Shell, which has a local presence, whereas the Government is based far away in the capital (UNDP, 2006b).

The existence of human rights violations and/or conflict situations highlights the dilemma faced by TNCs when deciding whether or not they should engage in operations in a certain country. The mere presence of foreign investors may contribute indirectly to the maintenance or prolongation of a conflict. The issue has been highlighted in the case of Sudan, where some companies have chosen to divest while others have entered.[88] More research is needed to clarify under what circumstances it is appropriate for a company to operate in countries characterized by conflict or serious human rights violations.

E. Conclusions

As in other industries, the involvement of TNCs in extractive industries may assist or hamper the achievement of various development objectives. At best, it can put a host country on a faster development track; at worst it can accelerate a vicious circle of negative results. The net outcome depends on such factors as the mineral extracted, the behaviour of the TNC involved and the country's institutional capacity to regulate and monitor its extractive industries. Host-country policies and institutions are crucial in this context, as they shape the relationship between TNCs and various stakeholders, influence the behaviour of TNCs and determine how the resource rent will be shared. Without a well-developed institutional framework, there is an increased risk that economic benefits from mineral extraction will be outweighed by environmental and social costs, resulting in few, if any, benefits (chapter VI).

Many of the underlying determinants of the economic performance of resource-rich countries are not directly related to TNCs. Therefore, the involvement of extractive-industry TNCs per se may not be the main factor explaining the net outcome of resource-based development. TNCs can, however, improve the overall performance of the extractive industries by contributing capital, technology and management skills and, as a result, boost output, exports and government revenues. They can also complement domestic investment and expose local companies to competition. Moreover, responsible TNCs may be better placed to address adverse environmental and social impacts of their activities. But there can also be drawbacks to their presence in developing countries that are related, for example, to their ownership and control over production and revenues, transfer pricing, limited local procurement and linkages and various adverse environmental and social impacts of their activities, as well as to the unequal bargaining power of host-country governments vis-à-vis the TNCs.

Some new extractive-industry TNCs originate in home economies with less stringent regulations in the social and environmental areas. Moreover, they may not be subjected to the same level of public scrutiny (e.g. by media and civil society) as other companies (*WIR06*). A number of them operate in host countries which other TNCs are, for a variety of reasons, less likely to operate in (chapter IV). The overseas expansion of these newcomers is a recent phenomenon, and relevant data for systematic comparisons are lacking. As their foreign activities are expected to expand, however, they would likely benefit from an increased awareness of how to address various social and environmental issues associated with their activities abroad.

The most positive outcomes of resource extraction have been achieved in countries with well-functioning institutions, where the development of industries has involved the active participation of domestic enterprises rather than only TNCs. Low-income countries that lack adequate domestic resources and productive capabilities are the most in need of the package of assets that TNCs can offer: foreign capital, know-how, technology and skills. At the same time, weak domestic capabilities often limit their ability to reap various benefits from the entry and operations of TNCs. This weakness also places them in a less favourable position in

negotiations with foreign investors and reduces their opportunities for securing wider economic benefits through linkages and spillovers. Government policies therefore need to address not only the manner of participation of TNCs in the extractive industries, but also the capabilities of domestic companies in those and supportive industries.

The chances of benefiting from TNC participation in the extractive industries increase if host governments have a long-term plan concerning natural resource extraction, and an effective, mechanism for ensuring that the benefits accruing are fairly shared by the various stakeholders. Governments also need to invest some of the revenues earned from mineral extraction in building the economic and social infrastructure needed for sustainable development. The challenge is to take advantage of what TNCs can offer as a catalyst for industrial and economic growth while minimizing the costs. In particular, when designing institutions and policies, social and environmental concerns need to be balanced against economic considerations.

Notes

1 The shares of minerals in the total exports of China and India during the period 1990–1999 were 1.9% and 3.8% respectively, which are the lowest among 51 developing countries with significant mining industries (World Bank and IFC, 2002).

2 Minera Escondida has the largest copper production in the world. It is owned by BHP Billiton (Australia) (57.5%), Rio Tinto (United Kingdom) (30.0%), JECO Corp. (Japan) (10.0%) and IFC (2.5%) (www.escondida.cl).

3 "Latin America: beating the oil curse", *Business Week*, 4 June 2007.

4 It has been estimated that in the Russian Federation $900 billion in investments would be required to increase the current output of 9 million barrels of oil per day to 10.5 million barrels per day by 2030, see "A side door to Russia's oil fields Moscow's need for Western technology could lower barriers", *International Herald Tribune*, 13 May 2006.

5 *Source*: Ministry of Energy and Mining, Government of Peru.

6 See, for example, "The wealth underground: Bolivian gas in State and corporate hands", *Znet*, 8 May 2006 (www.zmag.org). See section II.A.3 for the latest trends in the nationalization of Bolivia's oil and gas industry.

7 For example, Rosneft raised some $10 billion through an IPO.

8 The initial capital of the proposed bank will come from the foreign exchange reserves of several Latin American countries, including Argentina, Bolivia, Brazil, Ecuador, Paraguay and Venezuela. These reserves have substantially increased since 2004 partly as the result of the commodity price boom. It has been proposed that all member countries contribute fairly equal shares to the Bank's initial capital. Among others, it has been announced that it could provide finance for the gas pipeline project from Argentina to Bolivia (See "Banco del Sur to start up in 1H07", 1 May 2007, at: www.rigzone.com).

9 For example, the Camisea Project is owned by a gas production and gas pipeline consortium, TGP, which has received a loan of $109 million from the Brazilian Development Bank (BNDES).

10 Heavy crude oil is any type of crude oil which does not flow easily. Its production is usually difficult, requiring a variety of enhanced oil recovery techniques.

11 See "Venezuela moves to nationalize its oil industry", *Power and Interest News Report*, 19 May 2006 (www.pinr.com).

12 See "CNOOC: limited room in the down stream, deep-sea technology still weak", 25 April 2005 (http://biz.ec.com.cn).

13 Different activities along the extractive value chain have different degrees of labour intensity and require different types and levels of skills and competencies. Most job opportunities usually arise in construction and extraction occupations, followed by other blue-collar occupations in production, transportation (including of materials), and installation and maintenance, as well as various management and professional occupations, such as engineers and technicians (Bureau of Labor Statistics, United States Department of Labor, www.bls.gov).

14 For example, in 2003, every $1 million of United States outward FDI stock in the extractive industries in developing countries was related to 2.5 jobs, compared with 23.8 jobs in manufacturing (table I.6).

15 In metal mining, for example, surface mining operations that dominate TNCs' extractive activities are particularly capital-intensive.

16 In some developing countries, artisanal and small-scale mining, which is labour-intensive, contributes significantly to employment creation (chapter III).

17 Mining companies employ somewhat more people, as employees not directly engaged in mining activities are classified under other economic activities.

18 *Source*: National Institute of Statistics and Information of Peru.

19 See "Sakhalin Energy 2006" (www.sakhalinenergy.com) and "Shell v Rossii 2007" (http://www.shell.com).

20 See section D for related social problems.

21 See "CNOOC: limited room in the down stream, deep-sea technology still weak", 25 April 2005 (http://biz.ec.com.cn).

22 Although their marketing advantages for distributing minerals may not be as important as in distributing consumer goods, foreign affiliates in mining often have advantages over local firms in host developing countries in accessing and serving foreign markets.

23 In Botswana, for example, mineral extraction driven by TNC participation has had a strong impact on exports, which rose from $15 million in 1969, prior to the start of mineral exports, to $4.4 billion in 2005. Minerals now dominate the country's exports, with diamonds accounting for 78% of total exports during 2001-2005 (Source: Central Statistics Office of Botswana).

24 *Source*: Chilean Central Bank and ECLAC Yearbooks.

25 *Source*: Central Statistics of Zambia.

26 *Source*: Ministry of Energy and Minerals and National Bureau of Statistics, United Republic of Tanzania.

27 Mineral rents reflect the difference between the market price of the minerals and the relevant costs, including the costs of exploration, production and any necessary processing (processing or treatment required to make transportation economically feasible), as well as a certain ("normal") return on investment.

28 The government's "take" refers to the proportion of the undiscounted net revenues generated over a project's lifetime that is captured through the fiscal system.

29 In Mali, the 1991 mining code provided mining companies a 5-year tax holiday after first production. The mining code revised in 1999 abolished the tax holiday, but the stability guaranteed by the mining convention meant that the companies could opt to remain under the previous fiscal rules (Cole-Baker, 2007).

30 In the oil and gas industry (as in the metal mining industry), information on tax payments by TNCs is seldom disclosed on a country-specific basis (Save the Children, 2005).

31 Comparing tax payments with export revenues can be misleading as the latter is a gross measure that includes the cost of production.

32 *Source*: Chilean Copper Commission and the Ministry of Finance of Chile. Data on non-copper mineral exports are not available.

33 During the period 2004-2005, total copper exports of the 10 largest private mining companies amounted to $16.6 billion,

and their tax payments totalled $2.7 billion (Source: Chilean Copper Commission and the Ministry of Finance of Chile).

34 *Source*: Bolsa de Valores de Lima (www.bvl.com.pe) and Superintendencia Nacional de Administración Tributaria (www.sunat.gob.pe).

35 *Source*: Ministry of Energy and Minerals, United Republic of Tanzania.

36 *Source*: Central Statistical Office of Zambia.

37 In Bolivia, for example, in an interview the Minister of Mining, Guillermo Dalence, called the $45 million received in tax revenue a "ludicrous amount" compared with the recorded mining exports of $1 billion in 2006. See "Bolivian official calls for 600% mining tax increase", *Resource Investor*, 8 January 2007 (www.resourceinvestor.com).

38 Even without accelerated depreciation, operations may take a long time to show any profits, particularly if companies are allowed to carry over losses to subsequent years.

39 In addition, another $125 million was collected in 2006 following the introduction of a royalty tax on mining companies in 2004.

40 *Source*: Chilean Copper Commission.

41 These companies represent over 80% of the global metal mining industry by capitalization.

42 Governments have also collected indirect tax revenues, such as import duties, property taxes and royalties.

43 For example, United States, the home country of ALCOA, accounted for 14% of the company's income from continuing operations in 2004, but for 30% of the company's total current income tax payment (ALCOA, Annual Report 2005).

44 See, for example, Campbell, 2004; UNRISD, 2005; Christian Aid, 2007.

45 For example, labour unrest has been a continuing problem for Grupo México, with strikes occurring during 2004 and 2005 at each of its divisions. In some cases, disputes concerned labour contract renewals; in others, potential job losses triggered the discontent. In mid-2006, the company was once again strike-bound, with both its Cananea and La Caridad copper operations affected, as well as its San Martin polymetallic mine.

46 El Abra is the first important joint venture between a foreign company and Codelco. Phelps Dodge and Codelco own 49% and 51%, respectively, of the venture.

47 However, the bargaining between the two is not a zero-sum game, as some kinds of collaborative strategies can increase the overall size of the rents to be divided and increase the absolute level of returns to all parties. The specific policy choices and institutional arrangements are the outcome of the interplay of domestic groups trying to maximize their own interests as well as the national interest.

48 See also chapters III and VI.

49 Governments also need to avoid using the revenue or expectations of more revenue to increase borrowing as this may exacerbate the symptoms of Dutch disease by adding to the appreciation of the real exchange rate. See also chapters III and VI.

50 In developing and transition economies where State-owned enterprises play an important role, especially in the oil and gas industry, the cost of monopoly in terms of efficiency loss can be high. For example, in six oil-producing countries in which a State-owned company has dominated the oil and gas industry, the lack of competition has resulted in lower efficiency in upstream activities (Heum et al., 2003).

51 Oilfield services include a wide range of operation and management services in the exploration, production and distribution processes. According to an estimate by the African Export Import Bank, oilfield services now account for 90% of the total cost of producing one barrel of oil (UNCTAD, 2006d).

52 Minera Escondida, which accounted for 24% of total copper production in Chile in 2005, was planned from the outset to supply, among others, the overseas refineries of JECO Corp. (Japan) that partly financed the investment (Dietsche et al., 2007a).

53 For example, Rio Tinto (United Kingdom) must build roads, a new port and power and water supply systems in order to develop an ilmenite mine in Madagascar ("Madagascar is becoming an attractive mining destination", *New Frontiers,* 15 March 2007).

54 At Lumwana, a new township of 20,000 houses, together with schools, health centres and police services, is planned as an additional investment. In the Solwezi district, near the Kansanshi mine, a great expansion of social services is under way in the form of new housing developments, road rehabilitation and improvements in the supply of education, health and other social amenities (UNCTAD, 2007g).

55 Deirdre Lewis (CSA Group), personal communication, July 2007.

56 See "Sakhalin-1 Project 2007" (www.sakhalin1.com); "Sakhalin Energy 2006" (www.sakhalinenergy.com); "Exxon Mobil" (2006) (www.businesswire.com); "Shell v Rossii" (2007) (www.shell.com).

57 The benefits of the investments in infrastructure related to Minera Escondida were limited simply because the mine's location is in a desert with few settlements (Dietsche et al., 2007a).

58 Botswana's foreign exchange reserves are among the largest in the world, relative to the size of the economy; this is a major factor that has helped earn the country an investment grade credit rating by Moody's, and Standard & Poors (UNCTAD, 2007i).

59 FDI inflows to Chile in 2006 were $8 billion, of which reinvested earnings accounted for 93% (chapter II).

60 See, for example, Sachs and Warner, 1999; and Murphy, Shleifer and Vishny, 2000.

61 One concern is related to the "trap of specialization" and its implication for industrialization. In addition to the negative effect of the appreciation of the real exchange rate of local currency on exports, the stimulated oil and non-tradable sectors may pull resources from other sectors. That makes the economy specialized in the primary sector and causes the manufacturing sector to shrink, a typical "Dutch disease" syndrome.

62 The distribution of income gains from improving terms of trade can be largely captured by examining the difference between GDI and GNI. Accounted for by net factor payments abroad, the difference can be considerable in countries where the income effects of terms-of-trade changes are associated with changes in FDI income (UNCTAD, 2005c: 104).

63 Indeed, much of the early debate on the environmental impacts of TNCs in developing countries focused on the extractive industries, largely because of the highly visible "environmental footprints" left by some extractive projects in which they were involved (*WIR99*: 291).

64 For example, technologies used for extracting diamonds from kimberlite pipes in Botswana have much less of an environmental impact than those used for extraction from alluvial deposits. In general, open pit mines tend to be more environmentally damaging than underground mines.

65 The public image of mining TNCs was adversely affected during the 1990s by a number of widely publicized spills from tailings dams, including in Guyana (1995) and the Philippines (1996) (*WIR99*: 291). Tailings are the fine particles produced by the processing of minerals, which involves the use of acid and heavy metals that can leach into water supplies, and the dust containing these particles can adversely affect health and the environment.

66 In the reform era after 1998, the Ministry of Forestry drafted a new forestry bill, which included a ban on mining in forest conservation areas.

67 In surface mining, the layers of soil or overburden that are removed to open up the mine are usually used to fill it in and reshape the land after its closure. Underground mining does not require an extensive reclamation process; however, it is still important to ensure that water remains uncontaminated and that abandoned mines will not collapse.

68 For example, abandoned pits and shafts over a large area of unregulated artisanal mining in West Africa have posed a risk to local populations and animals (Balkau, 1999).

69 For example, members of the International Council of Mining and Metals subscribe to a set of industry-wide principles to promote more environment-friendly investments (see www.icmm.com).

70 For example, increased use of hydrometallurgical processes have lower environmental impacts than the pyrometallurgical processes used previously, because they use less water and have no air emissions (Borregaard and Dufey, 2002).

71 For example, the dangerously high lead levels found in children's blood in communities living in La Oroya, Peru are attributed to the mining and smelting operations of Doe Run Corporation (United States) (http://www.blacksmithinstitute.org/site10e.php).

72 According to the ILO, "especially hazardous sectors" include agriculture, construction, fishing, mining and shipbreaking industries, as well as the informal sector (www.ilo.org/public/english/protection/safework/hazardwk/index.htm).

73 See ILO, "Sector activities: oil & gas production" (www.ilo.org/public/english/dialogue/sector/sectors/oilgas/safety.htm).

74 "Oil industry defends its safety record", *The Guardian*, 13 December 2005.

75 See "Sakhalin-1 Project 2007" (www.sakhalin1.com) and "Exxon Mobil" (2006) (www.businesswire.com).

76 For example, BP (United Kingdom) has been involved in a number of incidents in recent years. In 2005, an accident at a refinery in Texas City, United States, killed 15 workers and injured many more. In 2006, an oil spill of between 200,000 and 300,000 barrels of oil was detected on the Trans-Alaska Pipeline, which is maintained by BP, and in the Gulf of Mexico cracks in oil platform equipment were found on the seabed (See "BP's credibility gap", *International Herald Tribune*, 12 August 2006).

77 Many of these costs are related to perceived unfairness and growing inequalities. For example, increasing inequality around a large-scale mine has been conceived in terms of four overlapping and intersecting axes: geography, hierarchy, gender and identity (Banks, 2005).

78 For example, at the Porgera mine in Papua New Guinea, those groups living within the Special Mining Lease received substantial compensation, while those outside did not. This inequality of treatment created friction among the people of the Porgeran community (Biersack, 2006).

79 Land is central to the livelihoods and cultures of many communities, especially those living in remote areas, and when they are affected by mining operations compensation and employment can seldom provide an acceptable alternative (see, for example, Robinson, 1991).

80 For example, the Chad-Cameroon pipeline project has been accompanied by increasing alcoholism and prostitution, and there has been a marked increase in the rate of HIV/AIDS infections along the pipeline corridor (Horta, Nguiffo and Djiraibe, 2007).

81 Debswana's hospitals at Jwaneng and Orapa are now specialized infectious disease care centres, which provide local communities with ART and related treatment in partnership with the Government of Botswana (UNCTAD, 2007i).

82 *Source*: Ministry of Minerals and Energy, the United Republic of Tanzania.

83 Petrodar Operating Company is owned by CNPC (China) (41%), Petronas (Malaysia) (40%), Sudan Petroleum Company (8%), Sinopec (China) (6%) and Al Thani Corporation (United Arab Emirates) (5%) (www.petrodar.com/profile.html).

84 Local artisanal miners have sometimes become victims. For example, in the Obuasi gold-mining project undertaken by AngloGold Ashanti in Ghana, force was allegedly used to keep artisanal miners out of the company's lease area, resulting in the deaths of some of these miners (ActionAid, 2006). However, AngloGold Ashanti stated that its security staff fully respected human rights (see response of AngloGold Ashanti to ActionAid report concerning Obuasi, Ghana, 7 October 2006, at: www.reports-andmaterials.org).

85 For example, the Grasberg mine operated by Freeport (now part of Freeport-McMoRan Copper & Gold) in Indonesia was allegedly involved in the extrajudicial killing by the Indonesian military of as many as 200 people between 1975 and 1997; almost all of them were unarmed civilians (Ballard, 2001).

86 A presentation by the Business and Human Rights Resource Centre to the meeting of a United Nations Working Group on the use of mercenaries listed a number of alleged human rights abuses committed by private security companies in the service of mining TNCs (http://www.reports-and-materials.org/BHR-statement-to-UN-Working-Group-on-mercenaries-21-Feb-2007.doc).

87 Business and Human Rights Resource Center, "Private security companies and human rights", Public seminar co-hosted by the Business and Human Rights Resource Centre and the United Nations Working Group on the use of mercenaries as a means of violating human rights and impeding the exercise of the rights of peoples to self-determination, 21 March 2007, Geneva, Switzerland.

88 For example, due to pressure from NGOs and their shareholders, Talisman Energy (Canada) in October 2002 divested its ownership interest in an oil extraction project to ONGC Videsh (India) (Manhas, 2007). Lundin Petroleum (Sweden) in June 2003 sold its rights to explore for and produce oil and gas in one concession (Block 5A) to Petronas (Malaysia) but retained an ownership stake in another (Block 5B) (Batruch, 2003; Human Rights Watch, 2003).