
4

Managing the Recent Commodity Price Cycle

THE PAST FEW YEARS HAVE SEEN SHARP VARIATIONS in primary commodity prices. Energy prices were especially volatile. Crude oil prices rose 74 percent from early 1994 through the end of 1996, then fell 56 percent by the end of 1998, and in 1999 recovered nearly the entire decline of the previous two years. Average non-oil commodity prices rose by 46 percent from the monthly low in mid-1993 to mid-1997, and then dropped 30 percent by late 1999. The variation of individual commodity prices was sharper still. Such volatility poses real challenges for developing countries that depend on primary commodities for a substantial share of their export revenues. Countries where consumption rises with real incomes during commodity price booms will face a difficult adjustment when prices fall. The ability to sustain consumption by borrowing or running down assets may be limited. Cutting back on investment will depress long-term growth, and sharp reductions in consumption can be extremely painful for the individuals most affected, often the poorest members of society, and may require costly reallocations of labor and capital.¹ Thus, efforts to smooth consumption over the commodity price cycle can be critical to welfare, efficiency, and growth over the long term.

Two groups of developing countries were most affected by the commodity price cycle: the major oil exporting countries (countries where oil accounts for more than 50 percent

of merchandise exports) and the non-oil exporting countries of Sub-Saharan Africa, where non-oil primary commodities, on average, make up 80 percent of exports. These countries are among the most dependent on commodity prices. This chapter will discuss how these commodity-dependent economies have adjusted to the swings in real incomes generated by recent commodity price volatility, focusing on their success in smoothing consumption over the price cycle and the implications for growth prospects.

The main message is that countries' savings and investment behavior differed markedly over the commodity price cycle and that these differences primarily reflected the quality of policies rather than shifts in the terms of trade. The policy environment was improving in the non-oil exporting countries of Sub-Saharan Africa, and they achieved increases in savings and investment over the commodity price cycle. In the oil exporting countries, weak policy environments led to mixed savings performance and to lower investment over the oil price cycle.

This chapter reaches the following conclusions:

- The pronounced cycle in primary commodity prices since the mid-1990s was driven by changes in global demand, weather-related supply shocks, supply responses to the high prices of the early 1990s, technological innovations that

have reduced production costs, and exchange rate depreciations among large commodity exporters linked to the Asian crisis. Primary commodity prices have been more volatile than the prices of manufactures in the last two decades, and both oil prices and non-oil commodity prices have fallen relative to the prices of manufactures.

- The major oil exporting countries had mixed success in smoothing consumption over the recent oil price cycle. On average, countries allocated to increased consumption about half of the average 5 percent of gross domestic product (GDP) improvement in real incomes during the upswing in oil prices (1996–97). During the 1998 drop in oil prices, however, consumption did not decline, implying that savings fell by the full amount of the decline in real incomes. Countries' performances varied greatly, depending on their specific political and economic circumstances.
- Oil exporting countries' investment fell relative to output over the commodity price cycle. The decline in investment was actually greater than the decline in domestic savings, so the current account deficit fell. The major oil exporting countries have generally failed to reduce their dependence on oil revenues, and the fall in investment will further impede progress. At the same time, several of these countries face high levels of unemployment, continued slow growth, and rapidly expanding populations. They need to strengthen their policies to encourage greater private sector (and non-oil) activities and to improve the institutional environment.
- The commodity price cycle of the 1990s does not appear to have adversely affected the prospects for growth in the non-oil exporting countries of Sub-Saharan Africa. Changes in real incomes were generally smaller than in the oil exporting countries because the price of their com-

modity exports changed by less than the price of oil, and the losses from declining export prices were partially offset by gains from lower import prices, particularly energy prices. More important, however, improved policies in several countries enabled them to increase their savings and investment rates both during commodity price booms and busts. Many countries cut their fiscal deficits in an effort to rein in the growth of debt and to reduce inflation, while private savings rose in response to improved policies that increased the return to investment, particularly in export sectors. Countries with better policies, as measured by the World Bank, achieved larger increases in savings and higher growth of GDP than countries with worse policies, despite smaller increases in real incomes in the former group.

Key issues confronting primary commodity exporters

The heavy dependence of many developing countries on primary commodities for the bulk of their export receipts can create substantial problems for economic management. Primary commodity prices tend to be volatile, and are subject to long-term cycles as well as to short-term booms and busts. Commodity prices have also declined relative to manufactures' prices during the past two decades.

Dependence on primary commodities

Primary commodities accounted for 42 percent of developing countries' total merchandise exports in 1997, compared with 19 percent for high-income countries. In Sub-Saharan Africa, primary commodities accounted for about 75 percent of total exports, and the share of commodities in the exports of individual countries often exceeded 90 percent. The high volatility of commodity prices thus often leads to high volatility of export earnings. However, many of these countries also import signifi-

cant amounts of primary commodities, and commodity prices tend to be highly correlated. Deflated by the manufactures unit value index, the correlation coefficients of the price indexes of agriculture, energy, and metals from 1960 to 1998 are all 0.79 or higher. Thus primary commodity exporters' terms of trade tend to be less volatile than the price of their commodity exports.

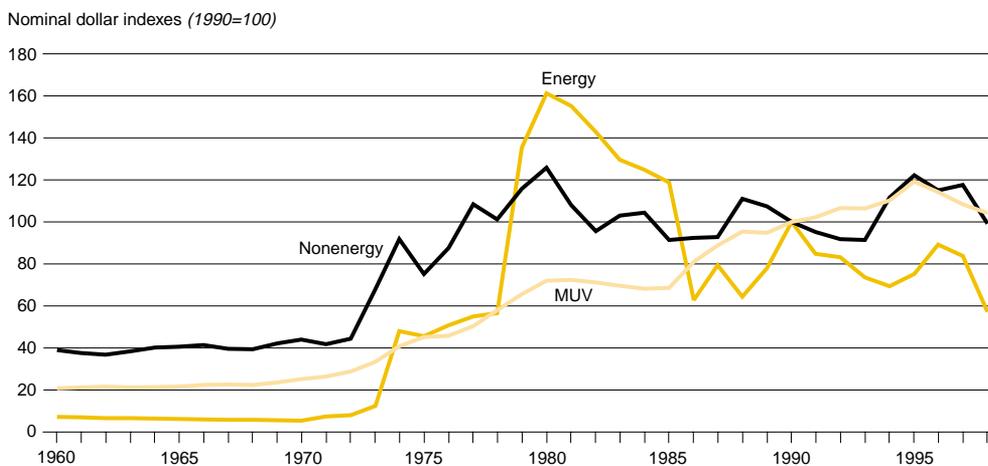
The volatility of primary commodity prices

The volatility of primary commodity prices increased sharply following the collapse of the Bretton Woods system in the early 1970s (figure 4.1) and has remained high (Maizels 1994; Reinhart and Wickham 1994). The standard deviation of the absolute value of the year-on-year changes in the nonenergy commodity price index during 1970–98 was 11.5, compared with 5.7 for the manufactures unit value index during the same period.² Energy prices have been particularly volatile. Measured in U.S. dollars, the coefficient of variation of energy prices was at least twice that of manufactures in each decade.

These measures of volatility may exaggerate the extent of uncertainty caused by commodity price changes because many series exhibit trends and some of the variation is predictable. Results by Dehn and Gilbert (1999) show that oil exporting countries face the greatest uncertainty.³ Exporters of the other three commodity groups (agricultural foodstuffs, agricultural nonfoods, and metals and minerals) face only slightly smaller levels of uncertainty.

Primary commodity prices are volatile for a number of reasons. Supplies of agricultural commodities are dependent on the weather, as is the demand for oil. The demand for most commodities is less price-elastic than for manufactures, and this causes supply variability to lead to greater price variability. Supply is also often very inelastic in the short term (especially when the commodity is perishable, the costs of inventory are high, or the production takes considerable time, for example, tree crops) so that shifts in demand have a large impact on prices. In addition, producers' organizations, such as the Organization of Petroleum Exporting Countries (OPEC), have at

Figure 4.1 Primary commodity prices versus manufactures unit value index (MUV), 1960–98



Source: World Bank staff calculations.

times contributed to volatility through large shifts in supply.

The secular decline in commodity prices

Commodity prices have declined relative to manufactures' prices during the past two decades. The real price indexes (nominal price indexes divided by the manufactures unit value index) of both agriculture and metals and minerals fell by about 45 percent during 1980–98. Energy prices have fallen by 76 percent in real terms since 1980 and in 1998 were less than half the level reached after the first oil price rise in 1973–74. Even with the recovery in 1999, the real energy price index likely will remain at only 55 percent of the 1974 level. Researchers have concluded that the decline in the ratio of the price of primary products to manufactures is statistically significant (Bleaney and Greenaway 1993; Sapsford and Balasubramanyam 1994).

The view that the terms of trade of primary commodity exporters show a secular deterioration dates at least from the 1950s (Prebisch 1950; Singer 1950).⁴ The initial analysis of this issue raised a host of methodological and data questions (Spraos 1980), and later researchers focused on compiling better and longer time series (Grilli and Yang 1988) and on bringing more sophisticated statistical techniques to bear.⁵ Most of these writers found that commodity prices followed close to a random walk (where the best predictor of tomorrow's value is today's value), but with large, predominantly negative shocks that tended to persist. Thus, the decline in commodity prices has been due to a series of random shocks that were more negative than positive, rather than a consistent, and therefore predictable, trend.

The decline in commodity prices relative to manufactures depends on the index used for manufactures as well as for commodities. Lipsey (1994) argues that the increase in manufactures prices has been overestimated by roughly one percentage point per year because of the failure to adjust for changes in the qual-

ity and mix of manufactures over time. Since 1980 real commodity prices have declined by about 45 percent. Adjusting for quality changes in the index of manufactures, the decline in real commodity prices would fall to 27 percent.

The recent boom and bust in commodity prices

Commodity prices appear to exhibit long cycles driven by technological improvements, as well as short-run booms or busts, which have occurred every ten years or so during the last five decades (Varangis, Akiyama, and Mitchell 1995). The most recent boom was from 1994 to 1997, followed by a bust from 1997 through early 1999. Energy and non-energy prices followed similar paths, with minor differences. Nonenergy commodity prices rose by 46 percent from the monthly low in mid-1993 to mid-1997, before falling 30 percent by late 1999. Energy prices rose 74 percent from early 1994 to the end of 1996 and then fell 56 percent by early 1999. Individual commodities were even more volatile. For example, the price of robusta coffee (exported primarily from Africa and Asia) rose by 390 percent from 1992 to 1994, fell 66 percent from 1995 to 1996, and then rose again by 48 percent in 1997.

The decline in primary commodity prices since 1997 was in part a response to an unusually large increase in supply. The rate of growth of world production of agricultural commodities rose from 1 percent per year in 1990–94 to 2.6 percent in 1994–98, whereas world production of metals and minerals was flat in 1990–94, but increased by 3.5 percent per year in 1994–98.⁶ The acceleration of consumption of primary commodities between the two periods was much less. Increased production was in part a response to the high prices that prevailed during 1993–95. In the case of agriculture, favorable weather conditions also led to higher yields, and global agricultural production surged in 1996 and 1997. For example, world grain production increased 5 percent per year and world soybean produc-

tion by 6.4 percent per year from 1995 to 1997, compared with average annual production growth rates of 1.4 percent and 3.3 percent, respectively, for 1980 through 1994.

The supply increases were widespread and were not confined to a few commodities or a few countries.⁷ The increases were most rapid in developing countries. The Food and Agriculture Organization of the United Nations (FAO's) index of the volume of agricultural production rose by 3.8 percent per year for all developing countries from 1990 to 1997. The global supplies of metals and minerals also increased rapidly following the sharp price increases of the mid-1990s and the investments made in the late 1980s and early 1990s. Aluminum production increased by 5 percent per year during 1995–97, while consumption grew by only 3 percent per year. Copper production grew by 6 percent from 1995 to 1997, while consumption grew by 4 percent. Nickel production increased by more than 5 percent from 1995 to 1997, while consumption fell slightly.

The surge in commodity supplies was due in part to improved technology. Technological advances have taken many forms, including increased computerization in many areas, expanded use of and refinements to leaching and solvent extraction techniques in mining, horizontal drilling, three-dimensional computer seismology, progress in deepwater technology in oil, and improved seeds in agriculture.

Policy reforms and increased privatization have also boosted production in some developing countries. For example, in Argentina deregulation of the ports and the maritime sector in 1992 led to heavy investment and reduced the cost of loading grain from \$10/ton to \$2/ton, according to the International Grains Council. This made Argentina a more competitive exporter, and maize exports tripled in volume terms from 1993–94 to 1997–98. Sri Lanka privatized the management of tea estates in 1992, and the private sector was allowed to take long-term leases in 1995, thereby contributing to higher investment and

better management. Tea yields increased 46 percent from 1990–92 to 1996–98, and production increased 25 percent, despite a 15 percent decline in growing area as unprofitable fields were taken out of tea. As a result, exports increased by 25 percent. Many African countries have also undertaken important liberalization efforts in the last decade, especially in commodities that earn foreign exchange, such as coffee, cocoa, and cotton. For example, Uganda reformed its coffee sector following the political turmoil of the 1970s and 1980s, and average annual export volumes in 1994–97 were 50 percent higher than in 1980–93.

The Asian crisis contributed to the fall in commodity prices. Declines in incomes and the steep currency devaluations significantly reduced demand for commodities, with a significant impact on the prices of commodities where East Asia had a large share of world consumption. For example, East Asia, including Japan, accounted for 21 percent of world crude oil consumption in 1997, and East Asian imports of oil dropped by 4 percent in 1998. Production continued to rise, stocks soared, and prices fell by 56 percent from November 1997 to a low point in the first quarter of 1999. Furthermore, the East Asian economies had accounted for a significant share of the increase in world consumption of some commodities in recent years. Investments in production, which generally take a few years to come onstream, are typically based on demand forecasts, which prior to the crisis would have included healthy increases in consumption in East Asia. Thus, the crisis substantially reduced demand below the levels that could be produced given recent investments, further exacerbating price declines. For example, the five crisis countries and Japan accounted for about one-fifth of the increase in world copper consumption from 1994 to 1996. When these countries' copper consumption fell in 1998, copper consumption was some 500,000 tons below expected levels, or about 4 percent of world demand. Because supply is highly inelastic in the short term, production levels did

not fall as prices declined. The fall in demand from Asia thus contributed to the 44 percent drop in copper prices from June 1997 to December 1998. Other commodities hit by the decline in East Asian demand included aluminum, maize, sugar, and cotton.

The crisis also had important effects on the supply side. Currency devaluations increased the competitiveness of the crisis countries, thereby contributing to increases in supply in several commodities. For example, Indonesia, Malaysia, and Thailand account for 70 percent of the global exports of natural rubber, and prices for this commodity fell by nearly one-third in the two years following the start of the Asian crisis in July 1997 (although natural rubber prices had already nearly halved in the two years prior to July 1997). The prices of logs from Malaysia (40 percent of world exports) and rice from Thailand (23 percent of world exports) also dropped sharply after July 1997.

The results of simulations using a computable general equilibrium model indicate that the crisis-induced fall in demand from East Asia and the increased supply from the East Asian exchange rate devaluations had a substantial role in reducing commodity prices (see chapter 1 for an explanation of the methodology used). The commodities exported by

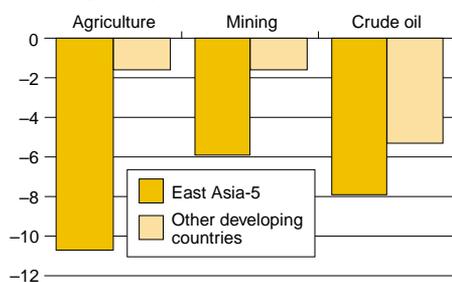
East Asian countries were the hardest hit. Selected agricultural prices fell by 10 percent, mineral prices fell by 6 percent, and oil prices fell by 8 percent (figure 4.2). The decline in average non-oil commodity export prices for other developing countries was just under 2 percent.

Note, however, that the cyclical decline in commodity prices had already begun when the crisis hit. The World Bank's food price index peaked in April 1996 and had declined 12.7 percent by June 1997. The index of metals and mineral prices peaked in August 1995 and had declined 11 percent by June 1997. Petroleum prices had declined 24.1 percent by June 1997 from their peak in December 1996. Beverage prices (coffee, cocoa, and tea) fell more than 40 percent since their peak in May 1997, due to large supply increases from South America.

The decline in nonenergy commodity prices since May 1996 has now exceeded previous declines and has lasted slightly longer. Following the 1980 and 1988 price peaks, commodity prices declined for an average of 35 months and by an average of 25 percent before prices either stabilized or increased (figure 4.3). Currently, nonenergy commodity prices have declined by 30 percent over 37 months and have since rebounded slightly.

Figure 4.2 The decline in commodity prices due to the East Asian crisis

Percentage change due to crisis

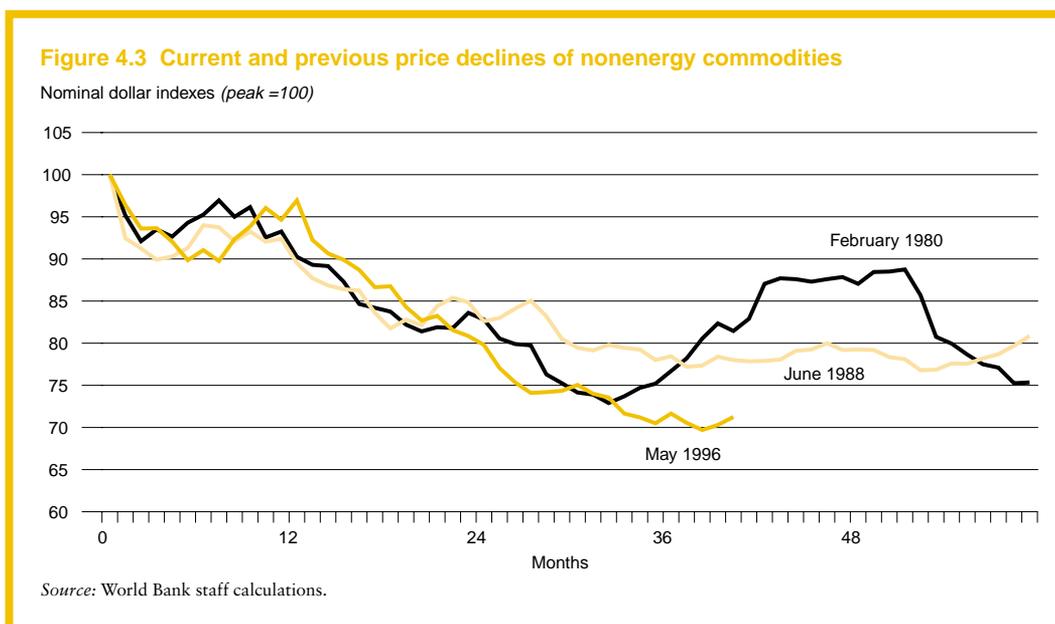


Note: East Asia-5 includes Indonesia, Malaysia, the Philippines, the Republic of Korea, and Thailand.
Source: Datastream.

The savings response to commodity price cycles

Heavy dependence on highly volatile commodity prices can impose significant costs on an economy (World Bank 1994). The potential for massive changes in relative prices, in real incomes, and in the level of economic activity can increase uncertainty and can have a negative impact on performance and poverty. (The evidence is discussed further in chapter 2.)

Economists have long known that households tend to smooth the impact of volatile prices on consumption (Harberger 1950). The relationship between terms of trade and sav-



ings depends on the expected duration of the terms of trade shock. If the rise in price is viewed as permanent, consumption increases to the higher level of income, but if prices rise only temporarily, savings rise to cushion the fall in income when the price declines (Sachs 1981; Svensson and Razin 1983; Ostry and Reinhart 1992). Both case study and econometric evidence indicate that private agents will tend to save substantial portions of temporary commodity price windfalls.⁸

The rise in consumption expenditures from a temporary commodity price rise should be extremely small if consumption is based on permanent income. With a real rate of interest of 5 percent, the warranted increase in consumption of a temporary boom is only 5 percent of the present value of the windfall gain, assuming an infinite planning horizon (Cuddington 1988). For example, if oil prices were expected to double in real terms (the largest percentage increase that occurred in a single year from 1960 to 1998) and then to return to their former level after one year, a country whose oil exports equal about 40 percent of GDP—for example, Saudi Arabia—should in-

crease consumption by only 2 percent of GDP, or one-twentieth of the initial increase in export earnings.

Savings behavior should take into account the possibility that what may look like a temporary decline in prices actually represents a medium-term trend. If prices are on a declining trend, then the rise in savings during booms should be higher (and the decline in savings during busts lower) than if prices are expected to return to a long-term average. This asymmetric approach to managing commodity price volatility would minimize the cost over time of adjusting to a secular decline in primary commodity prices.

Savings decisions in countries that export nonrenewable resources, such as oil or minerals, should also take into account the potential decline in these resources over time. The export of a nonrenewable resource is counted as an addition to GDP (and thus to savings) in national income accounts. However, this export actually represents the liquidation of an asset rather than an increase in savings. Calculations of “genuine savings” reduce recorded savings by the extent of natural re-

source depletion, among other factors. The reduction in savings in 1997 in the major oil exporting countries required to reflect the depletion of energy resources ranged from 2 percent of GDP to 44 percent (World Bank 1999). Calculations of genuine savings in the Middle East and North Africa are strongly negative from 1980 to 1993 (Hamilton and Clemens 1999), while savings recorded in the national accounts averaged 23 percent during this period.⁹ Countries where proven oil reserves are low or production is declining may need to achieve relatively high savings to sustain permanent income in the medium term.

Economies may not generate adequate levels of savings to smooth consumption in the face of volatile real incomes for several reasons. Most important, distinguishing between temporary and permanent shocks to commodity prices can be extraordinarily difficult. The swings in commodity prices can be too large and uncertain to ascertain their causes and nature (Deaton and Miller 1995). The degree of uncertainty about the duration of a price shock varies. For example, market participants could see that the sharp jump in coffee prices caused by the Brazilian frost of 1994 was likely to be reversed, assuming a return to more normal weather. By contrast, most analysts assumed that the high oil prices during the mid-1970s and early 1980s would last indefinitely.¹⁰

Second, revenues from some primary commodity exports (particularly oil and metals and minerals) are channeled through the public sector, and the public sector often captures these gains through taxation. Political and social pressures often lead governments to increase expenditures during commodity booms. For example, the commodity boom in the 1970s resulted in increased public expenditures in many Sub-Saharan African countries (Bevan, Collier, and Gunning 1990; Wetzel 1992; Alpine and Pickett 1993; and Little and others 1993).¹¹ In some cases, boom revenues invested in external assets by responsible governments have been dissipated later by less responsible ones. An alternative is to

transfer public sector revenues to the private sector, although this can be difficult to achieve in a transparent and efficient way (Stauffer 1999).

Even responsible governments that attempt to capture the gains from commodity booms and to channel this income to the private sector may create difficulties. Public sector interventions may obscure the source of the rise in income. This makes it more difficult for the private sector to determine whether the increase in their real incomes is temporary or permanent. Collier, Gunning, and Associates (1999) found that savings rates out of positive shocks tended to be higher when economic agents were the direct beneficiaries of increased prices than when the rise in incomes was intermediated by the government, for example, by taxing exporters and reallocating funds to other groups in the economy. One important role for government is to ensure that adequate information on the causes (and, if possible, the likely duration) of price booms and busts is disseminated widely so that private agents can make appropriate decisions about savings behavior and resource allocation.

Finally, a country may be unable to smooth consumption because of limited access to international financial markets (see below).

The savings response by oil exporting countries to the recent swing in oil prices

The major oil exporting countries, which are among the most commodity-dependent economies in the developing world, faced substantial difficulties in smoothing consumption over the commodity price cycle.¹² Two-thirds of these countries receive more than 80 percent of export revenues from fuels. The availability of large oil reserves in a few countries and the huge difference between the average production cost and the selling price have encouraged specialization in oil. According to the United Nations Conference on Trade and Development, half of the countries reporting

(including developing and high-income countries) that had export concentration ratios of more than 50 percent were oil exporters.¹³

Implications of the 1990s swing in energy prices

The sharp swings in the price of fuels from 1996 to 1998 had an enormous impact on export revenues, economic activity, and real income in the major oil exporting countries.¹⁴

During the 1996–97 price boom, export revenues for 11 major oil exporters rose by 45 percent of 1993–95 imports, and during the 1998 collapse in oil prices, export revenues fell by 14 percent of base-year imports. On average, changes in the terms of trade increased real income in the oil exporting countries by 4.6 percent of GDP per year in 1996–97 compared with 1993–95, and reduced real income by 5.4 percent in 1998 (relative to 1993–95) (table 4.1).¹⁵ The average data, however, mask considerable differences among countries. Countries where oil accounted for the largest share of export revenues, and where the exports were large relative to imports and GDP, experienced the sharpest swings in real incomes. For example, in Angola and Nigeria fuels account for more than 90 percent of export revenues, and the 1996–97 real income gains were 14 and 8 percent of GDP, respectively. In Oman, exports were 40 percent larger than imports and almost half the size of GDP, and the 1996–97 real income gain was 8.5 percent of GDP. The composition of imports

also had an important impact on the size of real income gains. Trinidad and Tobago’s import price index increased 10.5 percent in 1996 because of the jump in raw materials prices, and real income rose by only 0.2 percent in 1996–97.

If a substantial portion of the change in oil prices represented temporary deviations from trend, basing consumption on permanent income would have implied that savings should have increased significantly during the boom in 1996–97 and then fallen during the 1998 price decline.¹⁶ During the boom the average savings rate did increase by slightly more than half the rise in real income, measured as a percentage of base-year GDP, and a few countries actually increased their savings rates by more than the increase in real income. The group’s average was reduced by the decline in savings rates in Angola, the Islamic Republic of Iran, and Trinidad and Tobago because of economic or political difficulties. However, during the bust savings rates fell by the full amount of the decline in real incomes. Of the 11 countries, 6 reduced their savings rates by more than the fall in real incomes, and 3 others reduced their savings rates by more than 70 percent of the decline in real incomes. In other words, most of the major oil exporters acted as if the loss was almost entirely temporary. This experience has disturbing implications for the future if oil prices continue to fall, as countries would fail to adjust over the course of the cycle to the permanently lower

Table 4.1 Savings, investment, and real income changes, selected country groups, 1996–98

(percentage of GDP)

	Savings		Investment		Foreign savings		Real income	
	1996–97	1998	1996–97	1998	1996–97	1998	1996–97	1998
All oil exporters	2.5	-5.3	-2.5	-3.4	-5.1	1.9	4.6	-5.4
Middle-income	2.2	-5.0	-2.4	-3.6	-4.6	1.4	4.2	-5.3
Debtors	2.1	-4.2	-3.9	-5.8	-6.0	-1.6	3.4	-3.5
Creditors	2.4	-6.6	0.5	0.5	-1.8	7.0	5.6	-8.6
Low-income	6.5	-8.0	-4.5	-0.1	-11.0	7.9	9.3	-7.0

Note: *Savings* and *investment* refer to the average ratio to GDP during the period shown, minus the average ratio in 1993–95. *Real income* refers to the change in real income from 1993 to 1995 caused by changes in the terms of trade, as a share of 1993–95 GDP. All group averages are weighted by base-period GDP.

Source: World Bank staff calculations.

level of oil prices. An analysis of a longer period (1980–96) that takes other determinants of savings behavior into account also indicates that oil exporting countries have tended to treat changes in the terms of trade as temporary (see below).

Using historical data on savings and real income to analyze the extent of adjustment to commodity price cycles has limitations. The windfall gains and losses are measured by changes in oil prices relative to trend, and determining the trend depends on arbitrary judgments, such as the period over which the trend is estimated. Thus, the windfall elements of changes in the terms of trade may not be accurately measured. Box 4.1 describes counterfactual scenarios of savings behavior, which provide an additional estimate of the extent

of savings out of windfall income. These scenarios generally confirm the conclusions reached earlier.

Investment and foreign savings during the swing in fuel prices

Oil exporting countries’ investment fell relative to output over the commodity price cycle. The decline in investment was actually greater than the decline in domestic savings, so the current account deficit fell. During the boom in oil prices, the average ratio of investment to GDP in the oil exporting countries was 2.5 percentage points lower than during the 1993–95 base period, and during the bust investment was 3.4 percentage points lower than in the base period (table 4.1). Of the 11 countries, 7 experienced a decline in investment

Box 4.1 Counterfactual scenarios

Simple counterfactual scenarios generally confirm the conclusion that the savings of oil exporting countries declined relative to permanent income over the oil price cycle. The scenarios show a hypothetical measurement of the windfall gain (or loss) from oil based on the deviation of the oil price from trend.¹⁷ If economic agents consider the windfall as temporary, then savings should rise by the full amount of the windfall gain during the boom, and fall by the amount of the loss during the bust.¹⁸ The table shows the change in the actual and hypothetical savings rates from the base year in six of the oil exporters during the oil price cycle of the late 1990s.¹⁹

The scenario results provide one measurement of the deviation of actual savings behavior from desired savings behavior. When oil prices were high (in 1996–97), oil exporting countries on average saved only a portion of the windfall gain. In the Islamic Republic of Iran and Trinidad and Tobago actual savings rates fell relative to the base year despite the windfall gain. By contrast, in Algeria, Nigeria, and Venezuela savings rates rose by more than the hypothetical increase. In 1998 all of the countries (except Algeria) dissaved by significantly more than the windfall loss.

Change in ratio of savings to GDP from base years, selected countries, 1996–98
(percentage points)

	1996–97		1998	
	Actual	Hypothetical	Actual	Hypothetical
Algeria	5.8	4.0	5.6	-2.3
Iran, Islamic Rep. of	-2.9	2.9	-6.8	-1.6
Nigeria	8.0	3.5	-7.9	-1.8
Saudi Arabia	2.4	5.0	-6.3	-3.0
Trinidad and Tobago	-6.2	3.0	-13.1	-1.7
Venezuela	7.7	4.6	-6.0	-2.8

Source: World Bank staff calculations.

rates during both base and boom periods. The decline in investment over the commodity price cycle is likely to impede efforts to improve oil exporting countries' disappointing growth performance.

The decline in investment in the major oil exporting countries appears to be concentrated in the private sector, as the average ratio of private investment to GDP fell by 2 percentage points during the boom, while the ratio of public investment to GDP declined by only 0.5 percentage points.²⁰ However, the data on private investment include state enterprises. Therefore, the allocation of public and private investment may reflect decisions concerning the transfer of resources between state enterprises and the central government, rather than different investment behavior by the public and private sectors. Also, in countries with a substantial influence over price, investment in the state enterprise responsible for oil exploration may decline during booms if the authorities anticipate that output reductions will be required to establish more profitable price levels. Given the commanding role of the public sector in many of the oil exporting countries, even declines in private investment rates may largely reflect public sector decisions.

Increasing public investment substantially during a commodity price boom may not be advisable, because the return on public investment can decline during booms (see box 4.2). Also, central government investment expenditures tend to fall more heavily on nontradable capital goods, such as buildings, than private investment, and the rise in demand for nontradable capital goods during a boom will tend to increase their price. By contrast, the prices of tradable capital goods are set in global markets and, therefore, will be relatively unaffected by demand conditions in an individual country. In 12 of 14 case studies reported in Collier, Gunning, and Associates (1999), the relative price of nontradable capital goods rose during the commodity price boom and fell thereafter. Thus, it may make sense for the central government to delay a

portion of the investment of real income gains until after the boom is over and the price of nontradable capital goods has declined.

The decline in investment was large enough to cause countries to reduce their reliance on foreign savings, which fell by a cumulative 12 percent of GDP during the two-year boom in oil prices. Thus, a significant portion of the 1996–97 boom in export receipts was allocated to reserves.²¹ Foreign savings also increased somewhat during the 1998 fall in oil prices.

Most of the oil exporting countries rely heavily on sales of external assets to adjust to declines in real income because external finance has often not been available to help smooth consumption in the face of declining commodity prices. Developing countries are subject to credit constraints that generally become more binding in the face of adverse shocks, and capital flows are often procyclical for marginally creditworthy borrowers (Dadush and Dasgupta 1999). Most of the middle-income debtors among the oil exporting countries either have speculative grade credit ratings (Bahrain, the Islamic Republic of Iran, Trinidad and Tobago, and Venezuela) or are not rated. Of the oil exporting developing countries, only Oman and Saudi Arabia have investment-grade ratings. Increases in oil prices can help make the marginally creditworthy countries eligible for loans from the international capital markets (thus facilitating spending the windfall or even more than the windfall), but sharp declines in oil prices can mean that access is reduced or even shut off.

Although many considerations influence the level of flows from private capital markets, some evidence indicates that private lending to the oil exporters has been positively related to changes in the oil price. In periods where the price of oil (relative to the average price of manufactures exports from industrial countries) was falling, long-term gross disbursements from private creditors have generally declined, while gross disbursements have risen when real oil prices were on the

upswing (table 4.2). The real oil price was significantly and positively related to disbursements to the oil exporting countries during 1972–97, although the oil price explains only 22 percent of the variation in disbursements.²² However, the procyclical effect of capital flows had only a limited impact during the most recent commodity price cycle. Gross disbursements to the net debtors increased by \$3 billion during the most recent oil price boom (table 4.2), which is consistent with some improvement in access. Nevertheless, net disbursements averaged negative \$1 billion per year during this period (compared with an average of \$700 million per year in 1990–95) because of the large repayments due on existing debt. Thus, reliance on foreign savings fell during the rise in oil prices, as indicated in table 4.1.

Mexico's experience prior to the 1982 debt crisis, when oil accounted for three-quarters of export revenues, provides a more dramatic illustration of the procyclical nature of international capital flows (figure 4.4). Mexico's current account deficit to GDP ratio more than doubled following the oil price rise of 1973–74 and remained high through 1976. The ratio fell in 1977 as oil prices remained flat and then more than doubled again following the 1979–80 price rise, despite the sharp increases in export revenues along with the price of oil. Clearly the major factor driving the deficit was increased borrowing in response to the improved access to international capital markets. Mexico's debt-to-GDP ratio

rose from 14 percent in 1973 to 53 percent in 1982, when the country could no longer service its commercial bank debt.

Fiscal policy and adjustment to the oil price swings. Oil revenues are usually channeled through the public sector so that public sector policies have an important influence on the patterns of adjustment observed during the oil price cycle. In the past, many oil exporting countries have greatly increased fiscal expenditures in response to increases in fuel prices. Some governments have used their new-found access to capital markets to borrow, in effect spending their anticipated future wealth today. The spending of what turned out to be temporary increases in fuel revenues resulted in a need for sharp reductions in expenditures once fuel prices declined. In several countries, the efficiency of these large increases in expenditures was questionable (see box 4.2).

The fiscal positions of governments in oil exporting countries deteriorated somewhat over the commodity price cycle. The average ratio of the current budget balance to GDP improved by 3.6 percentage points during the 1996–97 boom (compared with 1993–95), slightly less than the real income gain (table 4.3).²³ By contrast, private savings declined.²⁴ Subsequently, public savings dropped by almost 6 percent of GDP during the bust in 1998. Furthermore, several countries had high fiscal deficits during the base period. For example, in Angola the current budget balance in 1993–95 averaged 17 percent of GDP,

Table 4.2 Capital flows to oil exporters and energy prices, 1970–97

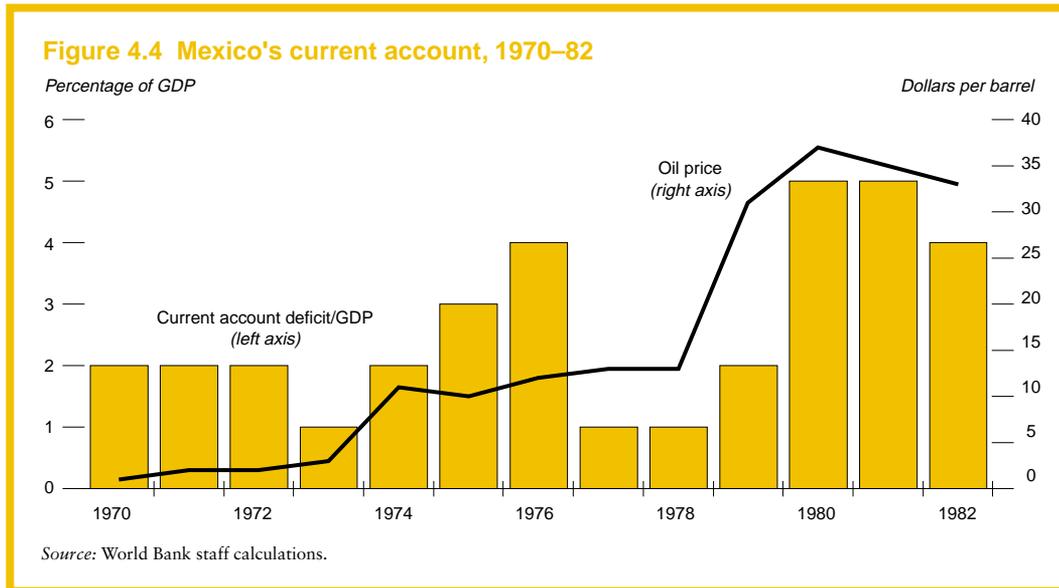
	1970–80	1980–86	1986–90	1990–95	1995–97
Change in gross disbursements (millions of U.S. dollars) ^a	9,658	-2,897	410	-3,249	2,956
Percentage change in real oil price ^b	962	-65	29	-37	23

a. Change in gross disbursements of long-term flows from international capital markets from beginning to end of period.

b. Percentage change in oil price relative to manufactures unit value index.

Note: The countries included are Algeria, Gabon, the Islamic Republic of Iran, Nigeria, Oman, Republic of the Congo, Trinidad and Tobago, and Venezuela.

Source: World Bank staff calculations.



and Venezuela experienced a foreign exchange crisis in 1995–96 as a result of the high government deficit and triple-digit inflation (see box 4.3). Also, the rise in public savings in 1996–97 in seven of the ten countries reflected a sharp improvement in 1996, followed by some deterioration in the fiscal balance in 1997, largely due to a significant rise in expenditures.²⁵ The deterioration in the fiscal position in 1998 (relative to high deficits in 1993–95), therefore, is a matter for serious concern in some of the oil exporting countries.

Table 4.3 Ratios of public and private savings to GDP, 1996–98

(change from 1993–95 average)

	1996–97		1998	
	Public	Private	Public	Private
All countries	3.6	-1.1	-5.6	0.3
Middle-income	3.6	-1.4	-5.2	0.1
Debtors	2.4	-0.3	-9.2	5.0
Creditors	5.8	-3.5	2.4	-9.0
Low-income	3.7	2.7	-10.8	2.2

Source: World Bank staff calculations.

Long-term economic performance

The rise in consumption and the fall in private investment during the oil price cycle of the 1990s has complicated efforts to reverse the weak economic performance of many oil exporting countries since the quadrupling of oil prices in 1974. Although output growth was rapid in the 1970s, growth slowed during 1980–97 to 2.1 percent per year, below the 2.8 percent annual growth in developing countries as a group.²⁶ Output and investment performance in the oil exporting countries was substantially poorer compared with other countries in the same region in Latin America and the Middle East and North Africa, while performance was slightly better among the oil exporters in Sub-Saharan Africa (table 4.4).

Poor economic performance since 1980 has been attributed to the sharp decline and high level of volatility of oil prices, as well as to a mixed record of policy reform. Some countries have made substantial efforts to improve incentives for private sector activities. Nevertheless, policy regimes in some oil exporting countries have been characterized by inadequate macroeconomic environments; poor

Box 4.2 Public sector expenditures during the oil price boom

The low efficiency of public sector expenditures in several oil exporting countries has impaired economic performance. In all these countries, the public sector is the main owner of fuels resources and accounts for a significant share of economic activity. In 1996 public sector expenditures averaged about 30 percent of GDP in the major oil exporters, compared with less than 20 percent, on average, for the developing countries.

Particular problems have been evident in the efficiency of public investment undertaken during booms. During the past three decades many oil exporting countries have squandered a large portion of the income from oil revenue increases on low-return public investment projects (Gelb and Associates 1988). Huge investments in state-owned enterprises and human skills unsuited to today's global marketplace resulted in relatively low productive uses of oil revenues in several countries of the Middle East and North Africa (Page 1999). Investments during the oil price boom also frequently generated disappointing results because of transport bottlenecks resulting from a flood of investments and the inability to fund, when prices retreated, the recurrent costs required for project success. Particularly unsuccessful examples of investment include the establishment of state enterprises in the manufacturing sector. For example, in Nigeria and Trinidad and Tobago, such enterprises

took up substantial portions of the boom revenues and left a legacy of debt and losses in post-boom years that contributed to fiscal deficits (McMahon 1997). Capital output ratios in oil exporting developing countries increased during the 1970s, in part reflecting heavy investments in long gestation projects in infrastructure and human capital formation, as well as capital-intensive hydrocarbons investments. However, the reduction in efficiency also stemmed from ill-conceived investments, planned too hastily and subject to enormous constraints on implementation (Ahamed 1984).

One popular use of oil windfalls involved efforts to diversify into resource-based industries, for example mineral processing (iron ore into steel, bauxite into aluminum, and hydrocarbons into petrochemicals). Ultimately these efforts had disappointing results, largely because the projects were implemented inefficiently. With few financial constraints and a strong impetus toward diversification, feasibility studies greatly overestimated future demand. By the mid-1980s prices were between two-thirds and half the levels projected, and potential rents were minimal, even for effectively implemented resource-based industrial projects. Low capacity utilization combined with high levels of debt and rising interest rates to greatly reduce the profitability of resource-based industrial projects (Auty 1988).

investment decisions; and the frequent use of producer and consumer subsidies, price controls, and trade restrictions (Gelb and Associates 1988; McMahon 1997). The World Bank's country performance ratings for oil exporting countries are 0.5 points below the average for developing countries (on a scale of 1 to 5). Ratings done by private services also indicate that some oil exporting countries are perceived as worse than the average of developing economies in terms of corruption, trade policy, and the environment for foreign direct investment.²⁷

Inappropriate policy regimes may have impeded the diversification of production toward non-oil activities that could support faster growth in the wake of the secular decline in oil prices. For the most part, the major oil exporting countries have been slower to diversify their exports (to either other primary commodities or manufactures) than other developing countries. Of the 12 countries where oil accounted for more than 80 percent of exports in 1980, only 2 had reduced their share of fuel exports below 80 percent by 1997 (table 4.5), despite a 65 percent de-

Box 4.3 Fiscal adjustment in Venezuela and Saudi Arabia

Venezuela's experience illustrates the dangers of increasing expenditures as a result of a commodity boom. The government had adopted a stabilization program in 1996 in response to inflation of 103 percent and a deficit of 7 percent of GDP. Higher international oil prices, increased tax revenues, increased fuel production because of the investment drive initiated earlier in the decade, and a cutback in civil service wages in real terms achieved a massive shift of the fiscal balance to a surplus of 7.25 percent of GDP in 1996.

However, the government's balance deteriorated to 1.5 percent of GDP in 1997 because of wage increases that averaged about 90 percent, transfers to local governments and decentralized public sector agencies totaling 2.75 percent of GDP, and a real appreciation that reduced the contribution of dollar-denominated oil receipts to the budget. Despite efforts to restrain expenditures in the first half of 1998, the deficit of the nonfinancial public sector is estimated at 6 percent of GDP. Almost the entire deficit was financed by the liquidation of assets, including through privatization, liquidation of external assets, and a sharp decline in government cash balances. The Tesorería Nacional began in 1998 with a balance

of Bs1.2 billion (\$2.35 billion) but ended the year with only Bs362 billion, about \$600 million. Thus, by the end of 1998, the government had spent all of the extraordinary revenue from the rise in the price of petroleum, and was left with a higher public sector wage bill and high external amortization payments.

By contrast, Saudi Arabia devoted a significant portion of the rise in oil revenues in the mid-1990s to retiring debt, which helped to ease its adjustment to the oil price fall in 1998. In 1996 the government paid SR22 billion (\$5.9 billion) to domestic creditors, largely to cover arrears from unpaid bills, such as the issuance of agricultural certificates to farmers in lieu of cash for the 1993–94 harvest. These payments increased total expenditures to 35 percent over budget. Essentially, the government spent a portion of the unanticipated rise in revenues from higher oil prices on clearing arrears, leaving government finances in a stronger position to accommodate the 1998 fall in revenues. While expenditures were cut and government payments to contractors and suppliers were stretched to the 180-day limit, most public agencies maintained current payments, and the government also continued to redeem past arrears (Kemp 1998).

Table 4.4 Economic performance of major oil exporters and other countries, 1980–97
(percent per year)

	GDP growth	Investment growth
Middle East and North Africa		
Oil exporters	2.2	1.3
Other countries	4.1	1.9
Sub-Saharan Africa		
Oil exporters	2.1	0.2
Other countries	1.8	-0.9
Latin America and the Caribbean		
Oil exporters	1.5	-1.1
Other countries	2.2	0.7

Source: World Bank staff calculations.

cline in the price of oil relative to manufactures from 1980 to 1997. By contrast, of the 27 countries where the share of nonfuel commodities exceeded 80 percent in 1980, 8 countries managed to reduce their nonfuel commodity share below 80 percent. The greater success in diversification of nonfuel commodities exporters is not comparable for less extreme export concentrations. Almost all the countries where fuels accounted for more than 50 percent, but below 80 percent, of exports in 1980 had reduced this share below 50 percent by the late 1990s.

The failure to diversify is likely to hamper growth over the medium term. Oil-dependent economies remain subject to the depressed

Table 4.5 Share of oil and non-oil commodities in merchandise exports, 1980 and most recent year
(number of countries)

	Between 50 percent and 80 percent of merchandise exports		More than 80 percent of merchandise exports	
	1980	Most recent year ^a	1980	Most recent year ^a
Non-oil exporters	28	18	27	19 ^b
Oil exporters	7	1	12	10 ^c

a. Only covers those countries included in the column to the left. Figures for oil exporters are from 1997; figures for non-oil exporters vary from 1993 to 1997.

b. Of the eight countries that reduced their share of non-oil exports below 80 percent from 1980, all remained with shares above 50 percent in the most recent year.

c. The two countries that reduced their share of oil exports below 80 percent from 1980 remained with export shares above 50 percent in the most recent year.

Note: Excludes countries where data were not available in either 1980 or the mid-1990s.

Source: World Bank 1999; World Bank staff calculations.

level of oil prices relative to manufactures and to slow growth in demand. These economies will continue to suffer from the adverse impact of commodity price volatility on investment and welfare (discussed in chapter 2). Also, the existence of large government-controlled rents in economies dependent on oil exports encourages rent seeking behavior that tends to lead to inefficient expenditures (see Lane and Tornell 1995). The lack of diversification also means that economies fail to capture the benefits of manufactures production. Manufacturing is characterized by positive externalities, that is, benefits to the economy that are not captured by the firm. For example, skills training provided either formally or through learning by doing to suppliers and employees is readily transferable to other activities (Matsuyama 1992; Mayer 1996). Also, increasing returns to scale may exist in manufacturing or in the education and job training that is appropriate for manufactures (Sachs and Warner 1999). Thus, increasing the production of manufactures may raise the total productivity of the economy.

Slow output growth coupled with high population growth poses enormous challenges for many oil exporters. Projections indicate that the labor force in oil exporting countries will increase by 54 percent by 2010, compared with 23 percent for developing countries as a group. In addition, unemployment is already high in several countries. For example, approximately

40 percent of the Saudi Arabian population is younger than 14 years of age, and it is therefore anticipated that new entrants to the labor force will total almost 4 million people over the next decade, or two-thirds of the current labor force. Given the high rate of labor force growth, even employment growth of 5 percent per year from 2000 to 2015 would make only limited progress in reducing unemployment by the end of the period. The unemployment problem in oil exporting countries is exacerbated because the bulk of the labor force is employed in the nontraded sector. The oil sector is an enclave that generates few jobs directly. Large parts of the nontraded sector are exposed to limited competition, often implying limitations on the growth of output and labor demand.

Improvements in policy regimes to strengthen incentives for non-oil production and to remove constraints on competition are essential in several countries to avoid growing unemployment and deteriorating living standards. In particular, some governments need to consider lowering taxes and removing barriers to employment that restrict the flexibility of using labor. For example, in Algeria firms pay 24 percent of the wage bill in taxes and face significant severance and administrative costs when laying off employees (Ruppert 1996). It should be noted that in some countries attitudes are shifting toward more market-oriented policies, which provides hope for an acceleration of growth.

The savings response by non-oil commodity exporting countries of Sub-Saharan Africa

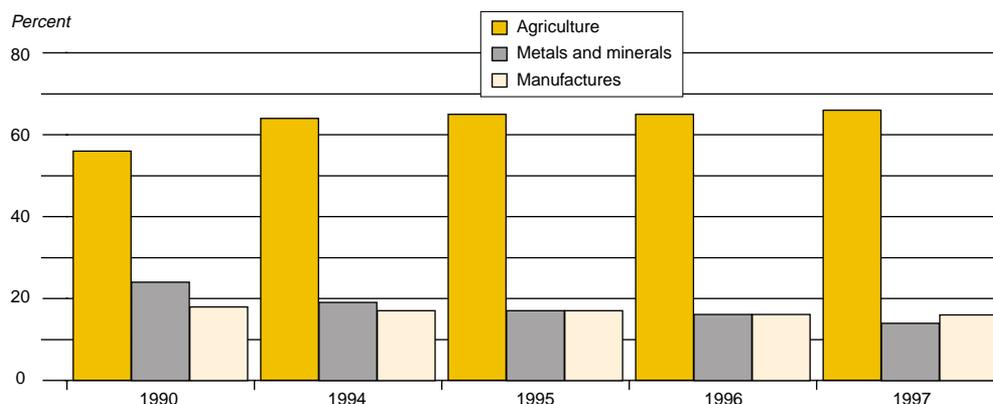
Non-oil primary commodity prices underwent a pronounced cycle, similar to oil prices, during the 1990s. However, the commodity price cycle does not appear to have adversely affected the prospects for growth in the non-oil exporting countries of Sub-Saharan Africa for two reasons. First, changes in the terms of trade and real incomes were generally smaller than in the oil exporting countries. Second, improvements in policies enabled countries to achieve increases in savings and investment rates during both booms and busts in commodity prices.

Next to the oil exporters, the non-oil exporters of Sub-Saharan Africa are the most dependent on primary commodities.²⁷ Non-oil primary commodities accounted for 80 percent of merchandise exports from these countries in 1997, which is about the same as in 1990 (figure 4.5). By contrast, non-oil primary commodities accounted for 15 percent of merchandise exports from East Asia and Pacific, 35 percent from Latin America and the Caribbean, and 21 percent from South Asia.

The commodity price cycle and the terms of trade

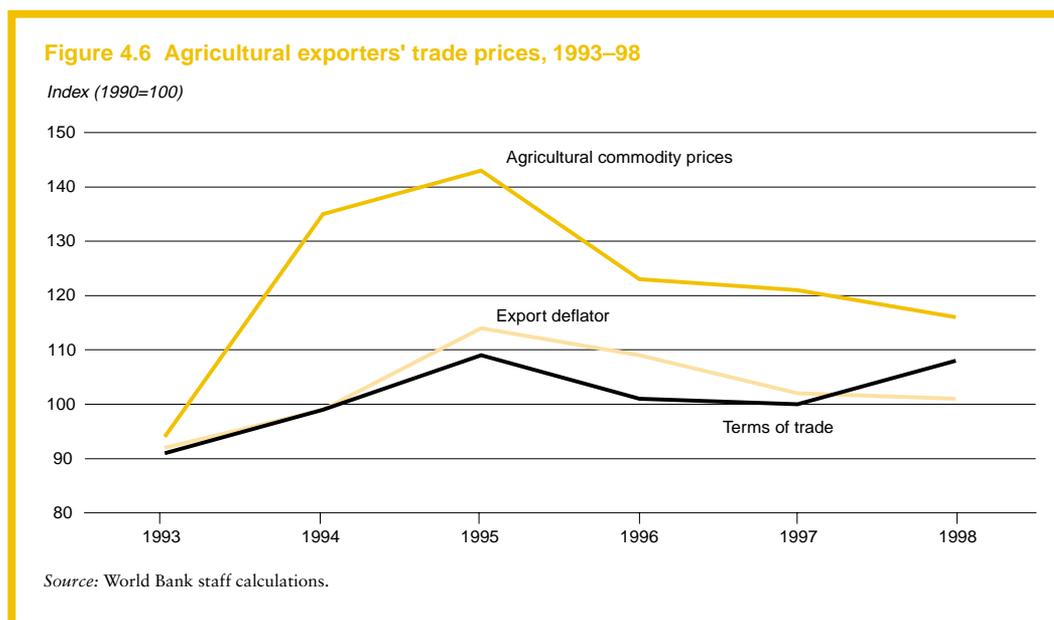
The global market prices of non-oil primary commodities have undergone sharp changes since 1993. Agricultural prices, weighted by the share of exports from Sub-Saharan Africa during 1987–89, increased by 52 percent in 1994–95 before falling by 19 percent during the next three years (figure 4.6). However, the 1994–95 increase in these countries' export deflators was significantly less than the rise in the global market prices of agricultural products, and the average export deflator remained below the commodity price index through 1998. In part, this reflected the 23 percent share of manufactures in these countries' exports (manufactures export prices rose by only 4 percent in 1994).²⁸ There is a considerable lag between changes in market prices and changes in the prices actually received by exporters, owing to the existence of fixed price contracts. Also, the global commodity price indexes are based on average prices quoted in international markets throughout the year, while export deflators reflect prices at the dates of sale, which are limited to certain times of the year for agricultural commodities. For

Figure 4.5 Shares of merchandise exports of Sub-Saharan Africa non-oil commodity exporters, 1990–97



Note: The list of countries included in the data for this figure is given in footnote 28. Coverage of trade shares excluded because of the lack of data.

Source: Comtrade.



example, one reason that the average export price deflator rose much less than the international market price in 1994 was that coffee prices jumped in July when frost damaged the Brazilian crop, but coffee sales are usually made from November to March, and by then prices had dropped significantly. Therefore, the average international market price for coffee in 1994 was much higher than the price that was actually received by most developing countries.²⁹

The average rise in the terms of trade during 1994–95 was even less than the increase in export prices, because these countries also import substantial amounts of primary commodities (about one-fifth of total imports, equal to one-third the size of primary commodity exports). Higher prices for these countries' agricultural and fuel imports thus partially offset their higher export prices. Conversely, in 1998 export prices fell by less than the price of imported products, particularly fuels, and the terms of trade rose by 8 percent. The gain in real income during booms averaged 1.5 percent of base period GDP for the agricultural exporters, while real income

was roughly equal to the base period during busts. Boom and bust periods were chosen for each country based on when agricultural prices and export revenues were rising.³⁰

While the terms of trade and real incomes rose only modestly during the commodity price boom, export revenues soared, increasing by an average of 12 percent per year. A portion of the rise in export revenues may stem from increased reporting rather than actual increases in exports, as the liberalization of trade and foreign exchange regimes reduced incentives to evade tariffs. This strong export performance reflected somewhat higher prices and sharp increases in volumes as world trade increased. Several countries improved incentives for agricultural production by removing price controls, by dismantling government-run boards that monopolized the purchase of key export crops, and by establishing market-based exchange rates.

The metals and minerals exporters also experienced sharp changes in the market prices of the commodities they exported, but relatively small movement in the terms of trade. Global metals and minerals prices rose by 43

percent during 1994–95, only somewhat less than the prices of agricultural goods (figure 4.7). However, these countries' export price deflator increased by only 2 percent in 1994 and by 6 percent in 1995.³¹ By 1998 the export price deflator and the terms of trade were not significantly different from their 1994 levels. During boom periods, the change in real income caused by changes in traded goods prices averaged 0.5 percent of base year GDP, and during bust periods, real incomes fell by 0.6 percent.³² These countries' export volumes increased by an average of 3.4 percent per year during boom periods, compared with 7.7 percent for the agricultural exporters.

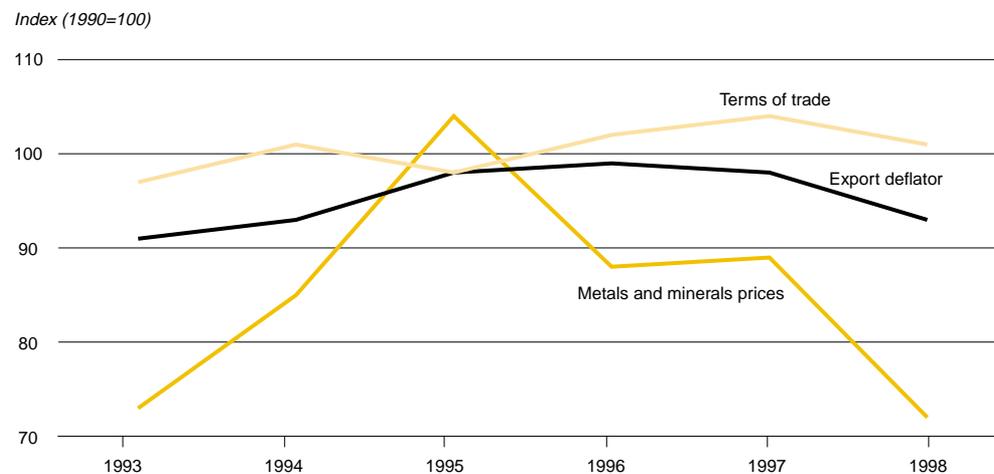
Policies and country performance

Improved policy performance enabled many of the non-oil exporting countries of Sub-Saharan Africa to increase their savings and investment rates over the commodity price cycle. Several countries in Sub-Saharan Africa adopted more prudent macroeconomic policies, established market-determined exchange rates, reduced quantitative restrictions on imports, reduced tariff rates, introduced

greater private sector participation in the economy through privatization and the dismantling of marketing boards, removed price controls and some other restrictions on private sector economic activity, and took steps to improve the efficiency and soundness of their financial sectors.

These policy reforms usually increased savings through a number of channels. First, one goal of several programs was to raise public savings directly through increases in revenues and through improved control over current expenditures, in part to strengthen macroeconomic management and in part to make necessary increases in public investment. Second, reduced inflation and the establishment of more efficient financial systems increased the return on holding savings domestically, which may have had some impact on private savings behavior. Finally, policy reforms increased the expected return on investment, particularly for exporters, because a key element of reform programs involved reducing biases against exports. Real investment increased strongly in many of these countries. Since they lack access to private capital

Figure 4.7 Metals and minerals exporters' trade prices, 1993–98



Source: World Bank staff calculations.

markets and official flows have declined during the 1990s, the rise in investment had to be financed by increased domestic savings.

The link between policies and performance can best be seen by grouping the sample of non-oil commodity exporters in terms of ratings of their policies (table 4.6).³³ Countries with ratings of more than 3.5 (1 is worst, and 5 is best) increased their GDP by 5 percent per year during the boom, while countries with ratings of 3.5 or less increased their GDP by only 3 percent per year. Policy performance was by far a better predictor of savings behavior than changes in real income. The countries with better policies increased savings rates by more than those with relatively poorer policies (almost 7 percent of GDP over the base period versus 3 percent of GDP). However, the average rise in real income in the countries with better policies was less than in the countries with poorer policies (1 percent of GDP versus 2 percent).³⁴

Note that this is a biased sample of Sub-Saharan non-oil commodity exporters. To analyze macroeconomic adjustment over the commodity price cycle, countries with severe civil conflicts and countries with inadequate data were excluded. Both these groups of countries tend to have lower performance ratings than countries with civil peace and more developed statistical services. The average performance rating of the countries in the sample is 3.4, while the average performance rating of the non-oil commodity exporting countries in Sub-Saharan Africa excluded from the

sample is only 2.7. Thus the improvements in savings, output growth, and investment for the sample are probably larger than for the Sub-Saharan African non-oil commodity exporters as a whole.

Savings, real income changes, and the commodity price cycle

Policy performance was the primary reason for differences in savings performance. By contrast, changes in real income caused by changes in traded goods prices had a more limited impact on savings during the commodity price cycle. To analyze adjustment to real income changes during the commodity price cycle, a useful approach is to group the sample of the non-oil exporting countries by the percentage change in export revenues and the terms of trade in the boom relative to the base period for each country (table 4.7).

The two groups with more than one country experienced substantial increases in savings rates during both booms and busts, despite the different magnitudes of changes in real income (table 4.8). The group with flat terms of trade and relatively small changes in real incomes actually increased its savings rates by more than the group with large terms of trade and real income gains. Savings rates remained above base period levels during the decline in commodity prices. Both groups' savings performance was much greater than that achieved by the oil exporting countries during the boom and bust of oil prices and was larger than the average savings out of windfall incomes (about one-half) recorded in other studies of savings from commodity price windfalls (Collier, Gunning, and Associates 1999). An analysis of savings behavior in Sub-Saharan African countries over a longer period, from 1980 to 1996, that takes other determinants of savings into account also finds that savings were not closely tied to changes in real incomes (box 4.4).

The sharp increase in savings rates during boom periods enabled the Sub-Saharan African non-oil commodity exporters to increase investment rates compared with the base period by 1.1 percentage points in the group with

Table 4.6 Policy performance and GDP, savings, and real income during boom periods
(average annual percentage change from base period)

Average policy performance rating ^a	GDP	Savings	Real income
Above 3.5	5.3	6.7	1.2
3.5 or below	3.2	3.1	1.9

a. Based on a survey of World Bank country economists.
 Note: Only boom periods are shown because none of the good performers had bust periods.
 Source: World Bank staff calculations.

Table 4.7 Exports and terms-of-trade changes, boom compared to base period

	Large increase in terms of trade	Little change in terms of trade	Large decrease in terms of trade
Large increase in export revenues	Benin Botswana Chad Ethiopia Ghana Kenya Malawi Tanzania Uganda	Central African Republic Côte d'Ivoire Ghana Guinea Madagascar Mali Senegal Zimbabwe	Togo
Little change in export revenues	Mauritania	Niger	Zambia

Note: The cutoff for *large increases* is plus or minus 5 percent for export revenues and 3 percent for the terms of trade (per year). The boom and bust periods were chosen for each country based on movements in export prices, the terms of trade, and export revenues during 1994–98, with the three years prior to the beginning of the boom as the base period. Most of the boom periods are 1995–97, 1994–97, or 1994–98.

Source: World Bank staff calculations.

large terms-of-trade gains and by 3.8 percentage points in the group with only small improvements in the terms of trade. Savings and investment increased by much less during busts, but still rose by more than the negligible change in real income. This experience contrasts sharply with that of the oil exporting countries, where investment rates fell over the commodity price cycle. The non-oil exporters of Sub-Saharan Africa also allocated a portion of the rise in domestic savings to reduce their reliance on foreign savings, which fell by more than 2 percent of GDP in both groups during booms and by 1 percent of GDP during busts.

The difference in savings performance between the groups is partially related to changes in aid flows. Most of these countries experienced a decline in net concessional flows during boom periods (data are not yet available on net flows during busts, which took place in 1998 for most countries), reflecting the general decline in aid since the early 1990s. However, the countries in the first group (with the smallest rise in savings rates despite the largest rise in real income) saw a decline in the ratio of aid to GDP of 5 percentage points in the boom compared with the base period. By contrast, the group of countries with the

Table 4.8 Changes in savings and real income relative to base periods

(percentage of GDP)

Country group	Savings	Investment	Foreign savings	Real income
During boom				
Large increases in exports and in terms of trade	3.5	1.1	-2.4	2.3
Large increases in exports, flat terms of trade	6.5	3.8	-2.7	0.6
During bust ^a	1.5	0.4	-1.0	0.1

a. This includes only four countries, because several countries did not experience a decline in export revenues or real income, so that the boom continues through 1998.

Note: *Savings* indicates an average change in the ratio of savings to GDP in boom or bust periods relative to the base period. *Real income* indicates average change in real income (as a percentage of the base period GDP) caused by changes in export and import prices. Base, boom, and bust periods differ by country depending on the evolution of export prices, revenues, and terms of trade. Group averages reflect the weight of GDP in the base period.

Source: World Bank staff calculations.

Box 4.4 Savings and real incomes during the commodity price cycle

The main text shows that changes in real incomes because of shifts in the terms of trade have not played a major role in determining savings behavior in the non-oil exporters in Sub-Saharan Africa. This box attempts to control for other determinants of savings when measuring the impact of changes in real incomes. The economics literature cites several determinants of savings: (a) higher GDP growth is associated with higher savings, (b) countries with higher per capita incomes normally have higher savings rates, (c) high levels of inflation discourage savings by reducing the real value of some financial assets, (d) countries with a higher age dependency ratio (share of population either very young or very old) generally save less, and (e) increases in foreign savings and official aid are associated with reduced savings (Ghura and Hadjimichael 1995; Ogaki, Ostry, and Reinhart 1995; Dayal-Gulati and Thiman 1997; Loayza, Serven, and Schmidt-Hebbel 1999). The table shows the estimated impact on savings of upswings and downswings in the terms of trade during 1980–96 after controlling for these other determinants of savings.³⁵

The regression results are roughly consistent with two of the major findings presented in this chapter, even though the regressions account more fully for other determinants of savings and cover a

longer period. First, the relationship between savings and the terms of trade varies considerably among country groups. This relationship is positive and significant for oil exporters in both upswings and downswings and for metals and minerals producers during upswings (but not downswings), but is not significant for agricultural producers. Note that the relationship between savings and the terms of trade is the same in the upswing as it is in the downswing during 1980–96. In the most recent cycle, however, oil exporting countries tended to save less than the rise in real income during the upswing and dissaved the full amount of the fall in real income during the downswing (see main text). It is unclear whether this difference stems from the longer time period and different country coverage of the regressions, or if it reflects a more accurate measurement of the impact of terms-of-trade changes after accounting for other determinants of savings. Second, while changes in the terms of trade are not significantly related to savings by the Sub-Saharan African agricultural producers, a time trend is positive and significant. This result is at least consistent with the view that policy improvements undertaken in several countries since the 1980s have had a more important impact on savings than changes in the terms of trade.

Terms-of-trade shocks and savings

Impact on savings rates (number of observations)	Term-of-trade upswing	Terms-of-trade downswing	Time
Oil exporting countries ^a (120)	0.143*	0.131*	
Metals and minerals producers in Sub-Saharan Africa ^b (78)	0.196**	0.110	
Agricultural producers in Sub-Saharan Africa ^c (207)	0.038	0.022	0.004*

a. Algeria, Equatorial Guinea, Gabon, the Islamic Republic of Iran, Nigeria, Republic of the Congo, Russian Federation, Trinidad and Tobago, Venezuela, and the Republic of Yemen.

b. Botswana, Guinea, Mauritania, Niger, Togo, and Zambia.

c. Central African Republic, Chad, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mali, Senegal, Uganda, and Zimbabwe.

Note: Asterisks indicate significance at a 1 percent (*) or 10 percent (**) level. Estimation is based on panel data with country-fixed effects and instrumental variables estimators.

Source: World Bank staff calculations.

largest increase in savings rates experienced a decline in the ratio of aid to GDP of only 1 percentage point. The relationship between savings, real incomes, and aid flows on a country basis is represented in figure 4.8, which shows data on changes in real income and savings (as a share of GDP) during boom periods compared with base periods. All the countries with real income gains that were larger than average (1 percent of GDP), but which had increases in savings that were smaller than average (5 percent of GDP), had large declines in aid flows.

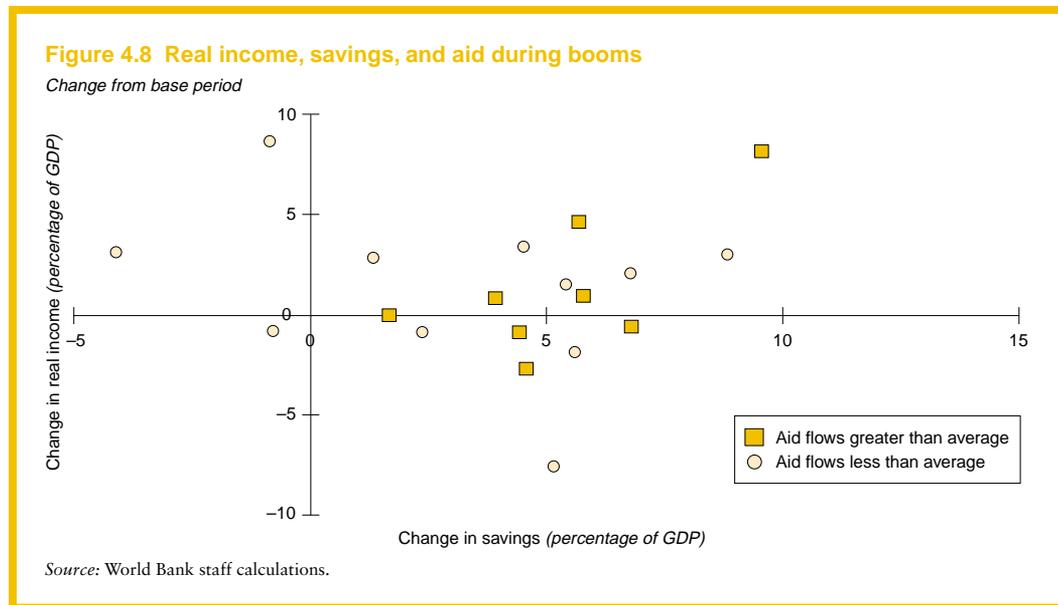
Both the private and public sectors contributed to the rise in savings rates during the boom.³⁶ Stronger macroeconomic policies were reflected in improvements in government current balances for both groups. National account data show that private savings also increased significantly during the boom, by 2.8 percent of GDP in those countries with flat terms of trade and by 1.7 percent of GDP in the other group (figure 4.9).

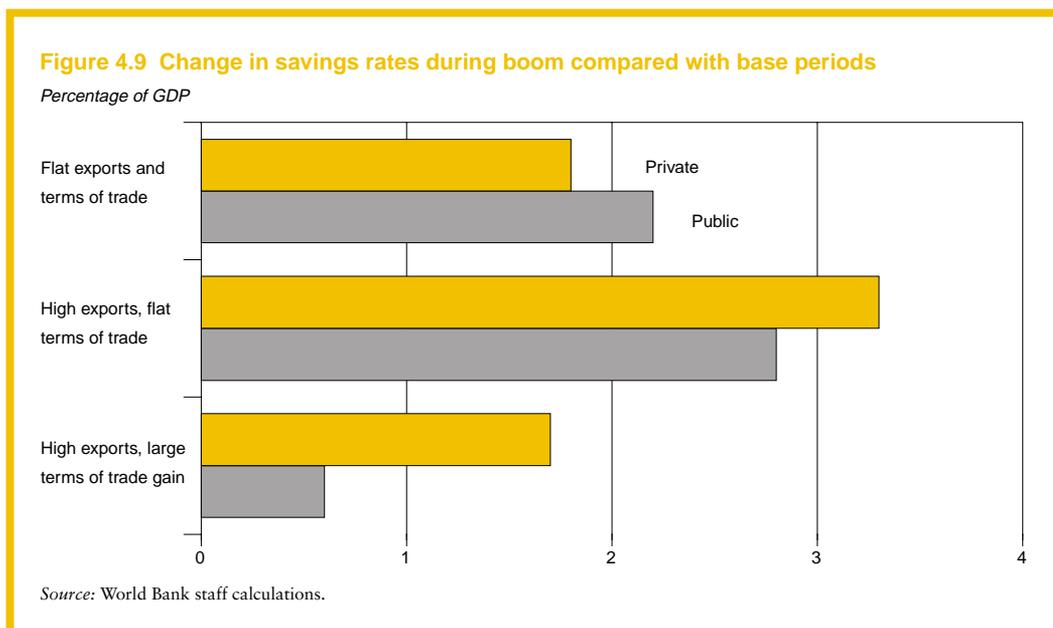
Improved policy performance led to an acceleration of GDP growth, which rose sharply during booms, averaging 3.8 and 4.6 percent per year in the two groups (table 4.9).

The terms-of-trade effects account for only a small fraction of the increase in GDP growth. Based on estimates by Deaton and Miller (1995), the income gains would have increased GDP growth on average by 1.2 and 0.3 percentage points during the boom periods for the two groups.³⁷ These results do not imply that the changes in real incomes did not have an impact on growth rates. Countries experiencing a bust did see slower rates of GDP growth (by 2 to 3 percent per year) than countries experiencing a boom in commodity prices.³⁸

The commodity price cycle and the internal distribution of income

The commodity price cycle had a significant impact on the internal distribution of income in many of the non-oil commodity exporters, including some countries that did not experience a sharp change in aggregate real income. Table 4.10 decomposes the change in real income between changes that resulted from movements in export prices and from movements of import prices. The countries with little change in the terms of trade experienced an internal shift in real income when commod-





ity prices were high. Two factors lay behind this shift. Firms and households that earn their income from exports saw a gain of up to 2 percent of GDP because of higher prices, while firms and households that depend largely on imported goods lost as much as 1.4 percent of GDP.³⁹ In many of these countries, higher export prices increased incomes in rural areas, where export crops are produced and where people tend to consume locally produced food, but higher import prices reduced incomes in the urban areas that are dependent

on imported food. Benin provides an interesting example of the internal distribution of real income changes (box 4.5).

Conclusion. The recent swing in commodity prices posed a significant challenge to economic management in those developing countries that are dependent on commodity exports, and the quality of economic policies played an important role in determining countries' responses. Policies have been weak in several oil exporting countries, and many of the countries experienced a deterioration of

Table 4.9 Economic performance

(average annual percentage change from base period)

Country group	GDP	Investment	Export volumes
During boom			
Large increases in exports and in terms of trade	4.6	5.3	6.4
Large increases in exports, flat terms of trade	3.8	7.1	7.4
During bust ^a	1.7	1.7	5.2

a. Country coverage differs substantially between boom and bust periods.

Note: Data show change in real income caused by export and import prices. A negative sign indicates a fall in real income, either from lower export prices or higher import prices. See notes to table 4.8.

Source: World Bank staff calculations.

Table 4.10 Decomposition of real income changes*(percentage of base year GDP)*

Country group	Real income change caused by:	
	Export prices	Import prices
During boom		
Large increases in exports and in terms of trade	2.7	-0.4
Large increases in exports, flat terms of trade	2.0	-1.4
During bust ^a	-0.3	0.2

a. Country coverage differs substantially between boom and bust periods.

Note: Data show change in real income caused by export and import prices. A negative sign indicates a fall in real income, either from lower export prices or higher import prices. See notes to table 4.8.

Source: World Bank staff calculations.

savings and investment performance during the commodity price cycle. By contrast, the past few years have seen substantial improvements in policies in many of the non-oil exporting countries of Sub-Saharan Africa, and these countries' savings and investment rates increased.

Notes

1. The impact of volatility on the poor is discussed in chapter 2.

2. Some measures of commodity price volatility declined after the mid-1980s, but remained higher than in the 1970s (Dehn and Gilbert 1999).

3. Dehn and Gilbert (1999) used a recursive forecast model to evaluate the degree of uncertainty or

Box 4.5 Real incomes in Benin during the commodity price cycle

Benin experienced sharp changes in the distribution of income as a result of the commodity price cycle and the CFA franc devaluation during the mid-1990s. During 1994–96 the U.S. dollar price of cotton, which accounts for 80 percent of Benin's merchandise exports, rose by 48 percent from its 1992–93 level. Also in 1994, the 50 percent devaluation of the CFA franc greatly increased the prices of exports and imports in local currency. By 1996 the cotton producer price had risen to twice its 1992–93 level in CFA franc terms, and the boost to real income during 1994–96 from the rise in export prices was 7 percent of 1992–93 GDP. Import prices also increased sharply, however, because of the devaluation and the rise in the dollar price of primary commodity imports. Import prices in CFA franc terms doubled during 1994–96 compared with 1992–93, equivalent to a loss of 20 percent of GDP. Imports were almost three times the size of exports (excluding re-exports) during 1992–93, so the loss from the rise in import prices

was much greater than the gain from exports. The net loss to the economy was about 13 percent of GDP during 1994–96 compared with 1992–93.

Rural areas saw an increase in incomes and labor demand as the price rise encouraged greater cotton production (the area under cotton cultivation almost doubled from 1993–94 to 1996–97).⁴⁰ Urban workers, however, experienced a decline in living standards following the devaluation as the cost of living increase exceeded the rise in wages. A 46 percent rise in the *salaire minimum interprofessionnel garanti* was granted in May 1994, compared with a 54 percent increase in the consumer price index. Moreover, actual earnings did not fully reflect the increase in wage rates as the government was substantially in arrears paying wage increases. Finally, many workers, particularly the more vulnerable, lower-income ones, were employed in the informal sector where incomes probably did not keep pace with the rise in living costs.

unpredictability in commodity prices, where uncertainty was measured by the standard deviation of the forecast error.

4. Selected commodity prices (coffee, cotton, gold, and copper) have remained roughly flat relative to U.S. inflation since 1900. At a minimum, owners of a constant flow of one of these commodities would not have seen much growth in real income during the twentieth century (Deaton 1999).

5. Statistical analyses of commodity price series can be found in Cuddington and Urzúa 1989; Cuddington 1992; Deaton and Laroque 1992; Reinhart and Wickham 1994; León and Soto 1997; and Cashin, Liang, and McDermott 1999.

6. These data are based on a limited sample of commodities. The agricultural products included are cocoa, coffee, tea, fats and oils, cotton, sugar, rubber, soybeans, maize, rice, and wheat. The metals and minerals are aluminum, copper, gold, and steel.

7. However, these increases did not occur in the countries of the former Soviet Union, where production continued to fall. According to the Food and Agriculture Organization of the United Nations, agricultural production in transition economies fell by 35 percent from 1990 to 1998. This partially offset gains in other countries.

8. Case studies are given in Collier, Gunning, and Associates (1999), Ingham (1973), and Paxson (1992). Econometric studies include Dayal-Gulati and Thimann (1997) and Loayza, Serven, and Schmidt-Hebbel (1999). Studies have also found that consumption behavior in some developing countries is closely related to permanent income (Ostry and Reinhart 1992; Ghosh and Ostry 1993; Borensztein and others 1994).

9. The Middle East and North Africa region has many oil exporters. Note that these estimates of the size of resource depletion are probably overstated. Estimates of depletion should reflect the price of the resource minus the marginal cost of extraction. In practice, data on marginal extraction costs are generally not available, so that average production costs are used. This practice overstates depletion, and hence understates levels of genuine savings.

10. See, for example, the U.S. Department of Energy's *Annual Energy Outlook*, various issues. The World Bank's forecasts also envisioned continued high energy prices in the early 1980s.

11. However, many Sub-Saharan African countries have liberalized marketing arrangements and reduced export taxes since the 1970s, which has reduced the government's role in allocating commodity price windfalls.

12. This section covers 11 developing countries where oil exceeded 50 percent of exports in 1997, namely: Algeria, Gabon, the Islamic Republic of Iran, Oman, Trinidad and Tobago, and Venezuela (middle-income debtors); Bahrain and Saudi Arabia (middle-income creditors); and Angola, Republic of Congo, and Nigeria (low income). These countries account for 93 percent of the total oil exports of the major oil exporting developing countries. Equatorial Guinea, Iraq, Libya, the Republic of Yemen, and some of the transition economies are excluded due to lack of sufficient data.

13. The concentration index ranges from zero to one, with one representing the most extreme concentration (UNCTAD 1994).

14. For the purpose of this analysis, the fuels price boom is dated as 1996–97 (when prices were above trend) and the bust as 1998 (when prices fell below trend). The trend is calculated beginning in 1986 to exclude the last major collapse of oil prices.

15. The methodology used in the IMF (1998) was used to measure the loss in real incomes due to terms of trade changes. The formula is $[(PX_{t+1} - PX_t) * X_t - (PM_{t+1} - PM_t) * M_t] / GDP_t$, where PX and PM are price indexes for exports and imports, X and M are export and import volumes, and GDP is at current prices. This calculation ignores changes in the volume of exports and imports. To the extent that changes in volumes are in response to changes in prices, the formula fails to reflect the full impact of price changes on real incomes.

16. The flexibility of consumption levels in response to terms-of-trade changes is limited in some countries because of the unstable security environment (military expenditures are typically counted as consumption in the national accounts).

17. Permanent income from oil was calculated assuming that production was constant (the extent of depletion of oil reserves was not viewed as an important consideration over a short time period) and that the real oil price was equal to the trend. Permanent income in the non-oil sector was set equal to the actual level during the period.

18. This is an extreme assumption, as typically producers will view a portion of the rise in price as permanent.

19. The number of countries is limited based on the availability of data for 1998 and on estimates for non-oil GDP.

20. This calculation is based on a sample of seven countries, determined by data availability. The data refer to fixed investment, while the data on total investment include changes in stocks.

21. There were substantial differences between the magnitude of changes in foreign savings as shown

in national income accounts and in the current account of the balance of payments, partly because of data discrepancies between the two sources and partly because of movements in factor income and other current account items.

22. The regression equation is $\text{disbursements} = 6.6 + .66 \times \text{oil price}$, where all variables are expressed in natural logarithms. The coefficient of the oil price is significant at the 1 percent level.

23. The measurement of the change in real income refers to the economy as a whole, not to the government. Determining the government's share of the real income gain is difficult. Typically, the government, or the public sector as a whole, directly captures the bulk of the rise in oil prices, but data to measure the impact of changes in import prices on government incomes are not available.

24. Private sector savings are calculated by subtracting the government's current balance from the economy's total savings. Thus, public enterprises are classified under the private sector, which for some countries reduces the accuracy of these data as indicators of private sector behavior. Also, discrepancies in national income accounts could distort the data on private sector savings.

25. Data on public savings in 1998 are not available for the Republic of the Congo. Therefore, table 4.3 covers only 10 countries (compared with 11 countries for table 4.1).

26. Output growth is not a reliable indicator of economic performance for some of the major oil exporting countries because it reflects, in part, changes in the volume of oil production in line with efforts to support prices. Also, the huge shifts in oil prices since the 1970s make interpreting long-term changes in constant price data difficult. Growth in non-oil output is a better indicator of performance, but sufficient historical data are available for only a limited number of countries.

27. *International Country Risk Guide 1999.*

28. The countries discussed in this section include the agricultural exporters Benin, Central African Republic, Chad, Côte d'Ivoire, Ethiopia, The Gambia, Ghana, Kenya, Madagascar, Malawi, Mali, Senegal, Tanzania, Uganda, and Zimbabwe. Minerals exporters are Botswana, Guinea, Mauritania, Niger, Togo, and Zambia. Burundi, Democratic Republic of the Congo, Liberia, Mozambique, Rwanda, Sierra Leone, Somalia, and Sudan are excluded because of civil strife. Burkina Faso, Cape Verde, Comoros, Djibouti, Eritrea, Guinea Bissau, Lesotho, Namibia, São Tomé and Príncipe, Seychelles, and Swaziland are excluded because of the lack of data. The sample countries account for approximately 75 percent of the total GDP

of the non-oil commodity exporters of Sub-Saharan Africa.

29. However, a substantial portion of these countries' manufactured exports represents agricultural goods with limited processing, whose prices probably move closely with primary commodities. The export price deflator roughly followed the average deflator of the largest two commodities from each country.

30. The commodity price index also may differ from export price deflators because the fixed weights used in the former may not reflect the export composition of the countries in our sample during the 1990s. For example, coffee and cocoa prices, which account for almost half of the Sub-Saharan Africa agriculture price index using 1987–89 weights, increased more rapidly than total agricultural prices during 1990–97, but exports of coffee and cocoa from the principal producers increased more slowly than the group's total exports. Therefore, in this case the weight of the more rapidly growing commodities among the export price deflators would have declined relative to the fixed weight index.

31. The sample of countries with bust periods is smaller than the sample with boom periods because in some countries export revenues and prices never fell significantly.

32. The price index for metals and minerals does not cover all the relevant goods exported by these countries. For example, the average commodity price for metals and minerals does not include diamonds, which is an important export of Botswana, because of the lack of data.

33. The country composition during boom and bust periods differs, because some countries never experienced a bust.

34. The ratings are prepared by World Bank country economists, based on their evaluation of macroeconomic policies, structural policies, reduction of inequality, and public sector management.

35. We discuss later how differences in savings performance depended in part on aid flows. Note that changes in aid flows do not explain the differences in performance of the two groups, as they experienced almost the same decline in aid flows during boom periods.

36. The dependent variable is savings divided by GDP. The terms of trade variables are constructed in three steps. First, an index of the terms of trade is multiplied by the ratio of exports to GDP and the growth rate is calculated. Second, dummy variables are constructed to represent upswings and downswings in the terms of trade. A value of 1 or 0 is assigned to each year and country, based on an analysis of the evolution of prices and revenue of each country's commodity exports.

Finally, the dummy variables are multiplied by the growth rate of the terms of trade variable.

37. Data are not yet available to distinguish between public and private savings during bust periods, which occurred in 1998 for most countries.

38. Deaton and Miller (1995) estimate that a 1 percent gain in GDP from terms of trade would add about one half of 1 percent in GDP growth during the boom, in addition to the real income effects.

39. The country composition is substantially different between boom and bust periods. Thus the conclusion cannot be drawn that output in individual countries necessarily grew more slowly during the bust.

40. Exporters may depend on imported inputs, and firms in the traded goods sector that depend on imported inputs may have benefited from increased output prices. Thus, neither group experienced the full amount of gain or loss represented by the change in export and import prices.

41. However, producers' prices rose by considerably less than what would be implied by the increase in international prices and the CFA franc devaluation. Therefore, the marketing board or the government reaped a large portion of the gain.

References

- Ahamed, Liaquat. 1984. "Oil Exporting Developing Countries: Macroeconomic Policies and Adjustment Issues." *Country Policy Department Discussion Paper* 1984-7. Washington, D.C.: World Bank.
- Alpine, Robin W., and James Pickett. 1993. *Agriculture, Liberalisation and Economic Growth in Ghana and Côte d'Ivoire 1960-90*. Paris: Organisation for Economic Co-operation and Development.
- Auty, Richard M. 1988. "Oil-Exporters' Disappointing Diversification into Resource-Based Industry." *Energy Policy* 16:230-42 (June).
- Bevan, David, Paul Collier, and Jan Willem Gunning. 1990. *Controlled Open Economies*. Oxford: Clarendon Press.
- Bleaney, Michael F., and David Greenaway. 1993. "Long-Run Trends in the Relative Price of Primary Commodities and in the Terms of Trade of Developing Countries." *Oxford Economic Papers* 45(July): 349-63.
- Borensztein, Eduardo, Mohsin S. Khan, Carmen M. Reinhart, and Peter Wickham. 1994. *The Behavior of Non-oil Commodity Prices*. Washington, DC: International Monetary Fund.
- Cashin, Paul, Hong Liang, and C. John McDermott. 1999. "How Persistent Are Shocks to World Commodity Prices?" Working Paper no. 99/80. International Monetary Fund, Washington, D.C.
- Collier, Paul, and Jan Willem Gunning. 1996. "Policy Towards Commodity Shocks in Developing Countries." Working Paper no. 96/84. International Monetary Fund, Washington, D.C.
- Collier, Paul, Jan Willem Gunning, and Associates. 1999. *Trade Shocks in Developing Countries*. Volume I: Africa and Volume II: Asia and Latin America. Oxford: Oxford University Press.
- Cuddington, John. 1988. "Fiscal Policy in Commodity-Exporting LDCs." Policy, Planning and Research Working Paper no. 33. World Bank, Office of the Vice President, Development Economics, Washington, D.C.
- _____. 1992. "Long-Run Trends in 26 Primary Commodity Prices." *Journal of Development Economics* 39 (October): 207-27.
- Cuddington, John, and Carlos M. Urzúa. 1989. "Trend and Cycles in the Net Barter Terms of Trade: A New Approach." *Economic Journal* 99 (396): 426-42.
- Dadush, Uri, and Dipak Dasgupta. 1999. "The Benefits and Risks of Private Capital Flows to Developing Countries." World Bank, Development Prospects Group, Washington, D.C.
- Dayal-Gulati, Anuradha and Christian Thimann. 1997. "Saving in Southeast Asia and Latin America Compared: Searching for Policy Lessons." Working Paper no. 97/110. International Monetary Fund, Asia and Pacific Dept., Washington, D.C.
- Deaton, Angus S. 1999. "Commodity Prices and Growth in Africa." *Journal of Economic Perspectives* 13(3): 23-40.
- Deaton, Angus S., and Guy Laroque. 1992. "On the Behavior of Commodity Prices." *Review of Economic Studies* 59 (198): 1-24.
- Deaton, Angus S., and Ronald I. Miller. 1995. "International Commodity Prices, Macroeconomic Performance, and Politics in Sub-Saharan Africa." Studies in International Finance no. 79. Princeton University Press, Department of Economics, International Finance Section, Princeton, N.J.
- Dehn, Jan, and Christopher L. Gilbert. 1999. "Commodity Price Uncertainty and Economic Growth and Poverty." Processed.
- Gelb, Alan H., and Associates. 1988. *Oil Windfalls: Blessing or Curse?* New York: Oxford University Press.
- Ghosh, Atish, and Jonathan Ostry. 1993. "Do Capital Flows Reflect Economic Fundamentals in Developing Countries?" IMF Working Paper no. 93/34. International Monetary Fund, Washington, D.C.

- Ghura, Dhaneshwar, and Michael T. Hadjimichael. 1995. "Growth in Sub-Saharan Africa." IMF Staff Working Paper no. 95/136. International Monetary Fund, Washington, D.C.
- Grilli, Enzo, and Maw Yang. 1988. "Primary Commodity Prices, Manufactured Goods Prices and the Terms of Trade of Developing Countries: What the Long Run Shows." *World Bank Economic Review* 2 (January): 1–47.
- Hamilton, Kirk, and Michael Clemens. 1999. "Genuine Savings Rates in Developing Countries." *World Bank Economic Review* 13(2): 333–56.
- Harberger, Arnold C. 1950. "Currency Depreciation, Income, and the Balance of Trade." *Journal of Political Economy* 53(February): 47–60.
- Ingham, Barbara M. 1973. "Ghana Cocoa Farmers—Income-Expenditure Relationships." *Journal of Development Studies* 9(April): 365–77.
- IMF (International Monetary Fund). 1998. *World Economic Outlook*. Washington, D.C.
- International Country Risk Guide* 1999. Syracuse, New York: PRS Group.
- Kemp, Peter. 1998. "Wishing and Waiting for the Oil Price Recovery." MEED Saudi Arabia Special Report. *MEED East Business Weekly* June 12: 29–35.
- Lane, Philip R., and Aaron Tornell. 1995. "Power Concentration and Growth." Discussion Paper no.1720. Cambridge: Harvard Institute of Economic Research.
- Léon, Javier, and Raimundo Soto. 1997. "Structural Breaks and Long-Run Trends in Commodity Prices." *Journal of International Development* 9 (May–June): 347–66.
- Lipsey, Robert E. 1994. "Quality Changes and Other Influences on Measures of Export Prices of Manufactured Goods." Policy Research Working Paper no. 1348. World Bank, Washington, D.C.
- Little, I. M. D., Richard N. Cooper, Max W. Corden, and Sarath Rajapatirana. 1993. *Boom, Crisis and Adjustment*. Oxford: Oxford University Press.
- Loayza, Normal V., Luis Servén, and Klaus Schmidt-Hebbel. 1999. "What Drives Savings across the World?" In Klaus Schmidt-Hebbel and Luis Servén, eds., *The Economics of Savings and Growth*. Cambridge: Cambridge University Press.
- Maizels, Alfred. 1994. "The Continuing Commodity Crisis of Developing Countries." *World Development* 22(11): 1685–95.
- Matsuyama, K. 1992. "Agricultural Productivity, Comparative Advantage, and Economic Growth." *Journal of Economic Theory* 58: 317.
- Mayer, Jorg. 1996. "Learning Sequences and Structural Diversification in Developing Countries." *Journal of Development Studies* 33(2): 210–29.
- McMahon, Gary. 1997. "The Natural Resource Curse: Myth or Reality?" World Bank, Washington, D.C.
- Ogaki, Masao, Jonathan David Ostry, and Carmen M. Reinhart. 1995. "Saving Behavior in Low- and Middle-Income Developing Countries: A Comparison." IMF Staff Working Paper no. 95/3. International Monetary Fund, Washington, D.C.
- Ostry, Jonathan D., and Carmen M. Reinhart. 1992. "Private Savings and Terms of Trade Shocks: Evidence from Developing Countries." *Staff Papers* 39 (September): 495–517.
- Page, John. 1999. "The Middle East and North Africa: An Overview." World Bank, Washington, D.C.
- Paxson, Christian H. 1992. "Consumption and Income Seasonality in Thailand." Research Program in Development Studies, Discussion Paper no. 150. Woodrow Wilson School of Public and International Affairs, Princeton, N.J.
- Prebisch, Raul. 1950. *The Economic Development of Latin America and its Principal Problems*. New York: United Nations.
- Reinhart, Carmen M., and Peter Wickham. 1994. "Commodity Prices: Cyclical Weakness or Secular Decline?" *International Monetary Fund Staff Papers* 41(2): 175–213.
- Ruppert, Elizabeth. 1996. "Unemployment Insurance in Algeria: Implications for a Labor Market in Transition." Policy Research Working Paper no. 1659. World Bank, Washington, D.C.
- Sachs, Jeffrey D. 1981. "The Current Account and Macroeconomic Adjustment in the 1970s." *Brookings Papers on Economic Activity* 1: 201–68.
- Sachs, Jeffrey D., and Andrew M. Warner. 1999. "Natural Resource Intensity and Economic Growth." In Jörg Mayer, Brian Chambers, and Ayisha Farooq, eds., *Development Policies in Natural Resource Economies*. United Nations Conference on Trade and Development. Cheltenham, U.K.; Northampton, Mass.: Edward Elgar in association with UNCTAD.
- Sapsford, David, and V. N. Balasubramanyam. 1994. "The Long-Run Behavior or the Relative Price of Primary Commodities: Statistical Evidence and Policy Implications." *World Development* 22(11): 1737–45.
- Singer, H. W. 1950. "The Distribution of Gains between Investing and Borrowing Countries." *AER Papers and Proceedings* 40: 473–85.

- Spraos, John. 1980. "The Statistical Debate on the Net Barter Terms of Trade between Primary Commodities and Manufactures." *Economic Journal* 90 (357): 107–28.
- Stauffer, Thomas. 1999. "Macroeconomic Management of Windfalls." Lecture given at the World Bank, Washington, D.C.
- Svensson, Lars E. O., and Assaf Razin. 1983. "The Terms of Trade and the Current Account: The Harberger-Laursen-Metzler Effect." *Journal of Political Economy* 91 (February): 97–125.
- UNCTAD (United Nations Conference on Trade and Development). 1994. *Handbook of International Trade and Development Statistics*. N.Y.: United Nations.
- Varangis, Panos, Takamasa Akiyama, and Donald Mitchell. 1995. "Managing Commodity Booms—and Busts." In *Directions in Development*. Washington, D.C.: World Bank.
- Wetzel, Deborah L. 1992. "Temporary Trade Shocks in Developing Countries: A Case Study of the Ghanaian Cocoa Boom." Centre for the Study of African Economies, Oxford, U.K.
- World Bank. 1994. *Global Economic Prospects*. Washington, D.C.
- World Bank. 1999. *World Development Indicators*. Washington, D.C.