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UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT  
GENEVA

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# TRADE AND DEVELOPMENT REPORT, 2005

## *Chapter III*

### EVOLUTION IN THE TERMS OF TRADE AND ITS IMPACT ON DEVELOPING COUNTRIES

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## **EVOLUTION IN THE TERMS OF TRADE AND ITS IMPACT ON DEVELOPING COUNTRIES**

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### **A. Introduction**

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Price movements of internationally traded goods, as well as changes in the volume and product composition of trade, affect the gains an individual country can reap from international trade. These gains are traditionally measured by the terms of trade (the evolution of a country's export prices relative to its import prices) and the purchasing power of its exports (defined as the export value deflated by import prices). The impact of price movements in global markets for primary commodities and manufactures on both these measures is determined, in the short term, by the composition of a country's imports and exports, and, in the medium term, by its flexibility in being able to adapt the composition of its exports and imports to changing international demand and supply conditions. Clearly, the impact of a change in the terms of trade on an economy increases with the relative importance of external trade in its GDP.

The significance of the terms-of-trade concept has long been recognized in the context of

international trade theory (Benham, 1940). Originally, the discussion of the terms-of-trade problem of developing countries focused on movements in the prices of primary commodities relative to those of manufactures. The works of Prebisch (1950, 1952) and Singer (1950) triggered broader debate on this issue. This was supported by empirical research underlying what came to be known as the Prebisch-Singer thesis of a secular decline in the terms of trade of internationally traded primary commodities vis-à-vis manufactures. Subsequent studies also found support for this thesis for a number of commodities (see Bleaney, 1993; Akiyama and Larson, 1994; World Bank, 1996: 55; *TDR 1993*: 98–102; Ocampo and Parra, 2003; and UNCTAD, 2003a: 13–19).

Today, a large number of developing countries, particularly in Africa, are still highly dependent on exports of primary commodities, and their terms of trade continue to be closely correlated with the terms of trade of primary commodities vis-à-vis manufactures (UNCTAD, 2003a). But it

is also true that the share of primary products in the merchandise exports of some developing countries, particularly the successful late industrializers, has been diminishing in favour of manufactures. These countries have become suppliers of manufactured goods not only to developed countries but also to other developing countries. Against this background, the evolution of the prices of manufactures exported by developing countries relative to those exported by developed countries has received increasing attention. Moreover, in the process of their industrialization the exporters of manufactures among the developing countries have also gained in importance as importers of primary commodities from other developing countries, to such an extent that their increasing demand has been a decisive factor in the recent price hikes of a number of internationally traded primary commodities. This has even led to expectations that the long-term downward trend in the terms of trade of commodity prices could be reversed.

The objective of this chapter is to show how recent developments in the world economy, in

particular changes in the direction and product composition of world trade resulting from rapid growth in the large Asian economies, have affected the terms of trade of different groups of developing countries, and the growth of their national income. The chapter first revisits the terms-of-

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**Increasing demand from developing countries has been decisive in the recent price hikes of primary commodities.**

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trade concept in the context of the declining importance of primary commodities in the total exports of an increasing number of developing countries. It then analyses recent developments in terms of trade resulting from changing international supply-and-demand patterns, where some developing countries have become

important drivers of the global economy at a time when demand in major developed countries has been insufficient to stimulate worldwide growth. Section D looks at the effects of terms-of-trade changes on real domestic income in countries with different export structures and different degrees of openness to international trade; section E takes up the issue of how income gains or losses are shared between the national economy and foreign investors. The final section addresses a specific issue in this context: the sharing of rents from oil and mining activities.

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## B. The terms-of-trade problem revisited

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In the terms-of-trade debate of the early 1950s, the observed downward trend in the prices of primary commodities relative to those of manufactures (and, consequently, the terms of trade of developing countries vis-à-vis developed countries) was attributed to the different modes of price formation in the markets for primary commodities and those for manufactures. As a result of these differences, productivity gains in the production of food and raw materials in developing countries translated into lower prices (increasing the real income of consumers) rather than into higher remuneration for local factors of production. This was because surplus labour in the producing countries exerted a downward pressure on wages. By contrast, technical progress in manufacturing industries in the industrialized countries led to a rise in wages and profits (Singer, 1950: 311) as a result of a higher degree of organization of labour and the practice of mark-up pricing.

This widening gap between the prices of manufactures and primary commodities was also attributed to the fact that the income elasticity of demand for food is less than unity, and that technical progress in manufacturing tends to reduce the amount of raw materials used per unit of output (Singer, 1950: 312). This tendency was further strengthened by the protection of domestic primary production in the industrialized countries. On the other hand, faster growth in developing countries depends to a large extent on imports of manufactures, mainly capital goods, for the creation or expansion of industrial capacity and

infrastructure. Simultaneous attempts by an increasing number of developing countries with similar natural-resource endowments to boost primary exports to finance such imports added to the downward pressure on commodity prices (*TDR 2002*, chap. IV).

A strategic consequence of these observed trends was that developing countries had to aim at changing their position in the international division of labour by accelerating their pace of industrialization. Indeed, over the past five decades, progress with industrialization in a number of developing countries, and their increasing participation in trade in manufactures, has added new dimensions to the problem. Thus, while the issue of prices of primary commodities vis-à-vis those of manufactured goods continues to be as relevant as ever for many developing countries whose export earnings still depend on a very limited number of primary commodities, developing countries as a group can no longer be stereotyped as exporters of primary commodities and importers of manufactures.

Accordingly, increasing attention has been paid to relative movements in the prices of manufactures exported by developing countries vis-à-vis those exported by developed countries. Empirical studies conducted so far have generally found evidence of a decline in developing countries' terms of trade in manufactures since 1975 (*TDR 2002*: 117–121), due to more intense global competition for the specific types of manufactures

typically produced by developing countries at early stages of their industrialization (i.e. low-skill, labour-intensive manufactures). The rapid export growth of these types of manufactures by the large Chinese economy and by a number of other developing countries has intensified competition in the markets for these goods, thereby exerting downward pressure on their prices.

For example, according to data from the United States Department of Labor, prices of electronic products, including computers and telecommunications equipment, have been falling worldwide since the early 1990, as indicated by the decline in both United States export and import prices (fig. 3.1). Within this overall trend, the fall in import prices has been stronger than the fall in export prices in the United States since the mid-1990s, suggesting that goods in this product category that are exported from developing countries have been subject to a sharper decline than goods exported from the United States that fall into the same broad product category.

There is also evidence that the export prices of textiles and clothing (apparel) from developing countries have followed a declining trend since the mid-1990s, though less steep than those of electronic products. According to UNCTAD secretariat estimates, prices of apparel exported from developing countries to the world market fell by more than 7 per cent between 1996/97 and 2002/03. This trend is also confirmed by data from the United States Department of Commerce, which show a decline in the unit value of United States apparel imports from developing countries of more than 10 per cent between 1995 and 2004 (see chapter II, table 2.10).

The main reasons for the weak prices of manufactures produced in developing countries are by and large the same as those that were identified as causing the decline in the terms of trade

of primary commodities vis-à-vis those of manufactures: different labour market conditions and the existence of abundant and unorganized low-skilled labour. This implies that productivity gains are to a large extent reflected in lower prices and that wages in the developing countries tend to be

more flexible than in developed countries. The downward pressure on prices resulting from a simultaneous export drive by developing countries in standardized labour-intensive products is also a phenomenon that in the past was typical of primary commodity markets. Thus price formation

for low-skilled manufactures resembles that of primary commodities more than price formation for manufactures produced in developed countries. However, there is one major difference: while the relative decline in the export prices of low-skilled manufactures has generally been associated with considerable volume growth, declining export prices for primary commodities are typically associated with lower volume growth (and vice versa), due to the much lower price elasticity of demand.

Applied to a country's external trade, the concept most widely used since the beginning of the terms-of-trade debate in the 1950s has been the "net barter terms of trade", defined as the ratio between the unit value index of exports and that of imports (hereinafter referred to as terms of trade, *tout court*). Obviously, this only captures one of the factors determining a country's gains (or losses) from trade, while neglecting changes in the volume of exports that may accompany, and in some cases even cause, the observed changes in export

prices. In order to assess a country's capacity to import essential goods for its development, it is more meaningful to look at the "income terms of trade", also known as the purchasing power of exports. This is defined as the value index of exports deflated by the unit value of imports. If the fall in a country's terms of trade is overcompensated by a rise in the volume of its exports result-

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Commodity issues continue to be as relevant as ever for many developing countries ...

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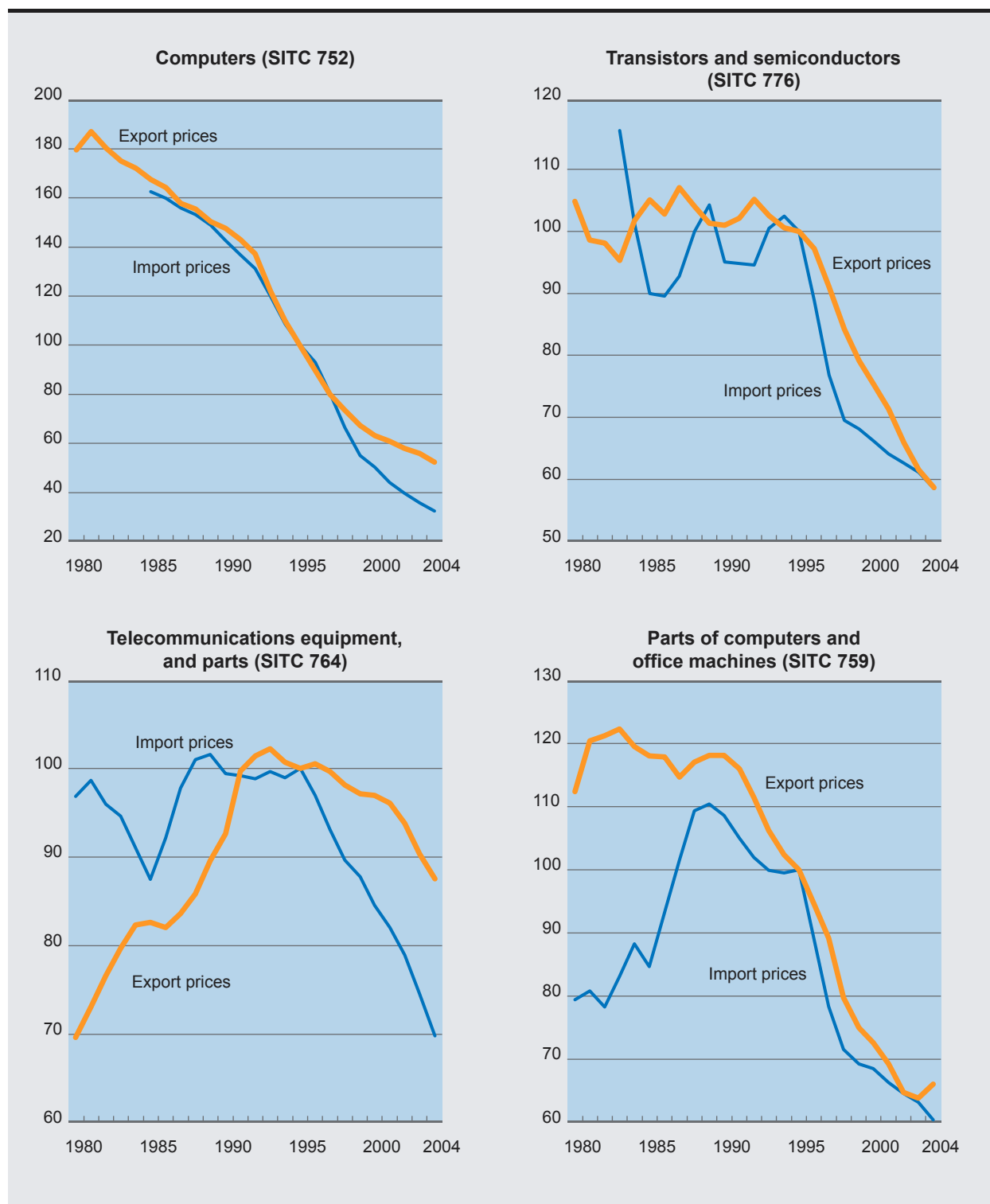
... but developing countries as a group can no longer be stereotyped as exporters of primary commodities and importers of manufactures.

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Figure 3.1

**UNITED STATES IMPORT AND EXPORT PRICE INDICES FOR SELECTED ELECTRONICS PRODUCTS, 1980–2004**

(Index numbers, 1995 = 100)



Source: UNCTAD secretariat calculations, based on United States Department of Labor database ([www.bls.gov/data/](http://www.bls.gov/data/)).

ing from growing international demand or an increase in the country's world market share, the country will register a rise in the purchasing power of its exports, indicating that it is able to increase real imports without adversely affecting its trade balance. Similarly, if productivity in its export industries rises fast enough, a country may obtain a larger quantity of imports from the same quantity of factors embodied in its exports, even if its terms of trade deteriorate.<sup>1</sup>

The variability of a country's terms of trade is determined to a large extent by the share of primary commodities in its exports and imports. The share of primary commodities (including fuels) in total developing-country exports has plunged, from around 65 per cent in 1980–1983, to around 30 per cent in 1999–2003 (table 3.1). This steep fall has been partly due to the fall in primary commodity prices, especially fuels, in the 1980s. But the most significant factor in the changing export structure has been the rapid expansion in the value of manufactured exports. By contrast, the product composition of developing countries' imports has not changed significantly. As a result, the sectoral composition of exports is now more similar to that of imports; in 1999–2003, manufactures accounted for 74 per cent of the total merchandise imports of all developing countries taken together and 68 per cent of their total merchandise exports.

A shift in the structure of exports towards a greater share of manufactures occurred in all developing regions. In Latin America, manufactures rose to become the major export category in the late 1990s, and in East and South Asia, where they had already been the largest category in the early 1980s, their share rose further, to reach 85 per cent in 1999–2003. By contrast, despite a considerable increase in the export share of manufactures, primary products still

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**Export prices of textiles and clothing from developing countries have been declining since the mid-1990s, though at a slower rate than those of electronic products.**

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constitute the majority of exports in Africa (around 75 per cent) and in West Asia (78 per cent), the bulk of which are still fuels (around 51 per cent and 72 per cent respectively). Moreover, the increase in the share of manufactures has been heavily concentrated in a relatively small number of countries. With the exception of East and South Asia, primary commodities still account for the largest share of exports in a majority of developing countries (table 3.2).

The shift towards manufactures in Latin America mainly reflects the rapid growth of manufactured exports from Mexico and, to a lesser extent, Brazil. In 2003, these two countries generated more than 75 per cent of the region's manufactured exports. In Mexico, 55 per cent of such exports in 2004 were generated by *maquila* industries which assemble imported inputs (INEGI, 2005). Several smaller Central American and Caribbean countries, which formerly specialized in food and beverages, have also become exporters of manufactures, owing largely to the expansion of their *maquila* plants. However, most South American countries still export mainly primary products: predominantly food in Argentina, Paraguay and Uruguay; ores and metals in Chile and Peru; and fuels in Bolivia, Colombia, Ecuador and Venezuela.

Similarly, in Africa and West Asia only a small number of countries account for the increase in the share of manufactures in total exports. Manufactured exports have expanded rapidly in Morocco, Tunisia and South Africa; they have also gained a relatively high share of the total exports of some sub-Saharan countries, such as Lesotho, Mauritius, Senegal and Swaziland. In West Asia, where the trade structure is largely dominated by fuel exports, Turkey's manufactured exports account for over 84 per cent of the total for the region.

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**Demand for manufactures is much more elastic with respect to prices and income than demand for primary commodities.**

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Table 3.1

**EXPORT STRUCTURE OF DEVELOPING COUNTRIES, BY REGION  
AND BY BROAD PRODUCT CATEGORY, 1980–2003**

*(Per cent share in total exports)*

	Fuels			Non-fuel primary commodities <sup>a</sup>			Manufactures <sup>b</sup>			Other <sup>c</sup>		
	1980–1983	1989–1992	1999–2003	1980–1983	1989–1992	1999–2003	1980–1983	1989–1992	1999–2003	1980–1983	1989–1992	1999–2003
Developing countries	38.8	22.5	18.0	26.0	19.7	12.7	31.4	55.7	68.1	3.9	2.2	1.2
Latin America and the Caribbean	23.3	22.6	16.2	42.9	40.7	25.7	32.6	35.9	56.6	1.3	0.9	1.5
Africa	40.8	47.9	50.6	32.7	24.9	24.0	12.7	15.7	23.0	13.8	11.5	2.4
West Asia	70.0	73.4	72.2	11.5	8.6	6.1	16.8	17.7	21.0	1.7	0.2	0.6
East and South Asia	18.5	7.2	4.9	24.3	15.1	9.1	54.9	76.5	84.8	2.3	1.2	1.1

**Source:** UNCTAD secretariat calculations, based on UN COMTRADE.

**a** SITC Rev. 2: 0 to 4 plus 68, 661 and 667 less 3.

**b** SITC Rev. 2: 5 to 8 less 68, 661 and 667.

**c** SITC Rev. 2: 9.

It is also important to note that in the majority of developing countries where the share of primary commodities in total exports has fallen, industrial development, and thus manufactured exports, are concentrated in natural-resource-intensive and low-skill, labour-intensive products. Only a few of them have a sizeable share of exports of higher skill and technology-intensive manufactures.

The increasing share of manufactures in the total exports of developing countries implies that they face different global demand dynamics than in the past. When commodities were their major exports, developing countries faced inelastic demand, and therefore relative export prices were the main determinant of real export earnings, as export volumes could not increase significantly given the slow growth of aggregate demand. Since demand for manufactures is much more elastic with respect to prices and income, this situation has changed, and export volumes respond more strongly to price changes.

Table 3.2

**DISTRIBUTION OF DEVELOPING COUNTRIES BY THEIR DOMINANT EXPORT CATEGORY,<sup>a</sup> 2003**

*(Number of countries)*

	Fuels	Non-fuel primary commodities <sup>b</sup>	Manufactures <sup>b</sup>	Total
Africa	9	30	9	48
Latin America <sup>c</sup>	3	11	6	20
Caribbean <sup>d</sup>	2	8	6	16
East and South Asia	1	2	16	19
West Asia	10	0	3	13
Total	25	52	41	118

**Source:** See table 3.1.

**a** Dominant signifies more than 50 per cent of total exports.

**b** For definitions see table 3.1.

**c** Including Cuba, the Dominican Republic and Haiti.

**d** Including Belize, Guyana and Suriname.

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### C. Recent trends in the terms of trade

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Trends in the terms of trade of the different developing regions and countries vary, depending on the composition of their exports and imports; and over the past few decades, these trends have increasingly diverged across different groups of developing countries. Since the early 1980s, all developing countries taken together have been experiencing a downward trend in their net barter terms of trade (fig. 3.2). The deterioration of about 15 per cent was accompanied by a rise in the volume of exports from the mid-1980s onwards, but this was mainly on account of a few economies in East and South Asia. It is only from the early 1990s onwards that Latin America has seen faster growth of export volumes, which supported the purchasing power of exports. In Africa, export volumes also expanded in the 1990s, but at a much slower rate.

Since the late 1990s these trends have been increasingly influenced by the growing importance of China and India in shaping the structure of international trade. The same factors that improved the terms of trade of some developing countries, especially the higher prices of oil, and mineral and mining products, led to a worsening of the terms of trade in others. In some countries, particularly in Latin America, but also in Africa, the positive effect of price movements on the purchasing power of exports was reinforced by an increase in export volumes. In others, however, gains from higher export unit values were offset by higher import prices. China and India themselves have seen their terms of trade deteriorate since 2002.

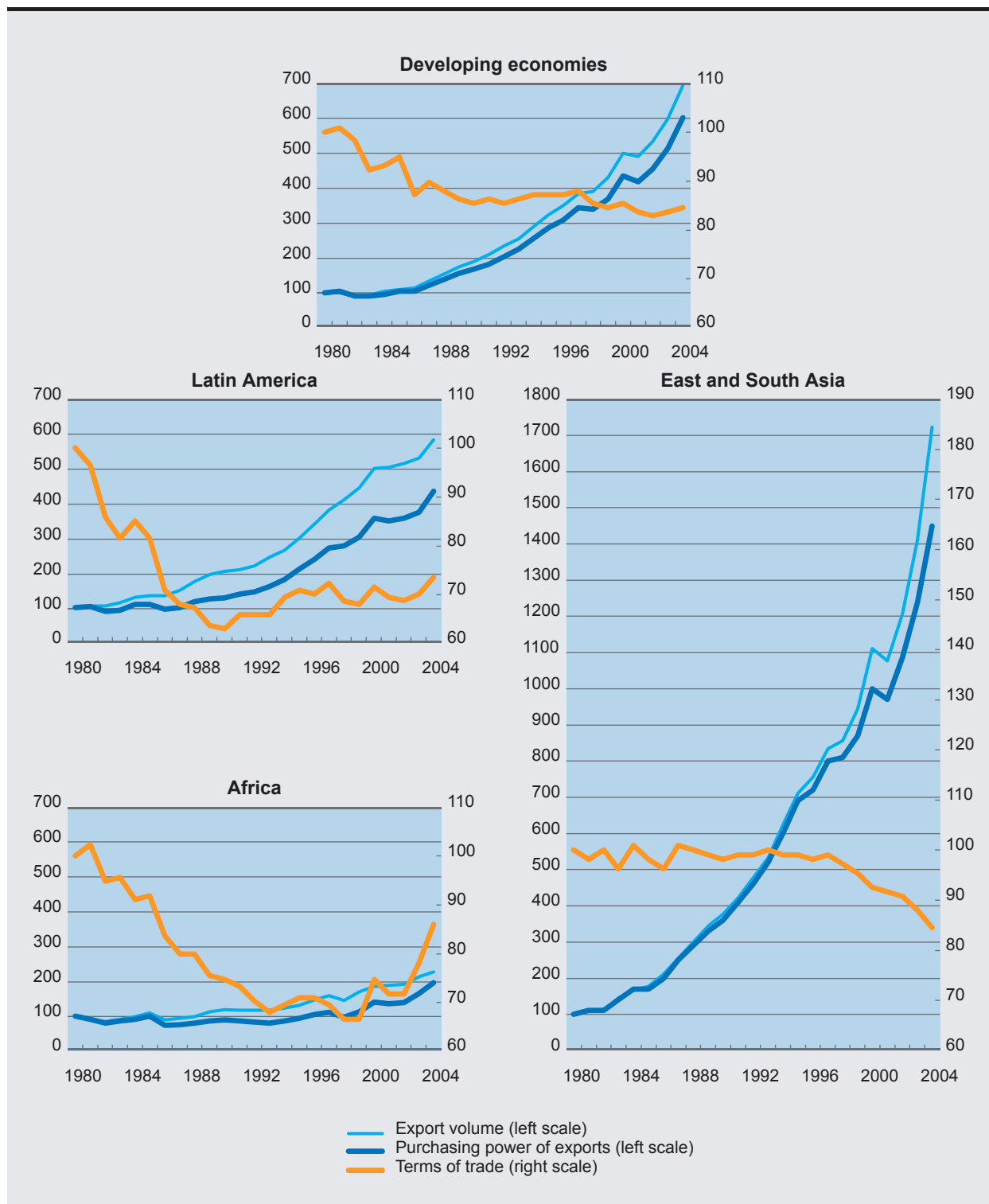
In East and South Asia, terms of trade were stable for more than 15 years before declining in the aftermath of the financial crisis in 1997. Until 2002 the reduction in the unit value of their exports (mainly of manufactures) was partly compensated by falling unit values of their imports (of both manufactures and primary commodities). But since then import prices of oil, industrial raw materials and a number of food items have reinforced the downward trend in their terms of trade, which fell by about 15 per cent between 1997 and 2004. Over the same period, there was a dramatic increase in the export volumes of countries in these subregions, so that the purchasing power of their exports almost doubled in a context of falling terms of trade. This was mainly due to a rapid growth of their exports to developed countries, as well as to transition economies and to those developing countries that have increased their import capacity owing to higher primary commodity export earnings. Moreover, the rapid expansion of their exports has occurred at a time of slow growth in the industrialized countries.

Africa and Latin America saw a dramatic deterioration in their terms of trade from the beginning of the 1980s until the beginning of the 1990s. Thereafter, there were considerable fluctuations around a slightly increasing trend, which has been reinforced in the past three years. In Latin America, the sharp deterioration in the terms of trade during the 1980s reflects the consequences of the debt crisis. Many countries in the region responded to the crisis by seeking to expand their exports to compensate for the abrupt ending of

Figure 3.2

**TERMS OF TRADE, EXPORT VOLUMES AND PURCHASING POWER OF EXPORTS  
IN DEVELOPING ECONOMIES, BY REGION, 1980–2004**

(Index numbers, 1980 = 100)



Source: UNCTAD Handbook of Statistics database.

capital inflows, and to generate a trade surplus for debt servicing, but this merely led to a fall in export prices. But unlike in East Asia in the aftermath of the financial crisis in the late 1990s, the fall in the dollar prices of exports was not accompanied by a commensurate increase in the volume of exports, which consisted of a much larger proportion of primary commodities. Moreover, the export push in Latin America coincided with a slowdown of growth in the major industrialized countries and a stagnation of global demand. The decline in Latin America's terms of trade bottomed out only by the beginning of the 1990s when the purchasing power of exports from the region also picked up. During the second half of the 1990s, the purchasing power of exports in Latin America rose almost at the same rate as that of East and South Asia, supported by both an acceleration of export volume growth and more favourable export and import unit values. Since then, many Latin American countries have benefited from a much higher share of manufactures in their exports than in the 1980s (see *TDR 2003*, table 5.8.).

In Africa, where much less progress was made in export diversification, the terms of trade were more unstable during the 1990s than in other regions, and export volume growth was very modest. As a consequence, the purchasing power of Africa's exports recovered to its level of 1980 only in 1996, where it remained until the end of the decade. Since 2000 Africa's terms of trade have risen more than those of the other regions as a result of higher demand from the fast growing Asian developing countries for certain primary commodities. Between 1999 and 2004, changes in the international prices of these commodities have resulted in an improvement of about 30 per cent in Africa's terms of trade, compared to some 8 per cent for Latin America, and a decline of 11 per cent for East and South Asia. In parallel, export volumes in Africa have grown at a pace not seen since the late 1960s. Yet, since the difference between Africa and Latin America in the recent evolution of the terms of trade is partly explained by the higher share of primary commodities and the lower degree of diversification

of African countries' export structures, the region remains more vulnerable than any other region to a deceleration of global demand. Thus, the recent positive evolution in Africa's terms of trade might well be just another temporary boom rather than the beginning of a sustained recovery.

A broad picture of how groups of developing countries with different trade structures have been affected by terms-of-trade movements over the past few years is given in figure 3.3. It shows

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**In East and South Asia,  
the decline in the terms of  
trade has been accompa-  
nied by a dramatic increase  
in export volumes.**

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the terms-of-trade movements of 40 developing economies, classified in five groups according to the major product category in their exports: oil, minerals and mining products, agricultural products, or manufactures. For some exporters of manufactures the classification is not straightforward, because their terms of trade con-

tinue to be highly sensitive to changes in the prices of the remaining primary commodities in their export basket, either because the share of the latter is still relatively high or because their prices are characterized by a particularly high variability (or a combination of both). For the purpose of this analysis such countries have been classified as "exporters of manufactures and primary commodities".

Since 2002, economies with a high share of oil, and minerals and mining products in their total merchandise exports have gained the most from recent developments in international product markets. According to preliminary estimates, the terms of trade of countries with a dominant share of fuels in their exports increased by 30 per cent between 2002–2004, and those of countries with a dominant share of mineral and mining exports increased by about 15 per cent.

The stronger improvement in the terms of trade of oil exporters is due not only to the sharp increase in international oil prices, but also to the fact that oil exporters have, on average, a less diversified export structure than exporters of minerals and mining products. Moreover, the composition of the latter product category is less homogeneous, and the different products in that category display large differences in price trends

(see chapter II, table 2.8). For these reasons there is also greater diversity among the countries within the group of exporters of mineral and mining products.

Among the countries with a dominant share of exports of minerals and mining products, exporters of uranium (Niger) and copper (Chile, Peru and Zambia) saw the strongest improvements in their terms of trade. Gold exporters (such as Kyrgyzstan) also experienced significant, although more gradual, improvements between 2002 and 2004. For these countries, the positive effect of the surge in the international prices of copper and gold exceeded the combined negative effects of rising oil prices and adverse movements in the prices of manufactures (see figure 3.4 for a decomposition of the changes in the terms of trade of selected countries, including Chile and Peru). But soaring export prices since 2003 have been insufficient, in most cases, to fully reverse the dramatic losses experienced in the 1980s; for some countries in this group, such as Chile and Peru, terms of trade in 2004 were still around 50 per cent lower than in 1980. Jamaica and Mozambique saw a slight deterioration in their terms of trade between 2000 and 2004. Both are exporters of bauxite and aluminium, the prices of which rose less than those of other mineral and mining products, and both were also negatively affected by higher import prices and unfavourable price developments for the agricultural commodity components of their exports (sugar in Jamaica, and sugar, tobacco and cotton in Mozambique).

Terms-of-trade developments have varied the most among economies where agricultural commodities have dominated their total merchandise exports. This reflects large differences in the movement of prices for specific products within this category, and differences across countries in the share of other primary commodities in total exports, as well as differences in the share of oil in their imports. For cotton exporters, such as Benin and Burkina Faso, the terms of trade were subject to wide fluctuations around a declining trend during the period 2000–2004. In Malawi, weakness in the prices of

tobacco and sugar has caused the terms of trade to decline dramatically every year since 2000, whereas in Cuba, another exporter of tobacco and sugar, this effect was largely offset by a sharp rise in the price of its nickel exports (see chapter II, table 2.8). In some coffee-exporting countries, such as Burundi, the slight improvement in the terms of trade in 2003 and 2004 was insufficient to make good the sharp deterioration of previous years. By contrast, in Côte d'Ivoire, the world's leading cocoa exporter, the terms of trade rose by more than 20 per cent between 2000 and 2004, despite a considerable reversal in 2004. The two other countries in the group of agricultural exporters that witnessed increases in their terms of trade, Argentina and Uruguay, benefited from higher prices for soybeans, beef and some cereals. In Argentina, this trend was strengthened due to the country being a net exporter of oil and mining products, although the impact of higher prices of these product categories was dampened by an increase in import prices of manufactures (fig. 3.4).

On the other hand, all the fuel-importing developing countries with a dominant share of manufactures in their merchandise exports have suffered from a deterioration in their terms of trade in the past two or three years. The terms-of-trade losses for East and South Asian exporters of manufactures in 2003 and 2004 ranged between 8 per cent for Taiwan Province of China, and more than 14 per cent for India. The losses were largely due to the heavy dependence of the countries in this group on fuel and metal imports, and to the relative decline in the prices of their manufactured exports. For example, the decline in the unit value of their machinery exports, which in large part consist of electronics products, was larger than the decline in the unit value of their imports of the same product category; while for other manufactures, import unit values grew faster than export unit values. The particularly unfavourable terms-of-trade trend in Pakistan since 2000 reflects an export structure dominated by labour-intensive clothing products and a higher-than-average share of oil in total imports. On the other hand, for some exporters of manufactures, higher prices of their food and bev-

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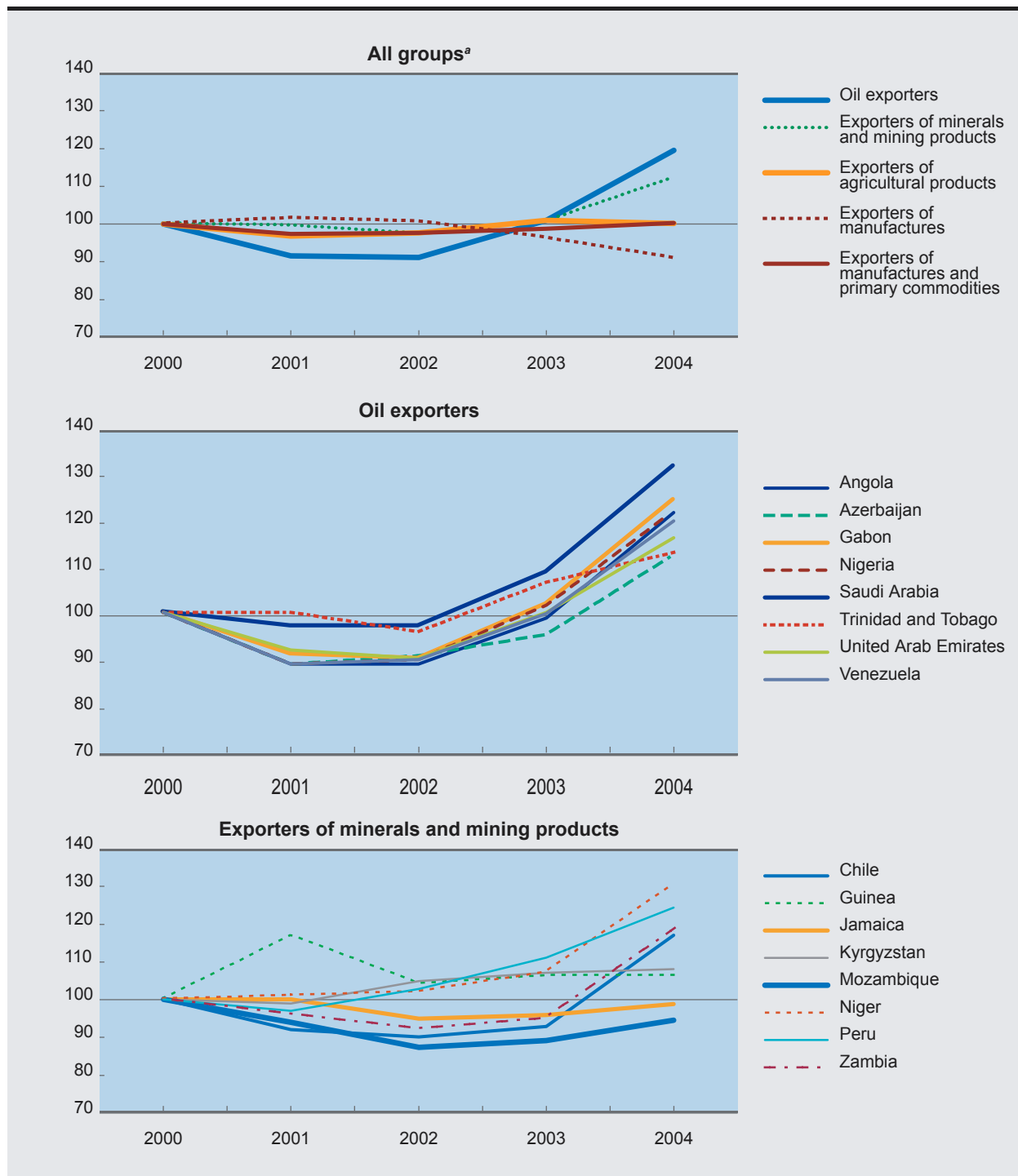
Since 2000, Africa's terms of trade have risen more than those of the other regions as a result of higher demand for certain primary commodities.

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Figure 3.3

**TERMS OF TRADE OF SELECTED DEVELOPING ECONOMIES,  
BY DOMINANT EXPORT CATEGORY, 2000–2004**

(Index numbers, 2000 = 100)

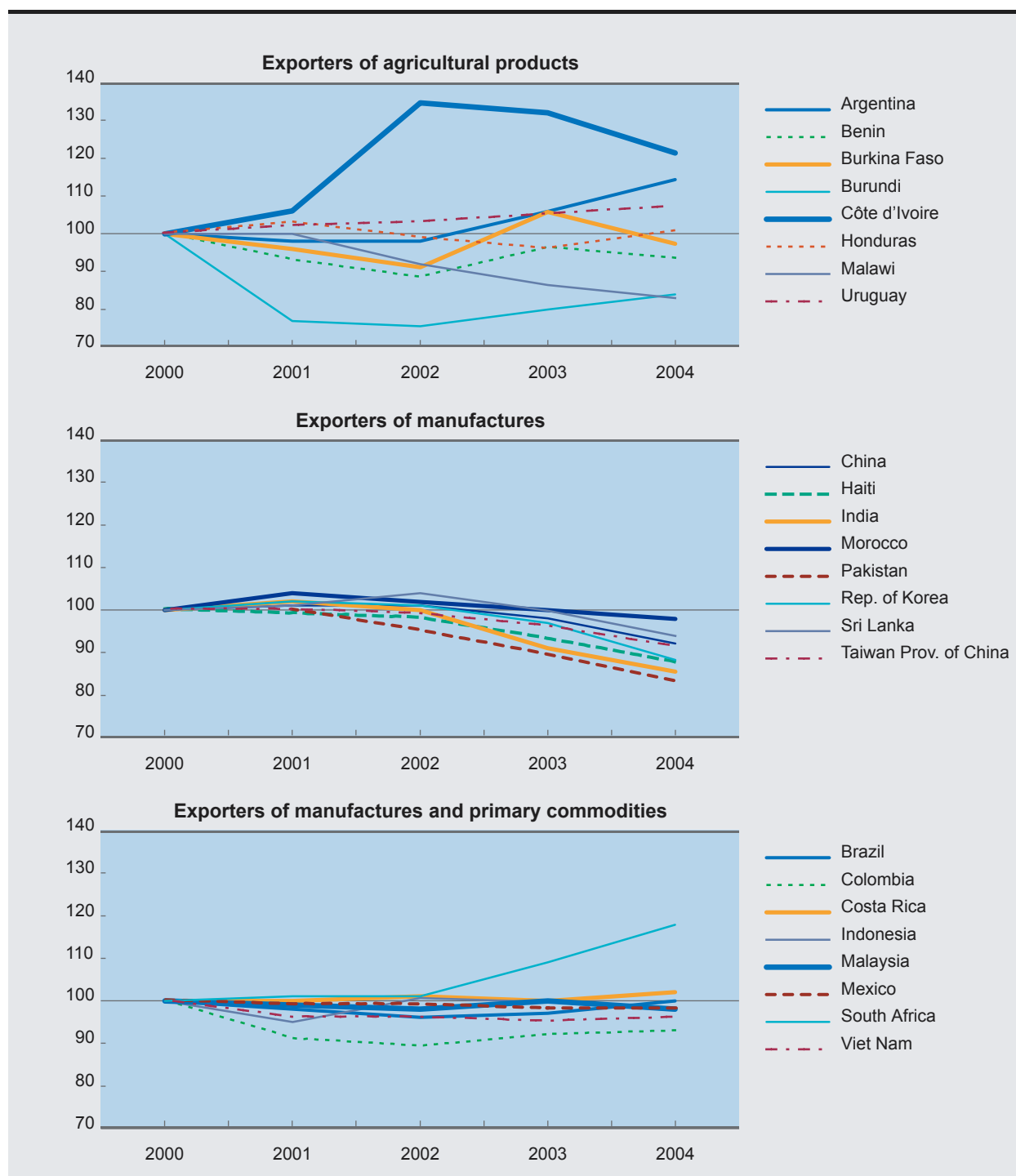


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Figure 3.3 (concluded)

**TERMS OF TRADE OF SELECTED DEVELOPING ECONOMIES,  
BY DOMINANT EXPORT CATEGORY, 2000–2004**

(Index numbers, 2000 = 100)



**Source:** UNCTAD secretariat calculations, based on UN COMTRADE; United States Department of Labor, Bureau of Labor Statistics, Import/Export Price Indexes database ([www.bls.gov/mxp/home.htm](http://www.bls.gov/mxp/home.htm)); Japan Customs, Trade Statistics database ([www.customs.go.jp](http://www.customs.go.jp)); IMF, International Financial Statistics database; and UNCTAD, *Commodity Price Bulletin*, various issues.

**a** Non-weighted average of 70 developing countries, including those presented in this figure.

Figure 3.4

**CONTRIBUTION OF DIFFERENT PRODUCT GROUPS TO TERMS-OF-TRADE CHANGES,  
SELECTED DEVELOPING ECONOMIES, 2000–2004**

(Per cent)

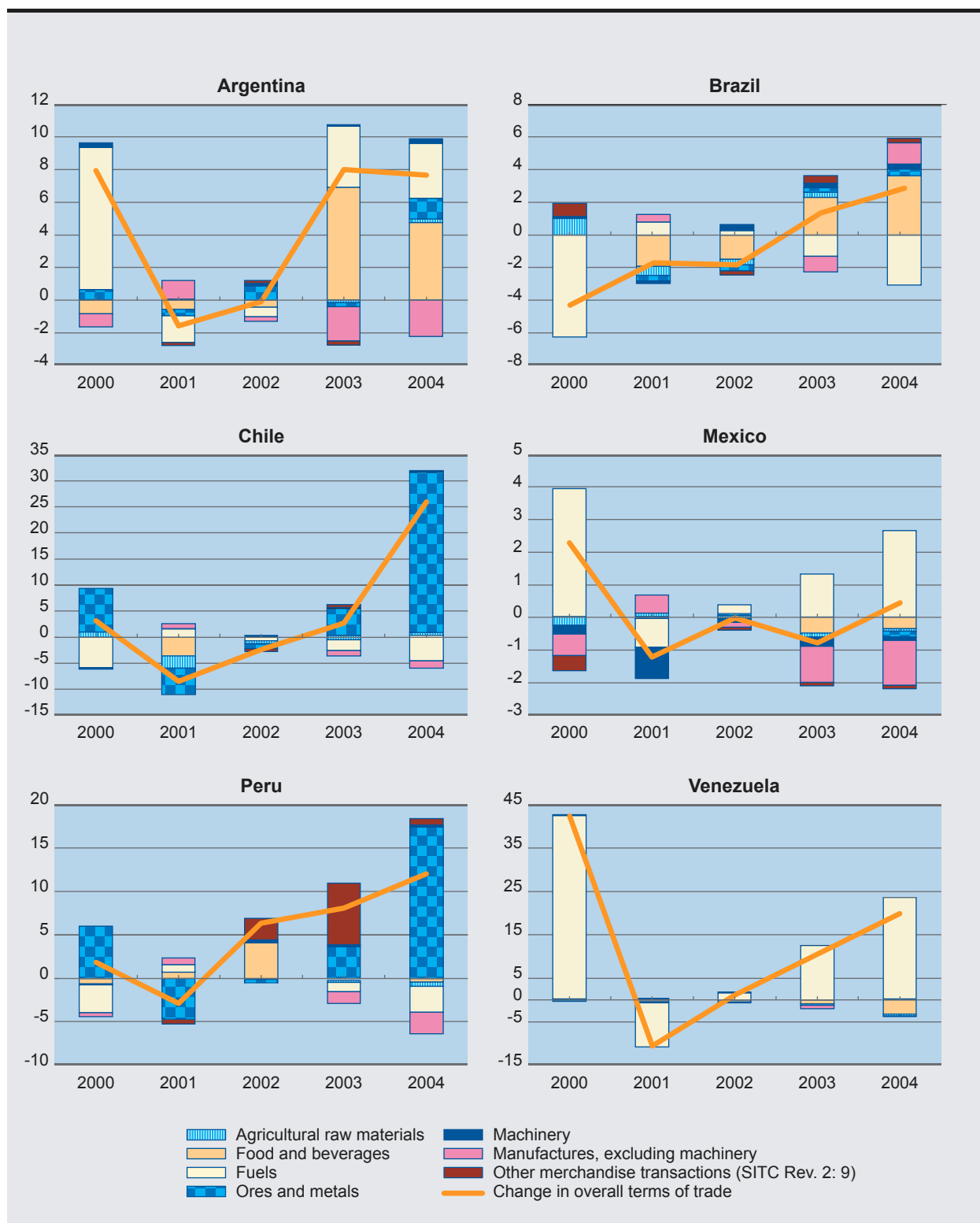
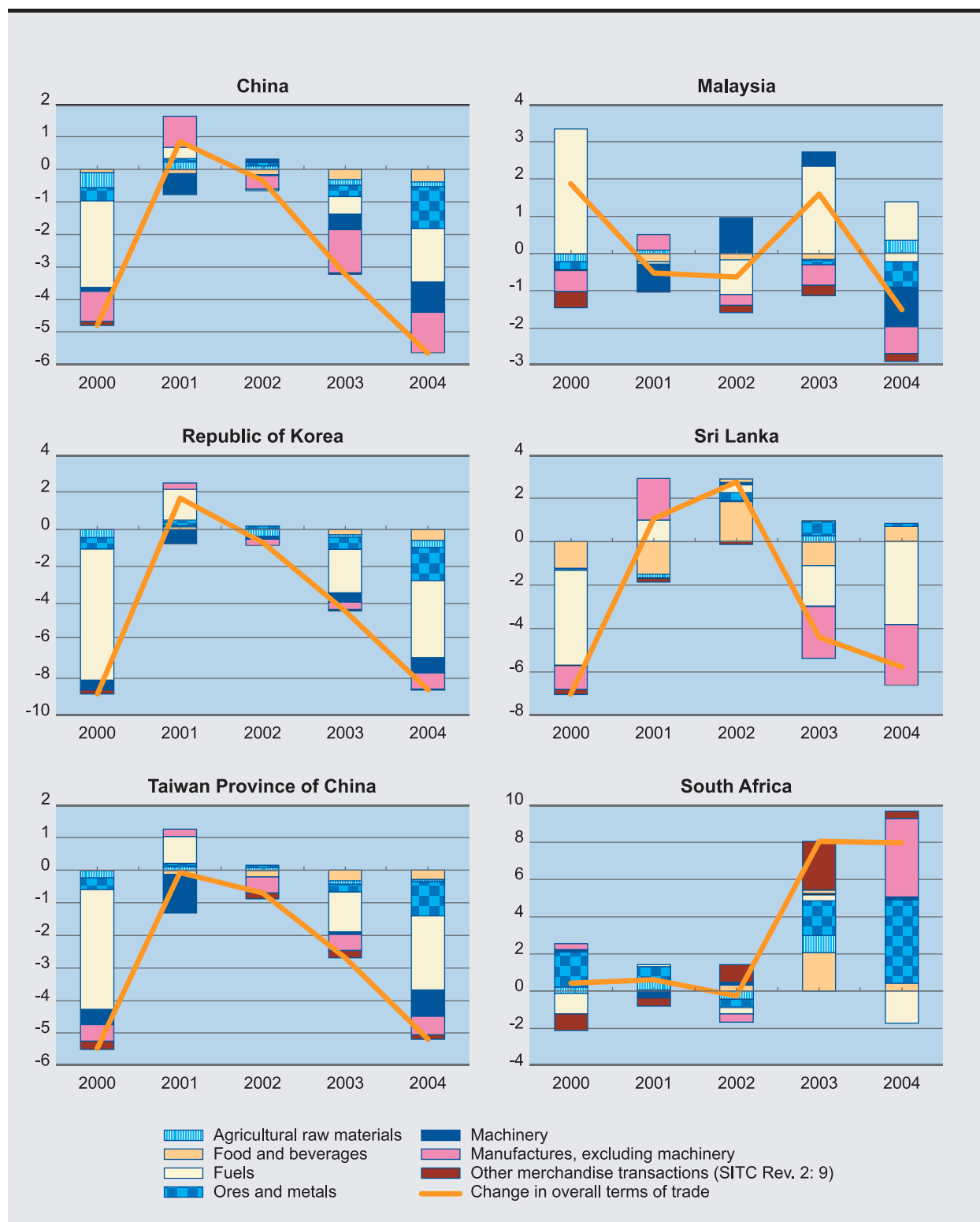




Figure 3.4 (concluded)

**CONTRIBUTION OF DIFFERENT PRODUCT GROUPS TO TERMS-OF-TRADE CHANGES, SELECTED DEVELOPING ECONOMIES, 2000–2004**

(Per cent)



Source: See figure 3.3.

erage exports alleviated the negative effects of high prices of fuel and some manufactures. This applied, for example, to Sri Lanka (tea) and Morocco (fish, fruits and vegetables).

In general, the combined effect of the lower prices of low-skill, labour-intensive manufactured exports and higher prices of imports was less pronounced in the countries classified as “exporters of manufactures and primary commodities”, which, while having become important exporters of manufactures, are still relatively sensitive to fluctuations in the prices of specific primary commodities. This is the case in particular for some countries in Latin America (Brazil, Colombia, Costa Rica and Mexico) and East Asia (Indonesia, Malaysia and Viet Nam), as well as South Africa. In many of them, price movements in the different product categories neutralized each other in their impact on the terms of trade. In Brazil, for example, recent movements in the prices of primary commodities and manufactures have not changed the positive long-term trend in its terms of trade since the early 1980s. This can be attributed to the diversification of the country’s exports, involving an increase in the share of manufactures, and to a progressive reduction of its dependence on oil imports. Since 2003, higher prices of food exports compensated for the effect of increasing oil import prices on Brazil’s terms of trade (fig. 3.4).

In Malaysia and Mexico, where fuels still account for 10 and 12 per cent, respectively, of total merchandise exports, the positive contribution of higher fuel prices largely compensated for the negative impact of trade in manufactures on their terms of trade in 2003 and 2004 (fig. 3.4). Although manufactures dominate exports in both countries, they are highly import-intensive and the lower cost of imported inputs mitigated the negative impact of the falling prices of their manufactured exports. This is especially true for assembly industries, which import and re-export the manufactures belonging to the same product group at different stages of processing; in Mexico they

represent 35 per cent of total imports and 47 per cent of total exports.

These examples of some economies illustrate the diversity in the impact of recent international price movements on the terms of trade of developing countries. The variations in the global pattern of demand and their impact on individual countries has led to a redistribution of income, not only between developing and developed countries,

but also, to an increasing extent, among different groups of developing countries. This does not necessarily imply absolute losses in real income for countries that have experienced a deterioration in their terms of trade, as long as global demand and, hence, export volumes of all countries, are expanding. Over the past few years, most developing countries have indeed gained from the expansion of global demand. However, for

some countries, less buoyant demand or unfavourable supply conditions of primary commodities have affected their export prices; this, combined with rising prices for fuel and food imports, has resulted in a severe deterioration in their terms of trade, which has not been redressed by higher export volumes.

The expansion of global demand for specific primary commodities and manufactures over the past few years has been stimulated mainly by the fast growth of demand from China and India, in addition to that of the United States. Europe and Japan, on the other hand, have contributed little to that expansion. This geographical pattern is not without risks, given the imbalances in the world economy and the possibility that adjustments of these imbalances could lead to a reduction of global demand (see chapter I, section B). Such a reduction might occur directly as a result of lower United States imports, and indirectly as a result of lower imports from the fast growing exporters of manufactures among the developing countries, which themselves depend on exports to the industrialized countries. In such a scenario, the recent improvements in the terms of trade of many countries could well be reversed, adding yet another

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Increasing supplies of raw materials, along with efforts in East and South Asia to reduce their dependence on imports of such goods, could bring the price increases to a halt, or even reverse them.

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episode of terms-of-trade volatility to the historical record.

Another reason for caution in forecasting terms-of-trade trends is that supply adjustments in the commodity sector, especially in fuels and mining, could soon arrest the upward price trend. They could even reverse the trend if increased production capacity were to coincide with recessionary tendencies in the world economy as a result of disorderly adjustments to the current

imbalances. Furthermore, the fast-growing developing economies of East and South Asia are likely to reinforce their efforts to reduce their dependence on raw material imports in response to the rising prices of such imports, partly through domestically produced substitutes and partly through reduced intensity of metal and energy use (see chapter II, section B.2). Their efforts could also contribute to a slowdown, or even to a reversal, of price increases of imported raw materials, particularly if there is a further expansion of supply capacity.

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## D. Effects of terms-of-trade changes on domestic income

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The strength of the impact of terms-of-trade changes on real national income depends on a number of factors. First, the income effects depend on whether a change in the terms of trade is accompanied by, or is even the result of, productivity growth that enables domestic exporters to reduce their prices. A second important determinant is the economy's openness to international trade. While terms-of-trade changes have a relatively minor impact on income in economies where exports and imports are small relative to GDP, even moderate terms-of-trade changes have a sizeable impact on national income in very open economies. Finally, secondary income effects from changes in the terms of trade depend on the use of income gains (or the form of adjustment to income losses), which, in turn, is influenced by the distribution of the gains or losses among the domestic private firms, employees, consumers and the State, as well as foreign investors.

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**Developing countries must not get complacent about industrialization and diversification.**

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A deterioration in the terms of trade due to lower export prices associated with, or resulting from, productivity growth in the exporting industries, does not mean an absolute loss of real income; yet part of the productivity gains, rather than accruing to the domestic economy, benefits, instead, the consumers, traders or producers of the importing countries. Similarly, for rapidly growing economies that face a rise in import prices resulting, at least in part, from their own growing demand (as China and other fast-growing Asian economies), the consequent deterioration in the terms of trade needs not lead to a net loss of real income. For most of the fast growing exporters of manufactures that have recently witnessed a deterioration in their terms of trade these two elements were combined. By contrast, suppliers whose export prices come under pressure but whose productivity is increasing less than that of their foreign competitors, tend to lose real income

Table 3.3

**SENSITIVITY OF DEVELOPING COUNTRIES TO TERMS-OF-TRADE CHANGES, BY BROAD PRODUCT CATEGORY AND BY REGION,<sup>a</sup> 1996–2004**

	<i>Terms-of-trade effects on GDI<sup>b</sup></i> (Per cent)	<i>Terms-of-trade variability<sup>c</sup></i>	<i>Exports–GDP ratio<sup>d</sup></i>	<i>Memo item: Share of the five leading products in total exports<sup>e</sup></i> (Per cent)
Exporters of manufactures	1.1	4.6	30.2	40.7
Oil exporters	4.3	19.3	29.1	71.4
Non-oil primary commodity exporters	1.5	10.0	18.5	64.7
East and South Asia	1.6	6.6	35.7	44.0
West Asia	4.9	19.9	31.5	76.0
Africa	2.2	12.1	23.1	71.4
Latin America	1.3	7.4	20.3	49.8

**Source:** UNCTAD secretariat calculations, based on UN COMTRADE; United States Department of Labor, Bureau of Labor Statistics, Import/Export Price Indexes database ([www.bls.gov/mxp/home.htm](http://www.bls.gov/mxp/home.htm)); Japan Customs, Trade Statistics database ([www.customs.go.jp](http://www.customs.go.jp)); UN Statistics Division Common Database; UNCTAD Handbook of Statistics database; and UNCTAD, *Commodity Price Bulletin*, various issues.

**a** Non-weighted average for the 12 African, 12 Latin American, 4 West Asian and 11 East and South Asian developing countries, listed in table 3.4.

**b** Average annual impact of terms-of-trade changes on GDI as a percentage of GDP, in absolute value, 1996–2004. It is calculated as the difference between the growth rates of GDI and GDP in real terms.

**c** Standard deviation of the annual rate of change of the net barter terms of trade.

**d** In current dollars, average for 1996–2004.

**e** 2002, at SITC Rev. 2 three-digit level.

from exports, either due to lower export volumes (reducing profits and employment) or lower export prices (reducing profits and wages).

Table 3.3 shows the exposure of different groups of countries to changes in the terms of trade as measured by the absolute difference between the growth rate of real gross domestic *income* (GDI) and that of gross domestic *product* (GDP). In the system of national accounts this difference corresponds to the “trading gain or loss resulting from changes in the terms of trade”.<sup>2</sup> The table also shows the factors contributing to the size of that gain or loss: terms-of-trade variability and openness to international trade. Terms-of-trade variability is to a large extent conditioned by the degree of export diversification.

In the period 1996–2004, the effects on domestic income were the strongest in the oil-exporting countries, where terms-of-trade variability and

export concentration are the most pronounced, and where the exports–GDP ratio is relatively high. In this group of countries, the average annual gain or loss of income from terms-of-trade movements amounted to more than 4 per cent of GDP. By contrast, in countries that export mainly manufactures much lower terms-of-trade variability combined with a similar degree of openness led to an average annual gain or loss of income of 1.1 per cent of GDP. The more closed economies of countries that export mainly non-oil primary commodities attenuated the impact of terms-of-trade changes on GDI, which amounted to 1.5 per cent.

These differences resulting from distinct export structures, are also reflected in the sensitivity of the different developing regions to terms-of-trade changes. The impact has been the strongest in West Asia, a region that includes many oil exporters. In Africa, where terms-of-trade variability has been considerably higher than in East and

South Asia and in Latin America, and where most countries also depend on a small number of primary commodity exports, the terms-of-trade effects on domestic income have tended to be stronger than in the two other regions, where manufactures account for a greater share of exports.

The differences in the size of the terms-of-trade movements and their income effects also show that the dependence on exports of primary commodities remains a central problem of development. Thanks to higher price and income elasticity of demand for manufactures, lower prices for exports of such products from developing countries will often be accompanied by higher volume growth. Therefore, it is imperative for developing countries not to become complacent about industrialization and diversification. There is a risk that the recent recovery of primary com-

modity markets could lead to a shift away from investment – both domestic and foreign – in the nascent manufacturing sectors of commodity-exporting countries in favour of extractive industries. While higher investment in that area may be beneficial in terms of creating additional supply capacity and raising productivity, this should not be at the expense of investment in manufacturing. Exporters of primary commodities that have recently benefited from higher prices and, in some cases, from higher export volumes, have to continue their efforts towards greater diversification within the primary commodity sector, as well as upgrading their manufacturing and services sectors. The recent windfall gains from higher primary commodity earnings provide an opportunity to step up investment in infrastructure and productive capacity – both essential for boosting development.

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## E. The distribution of gains or losses from terms of trade

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Table 3.3 gives figures for the direct income gains or losses from terms-of-trade changes. Indirect effects, resulting from the use of direct income gains or adjustments to direct income losses, are not measurable empirically and thus are not considered in that table. Therefore it shows only part of the full impact of terms-of-trade changes on real national income. Indeed, from a development perspective, the use of the additional income resulting from terms-of-trade changes is of crucial importance. For example, if terms-of-trade gains resulting from higher export prices accrue in the form of higher company profits, and if these are reinvested, the medium-term impact on growth will be much greater than in a situation where the gains accrue to the government through transfers from State-owned enterprises, which are used to

service the public debt, or in a situation where they accrue to workers in the form of higher wages that are spent for consumption. Similarly, a deterioration in the terms of trade resulting from higher import prices or lower export prices can lead, *inter alia*, to either a reduction of investment, an increase in government indebtedness or higher unemployment and wage compression if it is not counterbalanced by productivity and export volume growth. Regarding the distribution of income effects of terms-of-trade changes, sharing of profits from export-oriented activities among domestic and foreign actors is of particular importance, to the extent that the latter may repatriate higher profits arising from increases in international prices, thereby reducing the positive effect of terms-of-trade improvements on national income.

A central aspect in the distribution of income gains and losses from the terms of trade is captured by the distinction between gross *domestic* income (GDI) and gross *national* income (GNI).<sup>3</sup> The difference is accounted for by net factor payments abroad; it is often considerable when the income effects of terms-of-trade changes are associated with changes in profit remittances by TNCs. Since the beginning of the 1990s many developing countries have strengthened their efforts to attract FDI, and the most successful have been some fast growing exporters of manufactures and exporters of fuels and mining products. Especially in some of the latter countries, a large proportion of export activities are controlled by TNCs, and changes in their domestic income as a result of higher terms of trade may be partly absorbed by an increase in profit remittances. The inverse is of course, theoretically, also true. However, the reaction pattern is unlikely to be symmetrical; given the labour market situation in most developing countries, higher export prices (or falling prices for imported inputs) will more likely translate into higher profit remittances rather than higher wages, while lower export prices will more likely translate into lower wages rather than lower profit remittances.<sup>4</sup>

What appears as profit remittances in the current account of the balance of payments is often partially reinvested in the same host country, recorded in the capital account as an inflow of FDI. But this does not mean that there is a direct link between profit remittances and new FDI; like domestic investment, FDI is primarily determined by expected rather than current profits. Consequently, the reinvestment of TNC profits in the host country where they originate as a result of terms-of-trade gains, especially from increasing prices for oil and mineral and mining products, cannot be assumed to be systematic and therefore is not considered in the analysis presented in this and the following section.

Figure 3.5 presents estimates for growth rates of GDP, GDI and GNI for selected developing countries; it also shows the evolution of their terms of trade, which explains to a large extent the dif-

ferences between those rates. For example, in Côte d'Ivoire, Indonesia, Malaysia and Venezuela, the impact of terms-of-trade changes on GDI was considerable, but there were no large differences in the changes in GDI and GNI. This was not the case in other countries, such as Chile and Zambia, where net income payments were higher. These two exporters of mining products experienced a significant worsening of their terms of trade after 1997, which exacerbated the economic slowdown of 1998–1999. This procyclical impact of terms of trade also played a role in the upswing of 2003–2004, when it added to domestic income. In 2004, the gains from terms of trade were huge: more than 8 percentage points of GDP in Chile and 7 percentage points in Zambia. However, a considerable proportion of these gains was captured by TNCs, leading to an increase in net factor payments abroad. As a result, GNI grew more than GDP, but much less than GDI.

In China and El Salvador, countries with very different economic structures, but whose exports are dominated by manufactures, the terms of trade have been much less volatile than in countries whose exports are dominated by primary commodities. However, their terms of trade have been declining since 1998, a trend that explains the lower growth rate of income (both domestic and national) compared to GDP, especially in 1999 and in 2003–2004. While this has not prevented China from maintaining a rapid growth rate, it has contributed to weak growth in El Salvador in the past few years (fig. 3.5).

These examples illustrate the varying trends among developing countries since the mid-1990s. Table 3.4 presents an estimate, for a larger number of countries, of recent gains and losses in income arising from terms-of-trade changes and real net income payments. Despite the diversity of cases, it is possible to discern some general features. In 2002, the terms of trade generally had little effect on domestic income in developing countries. Among the 39 countries for which reliable data are available, gains or losses from terms-of-trade changes amounted to 1 per cent of GDP or more in nine countries and 5 per cent or more of GDP

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The distribution and use of income gains from terms-of-trade changes is of crucial importance.

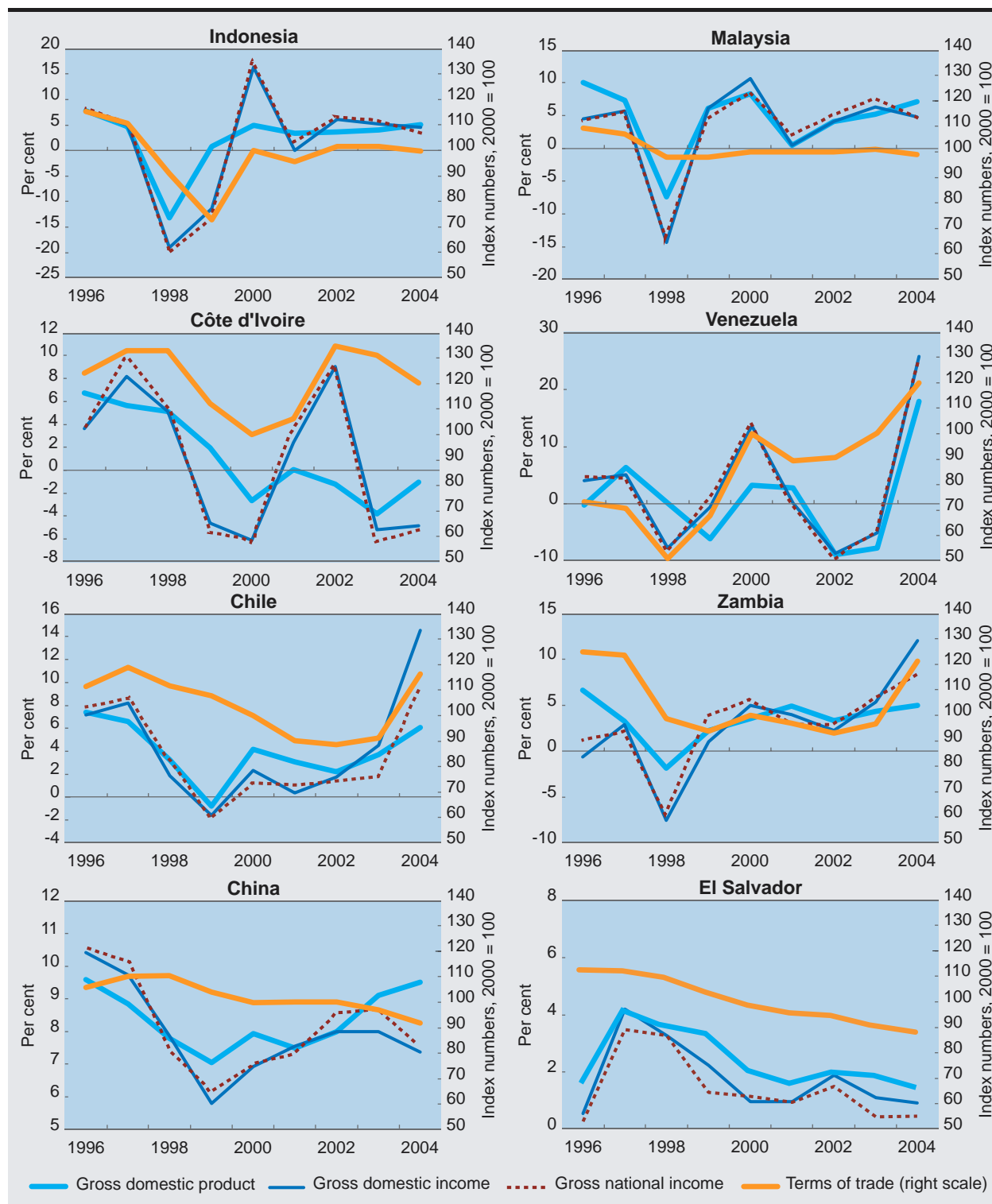
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Figure 3.5

**CHANGES IN GROSS DOMESTIC PRODUCT, GROSS DOMESTIC INCOME, GROSS NATIONAL INCOME AND TERMS-OF-TRADE INDICES, SELECTED DEVELOPING COUNTRIES, 1996–2004**

(Per cent and index numbers, 2000 =100)



Source: UNCTAD secretariat calculations, based on UN Statistics Division Common Database; IMF, Balance-of-Payments Statistics database; and UNCTAD estimates of unit value and volume of exports and imports.

Table 3.4

**IMPACT OF CHANGES IN TERMS OF TRADE AND NET INCOME PAYMENTS ON  
NATIONAL INCOME, SELECTED ECONOMIES, 2002–2004**

*(Per cent of GDP)*

	Gains or losses from terms of trade <sup>a</sup>			Effects of net income payments <sup>b</sup>			Gains or losses from terms of trade <sup>a</sup>	Effects of net income payments <sup>b</sup>
	2002	2003	2004	2002	2003	2004	Average 2002–2004	
<b>Exporters of manufactures<sup>c</sup></b>	<b>-0.5</b>	<b>-0.6</b>	<b>-1.1</b>	<b>0.4</b>	<b>-0.1</b>	<b>-0.0</b>	<b>-0.7</b>	<b>0.1</b>
Bangladesh	-0.4	-1.0	-0.8	0.1	-0.1	-0.2	-0.7	-0.1
China	0.0	-1.1	-2.1	0.5	0.6	0.1	-1.1	0.4
India	-0.3	-1.0	-0.7	-0.1	-0.7	0.1	-0.7	-0.2
Indonesia <sup>d</sup>	2.5	1.1	-0.5	0.2	0.4	-1.5	1.0	-0.3
Malaysia	0.0	1.1	-2.3	0.8	1.2	-0.4	-0.4	0.5
Pakistan	-0.8	-1.1	-1.2	-0.2	-0.3	-0.5	-1.0	-0.3
Philippines	-6.0	-1.8	-2.3	1.4	0.8	1.0	-3.4	1.1
Republic of Korea	-0.4	-1.6	-3.7	0.4	0.0	0.0	-1.9	0.2
Sri Lanka	0.9	-1.5	-1.6	0.2	0.4	-0.1	-0.7	0.1
Taiwan Province of China	-0.5	-1.5	-3.3	0.3	1.0	0.1	-1.7	0.5
Thailand	-0.7	0.5	1.0	0.2	-0.4	-0.3	0.3	-0.2
Turkey	-0.3	0.5	0.6	0.6	-0.6	-0.1	0.3	-0.0
Morocco	-0.4	-0.2	-0.4	0.2	-0.2	0.2	-0.3	0.1
South Africa <sup>d</sup>	0.1	2.7	2.4	1.0	-0.6	-0.6	1.7	-0.1
Tunisia	0.0	-0.7	0.0	-0.1	-0.6	-0.8	-0.2	-0.5
Brazil	-0.2	0.2	0.6	0.4	-0.3	-0.5	0.2	-0.1
Costa Rica	0.5	-0.5	-1.7	1.9	-2.0	1.9	-0.6	0.6
El Salvador	-0.2	-0.9	-0.6	-0.4	-0.7	-0.5	-0.6	-0.5
Mexico	0.1	-0.1	0.1	0.4	0.2	-0.2	0.0	0.1
<b>Oil exporters<sup>c</sup></b>	<b>-0.3</b>	<b>3.2</b>	<b>6.1</b>	<b>-1.1</b>	<b>-1.0</b>	<b>-0.1</b>	<b>3.2</b>	<b>-0.7</b>
Iran, Islamic Republic of	-2.1	2.2	4.6	0.2	-0.1	0.4	1.6	0.2
Kuwait	-0.5	7.9	11.3	-3.9	-1.4	6.2	6.3	0.3
Saudi Arabia	0.0	5.5	10.0	0.2	-0.6	0.6	5.2	0.1
Algeria	-1.1	6.8	6.6	-1.0	-0.5	-0.5	4.1	-0.6
Nigeria	0.8	6.8	10.7	-5.4	-4.0	-4.9	6.1	-4.8
Sudan	-0.4	1.9	2.8	-0.2	-1.7	-1.2	1.4	-1.0
Colombia <sup>d</sup>	-0.2	0.5	2.2	-0.2	-0.7	-1.0	0.8	-0.7
Ecuador	0.8	0.8	0.8	0.7	-0.7	-0.0	0.8	-0.0
Venezuela	0.3	2.7	7.8	-0.7	0.1	-1.2	3.6	-0.6
<b>Non-oil commodity exporters<sup>c</sup></b>	<b>1.4</b>	<b>0.6</b>	<b>1.5</b>	<b>0.0</b>	<b>-1.1</b>	<b>-1.5</b>	<b>1.2</b>	<b>-0.9</b>
Burundi	1.0	-0.2	-0.6	0.4	-1.1	-1.0	0.1	-0.6
Côte d'Ivoire	10.3	-1.4	-3.8	0.0	-1.2	-0.5	1.7	-0.5
Ethiopia	0.2	0.2	0.2	0.2	-0.1	-0.3	0.2	-0.1
Ghana	5.0	1.8	-0.6	-1.1	0.4	-0.7	2.1	-0.5
Uganda	-0.2	0.2	-0.3	0.2	-0.2	-0.5	-0.1	-0.2
Zambia	-1.0	1.0	7.1	0.4	0.3	-3.8	2.3	-1.0
Argentina	0.0	1.3	1.8	-0.2	-0.2	-0.7	1.1	-0.4
Bolivia	-0.0	1.0	1.6	0.2	-1.2	-1.3	0.9	-0.7
Chile	-0.5	0.8	8.4	-0.5	-2.9	-5.4	2.9	-2.9
Peru	1.0	1.1	2.2	-0.6	-1.2	-2.5	1.4	-1.4
Uruguay	0.1	0.5	0.4	0.9	-5.1	-0.3	0.3	-1.5

**Source:** UNCTAD secretariat calculations, based on UN Statistics Division Common Database; IMF, Balance-of-Payments Statistics database; national sources; and UNCTAD estimates of unit value and volume of exports and imports.

**a** Difference between the growth rates of GDI and GDP in real terms.

**b** Difference between the growth rates of GNI and GDI in real terms.

**c** Non-weighted averages.

**d** Not included in the product group average because the other product groups have an untypically strong influence on the terms of trade.



in three countries: Côte d'Ivoire (10.3 per cent), Ghana (5.0 per cent) and the Philippines (-6.0 per cent). In 2003 and 2004, the situation changed perceptibly. In both years, gains or losses from terms of trade exceeded 1 per cent of GDP in 24 countries, with 15 countries registering gains and 9 losses. On average, exporters of manufactures registered relative losses of GDI from terms of trade of 0.7 per cent of GDP in 2002–2004. Oil exporters, on average, saw relatively large domestic income gains in that period (3.3 per cent), while improvements in the terms of trade of non-oil primary commodity exporters led to relative gains in GDI, averaging 1.2 per cent in 2002–2004. These gains and losses were partly offset by changes in net income payments abroad. Over the three years, from 2002 to 2004, roughly 10 per cent of the relative income losses of exporters of manufactures were offset by lower net income payments abroad, while the oil exporters saw 25 per cent of their relative income gains vanish through higher net income payments abroad. The outcome has been dramatic for the exporters of primary commodities other than oil: on average, 75 per cent of their relative income gains from terms-of-trade improvements were absorbed by higher net income payments abroad.

In 2003 and 2004, the deterioration of the terms of trade of most economies of East and South Asia meant a loss of income frequently exceeding 1 per cent of GDP. Among Latin American countries, the terms of trade had a negative impact only on some exporters of manufactures that are also oil importers. In Costa Rica in 2004, a reduction in the profit remittances of TNCs compensated for the loss of income, reflected in the positive effect from net income payments. Chile and Venezuela obtained the greatest gains from terms of trade in the region, by as much as 8.4 and 7.8 percentage points of GDP, respectively, in 2004 alone. However, in Chile, a large

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Foreign investors may repatriate the higher profits arising from increases in international prices, thereby reducing the positive effect of terms-of-trade improvements on national income.

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Profit remittances are often reinvested in the same host country, but there is no systematic link between such remittances and new FDI.

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part of the gain was offset by higher net income payments abroad (\$8.1 billion in 2004, compared to \$4.6 billion in 2003), mostly by exporting TNCs. Other exporters of mining products (e.g. Peru) and hydrocarbons (e.g. Colombia and Bolivia) also experienced significant gains from terms of trade and suffered a negative effect from higher net income payments abroad. In Argentina, improving terms of trade contributed to a recovery from the 2001–2002 crisis, not least because a larger-than-average share of this gain remained inside the country.

The oil-exporting countries of West Asia, and, to a lesser extent, those of Africa (Algeria, Nigeria and Sudan)

registered relatively large domestic income gains. However, in the case of the West Asian oil exporters, the positive terms-of-trade effects on relative income growth were reinforced by increases in income payments received from abroad, reflecting the rising government revenues from foreign investments. By contrast, the domestic income gains in Nigeria and Sudan were in large part offset by higher net outflows of profit remittances. The African exporters of minerals and mining products, South Africa and Zambia, had large relative gains in domestic income. The effects of net income payments were negative in 2004 for almost all the African countries examined, and particularly so for Nigeria and Zambia, as profit remittances from oil and mining companies, respectively, increased.

Overall, the recent improvements in the terms of trade of many developing countries, as a result mainly of higher international prices for a broad range of primary commodities – especially fuels, and ores and metals – have translated into real income gains. In principle, these gains can have positive development effects by strengthening the ability of these countries to finance new investments in infrastructure and productive capacity, with attendant im-

improvements on employment, productivity and output growth. However, this depends on how the higher earnings from exports, resulting from rising export prices (or falling prices for imported inputs), are used. They may translate into higher wages, higher government revenue from taxes, royalties or profits of public enterprises, higher net profits of local firms, or higher net profits of foreign investors. The developmental effect further depends on the extent to which the different

groups use the higher income on investment or consumption. The observations in this section suggest that in a number of countries that have benefited in recent years from domestic income gains through improvements in their terms of trade, the potential of these gains to enhance the financing of development has not been fully realized because they were associated with increasing outflows of profit remittances, an issue that is examined further in section F.

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## F. The distribution of export income and rent from extractive industries

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In order to accelerate their economic and social transformation, and advance towards achieving the Millennium Development Goals (MDGs), developing countries need to use the income generated by export-oriented activities in a way that is conducive to faster capital accumulation and stronger productivity growth. That income may accrue to private agents in the form of profits, interest or wages, or to the government through profits transferred by State-owned enterprises (SOEs), or through royalties or taxes paid by companies in the export sectors. It may be used to reduce poverty and boost private consumption, or to increase private capital formation or public investment. When TNCs involved in export activities repatriate their profits, the potential development-enhancing effects are reduced (assuming that new FDI is independent of current profits). In the capital-intensive mining, oil and gas sectors, TNCs typically control a particularly large share of export activities. These are also the sectors where large differential rents

can occur, since production costs differ considerably depending on the localization, accessibility and richness of the deposits. On the other hand, the share of the government in the rent from export-oriented activities in these sectors is a potentially important source of revenue for financing development. Careful management of the rent from extractive industries is of special importance

in the context of sustainable development, because these rents are generated from the exploitation of non-renewable resources, which will eventually be depleted.

In this context, the State's retention of a part of the rents generated in these sectors has traditionally received special

attention in developing countries. Until the mid-1980s, the State controlled extractive activities in most developing countries. Subsequently, privatization of SOEs in the mining sector, along with tax incentives for foreign investors has led to a considerable reduction of government revenues from this sector (box 3.1).

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**The rent from extractive industries is a potentially important source of revenue for financing development.**

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Fiscal revenues from external trade in general and extractive industries in particular still provide a significant share of total revenue in a number of developing countries (table 3.5), although the amount and mechanisms for collecting the revenues differ widely from one country to another. Government revenue accrues from transfers of State-owned exporting companies or as a share of export income through royalties and income taxes paid by private operators. Despite the tendency towards a general reduction of import and export duties, they have remained an important source of public revenue for many countries, especially LDCs.

Although taxes on international trade mainly take the form of import duties, fiscal revenues from that source depend indirectly on the value of exports, since the latter largely determines the level of imports. Thus, recent increases in the export earnings of many developing countries have contributed, directly and indirectly, to an increase in their fiscal revenues. Moreover, some countries such as Argentina, Côte d'Ivoire and Ghana have applied taxes on exports – which are easier to collect – as a substitute for taxes on the profits of exporters, especially in agriculture. In Côte d'Ivoire, taxes on exports of coffee and cocoa provided 18 per cent of the public revenue in 2002. In Argentina, export taxes, at rates of 5 per cent for manufactures and 20 per cent for primary commodities, were introduced to absorb part of the windfall profits resulting from the large currency devaluation of 2002 and from the higher international prices of agricultural and energy products.

Government revenue from export-oriented activities is frequently reduced by fiscal incentives accorded to foreign investors. Although such incentives may have been successful in attracting additional FDI, they have increasingly come under criticism, especially in a number of Latin American countries. In response, some countries have recently revised their fiscal and ownership regulations relating to the oil and mining sectors. The rise in the prices of most mineral and mining products in the past few years has further stimu-

lated the debate on the distribution and use of the windfall. Revenue systems and the structure of ownership of these sectors differ considerably across countries, and reliable, detailed information on the income they generate in developing countries, or the government revenue realized from them, is not systematically available.<sup>5</sup> However, it is possible to identify some general trends and orders of magnitude based on rough estimates of the distribution of rents in the oil and mining sectors.

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**Privatization and tax incentives for foreign investors have led to a considerable reduction of government revenues from the mining sector.**

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As a first approximation, government revenue from natural resources may be compared with the value of the natural resources produced or exported (table 3.6). In some major oil-exporting countries for which data are available, such as Algeria, Ecuador, the

Islamic Republic of Iran, Kuwait and Nigeria, transfers to the public budget exceeded 60 per cent of total fuel export earnings in the reference year; and they amounted to between 16 per cent of GDP in the Islamic Republic of Iran and 43 per cent of GDP in Kuwait, depending on the degree of diversification of the economy. In these countries, with mature hydrocarbon industries, most government income is generated directly through SOEs or joint ventures.<sup>6</sup>

In several sub-Saharan African countries, such transfers account for a much smaller share of oil export earnings, especially in Chad, where they amount to only 6.7 per cent. In these countries, oil extraction industries are more recent and mainly operated by TNCs. The lower fiscal income in these countries is explained partly by high start-up costs and high initial depreciation allowances that reduce the taxable income, but also by fiscal incentives accorded to the foreign-owned companies. For example, in Chad, a country that has been presented as an example of sound management of oil revenues, TNCs only paid royalties of about \$2 per barrel in 2004.<sup>7</sup>

The counterpart of the relatively low share of the public sector in total oil earnings in sub-Saharan Africa is the higher share obtained by TNCs, which explains the sizeable income payments abroad in the balance of payments. Angola,

**Box 3.1****STATE INCOME FROM EXTRACTIVE INDUSTRIES: A HISTORICAL PERSPECTIVE**

In many countries, economic activities in the energy and mining sectors have long been directly controlled by the State. For example, in Argentina a public oil company was founded in 1922, and in Bolivia and Mexico private companies in these sectors were nationalized in 1937 and 1938 respectively. In other countries, where these activities were entirely or partly in the hands of domestic or foreign private operators, part of the income resulting from oil and mineral exports went to the State in the form of royalty payments or taxes on profits and export earnings. The size of those payments was often a source of conflict between host countries and foreign firms and their home countries. Well-established States, such as Chile, were able to collect significant revenues from exports of raw materials,<sup>1</sup> but this was the exception rather than the rule. Less organized independent States, colonies and protectorates would typically receive only a small share of export revenues, if any. Moreover, disclosure of costs and profits was not always obligatory. In the case of oil, for example, extraction costs, and thus the profits of the dominant firms (the “Seven Sisters”), were kept secret until the early 1950s.<sup>2</sup>

In the process of decolonization, the situation changed in many countries, particularly in respect of the oil sector. In the 1940s, the Venezuelan Government first imposed taxes on oil companies and later it required a 50/50 distribution of net oil earnings. Similar regimes were introduced by Kuwait, Iran (now the Islamic Republic of Iran) and Saudi Arabia in 1950. With the creation of the Organization of the Petroleum Exporting Countries (OPEC), its member States worked towards a harmonization of their oil regimes, and in 1970 they agreed to establish a minimum tax rate of 55 per cent. In parallel, State-owned oil firms were created during the 1960s in Algeria, Iraq, Kuwait, Venezuela and Saudi Arabia, and in the early 1970s, these and other OPEC countries went further by nationalizing or acquiring a majority share in their oil industries.

Beginning in the early 1950s there was also a nationalization wave in other sectors, as an increasing number of developing countries tried to increase their revenues and reaffirm their sovereignty. This included mining activities in Bolivia (1952), Zaire (now the Democratic Republic of the Congo) (between 1967 and 1974), Zambia (starting in 1970) and Chile (1971). As a result, the SOEs from Chile, Zaire and Zambia were the three major world copper producers in 1980.<sup>3</sup>

But soon many SOEs in developing countries, especially in the mining sector, faced serious problems that eventually undermined their ability to generate fiscal revenues from their export activities.

Chad, Congo and Equatorial Guinea had a large surplus in their trade balance in 2003 and 2004, the value of merchandise exports being roughly double that of imports. However, all these countries posted current-account deficits owing to profit remittances and other service payments, mainly linked to the oil sector.

A more precise estimate of the rent from extractive industries that is retained in an economy can be obtained from a comparison of the income

of the different domestic agents and foreign investors with the total rent generated in that sector. This requires information on costs, production and prices, which is not, however, systematically available. Nonetheless, in the annex to this chapter, such estimates are undertaken for some countries in Latin America during the period 1999–2004.

The country studies suggest that there are large differences in the distribution of the rents from extractive activities across countries and sec-

**Box 3.1 (concluded)**

Prices of most metals fell in the second part of the 1970s and much of the 1980s. Falling prices and economic problems due to the debt crisis of the 1980s aggravated the fiscal situation in many developing countries, as a result of which the SOEs had to transfer an increasing share of their revenues to central governments. This deprived them of the means of financing the investments needed for maintaining and expanding their production capacities. On the other hand, TNCs undertook a radical restructuring process that involved several mergers and acquisitions. They also developed new technologies that enabled them to profitably exploit lower-grade deposits despite lower prices.

As access to new technologies and capital had become crucial at a time when many SOEs were facing financial problems and losing their relevance as a source of public revenue towards the end of the 1980s, the doors were again opened to TNCs. They returned to developing countries or reinforced their presence through acquisitions of privatized companies, joint ventures and concessions in the extractive industries. In the oil sector, where OPEC members produced at very low costs, the position of public firms had remained viable and national ownership of most companies was maintained. But in the mining sector, most public companies were privatized. Ghana reformed its mining sector between 1985 and 1989, reducing State ownership and encouraging FDI through a reduction of corporate income tax from 55 to 35 per cent and royalties from 6 to 3 per cent. This early example was followed by other African countries, including Guinea, Madagascar, Mali and the United Republic of Tanzania.<sup>4</sup> In Latin America, a wave of opening up to FDI in the mining sector was pioneered by Chile, and followed by other countries including Argentina and Peru. A similar opening also occurred in the Latin American hydrocarbons industry (see also the annex to this chapter). In some cases, good management and sufficient resources enabled State firms to survive (e.g. the copper company in Chile).

<sup>1</sup> Taxes on saltpeter exports accounted for roughly half of Chile's fiscal income for almost 40 years in the late 19th and early 20th centuries (Bethell, 1986).

<sup>2</sup> Only in 1952, with the publication of *The International Oil Cartel* (a report by the Federal Trade Commission of the United States) was the *modus operandi* of the major international oil companies unveiled. For an analysis on the energy market from a historical perspective, see Chevalier, 2004.

<sup>3</sup> For a historical analysis of the copper sector, see UNCTAD, 1994b, and Moussa, 1999.

<sup>4</sup> For a recent account of FDI in Africa, see UNCTAD, 2005c, in particular section D.

tors as a result of differences in the role of SOEs and fiscal regimes. For example, in the case of the oil industry in Mexico, the entire rent went to the Government; in Ecuador and Venezuela, the Government received close to two thirds of the total rent throughout the period 1999–2004, and in Venezuela a sizeable share of the rent also accrued to domestic consumers. In Argentina, the government share in the oil rent fell from around 45 per cent in 2001 to an estimated 36 per cent in 2004. In these countries, State ownership of the

oil industry has been the main vehicle for capturing all or a large part of the rent from oil extraction. This is most apparent in Mexico, where PEMEX operates the State monopoly, but in Ecuador and Venezuela, where SOEs and private contractors coexist, the SOEs have also provided the bulk of fiscal receipts generated from the rent of the oil sector.

In the case studies on the mining sector in Chile and Peru, the distribution of the rent was



Table 3.5

**GOVERNMENT REVENUE<sup>a</sup> FROM  
INTERNATIONAL TRADE AND  
EXTRACTIVE INDUSTRIES,  
SELECTED DEVELOPING  
COUNTRIES**

*(Per cent of total current  
government revenue)*

	<i>Import and export duties</i>	<i>Revenue from extractive industries<sup>b</sup></i>	<i>Period con- sidered</i>
Algeria	7.3	68.7	2003
Angola	5.9	75.1	2003
Argentina	16.9	7.1	2004
Bahrain	4.4	74.2	2003
Bolivia <sup>c</sup>	3.5	26.2	2003
Botswana	11.0	52.7	2002
Chile	5.7	8.2	2003
Chad	17.3	33.8	2004
Congo	7.2	69.8	2003
Côte d'Ivoire	38.6	1.4	2002
Dem. Rep. of the Congo	28.5	20.7	2002
Ecuador	9.2	29.8	2002
Egypt	13.0	16.4 <sup>d</sup>	2003/04
Equatorial Guinea	0.9	91.9	2004
Ghana	22.7	3.5	2002
Guinea	19.8	14.0	2003
Indonesia	3.1	25.9	2002
Iran, Islamic Republic of	8.8	53.8	2004
Kuwait	1.3	71.6	2002
Malaysia	5.9	22.7	2004
Mexico <sup>c</sup>	1.7	33.1	2004
Namibia	24.9	18.4	2002/03
Nigeria	8.3	76.5	2003
Peru	7.3	2.4	2003
Sudan	20.7	44.8	2002
United Arab Emirates	2.8	69.2	2003
Venezuela	3.0	49.7	2003
Viet Nam	18.5	30.3	2002
Yemen	6.4	47.6	2003

**Source:** IMF, *Government Financial Statistics Yearbook*, and *Country Reports*; and UNCTAD secretariat calculations, based on national sources.

**a** Central government unless otherwise indicated.

**b** Government revenue from royalties, income taxes of exporting firms, and profits of State-owned enterprises transferred to the government budget.

**c** Non-financial public sector.

**d** Including revenues from the Suez Canal Authority.

less favourable for the State than in the case studies on the oil industry of other countries. For example, in Chile between 1999 and 2002 less than 20 per cent of the total rent originating from copper extraction accrued to the State; in 2003 this share rose to about 30 per cent and in 2004 to more than 50 per cent. The State-owned copper company, CODELCO, provided around 80 per cent of the public sector revenue from copper between 1999 and 2004, although its share in total copper production was less than 40 per cent (see annex to this chapter). In Peru, the proportion of the public sector's share in the total rent from gold and copper extraction averaged 15 per cent during that period. Similarly, in Argentina, the State has been able to obtain only a relatively small proportion of the growing total rent of its copper and gold sectors.<sup>8</sup> The relatively small government revenue generated by the mining sector in these countries appears to be largely the result of the policy of offering fiscal benefits to mainly foreign-owned private companies operating in that sector.

A general conclusion arising from these examples is that the ability of the State to capture a significant share of the rent has been relatively weak in the developing countries that privatized their national companies. In particular, government revenue from private oil and mining companies in the form of income taxes have been low compared to the oil and mining rent.

The increasing participation of TNCs in oil and mining activities since the mid-1980s has generally expanded production, but it has also reduced the share of the rent retained by the host countries. This is because the role of SOEs has been considerably reduced and fiscal charges for private foreign companies greatly lowered. Rising global demand for oil and mining products in the wake of fast output growth in East and South Asia, and the associated sharp price increases since 2003, have further attracted foreign investors in these activities. At the same time, governments of countries with large oil and mineral deposits have begun to review their regimes governing the distribution of rents in these sectors, and some reforms have already been initiated. This is the case in some Latin American countries that had been pioneers in privatizing their oil and mining activities or opening up their natural-resource sectors to private investment.

Table 3.6

## GOVERNMENT REVENUE FROM FUEL INDUSTRY IN SELECTED DEVELOPING COUNTRIES

	Value (\$ million)	Share in fuel exports	Share in fuel production	Share in total GDP	Year
Algeria	17 442	72.7	72.5	26.2	2003
Angola	3 892	44.8	58.3	28.2	2003
Chad	128	6.7	7.5	3.0	2004 *
Congo	725	34.4	42.0	20.7	2003 **
Ecuador	1 363	67.0	51.5	5.6	2002
Equatorial Guinea	1 513	32.8	38.0	33.7	2004 *
Gabon	1 136	33.3	36.3	15.7	2004 *
Iran, Islamic Republic of	22 521	83.3	73.8	16.1	2003 *
Kuwait	14 752	98.5	91.2	43.1	2001
Nigeria	16 298	61.3	64.0	27.9	2003 **
Sudan	905	59.9	n.a.	6.7	2002
United Arab Emirates	15 567	52.6	42.8	19.5	2003 **
Yemen	1 725	46.8	47.4	15.5	2003

Source: IMF, *Country Reports*; and UNCDB.

\* Estimates.

\*\* Preliminary estimates.

Several other countries have adapted their taxation rules to the changes in international primary commodity markets, especially in countries where taxes paid by private companies had been particularly low. For example, in 2004 the Government of Kazakhstan introduced a progressive “rent tax” on oil exports with a maximum tax rate of 33 per cent when the oil price rises to \$40 or more per barrel.<sup>9</sup> A similar progressive tax was also introduced in the Russian Federation.<sup>10</sup> In Argentina, duties on oil exports were raised with a view to increasing the public sector’s share in the windfall profit from higher oil prices.<sup>11</sup> In a number of other Latin American countries the conditions for private investors’ participation in the oil and mining industries have also been modified recently (see annex to this chapter), while in Bolivia, where the hydrocarbons sector was privatized in 1996, a con-

trovery about the distribution of the oil and gas income between the State and foreign companies led to a severe political crisis.<sup>12</sup>

In order to ensure that the considerable rents accruing in the extractive industries are used in a way that maximizes the gains for development and social welfare, governments need to design an appropriate fiscal framework for these industries, that strikes a balance between promoting long-term investment and realizing public revenue. On the one hand, a “race to the bottom” in the provision of fiscal incentives should be avoided. On the

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Progress towards the MDGs can be enhanced only if the income gains from favourable terms of trade are used strategically for physical and human capital formation.

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other, efforts to obtain adequate fiscal revenue should not deprive the operators, private or public, of the financial resources they need to increase their productivity and supply capacity, or their international competitiveness.

Recent upward trends in world market prices of fuels, and mineral and mining products as a result of growing demand from East and South Asia have themselves attracted higher FDI and new entrants to these sectors, including TNCs from China. This situation provides an opportunity to review the existing fiscal and ownership regimes. Such a review, and possible strategic policy adjustments, could be more effective if oil and mineral exporting countries would cooperate in

the formulation of some generally agreed principles relating to the fiscal treatment of foreign investors. Obviously, a higher share for the Government in the rent generated by extractive industries, or a higher share obtained by domestic consumers or investors, does not automatically enhance development and progress towards the MDGs; this will occur only if higher national income due to gains from the terms of trade is used strategically for physical and human capital formation. ■

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## Notes

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- 1 A fall in the terms of trade “does not mean that primary producers are worse off than they were before. Everything depends on the degree of increased productivity reached and the extent to which it is transferred to industrial manufacturers. If the index falls to 80, for instance, primary producers will be able to obtain 20 per cent less manufactured goods than they did before, for the same amount of primary goods. However, if to obtain the same amount they need work only half as long as before, one hour’s labour would now allow them to purchase 60 per cent more manufactured goods, instead of 100 per cent more, as would have been the case had they received the full benefits of their own technical progress” (ECLA, 1951: 47).
- 2 The *System of National Accounts* defines the income effect of terms-of-trade changes as follows: “GDP in constant prices, plus the trading gain or loss resulting from changes in the terms of trade, equals real gross domestic income” (United Nations et al., 1993: 405). Trading gains or losses (T) are measured by the formula:

$$T = \frac{X - M}{P} - \left( \frac{X}{P_x} - \frac{M}{P_m} \right)$$

where X and M are exports and imports at current prices;  $P_x$  and  $P_m$  are the price indices for exports

- and imports, and P is a price index expressed in a selected numeraire. For the analysis in this *TDR* the numeraire is  $P_m$  (which is one of the most frequently used), and the reference year for the price indices is the previous year. The formula thus becomes  $T = X/P_m - X/P_x$  (i.e. the difference between the purchasing power of exports and the volume of exports).
- 3 See United Nations et al., 1993: 405.
- 4 If, as is frequently the case, lower export prices are accompanied by real currency depreciation, the real effect of income payments will probably be greater in terms of current GDP, measured in local currency, even if the income payments fall in current dollars.
- 5 Different initiatives have been proposed for increasing the availability of information on revenues stemming from various extractive industries. In particular, in 2002 the British Prime Minister and the Department for International Development (DFID) of the United Kingdom launched the Extractive Industries Transparency Initiative, which was endorsed by the World Bank in 2003. The IMF also seeks to improve the quality of such information within the Article IV consultations with developing countries.
- 6 The situation is quite similar in the United Arab Emirates, but a significant proportion of the transfers to the Government are not included in the respective figure in table 4.6, because “some revenue is retained by the national oil company for financ-



- ing of investments, or is transferred directly to Abu Dhabi's government's foreign assets, rather than accruing to the budget" (IMF, 2004d: 26).
- 7 "Royalties, set at 12.5 percent of the wellhead price, were paid in 2004 using the agreed 2003 wellhead price of US\$ 16.9 per barrel because of a disagreement between the authorities and the oil companies on export prices and transportation costs. Negotiations on these issues are ongoing" (IMF, 2005b: 11).
- 8 Following the economic policy reforms, the mining industry in Argentina has benefited from special fiscal treatment such as accelerated depreciation allowances and exemption from the 20-per-cent export duty that was introduced in 2002 for all other primary exports. Moreover, although the peso has lost two thirds of its value since the end of 2001, payments of royalties and taxes by mining companies continue to be determined on the basis of an exchange rate of 1 peso to the dollar. As a consequence, the dollar value of government revenue from royalties and tax payments by the copper and gold mining sectors may have fallen between 2001 and 2004, although, as a result of higher production and prices, the rent from those sectors is likely to have increased considerably since 2001.
- 9 As a result of new tax legislation the Government's share in oil income will be raised to a range of 65–85 per cent. The former guarantee for investors of a fixed tax rate throughout the duration of a contract was abolished, while an excess profit tax and a minimal Government share of oil to be produced under new production-sharing agreements were introduced (see EIA, 2004: 3).
- 10 Below \$15 a barrel there is no export duty; between \$15 and \$20, the rate of duty is 35 per cent of market price minus \$15; in the \$20–\$25 range, the exporter must pay 45 per cent of market price minus \$20, plus \$1.75 a barrel; over \$25 a barrel, export duties are 65 per cent of market price minus \$25, plus \$4 a barrel.
- 11 In May 2002, a tax of 20 per cent was introduced for all primary commodity exports. The rate applicable for oil exports was raised in May 2004 to 25 per cent, and since August 2004, a progressive scale is being applied, ranging from 25 per cent when the reference oil price – the West Texas Intermediate (WTI) price – is below \$32, to 45 per cent when it exceeds \$45.
- 12 Since 1996, the royalty rate for the exploitation of old fields was 50 per cent, while the rate for new exploitations was reduced that year to 18 per cent. This new regime attracted significant amounts of FDI in the gas sector, in particular for the construction of a pipeline to Brazil between 1997 and 1999. In anticipation of rising export demand, TNCs also invested in exploration that resulted in the discovery of huge new gas reserves, exceeding what the Brazilian market could absorb. In 2001, an international consortium prepared a \$6-billion project for the export of liquefied gas to North America, which included the construction of a pipeline to the Pacific Ocean (Campodónico, 2004). This project met with strong public opposition, as both the price for the gas agreed with the North American importers and the royalties were considered too low. Popular concerns that, as on previous occasions, the income from the exploitation of the natural resources would not be used for national development, triggered massive protests, which led to the President's resignation in October 2003. In a subsequent referendum, a large majority approved the abrogation of the 1996 hydrocarbons law, the restoration of a public oil and gas company and the imposition of taxes or royalties on private companies of up to 50 per cent of the value produced. As a consequence, a new law promulgated in May 2005 has introduced a tax of 32 per cent, in addition to the 18 per cent royalty; it also requires mandatory conversion of old contracts to make them compatible with the new rules. However, political tensions persist: on the one hand, TNCs complain about a "confiscatory change in the rules", and, on the other, "civilian committees" in the gas-producing provinces have been claiming regional autonomy for gas policies. There have also been massive demonstrations calling for the nationalization of the hydrocarbons industry. Continuing protests led to the resignation of the President in June 2005, and the control of hydrocarbons and the distribution of the income they generate remain a burning political issue.



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**Annex to chapter III**

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## **DISTRIBUTION OF OIL AND MINING RENT: SOME EVIDENCE FROM LATIN AMERICA, 1999–2004**

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### **1. The oil industry in Argentina, Ecuador, Mexico and Venezuela**

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#### **Methodology**

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The oil rent is estimated as the difference between the values of production at the relevant international price and the cost of production. It considers only the “upstream” rent, thus excluding profits at the refinery and the commercialization stages (“downstream” income). Following the criteria used by the United States Energy Information Administration, cost of production includes the costs of exploration, extraction and production, plus administrative costs and depreciation.

The part of the rent accruing to the Government consists of proceeds from income tax and other relevant taxes plus royalties paid by private and State-owned firms, plus the latter’s profits transferred to the Government. Indirect taxes on hydrocarbons, such as value-added tax and specific consumption taxes, are not considered to be a part of the oil rent. The share of the rent obtained by the private sector (business sector and

consumers) is estimated as the difference between total and public rent. Undistributed profits of SOEs are included in the business sector rent. Subsidies for domestic oil consumption are considered as the portion of the rent that accrues to consumers.

#### **Argentina**

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In 2004, Argentina produced an average of 690,000 barrels per day (bpd), 14 per cent less than in 1999. Higher oil prices more than compensated for this decline. Devaluation of the currency in 2002 reduced production costs to an estimated \$6.1 a barrel. As a result of all these factors, oil rent increased significantly, reaching \$7.1 billion in 2004 (table 3.A1).

The State-owned oil company, YPF, was privatized in the 1990s, and in 2004 a new public firm in the energy sector, ENARSA, was created but its activities are not yet significant. The Gov-

Table 3.A1

ARGENTINA: ESTIMATE OF OIL RENT, 1999–2004					
	<i>Production</i>	<i>Price</i>	<i>Cost of</i>	<i>Rent</i>	<i>Total rent</i>
	(Million barrels)	(f.o.b.)	production		(\$ million)
			(\$ per barrel)		
1999	293	16.0	7.9	8.1	2 373
2000	282	26.6	7.9	18.7	5 273
2001	285	22.2	7.9	14.3	4 075
2002	276	22.2	6.1	16.1	4 444
2003	270	26.7	6.1	20.6	5 562
2004	252	34.4	6.1	28.3	7 132

**Source:** UNCTAD secretariat calculations, based on National Energy Secretariat of Argentina, Mercado de hidrocarburos database (<http://energia.mecon.gov.ar>); Repsol YPF S.A. and Petrobrás Energía S.A., *Estados contables, memoria y reseña informativa*, various years.

ernment obtains part of the revenues from the oil industry through royalties, income tax and export duties (table 3.A2). As the 1994 Constitution confers the original ownership of natural resources to the provinces, they receive the royalties, which at present amount to 12 per cent of the well-head value in dollars. The Government collects taxes on profits (35 per cent) and on exports (between 25 to 45 per cent, depending on the international price). Total government receipts have increased

considerably in absolute terms over the past few years, owing to the expansion of total rent and to the introduction of export taxes; between 2002 and 2004, 30 per cent of the production was exported. However, the share of the Government shrunk from 44.6 per cent in 2001 to 36.0 per cent in 2004, the remainder accruing to private firms. Domestic prices were similar to prices for exported oil, so that domestic consumers did not benefit from the rent.

Table 3.A2

ARGENTINA: ESTIMATE OF GOVERNMENT REVENUE FROM OIL RENT, 1999–2004					
(Millions of dollars and per cent)					
	<i>Royalties</i>	<i>Taxes on</i>	<i>Taxes on</i>	<i>Total govern-</i>	<i>Share of govern-</i>
		<i>oil exports</i>	<i>oil income</i>	<i>ment revenue</i>	<i>ment revenue</i>
				<i>from oil</i>	<i>in total oil rent</i>
					(Per cent)
		(\$ million)			
1999	503	..	481	984	41.5
2000	842	..	1 061	1 903	36.1
2001	691	..	1 128	1 819	44.6
2002	661	431	781	1 873	42.1
2003	735	447	1 109	2 291	41.2
2004	843	508	1 217	2 568	36.0

**Source:** See table 3.A1.

Table 3.A3

## ECUADOR: ESTIMATE OF OIL RENT, 1999–2004

	<i>Production</i> (Million barrels)	<i>Price</i> (f.o.b.)	<i>Cost of</i> <i>production</i> (\$ per barrel)	<i>Rent</i>	<i>Total rent</i> (\$ million)
1999	136	15.0	2.5	12.5	1 700
2000	140	24.9	4.1	20.8	2 906
2001	149	19.9	4.6	15.3	2 282
2002	143	22.1	5.7	16.4	2 348
2003	152	26.3	6.1	20.2	3 078
2004	193	30.2	6.4	23.8	4 582

**Source:** UNCTAD secretariat calculations, based on Petroecuador, *Estados Financieros 2003*, and *Indicadores Estadísticos*, 2005; Energy Information Administration (EIA), *Monthly Energy Review*, January, 2005; Gaffney, Cline and Associates, 2004; and Ministry of Economy and Finance, *Macroeconomic Programme 2004*.

### Ecuador

Oil production in Ecuador is controlled by the State-owned firm, Petroecuador, and by private companies. The latter operate mainly through production-sharing contracts, financing the investment and paying to the State a share of their revenue of approximately 25 per cent. Private companies must also pay royalties and 25 per cent income tax on their profits. Royalties vary between 12.5 per cent if production is less than 30,000 bpd, 14 per cent if production is between 30,000 and 60,000 bpd, and 18.5 per cent if production exceeds 60,000 bpd.

While Petroecuador's production fell from 256,000 bpd in 1999 to 189,000 bpd in 2004 due to insufficient investment, total oil production in Ecuador strongly increased after the completion of a pipeline for heavy crude oil in October 2003. This pipeline transports oil from areas mainly exploited by private firms. As a consequence, the share of Petroecuador in total production fell from 69 per cent to 36 per cent. Production costs have increased since 2000 due to inflation in the context of dollarization and higher costs of exploitation by private companies in the new fields. Nevertheless, the rise in international prices and in oil production led to a significant increase in the oil rent (table 3.A3).

The State obtained about two thirds of the oil rent, mainly from Petroecuador, which, despite its falling share in total oil production, still provided 75 per cent of the public revenue from oil in 2003. Public revenue from private companies came mainly from royalties and production-sharing; income tax represented only 3 per cent, on average, of total public revenues from oil activities. Part of the rent has been transferred to consumers through subsidized pricing of liquefied natural gas, diesel and fuel oil by Petroecuador (table 3.A4).

### Mexico

Mexico's Constitution provides for a State monopoly in the oil industry, including the exploration, production, refining, stocking, transport and distribution of crude oil and derivatives. These activities are performed by the State-owned company PEMEX. Crude oil production increased at an average annual rate of 3 per cent between 1999 and 2004, reaching 3.4 million bpd in 2004. Production costs, which have traditionally been low, have recently increased due to insufficient investment in new fields and higher costs of secondary exploitation of old fields. Nevertheless, the evolution of international prices has led to a sizeable increase in the rent per barrel and in total oil rent (table 3.A5).

Table 3.A4

## ECUADOR: ESTIMATE OF THE DISTRIBUTION OF OIL RENT, 1999–2003

(Millions of dollars and per cent)

	Government revenue			Total	After tax profits of private companies	Subsidies <sup>b</sup> to consumers	Share of government revenue in total oil rent
	Transfers from Petroecuador	Royalties <sup>a</sup>	Income tax				
	(\$ million)				(Per cent)		
1999	889	118	42	1 049	359	200	61.7
2000	1 377	239	45	1 661	637	300	57.2
2001	1 196	251	41	1 488	579	200	65.2
2002	1 286	313	31	1 630	643	200	69.4
2003	1 538	441	70	2 049	1020	192	66.6

Source: See table 3.A3.

<sup>a</sup> Including income from production-sharing contracts.<sup>b</sup> Implicit subsidy resulting from the difference between international and domestic sales prices.

This rent is almost entirely earned by the Government, given the special tax rules applying to PEMEX: the firm must pay various taxes (“extraction tax”, “extraordinary and additional duties” and an income tax) amounting to a total of about 61 per cent of its revenue. In addition, when the oil price exceeds the level stated in the govern-

ment budget, it must pay a supplementary 39.2 per cent of the excess revenue. As a result, the firm’s after-tax profits are low, if any. PEMEX charges the same prices on the domestic market as it does on the international market, so that domestic consumers do not share in the oil rent.

Table 3.A5

## MEXICO: ESTIMATE OF OIL RENT, 1999–2004

	Production	Price (f.o.b.)	Cost of production	Rent	Total rent
	(Million barrels)		(\$ per barrel)		(\$ million)
1999	1 061	15.9	3.5	12.4	13 121
2000	1 099	25.4	4.2	21.2	23 318
2001	1 141	18.9	4.6	14.3	16 275
2002	1 160	21.6	5.0	16.6	19 249
2003	1 230	24.8	5.5	19.4	23 808
2004	1 235	31.6	7.5	24.1	29 759

Source: UNCTAD secretariat calculations, based on PEMEX, *Statistical Yearbook and Annual Report*, various years; EIA, *Monthly Energy Review*, January, 2005; and Gaffney, Cline and Associates, 2004.

Table 3.A6

VENEZUELA: ESTIMATE OF OIL RENT, 1999–2004					
	<i>Production</i>	<i>Price</i>	<i>Cost of</i>	<i>Rent</i>	<i>Total rent</i>
	(Million barrels)	(f.o.b.)	production		(\$ million)
			(\$ per barrel)		
1999	1 117	14.3	2.9	11.5	12 817
2000	1 151	24.5	3.8	20.7	23 780
2001	1 115	18.0	3.9	14.1	15 750
2002	1 106	20.1	4.6	15.5	17 139
2003	989	23.8	5.6	18.2	17 995
2004	1 090	32.0	5.8	26.2	28 563

**Source:** UNCTAD secretariat calculations, based on PDVSA, *Estados Financieros Auditados*, various years; Ministry of Energy and Petroleum of Venezuela (PODE), *Petróleo y otros datos estadísticos – PODE 2002* database ([www.mem.gov.ve](http://www.mem.gov.ve)); EIA, *Monthly Energy Review*, January, 2005; and Espinasa, 2005.

## Venezuela

The bulk of oil income in Venezuela is generated by the State-owned company PDVSA, which accounted for 65 per cent of total production in 2004. In addition there are “operating service agreements” for marginal areas, which contributed 17 per cent to the total in 2004; the remaining 19 per cent comes from joint ventures (“strategic associations”) created for extracting the extra-heavy crude in the Orinoco River basin. Under the operating service agreements, private contractors are paid by the State for exploiting some fields. They pay a tax on their profits but no royalties. The strategic associations, on the other hand, are required to pay royalties as well as taxes on their profits. The rate of the royalties is normally 16.7 per cent, but in case of low profitability, the rate may be reduced to 1 per cent. The new Organic Hydrocarbons Act (2002) changed the conditions for the participation of private agents in upstream oil activities, but the old regime was still being applied in 2004.

Total oil production, which declined slightly between 1999 and 2004, was around 3 million bpd in 2004. In 2003, PDVSA’s production fell markedly following a strike. Production costs differ widely depending on the area of exploitation. In the fields exploited by PDVSA, the cost of a bar-

rel is below \$2.5. In the marginal areas the cost per barrel increased from \$7.4 to \$14 between 1999 and 2004, and the production cost of oil of the extra-heavy type in the Orinoco basin is estimated at \$10 a barrel. The relative decline in the share of PDVSA in total production explains the steady increase in the average production cost. However, this was compensated by rising international oil prices, which led to a significant increase in oil rent, especially in 2004 (table 3.A6).

Since 2001 the Government has received about two thirds of the total rent, most of it in the form of royalties, dividends and taxes paid by PDVSA. Moreover, PDVSA has used part of its profits for the financing of social programmes unrelated to the company’s main activities (table 3.A7 and 3.A8). The share of private companies in the total rent has increased from 1 per cent in 1999 to nearly 9 per cent in 2004. Domestic consumers have benefited from an implicit subsidy, as domestic prices have been well below international oil prices.

The transfers from PDVSA have accounted, on average, for about 95 per cent of government revenue from the oil rent, the remaining 5 per cent being paid by private companies. In view of the relatively low fiscal contribution by private contractors, the Government has announced its intention to review the existing contracts to bring them in line with the new Organic Hydrocarbons

Table 3.A7

## VENEZUELA: ESTIMATE OF THE DISTRIBUTION OF OIL RENT, 1999–2004

(Millions of dollars and per cent)

	Total government revenue	Non-distributed PDVSA profits	Profits of private companies	Subsidies <sup>a</sup> to consumers	Other payments <sup>b</sup>	Total rent	Share of government revenue in total oil rent
	(\$ million)						(Per cent)
1999	7 492	1 099	125	409	3 692	12 817	58.5
2000	13 235	5 198	479	1 617	3 250	23 780	55.7
2001	12 284	- 447	393	826	2 694	15 750	78.0
2002	10 063	788	769	3 504	2 015	17 139	58.7
2003	11 310	1 618	1 416	2 774	877	17 995	62.8
2004	19 021	922	2 443	4 374	1 804	28 563	66.6

Source: See table 3.A6.

<sup>a</sup> Implicit subsidy resulting from the difference between international and domestic sales prices.<sup>b</sup> Includes PDVSA's subsidies to its foreign subsidiaries, and financial costs.

Act.<sup>1</sup> As a consequence, the share of PDVSA in joint ventures would be increased to at least 51 per cent, and the royalty rate to 30 per cent (with the possibility of reducing the rate to 20 per cent in special cases), while the tax rate on profits would be reduced from 67 to 50 per cent. Former oper-

ating service agreements are to be replaced by joint ventures with the State oil company, which will hold a majority share, and those joint ventures involved in exploiting the extra-heavy oil from the Orinoco River basin will pay higher royalties, from the present 1 per cent to 16.6 per cent.

Table 3.A8

## VENEZUELA: COMPOSITION OF GOVERNMENT REVENUES FROM OIL, 1999–2004

(Millions of dollars and per cent)

	1999	2000	2001	2002	2003	2004	Average 1999–2004	
							(\$ million)	(Per cent)
Tax revenues	2 764	6 226	3 602	1 640	2 618	3 139	3 332	27.2
PDVSA	2 521	5 748	3 122	1 102	1 823	2 058	2 729	22.3
Orinoco River basin	25	129	150	263	467	698	289	2.4
Operating service agreements	218	349	330	275	328	383	314	2.6
Royalties	3 009	4 992	3 907	5 671	6 085	9 653	5 553	45.4
PDVSA	3 008	4 986	3 900	5 659	6 063	9 621	5 540	45.3
Orinoco River basin	1	6	7	12	22	32	13	0.1
PDVSA dividends	1 719	2 018	4 774	2 752	2 283	2 217	2 627	21.5
PDVSA social programmes	0	0	0	0	324	4 011	723	5.9
Total government oil revenues	7 492	13 235	12 284	10 063	11 310	19 021	12 234	100.0

Source: See table 3.A6.



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## 2. The mining industry in Chile and Peru

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### **Methodology**

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Rent from mining, as from oil exploitation, is estimated as the difference between the values of production at the relevant international price and the cost of production. In estimating the mining rent, however, costs of exploration and capital depreciation are not considered. Since initial investment is quite high and the fiscal arrangements typically allow for accelerated depreciation, a considerable difference arises between calculated rent and taxable profits, especially in the first years of production.

Unit production costs are estimated by dividing total costs (excluding depreciation) by total production. They depend critically on the grade of mineral ores. Following the accounting practices of Chilean firms, proceeds from the sale of molybdenum, a by-product in copper production, are deducted from the production cost. Due to lack of data this was not possible in the case of Peru implying that the calculation in this annex probably underestimates total copper rent in Peru.

### **Chile**

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Chile is the foremost copper producer in the world, accounting for 37 per cent of global production in 2004. About one third of its production comes from the State-owned CODELCO and 60 per cent from 10 large private companies, nine of which are TNCs, and one (El Abra) a joint-venture between a TNC and CODELCO. The remainder

is produced by several small- and medium-sized private companies. The present analysis is limited to the activity of the 11 main producers, that accounted for 93 per cent of Chilean copper output between 1999 and 2004. Including its participation in El Abra, CODELCO provides 38 per cent of this output. Total rent from copper production has been rising since 1999, with a dramatic increase in 2004 (table 3.A9).

The Government receives a part of this rent through taxes paid by private companies and through dividends and taxes paid by CODELCO, as well as from the transfer of 10 per cent of the latter's export revenues to the armed forces. Private companies pay income tax on their profits, like any other firm. The tax rate on undistributed profits was 15 per cent until 2001 and increased progressively thereafter, to reach 17 per cent in 2004. The tax rate on distributed profits is 35 per cent. Most firms, until recently, had no taxable profits, owing to an accelerated-depreciation regime and a provision allowing unlimited carry-forward of losses. Moreover, all the large private mining firms had chosen the legal status of "mining contractual firm" (instead of joint-stock company), which allowed them to transfer any financial surplus to their parent company without paying taxes on repatriated profits, if their financial statements showed no profits.<sup>2</sup> Moreover, taxable profits can be reduced by interest payments to the parent company. The tax rate on interest payments is only 4 per cent, compared to 35 per cent for the tax on distributed profits. This may explain why debt-capital ratios tend to be relatively high; investments are financed with a high proportion of loans from parent companies rather

Table 3.A9

## CHILE: ESTIMATE OF COPPER RENT, 1999–2004

	<i>Total production</i>	<i>CODELCO share in total copper production</i>	<i>Price (f.o.b.)</i>	<i>Cost of production</i>	<i>Rent</i>	<i>Total rent</i>
	<i>(Million pounds)</i>	<i>(Per cent)</i>		<i>(\$ per pound)</i>		<i>(\$ million)</i>
1999	9 027	39.4	0.71	0.41	0.30	2 717
2000	9 505	37.4	0.82	0.42	0.41	3 849
2001	9 719	38.5	0.72	0.37	0.35	3 382
2002	9 312	38.6	0.71	0.38	0.34	3 120
2003	9 957	37.1	0.81	0.39	0.42	4 212
2004	10 898	37.2	1.30	0.38	0.92	10 026

**Source:** UNCTAD secretariat calculations, based on Del Pino et al., 2005; CODELCO, *Estados Financieros* and *Annual Report 2004*; and annual reports and estados financieros of the following companies: La Escondida, Pelambres and Collahuasi, various years.

than with capital provisions. The average debt-capital ratio has been estimated at 3.5, with one firm reaching a ratio of 16.9 (Lavandero, 2003).

This legal framework, which offers special privileges to foreign investors in the mining sector, largely explains the low share of the Government

in the copper rent until 2004, and the fact that this share is mainly the result of transfers from the State-owned company. The latter has contributed more than 80 per cent of the public rent since 2002, much more than what would correspond to CODELCO's share in copper revenues (table 3.A10). In 2004, the rent obtained by the

Table 3.A10

## CHILE: ESTIMATE OF GOVERNMENT REVENUE FROM COPPER RENT, 1999–2004

(Millions of dollars and per cent)

	<i>Taxes and dividends from CODELCO<sup>a</sup></i>	<i>Taxes from private companies</i>	<i>Total government revenue from copper sector</i>	<i>Share of government revenue in total copper rent</i>	<i>CODELCO share in govern- ment revenue from copper</i>
	<i>(\$ million)</i>			<i>(Per cent)</i>	
1999	262	180	442	16.3	59.3
2000	564	230	794	20.6	71.0
2001	362	122	484	14.3	74.8
2002	303	59	362	11.6	83.7
2003	1 038	241	1 279	30.4	81.2
2004	4 568	950	5 518	55.0	82.8

**Source:** See table 3.A9.

<sup>a</sup> Including transfers to the armed forces (Act 13196).

Government increased significantly, both in absolute and relative terms, but the contribution of the private companies has remained relatively modest. The public debate on the relatively small contribution of private operators to government revenue, which had begun in the late 1990s, intensified in 2001, when Exxon announced that it was selling its mine, “La Disputada”, for \$1.3 billion. Exxon, which had acquired the mine in 1978, had consistently declared losses for more than 20 years, and consequently had never paid taxes. In May 2005, the Parliament approved a new legislation introducing a supplementary 5-per-cent levy on operational profits, for which there is less possibility of tax evasion.

### Peru

Following the privatization of public mining companies and new private investments in the 1990s, the production of copper and gold has been concentrated in four big companies controlled by foreign investors. Two of these companies, Yanacocha<sup>3</sup> and Barrick, produced 64 per cent of the gold in Peru in 2004, and two others, Southern Peru Copper Corporation and Antamina, accounted for 74 per cent of total copper production. The

analysis of the generation and distribution of mining rent is limited to these companies.

Total rent generated in the gold and copper sectors has increased significantly since 1999 (table 3.A11 and 3.A12) owing to higher prices and increasing production. Average unit costs of gold have increased due to the lower grade of mineral in one of the mines. The estimated rent that remained with the private firms includes the accounting after-tax profit and other income that is used to cover administrative and financial costs, as well as exploration and accelerated depreciation costs (corresponding to “other private surplus” in tables 3.A13 and 3.A14 that was estimated as a residual). Antamina, a company that took up production in 2001, has not declared any profits so far, and thus not paid any taxes.

The main source of fiscal revenue from these mining activities has been the 30-per-cent income tax on profits. Taxable income, if any, is normally very low in the first years of operation, owing to an accelerated-depreciation regime that can be applied over five years. Moreover, the General Mining Law of 1992 permits the deduction from taxable income of the costs of investment in infrastructure considered to be of public interest. Until August 2000, 80 per cent of retained profits could also be deducted from taxable income, no

**Table 3.A11**

#### PERU: ESTIMATE OF GOLD RENT, 1999–2004

	<i>Production</i> (Million ounces)	<i>Price</i> (f.o.b.)	<i>Cost of</i> <i>production</i> (\$ per ounce)	<i>Rent</i>	<i>Total rent</i> (\$ million)
1999	2.49	279	83	196	488
2000	2.62	279	73	206	540
2001	2.81	271	91	180	506
2002	3.18	309	112	197	626
2003	3.71	360	111	249	924
2004	3.65	411	130	281	1 026

**Source:** UNCTAD secretariat calculations, based on annual reports, various years, of the companies Barrick and Newmont Mining Corporation; and Yanacocha, *Social Balance*, various years.

Table 3.A12

## PERU: ESTIMATE OF COPPER RENT, 1999–2004

	<i>Production</i> (Million pounds)	<i>Price</i> (f.o.b.)	<i>Cost of</i> <i>production</i> (\$ per pound)	<i>Rent</i>	<i>Total rent</i> (\$ million)
1999	746	0.72	0.56	0.16	119
2000	751	0.84	0.54	0.30	225
2001	932	0.73	0.55	0.18	169
2002	1 493	0.73	0.49	0.24	357
2003	1 382	0.81	0.50	0.31	433
2004	1 694	1.29	0.48	0.81	1 374

**Source:** UNCTAD secretariat calculations, based on Southern Peru Copper Corporation (SPCC) and Noranda, *Annual Report*, various years; Lipkewich, 2003.

matter what their use. Other sources of public revenue have been negligible: the firms did not pay indirect taxes, since they exported 97 per cent of their production and benefited from a regime of anticipated reimbursement of these taxes. In June 2004, with a view to raise additional revenue from

private companies, a royalty on mining production was introduced, at a rate of between 1 and 3 per cent, depending on the volume produced, but due to prior agreements three of the four private companies are still exempted from the royalty.

Table 3.A13

## PERU: ESTIMATE OF GOVERNMENT REVENUE FROM GOLD RENT, 1999–2004

(Millions of dollars and per cent)

	<i>Income tax</i>	<i>After-tax profits</i> <i>of private companies</i> (\$ million)	<i>Other private</i> <i>surplus</i> <sup>a</sup>	<i>Share of govern-</i> <i>ment revenue in</i> <i>total gold rent</i> (Per cent)
1999	39	135	314	8.1
2000	42	226	271	7.9
2001	34	140	331	6.8
2002	72	290	264	11.5
2003	162	417	345	17.5
2004	181	476	369	17.6

**Source:** UNCTAD secretariat calculations, based on Newmont, *Annual Report*, various years; Yanacocha, *Responsabilidad Social de la Empresa 2002*; and Ministry of Energy and Mines of Peru, *Presentation to the Congress of the Republic on the financial and fiscal situation of Barrick*, January 2005.

<sup>a</sup> Residual from estimated rent and accounting profits.

Table 3.A14

## PERU: ESTIMATE OF GOVERNMENT REVENUE FROM COPPER RENT, 1999–2004

(Millions of dollars and per cent)

	<i>Income tax from copper sector</i>	<i>After-tax profits of private companies</i>	<i>Other private surplus<sup>a</sup></i>	<i>Share of govern- ment revenue in total copper rent</i>
	(\$ million)			(Per cent)
1999	10	29	79	8.3
2000	43	93	89	19.1
2001	12	47	110	6.9
2002	34	61	262	9.5
2003	79	119	235	18.2
2004	317 <sup>b</sup>	597	460	23.1

**Source:** UNCTAD secretariat calculations, based on Noranda, *Annual Report*, various years.

**a** Residual from estimated rent and accounting profits.

**b** Including \$15 million in royalties. ■

## Notes

- 1 See the Announcement by the Minister of Energy and Oil, M. Rafael Ramírez, in *Avances de la Nueva PDVSA*, 15 April 2005 ([www.pdvs.com](http://www.pdvs.com)), and EIU, 2005b: 1.
- 2 For a comparative analysis (that includes the Chilean case) of the legal framework for the mining industry, see Otto et al., 2000, and Sánchez Albavera, Ortiz and Moussa, 2001.
- 3 A minority share of Yanacocha's equity (43.6 per cent) is held by a private Peruvian firm.



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