



Explaining the resource curse, with special reference to mineral-exporting countries¹

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Recent studies have found an inverse correlation between economic growth and natural resource abundance among developing countries. There appears to be no obvious explanation for this finding, such as an important growth variable that is common in resource-poor countries and deficient in resource-abundant countries. The resource curse hypothesis is closely related to the problem of sustainability for resource-exporting countries since periods of high growth are frequently followed by long periods of stagnation. Models are examined showing how increases in export income can affect relative prices in the trade and nontrade sectors and how the changes in relative prices affect investment and growth. It is the thesis of this article that there is nothing inherent in resource-abundance that condemns countries to either low growth or nonsustainability. © 1998 Elsevier Science Ltd. All rights reserved

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The purpose of this paper is to explore the reasons for the relatively poor growth performance of mineral exporting countries. The mineral exporting countries are the most visible victims of the resource curse hypothesis, which holds that resource-abundant countries tend to perform more poorly in terms of sustainable growth than resource-poor countries. Most mineral exporting countries had relatively high rates of growth during the 1960–1980 period when mineral prices were rising. However, their growth rates declined sharply during the 1980–1993 period, and a substantial proportion of them experienced negative per capita growth rates during the latter period. For these countries, periods of high export earnings have not given rise to sustained growth.

Traditionally, abundant natural resources have been regarded as contributing to successful development and have provided an explanation for the growth of Western countries, such as Australia, the U.S. and Canada (North, 1963). However, during the past three decades, the star performers among developing coun-

tries, such as Korea and Taiwan, are resource poor, while the majority of the resource-rich countries, such as Argentina, Mexico, Peru, Saudi Arabia and Venezuela, have had lower than average annual rates of gross domestic product (GDP) growth in the 1980–1993 period, and negative per capita gross national product (GNP) growth. Several econometric studies covering nearly all developing countries have provided impressive evidence of the relatively slower rate of growth of the resource-rich countries over the past several decades (Nankani, 1979; Gelb *et al.*, 1988; Auty, 1986, 1993; Sachs and Warner, 1995). For example, Sachs and Warner (1995) found a negative relationship between per capita growth rates and the ratio of natural resource exports to GDP for eighteen developing countries over the 1971–1989 period. The authors found this result to remain significant in cross-country growth regressions, after taking account of a large number of additional variables, including initial GDP, trade policy, investment rates, and trade volatility. While relatively poor per capita growth performance characterized resource-rich developing countries generally, poor per capita growth was especially manifest in mineral exporting countries (Table 1). Thus, over the period 1980–1992

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Table 1 Exports of fuels, minerals and metals as a percentage of total exports, per capita GNP (1992 dollars), and average annual GNP growth rates, 1980–1992

Country	Share of exports (%)	GNP (1992 \$)	Average annual growth (%)
Sierra Leone	34	160	-1.4
Niger	86	280	-4.3
Nigeria	96	320	-0.4
Togo	45	390	-1.8
Mauritania	84	530	-0.8
Indonesia	38	670	4.0
Bolivia	66	680	-1.5
Papua New Guinea	52	950	0.0
Peru	49	950	-2.8
Congo	92	1030	-0.8
Ecuador	45	1070	-0.3
Jordan	34	1120	-5.4
Colombia	29	1330	1.4
Algeria	97	1840	-0.5
Iran	90	2200	-1.4
Chile	47	2730	3.7
Venezuela	86	2910	-0.8
Mexico	34	3470	0.2
Trinidad/Tobago	64	3940	-2.6
Gabon	89	4450	-3.7
Oman	94	6480	4.1
Saudi Arabia	99	7510	-3.3
Botswana	na	2790	6.1
All low- and middle-income countries:	—	—	0.9

Source: World Bank (1994).

Note: To the above list we may add Zaire and Zambia, which have a high proportion of mineral exports, but negative per capita GNP growth rates.

the average annual per capita GNP growth rate of twenty-three mineral exporters was a negative 0.5%, and only five of these countries (Indonesia, Colombia, Chile, Oman and Botswana) had positive rates of per capita GNP growth (Table 1). For all low- and middle-income countries, the average rate of growth in per capita GNP for this period was 0.9%. In a World Bank Staff Working Paper, Nankani (1979) found that mineral economies have been less successful in economic performance: lower rates of growth, lower levels of social welfare, and more highly skewed income distributions than nonmineral LDCs. Gelb *et al.* (1988) found the same thing specifically for oil exporting countries, and that for these countries the prudent use of boom windfalls was the exception rather than the rule.

It is not my purpose to discuss the statistical findings supporting the resource curse. Rather, I want to examine the reasons that have been advanced for the growth bias, specifically for mineral-exporting countries. Any single explanation for the relatively slow growth of resource-abundant countries must be shown to be uniquely characteristic of these countries and have a negative correlation with growth. Simply being a resource-abundant country is not a satisfactory answer. There are important exceptions to this slow growth bias among resource-abundant countries, and the explanations advanced for the resource curse cover a range of economic, structural, micro and macro policy, and political factors: the same combi-

nation of which rarely applies to more than one country. Therefore, it is difficult to identify growth-retarding factors common to a large number of resource-abundant countries.

The resource curse is paradoxical because production of natural resources (1) has been the initial source of nearly all development, (2) provides an almost immediate source of foreign exchange, (3) attracts foreign capital and skills, and (4) provides both raw materials for processing and a market for manufactured inputs. The traditional position that natural-resource exports are a primary engine of growth began to be questioned in the development literature following World War II. One of the first challenges to the efficacy of primary commodity-driven export growth was made by Raul Prebisch (1964) who argued that over the long term, prices of primary commodities decline relative to the prices of manufactured goods, thereby causing primary exporting economies to stagnate. However, evidence supporting Prebisch's terms-of-trade hypothesis is very weak. Firstly, there is no significant correlation between long-term declining real export prices and the rates of economic growth of exporting countries (Maizels, 1968). Secondly, Kindleberger (1956) and others have not found statistical support for the existence of long-term declines in the terms-of-trade of developing countries. In addition, the significance of long-term changes in terms-of-trade is doubtful because of constant improvements in the quality of

manufactured goods. Also, there have been substantial reductions in production costs for many primary commodities as a result of increased productivity, so that the economic rents produced by the natural resources have not declined with the decreases in primary commodity prices.

Another challenge to the contribution of natural resource industries to growth is provided by Hirschman's (Hirschman, 1958) analysis of forward and backward linkages, and his finding that resource industries have lower linkage effects than manufacturing and are, therefore, less effective in transmitting growth to the rest of the economy. Yet, primary commodity exports have provided the initial stimulus to manufacturing and there are many examples of parallel and symbiotic development of resource industries and manufacturing, such as that between mining and industrial development in the American West. Without the foreign exchange income from primary commodity exports, most countries would have been unable to buy the capital goods and intermediate inputs to develop the manufacturing sector.

Substantial volatility in export revenue is sometimes advanced as the reason for slow growth in primary commodity exports, and it is certainly true that terms-of-trade volatility is higher for primary commodity exporters than for industrial countries. Over the period 1960–1980, the standard deviation of annual percentage price changes for forty-nine primary commodities was 26.4%, while the deviation in the World Bank Overall Commodity Price Index was half that percentage. The terms-of-trade volatility of the regions with the highest primary export shares (Latin America, sub-Saharan Africa, the Middle East, and North Africa) were two to three times that of industrial countries over the 1970–1992 period. [Terms-of-trade volatility is defined as the standard deviation of the percentage growth rate of the terms of trade (Westley, 1995)]. However, Sachs and Warner (1995) did not find a strong relationship between terms-of-trade volatility and per capita growth.

Some mineral-exporting countries do not save and invest enough to compensate for the depletion of their reserves. However, most mineral-exporting countries have been able to expand their mineral output over the past three decades, and in only a few cases have countries been forced to curtail output because of reserve depletion. The latter will undoubtedly occur in a number of countries over the next few decades, but it cannot be regarded as a significant cause of the relatively slow growth in most mineral-exporting countries over the past three decades. Gross investment as a percentage of GDP declined for most mineral exporting countries between 1970–1980 and 1980–1993. This suggests they are not investing a sufficient amount in productive industries to replace the reduction in export earnings following a decline in export prices. For example, in Saudi Arabia, much of the oil revenues have gone for consumption by the middle- and upper-income classes, for defense, and

for public works that yield a low rate of return. The country has failed to direct enough oil revenue for investment in manufacturing, agriculture, and education. Although I fail to find any single explanation as to why countries heavily dependent on mineral exports should have relatively low growth, these economies do require special policies in dealing with adjustments arising from fluctuations in mineral exports.

The economics of export booms

Important to the explanation of the resource curse is the distortion created by export booms in the economies of the primary-commodity-exporting countries. These distortions are not simply transitory and disappear when the boom subsides, they affect the structure of production and investment required for future growth in a manner that may impair sustainability (Sachs and Warner, 1995, Appendix A).

If revenues from mineral exports were stable or expanding slowly, there would be no special economic impacts generating distortions that inhibit sustainable growth. Mineral-exporting countries are subject to temporary surges in export income, mainly from increases in world mineral-prices, but in some cases from new discoveries, such as a large petroleum-reservoir. Whatever the cause of the rise in export income, it levels off or declines so that it is no longer a source of increased income. Export booms not only increase domestic income, but affect savings and investment, government expenditures, and relative prices in different sectors of the economy. These economic impacts differ significantly among countries, and depend on the structure of the economy and the policies adopted by the government. However, in most cases, distortions occur that tend to depress output and investment in key sectors. The following paragraphs outline a typical set of responses to an export boom by a developing country heavily dependent on primary-commodity exports.

- (1) A surge in foreign exchange sold in the foreign-exchange market by both government and private firms causes the exchange rate to appreciate and domestic income to rise. The combination of a rise in the nominal exchange rate and domestic price inflation results in a rise in the real exchange-rate. (I define a rise in the real rate of exchange as a decline in the ratio of the price index of tradeable goods to the price index of nontradeable goods.²)
- (2) The real exchange-rate appreciation tends to reduce relative prices for tradeable products

²This definition of the real exchange rate is used by Edwards (1989). The reason for my preference for this definition of real exchange rates, as contrasted with the purchasing power parity method, is that it measures the effects on sectoral prices which, in turn, have a major impact on the economy.

(manufactured goods and agricultural products) relative to prices of nontradeables (construction and services), so that labor and capital are withdrawn from the tradeable sector and flow into the nontradeable sector.

- (3) Exports of nonresource tradeables decline and imports rise. Governments often respond to an increase in imports and fall in exports by imposing import restrictions and subsidizing exports. This brings about further distortions by attracting investment to high-cost importing-substituting manufacturing. Higher prices for manufactured goods depress agriculture and further reduce the competitiveness of all tradeables in the export markets, including mineral exports.
- (4) Foreign capital may be attracted by investment opportunities in the export boom sector, which may cause further appreciation of the real exchange-rate. There may also be an increase in foreign borrowing made possible by an improved credit standing of the government and private business. The proceeds of foreign borrowing by the government are often channeled into the non-tradeable sector in the form of low-yield public works, defense outlays, and social projects that expand consumption. The increased capital imports may lower interest rates, which induces domestic capital to go abroad in response to higher earnings.
- (5) The movement of resources between sectors may reduce capital accumulation. If the nontradeable sector is relatively labor intensive, while the tradeable sector is capital intensive, the movement in favor of the nontradeable sector will tend to raise wages and lower returns to capital, thereby reducing capital accumulation.
- (6) When the export boom subsides and the current account turns from surplus to deficit, the central bank may prevent a decline in the nominal exchange rate by intervening in the market so that the real rate of exchange remains high. Even if the real rate of exchange declines, it will require several years for the tradeable sector to recover from the price distortions occurring during an export boom. It may also require several years for the government's fiscal expenditures to decline in line with the decline in income and export taxes.

The typical effects of an export boom outlined above have been called the 'Dutch Disease', a term derived from the experience following a sharp rise in Holland's natural gas exports. When the export boom subsides and primary-commodity exports return to their pre-boom level or lower, growth may be reduced below the rate existing before the boom for the following reasons: (a) the economy is distorted, especially by the reduced output of tradeables; (b) tradeables become less competitive in world markets (including the domestic market) owing to the appreciation of the real exchange rate; (c) and saving and

investment decline. There may also occur an increase in external indebtedness, which increases payments abroad and may lead to debt crises and capital flight. Over time, adjustments are likely to be made to eliminate the distortions, perhaps with the assistance of the International Monetary Fund or the World Bank. However, meanwhile, the country has lost ground as a consequence of reduced investment, and may never recover the rate of growth experienced before the export boom.

Policies for avoiding or moderating Dutch Disease symptoms

The symptoms of Dutch Disease noted above can be moderated or largely avoided by adopting appropriate governmental policies. The increased foreign exchange income can be prevented from having a sudden large impact on domestic income and on the real exchange rate. Most of the export windfall can be channeled into a stabilization fund, or otherwise prevented from suddenly increasing domestic demand. If the government is the net recipient of the windfall, as in the case of state mining enterprises, the government could accumulate a large portion of the increased receipts, or the receipts could be sterilized by the central bank. A second policy action would be to prevent a significant appreciation of the real exchange rate. The central bank could require the export revenue windfall to be sold directly to the central bank, or the central bank could purchase foreign exchange on the exchange market to prevent an increase in the nominal exchange value of the domestic currency. Even if the central bank prevents the nominal exchange value of the domestic currency from rising, the increase in domestic demand may have the effect of increasing prices of nontradeables relative to tradeables so that there is real exchange-rate appreciation, as I have defined it. This may call for the nominal depreciation of the exchange rate by the central bank.

A third policy measure is for the government to allocate its increased income to productive investment. If the government uses the increase in its receipts arising from the increase in exports to increase social programs that increase consumer consumption, or channels the increased revenues into low-yield infrastructure projects or into defense, the increased export income will not be invested in ways that will sustain income. Temporary export windfalls should be invested in income-earning projects or in foreign exchange reserves, which can be used to maintain investment in periods of low export earnings. These policies should be integrated with appropriate fiscal and monetary policies to prevent inflation.

A legitimate question is whether the shocks caused by primary commodity export booms are more serious than the shocks experienced by resource poor countries. Perhaps they are, but they can be handled by adopting appropriate policies. Several mineral-

exporting countries have experienced Dutch Disease symptoms, but some have been able to avoid impairment of long-term growth. All countries experience shocks from a loss of major export markets, from sharp increases in prices of essential imports, or from shifts in capital movements. How the shocks are handled determines whether they will prevent sustainable development.

Growth experience of mineral-exporting countries since 1960

The growth records of mineral exporting countries over the past three decades reflect, in part, the effects of fluctuations in export revenue, but they also reflect symptoms of the Dutch Disease and various structural changes in the individual economies. The 1970–1980 period was one in which substantial export booms occurred in nearly all mineral-exporting countries. During this period, the average price of metals increased three-fold and the price of crude petroleum rose fifteen-fold. The price of copper approximately doubled and prices of most other metals, including aluminum, lead, tin, nickel and zinc rose two- or three-fold. However, between 1980 and 1985, metal prices declined sharply. Prices rose moderately in the late 1980s and 1990s, but never regained the earlier peak levels. Crude-petroleum prices declined drastically in the 1980s and remained quite low into the 1990s. During the 1960–1970 decade, both metals and petroleum were fairly stable and were, on the average, about the same as they were in 1970–1971 before the export booms took place.

A comparison of the average annual GDP growth rates of major petroleum and nonfuel mineral exporters for the periods 1960–1970, 1970–1980, and 1980–1993 (Table 2) shows that for nearly all the countries listed, average annual GDP growth rates declined during the 1980–1993 period from those of the boom period, 1970–1980.³ Only in the case of Chile, Jamaica, Papua New Guinea (PNG), and Oman were the growth rates higher during the 1980–1993 than in the 1970–1980 period. For nearly all these countries, average annual GDP growth rates during the pre-boom period, 1960–1970, were higher than the growth rates for the post-boom period of 1980–1993. The only exceptions were Chile and Indonesia, whose average annual GDP growth rates in the 1980–1993 period were significantly higher than in the pre-

boom period. This record is in line with the resource-curse thesis that growth rates following resource booms do not return to pre-boom levels. However, there are obviously other factors involved since the growth pattern for all low- and middle-income developing countries for the three periods was similar to that for the major mineral exporting countries (see Table 2). Average annual per capita GNP growth was negative for the 1980–1993 period for more than half the mineral exporting countries listed, as contrasted with respectable per capita GNP growth rates during the 1960–1970 period. There was also a sharp decline in per capita GNP growth rates for all low- and middle-income countries between the two periods, but the decline was not as large as for most of the mineral-exporting countries (Table 2).

The effects of export booms on individual mineral-exporting countries

An analysis of the economic conditions and policy responses in the individual countries listed in Table 2 reveals major differences in the factors responsible for growth performance. While most experienced some symptoms of the Dutch Disease, other factors (such as changes in mineral production caused by the opening or closing of major mines, changes in mineral export policy, or shifts in governmental objectives such as promoting social programs at the expense of investment), were as much or more responsible for their growth patterns than the factors described by the export boom model.

PNG and Botswana

PNG's GDP growth rate has fluctuated with mine production declining sharply with the closure of its Bougainville copper mine in 1988, but rose to an annual average of 9.3% in the 1990–1995 period with the expansion of the Ok Tedi gold/copper mine and the recovery of copper prices. The Dutch Disease played no discernible role. Nor did the Dutch Disease appear to have played a significant role in Botswana. The initial double-digit rate of growth in the 1960–1980 period was generated by the opening of diamond mines. There was a decline in the rate of growth after the large initial investments, but growth was sustained at nearly 10% over the 1980–1993 period.

Jamaica

Jamaica's average annual GDP growth rate declined from 4.4% in 1960–1970 to a negative rate of growth in 1970–1980. This decline occurred despite the fact that the country's bauxite and alumina exports peaked in 1973. Exports declined sharply in the second half of the 1970s, largely as result of the government's imposition of a levy on bauxite in 1974, which made the product less competitive on world markets. The decline in Jamaica's GDP growth rate from 6.7% in 1970–1973 to -2.2% in 1974–1979 was also due to

³If GDP for the mineral exporting countries was adjusted for the depletion of mineral reserves, decreases in GDP over the 1980–1993 period would have been even greater. For example, Repetto *et al.* (1989) adjusts the Indonesian national accounts over the period 1971–1984 for the depletion of the three principal natural-assets: hydrocarbons, forests, and soils. Inclusion of natural-asset depletion reduced the Indonesian economic growth rate from 7.1% per annum, using the standard national accounting system, to a sustainable growth of only 4% per annum. About 70% of the downward adjustment is due to hydrocarbon depletion, which accounted for a reduction of around 2.1% in the annual GDP growth rate.

Table 2 GDP growth rates for major mineral-exporting countries, 1970–1980 and 1980–1993 (%)

	GDP				Average per capita GNP growth rate		
	1960–70	1970–80	1980–93	Increase/decrease	Change: 1970–80 to 1980–93	1960–77	1980–93
Major oil exporting LDCs:^a							
Algeria	4.3	4.6	2.1	-2.5	-54	2.1	-0.8
Ecuador	2.2 ^c	9.5	2.4	-7.1	-75	3.1	0.0
Indonesia	3.9	7.2	5.8	-1.4	-19	3.3	4.2
Mexico	7.6	6.3	1.6	-4.7	-75	2.8	-0.5
Nigeria	3.1	4.6	2.7	-1.9	-41	3.6	-0.1
Oman	21.9 ^c	6.2	7.6	1.4	23	—	3.4
Saudi Arabia	11.2 ^c	9.0	0.4	-8.6	-96	6.7	-3.6
Trinidad & Tobago	4.0 ^c	5.9	-3.6	-9.5	-161	1.6	-2.8
Venezuela	6.0	3.5	2.1	-1.4	-40	2.7	-0.7
Total average annual ^d	7.6	6.3	2.3	-4.0	-63	3.2	-0.9
Major nonfuel mineral exporting LDCs:^b							
Bolivia	5.2	4.5	1.1	-3.4	-76	2.3	0.7
Botswana	14.8 ^c	14.5	9.6	-4.9	-34	—	6.2
Chile	4.4	1.8	5.1	3.3	183	1.0	3.6
Jamaica	4.4	-1.3	2.3	3.6	—	2.1	-0.3
PNG	6.7	2.2	3.1	0.9	41	3.4	0.6
Peru	4.9	3.5	-0.5	-4.0	-114	2.3	-2.7
Zambia	5.0	1.4	0.9	-1.3	-21	1.5	-3.1
Total average annual ^d	6.5	3.8	3.1	-0.7	-18	2.1	0.0
All low- and middle-income countries: ^d	5.6	5.2	2.9	-2.3	-44	3.0	0.9

^a Excludes Iran, Iraq, Bahrain, Libya and Qatar for lack of data. Excludes Israel, Hong Kong, Kuwait, Singapore and the United Arab Emirates which are regarded as high-income countries.

^b Countries for which nonfuel minerals constitute 30% or more of export income. Excludes some countries for lack of data.

^c 1965–1973.

^d Unweighted.

Sources: World Bank (1979, 1983, 1995).

the policies of the social democratic government, which neglected investment in favor of social programs and adopted monetary and fiscal policies which generated a 27% rate of inflation. The Jamaican economy recovered under a new right-of-center government, which came into power in 1980, but growth was impaired by an appreciation of the real rate of exchange of almost one-third between 1980 and 1983 (Findlay and Wellisz, 1993).

Peru

Peru, whose GDP growth rate declined from 3.5% in 1970–1980 to a negative 0.5% in 1980–1993, is closer to the Dutch Disease model than Botswana or PNG, since real appreciation of the exchange rate during the 1980s had a depressing effect on Peru's agriculture and manufacturing sectors. Despite sharp increases in copper and other metal prices, Peru's GDP growth rate in 1970–1980 was less than that in 1960–1970 when metal prices were lower. Extensive governmental intervention, high import protection, fiscal deficits, and high inflation also played a role in depressing productive investment.

In addition, Peru had debt crises from time to time because of borrowing for current expenditures not directed to productive investment.

Venezuela

Increases in oil prices in 1973–1974 and 1979–1980 provided Venezuela with two export booms with the windfalls going mainly to the government. Paradoxically, Venezuela's average annual GDP growth rate declined to 3.5 percent in 1970–1980, from a growth rate of 6 percent in 1960–1970 when oil prices and export revenues were lower. There was a further decline in the country's GDP growth rate to 2.1 percent for the 1980–1993 period, and average per capita GNP growth declined from 3.2 percent over the period 1960–1977, to a negative 0.9 percent in 1980–1993. Venezuela might be regarded as a classic resource curse case in the sense that a surge in resource-based exports was accompanied by reductions in the rate of growth and in per capita income. However, the poor performance of the non-oil sectors of the economy, including agriculture and manufacturing, was due more to faulty governmental

management than to distortions stemming directly from the export booms. Much of the windfall from the export booms went for increased consumption, and the windfall used for investment went largely for government-sponsored industrialization (e.g. steel and aluminum) which yielded low returns (Auty, 1986).

There was real exchange-rate appreciation in 1979–1981 which, together with increased real wages, brought about a contraction in nonoil output and discouraged investment. Controls over nominal interest rates in the face of inflation led to a reduction in real interest-rates which, along with an overvalued currency, induced substantial private-capital outflow in the early 1980s. An analysis of the Venezuelan economy published by the World Bank concludes that “nothing appears to have been gained from the windfalls in terms of non-oil GDP during 1973–1982. Consumption has been the only winner, and even that gain is probably temporary” (Gelb *et al.*, 1988, p. 322).

Have the oil windfalls been a curse to Venezuela and would the country have been better off if petroleum prices had stayed at the 1960 levels when Venezuela’s GDP growth rate was much higher? Would the absence of the export boom have promoted good government? I doubt if Venezuela’s performance would have been much better even without the direct effects of the export booms.

Chile

Chile’s favorable record was due to the policies adopted by the government to correct foreign exchange-rate appreciation and moderate the other distortions generated by export booms (IMF, 1996, pp. 404–405). Chile’s first export boom (1973–1974) occurred during a period of severe economic and political instability, which led to the overthrow of the Allende government in 1973. Despite an increase in copper prices, real GDP declined during the Allende regime, there was substantial inflation, and production was disrupted by the nationalization of the banks and industries. The military government under Pinochet instituted a severe anti-inflation program and devaluated the real exchange rate, which had appreciated significantly as a consequence of the 100% inflation rate during the Allende regime. Nominal exchange-rate depreciation tended to lag behind inflation so there was periodic real exchange-rate appreciation during the 1970s. Nevertheless, trade liberalization and reduced domestic demand boosted noncopper exports in 1976–1978. Chile’s second export boom, which occurred in 1979–1980 with a sharp rise in copper prices, was accompanied by substantial growth in real GDP. The decline in copper prices in 1981 led to a rise in the current account deficit financed by foreign debt. However, GDP grew at about 5% annually during the remainder of the 1980s and there was only a modest appreciation of the real exchange rate. Since the mid-1980s, the Chilean government has managed the economy well in the face of export booms and subsequent low copper

prices. The government retained export windfalls in a stabilization fund and prevented the non-mining tradeable sector from being suppressed from the effects of the Dutch Disease.

Indonesia

Indonesia experienced an appreciation of its real exchange-rate in two oil booms (1974–1978 and 1979–1981). However, in 1983 the government sterilized a substantial portion of the windfalls, substantially devalued the currency, and began trade liberalization. GDP growth recovered in the second half of the 1980s, despite the sharp fall in petroleum prices in 1982 (Gelb *et al.*, 1988, Ch. 12). Following the decline in petroleum prices, the Indonesian government cut public spending and reduced tariff barriers, both of which promoted competitiveness. Overall, Indonesia managed the fluctuations in its petroleum revenue with considerable skill as contrasted, say, with Venezuela or Mexico, both of which are also oil exporters with diversified economies.

Oman

Among the major oil exporters, only Indonesia (4.2%) and Oman (3.4%) had positive rates of growth in per capita GNP during the 1980–1993 period (Table 2). Yet all the oil exporters had positive per capita GNP growth rates in the 1960–1977 period, the highest being Saudi Arabia with a 6.7% rate. While the experience of most oil exporters is certainly in accordance with the resource curse, a comparison of the economic structures of good performers with those of poor performers provides little hint of the sources of the resource curse. For example, Oman has very little manufacturing or agriculture and is almost wholly dependent upon petroleum for export income. Oman has had good financial management and has accumulated significant foreign exchange reserves over the 1980–1993 period. Its GDP growth rate in 1980–1993 exceeded its GDP growth rate in 1970–1980 and the per capita GNP growth rate was 3.4% in 1980–1993. By contrast, Saudi Arabia failed to invest its large export windfall in either domestic production or foreign exchange reserves.

Conclusions from country reviews

My conclusions from this brief analysis of the experience of a group of mineral exporting countries are as follows:

- (1) The Dutch Disease was not the major factor in explaining the growth pattern for more than half of the countries reviewed.
- (2) Differences in the growth performance of the countries are not closely related to differences in economic structure, such as the degree of diversification.
- (3) Major determinants of performance include how

the government disposes of the windfalls and the policies it adopts to avoid inflation and maintain incentives for investment and production in the tradeable sectors.

These conclusions suggest that the Dutch Disease model provides only a partial explanation of the recent growth performance of mineral exporting countries and that we should examine other factors inherent in mineral abundance to explain why the mineral exporting countries have had less favorable growth performance than resource-poor countries.

Other explanations of the resource curse

Most of the studies seeking to explain the resource curse (Rainis, 1991; Krause, 1995; Sachs and Warner, 1995) place major emphasis on the failure of resource-rich countries to promote a highly productive manufacturing sector, which is regarded as the principal source of technological progress. The knowledge and skills generated in this sector spread throughout the economy and increase productivity in all sectors. Ample export income reduces the incentive of resource-abundant countries to develop manufacturing industries that are competitive in international markets. They tend to be protectionist in order to support import-substituting industries whose prices are noncompetitive in world markets.

A second explanation is that natural resource exploitation creates large economic rents, which accrue either to the government or to a few private owners of the resources. In the former case, the rents are often distributed to those in control of the government and their relatives, rather than being used for broadly based national development. (Kuwait and Saudi Arabia are good examples of this.) Concentration of rents in the hands of a few private owners directs revenue away from human resources and infrastructure, traditional agriculture, and small enterprise, in favor of consumption by the wealthy. Since the rulers of oligarchies are likely to favor maximizing resource rents for the benefit of the few rather than promoting broad development, it is suggested there is a positive relationship between growth performance and the political system, and that mineral-exporting countries are more likely to be oligarchies than democracies (Lal, 1995, Ch. 14). None of these relationships appear to be valid. Of the four good performers listed in Table 2, two are oligarchies (Indonesia and Oman) and two are democracies (Botswana and Chile). Among the poorest performers, Peru, Trinidad/Tobago, Mexico, Ecuador and Zambia are democracies, while Nigeria and Saudi Arabia are oligarchies. Some mineral-exporting countries have shifted from one political orientation to another over the past three decades. This has been particularly the case with Chile and Peru. Democracy does not insure good government, nor are all oligarchies poorly governed. Thus, the form of government does not provide a satisfactory explanation for the resource curse.

A third explanation is that governments of countries with widely fluctuating export revenues have special problems in adopting and carrying out the proper policies to promote economic growth. This suggests that governments of resource-poor countries are better able to adopt policies to promote sustainability. However, there is no convincing evidence for this generalization. Nearly all developing countries receive advice and assistance from the World Bank and the IMF. The issue is one of will rather than of knowledge or ability.

One of the factors often overlooked in explaining the resource-curse paradox is the development history of the individual countries. Except for city/states such as Hong Kong and Singapore, virtually all development begins with exploitation of the resource base, which initially may provide little more than subsistence agriculture. The sudden discovery of petroleum or other minerals in a primitive country results in substantial export income and initially a high rate of growth. If this growth rate is to be maintained, exports must continue to grow at the initial rate or other economic sectors must expand. Mineral exports do not expand indefinitely and development of the nonmineral sector requires considerable time, even if the export windfall is wisely invested. Meanwhile, the growth rate declines as mineral exports level off or fall. Can we assume that development will take off in a subsistence economy in the absence of an external stimulus? While some mineral exporting countries have not maintained the initial rate of growth promoted by suddenly becoming a large exporter, these countries might not have got much beyond the subsistence level in the absence of mineral windfalls. Saudi Arabia's GDP rate of growth fell from an average of about 10% in 1960–1980 to nearly zero in 1980–1993, but what would its per capita GNP have been in the absence of oil? Can we say that Saudi Arabia would have been better off without oil? Even though the country has not used its mineral resources for sustained growth, it is certainly better off for having the resource.

Conclusions

There is no single or even dominant explanation for the resource curse as applied to mineral-exporting countries. None of the explanations suggested apply to all mineral-producing countries and for most of the mineral-rich countries that experienced poor performance, the principal explanation was incorrect government policies or exogenous conditions that have little or nothing to do with mineral exports and could just as well have occurred in resource-poor countries. It may be that the bias against the growth performance of mineral-exporting countries arises from a number of factors which, while not applying to all these countries, applies as a group to more of them than would apply to resource-poor countries. For example, the Dutch Disease is more prevalent among mineral-

exporting countries, but it does not provide a single explanation of the resource curse. What may best explain differences in performances among developing countries is the advantage of endogenous growth over growth stimulated by external forces such as export booms.⁴ Without the policy conditions for endogenous growth, including free trade, incentives for investment, technological advance, and stable prices, sustained growth will not take place. However, the causal factors underlying endogenous growth are too complex to be satisfactorily explained by a country's resource endowment.

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⁴For a discussion of endogenous versus exogenous long-term growth, see Robert E. Lucas (1988) and Paul Roemer (1990).