

The resource curse

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Abstract

Countries that possess rich mineral deposits, it is widely assumed, are fortunate. Such deposits are assets, part of a country's natural capital. Mining is the key that converts dormant mineral wealth into schools, homes, ports, and other forms of capital that directly contribute to economic development. Over the past two decades, however, a more negative view of mining has emerged that questions the positive relationship between mineral extraction and economic development. The impetus for the alternative view came from empirical studies suggesting that countries where mining is important have not grown as rapidly as other countries. More recent studies have explored the possible reasons behind the disappointing performance of many mineral producing countries. While the central point of contention between the conventional and alternative views — namely, whether or not mining usually promotes economic development — remains unresolved, there is widespread agreement that rich mineral deposits provide developing countries with opportunities, which in some instances have been used wisely to promote development, and in other instances have been misused, hurting development. The consensus on this issue is important, for it means that one uniform policy toward all mining in the developing world is not desirable, despite the recent suggestions by some to the contrary. The appropriate public policy question is not should we or should we not promote mining in the developing countries, but rather where should we encourage it and how can we ensure that it contributes as much as possible to economic development and poverty alleviation.

Keywords: Resource curse; Mining; Dutch disease; Mineral policy; Developing countries.

1. Introduction

Where the extraction costs for a mineral commodity are less than its market price, mining generates economic rents. For this reason, most economists and policy makers presume that mining creates wealth and in the process contributes to economic development in rich and poor countries alike.

The past couple of decades, however, have witnessed the resurgence of a far less benevolent view of mining's contribution to economic development, particularly in the developing world. Based at first on observations by certain developing country officials, then on case studies of individual mining countries, and still later on more comprehensive empirical comparisons among countries, a growing number of scholars have reported a negative association between mining on the one hand and a host of different indicators of economic development on the other. Most strikingly, mining economies are found to grow more slowly

and have higher levels of poverty and corruption after controlling for GDP per capita.¹

These studies have led some (*Economist*, 1995; Friends of the Earth, no date; Ross, 2001a; Pegg, 2003) to conclude that the governments of developing countries, along with international organizations such as the World Bank, should critically review their policies. Perhaps, they contend, mining in developing countries should be discouraged, rather than encouraged. Though this alternative view of mining, as we will see, does have its critics, it is raising serious doubts about the benefits of mining for developing countries, even to the extent that the World Bank has recently conducted an independent critique — the Extractive Industries Review — of its activities in the mineral sector.²

This article provides an overview of the issues surrounding this important policy issue, highlighting where one still finds widespread agreement and where the debate between the two opposing groups rages on. It first describes the conventional and alternative views, then examines in some detail the status of the debate (the resolved and unresolved

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¹ For a recent review of the resource curse literature, see Stevens (2003).

² See *Striking a Better Balance* (Salim, 2003). For the response of the World Bank Group, see World Bank (2004).

issues), and finishes by exploring the policy implications for mining in developing countries.

The purpose is not to resolve the debate, but rather to provide for the interested non-specialist an analytical framework for interpreting the literature — a framework that we have found helpful and that leads to the conclusion that the policy prescriptions flowing from the conventional and alternative views are actually quite similar. This finding also reveals that the two views are in some sense talking past each other, and when viewed within a consistent framework there can be a unified set of policy implications for mining in the developing world that both sides would likely agree upon.

It is also important to stress that our use of the terms ‘the conventional view’ and ‘the alternative view’ is a convenient simplification.³ The conventional view has always had its critics, of whom Prebisch (1950) and Singer (1950) are perhaps the best known, and has never been universally accepted. Indeed, following World War II many developing countries, believing that specializing in primary product production led to low levels of economic development and slow growth, resorted to autarkic policies that protected inefficient domestic manufacturers. These policies had what are now widely considered disappointing consequences. If anything, this strengthened the conventional view and caused it to prevail at least until the last decade of the century.

2. The conventional view

The positive relationship between mining and economic development advanced by the conventional view rests on neo-classical economics and in particular the concept of the production function. The latter reflects the technical relationships that govern how much output a country can produce from given amounts of labour, capital, energy, materials, and other inputs.

The conventional view sees mineral reserves that can be mined profitably as part of a country’s stock of natural capital, along with agricultural land, forests, and other natural resources. There are, of course, other types of capital. Physical structures, including houses, roads, factories, hospitals, and railways, constitute man-made or physical capital. Education, safe public water and sanitary systems, as well as other investments in people, create human capital. Investments in scientific research and new technologies create knowledge capital. Finally, investments in the legal system and other forms of governance create institutional capital.

The World Bank (Kunte *et al.*, 1998) has estimated the natural, physical, and human capital on a per capita basis for nearly 100 countries for the year 1994. Table 1 gives

Table 1. The importance of mineral wealth

Subsoil assets for a selected group of countries, in US\$ per capita and as a percentage of the natural capital and total capital, 1994			
Country	Value in US\$ per capita	% of natural capital ^a	% of total capital ^b
Saudi Arabia	67,910	94	39.5
Venezuela	14,960	72	13.7
Papua New Guinea	2,980	40	7.6
Mauritania	1,640	32	7.0
Trinidad & Tobago	9,310	77	6.9
Norway	20,090	66	6.6
Jamaica	2,630	85	6.0
Chile	5,580	39	3.9
Mexico	3,860	58	3.5
Australia	9,080	26	3.1
Congo	960	22	3.1
Ecuador	1,970	17	2.9
Malaysia	3,230	27	2.6
Namibia	1,860	26	2.6
Canada	6,750	18	2.0
Bolivia	640	11	1.9
Colombia	1,380	23	1.6
South Africa	1,340	32	1.6
China	420	16	1.1
Indonesia	670	9	1.1
Netherlands	2,250	54	1.1
Brazil	910	13	1.0
United States	3,180	19	0.8
Peru	430	9	0.7
Botswana	570	10	0.6

Notes:

^aNatural capital includes the value of pasture land, crop land, timber resources, non-timber forest resources, protected areas, and subsoil (mineral) assets.

^bTotal capital is the sum of physical, human, and natural capital.

the World Bank estimate of the contribution of subsoil mineral assets (oil, natural gas, metals and minerals, and coal) to the natural and total capital in the 25 countries with most mineral wealth. While questions can be raised concerning the reliability of these estimates given the intrinsic difficulties involved in such an effort, the results are interesting. For a number of countries mineral wealth represents a significant portion of the natural capital and total capital that they can mobilize for development.

Generally, via the neoclassical production function, the more capital a country possesses, the greater its output and the higher its per capita income. This is not necessarily the case, however, for natural capital in the form of mineral deposits. As long as such deposits lie dormant in the ground, they remain unproductive. For their potential to be realized, mineral deposits have to be found and extracted. For example, America’s rise to industrial leader in the early 1900s coincided with its dominant position as a mineral explorer and producer, while similarly endowed countries like Chile, Russia, Canada, and Australia had barely begun to exploit their endowments, and experienced the same industrial push only decades later (Wright and Czelusta, 2004).

³ Other terms considered were the traditional view or the neo-classical view for the conventional view, and the new view or the radical political economy view for the alternative view.

So, according to the conventional view, mining plays an important role in the development process by converting mineral resources into an output that can be directly consumed or converted into another form of capital that raises future output in other sectors. That conversion process, and the technologies that it entails, can also spur knowledge gains that benefit the efficiency of conventional capital as well (de Ferranti *et al.*, 2002; Wright and Czelusta, 2004).

The conventional view recognizes that under special circumstances a country may want to postpone the development of its mineral wealth. Such behaviour makes sense if the value of its mineral wealth in the ground is appreciating faster than other assets with similar risks. The available empirical evidence, however, suggests this rarely if ever occurs in practice (Krautkraemer, 1998; Tilton, 2002b: Ch. 4).

Indeed, countries that contemplate deliberately delaying the mining of currently profitable deposits in the hope that these deposits will be even more valuable in the future run the risk that new technology or other developments may make them completely uneconomic. Radetzki (1992), for example, argues that the falling costs of transporting bulk commodities, which allowed the development of the great iron ore deposits in Brazil and Australia during the second half of the 20th century, would have destroyed much if not all of the wealth associated with the iron ore deposits in northern Sweden had Sweden decided to postpone their development during the first half of that century.⁴ So normally, it is assumed, a country is better off mining its economic mineral resources now.

As noted above, the output associated with extracting mineral resources can be consumed or invested in other forms of capital. Consumption tends to raise current welfare, while investment leaves current welfare unchanged but raises future welfare by promoting growth in the capital stock and subsequent economic growth. This assumes, of course, that the funds are invested wisely. If they are invested poorly, mining may provide little or no future benefit.

In such cases, however, the problem is not mining, according to the conventional view. Mining provides opportunities. If a country fails to take advantage of them, the fault lies with the government and the other entities that decide how the newly converted mineral wealth is used.⁵ Moreover, at times the welfare of society may require that governments use their available mineral wealth for purposes other than economic development. During World War II, for example, Britain, the United States, and their allies devoted much of their mineral wealth and resources to

winning the war. Few even now would argue that this was a mistake.

3. The alternative view

In the late 1980s, studies by Auty (1990, 1993, 1994a, 1994b, 1994c) and others found little or no economic growth in many mineral-intensive countries over extended periods. Growth was even negative for a number of countries, causing early regional dominance to be lost over time. This research appeared to demonstrate that the exploitation of mineral wealth was far from a sufficient condition for sustained economic development, a revision of arguments to this same effect that were prevalent in the radical political economy literature of the 1950s and 1960s (Davis, 1995).

In the wake of these country case studies, more comprehensive empirical analyses attempted to identify and measure the effect of mining on economic development using cross-section samples of developing countries. Many of these analyses, including the influential works of Sachs and Warner (1995a, 1995b, 1997a, 1997b, 1999a, 1999b, 2000, and 2001), found that a greater dependence on mining was associated with slower economic growth after controlling for the usual determinants of growth.

Of course, an association between two variables does not necessarily imply cause and effect. In addition, there is still some dispute over the soundness of the methodologies and the appropriateness of the time horizons that these studies employ.⁶ Still, the accumulating empirical evidence suggesting that mining is negatively associated with economic development raises the possibility of a causal relationship and has stimulated the search for reasons as to why this might be the case. The possible explanations, it turns out, are many.

3.1. Declining terms of trade

According to the alternative view, over time the prices of primary commodities tend to fall relative to those for manufactured goods. This is in part because primary commodity markets are competitive and so reductions in costs are passed on immediately to consumers in the form of lower prices. On the other hand, the producers of many manufactured products, it is argued, enjoy some market power, which allows them to divert the benefits of falling costs to workers in the form of better salaries and to shareholders in the form of greater dividends. As a result, countries that produce and export mineral commodities over time have to export more and more for a given basket of manufacturing imports.⁷

⁴ A referee has pointed out that another example is Australia's failure to develop its uranium deposits in the 1970s, losing out to Canada.

⁵ A large literature within the field of political science has developed around this theme. See Davis (1998) and Ross (1999) for a summary and critique.

⁶ See Wright and Czelusta (2004) for a summary of these contradictory findings.

⁷ Both Prebisch (1950) and Singer (1950) relied heavily on this argument in their early challenge to the traditional view of mining.

The effect, similar to having the purchasing power of one's salary decline, can cause growth in welfare to slow or even to turn negative.

3.2. *Volatile markets*

The markets for primary products, including mineral commodities, are known for their instability. Price variations of 30% or more within a year or two are not uncommon. In the case of mineral commodities, this volatility arises because demand fluctuates greatly over the business cycle.⁸ When the economy is booming, the end-use sectors that consume most mineral commodities — construction, capital equipment, transportation, and consumer durables — are expanding even faster than the economy as a whole. Conversely, when the economy is in a recession, these sectors are usually even more depressed.

Since instability in the metal markets arises primarily because of shifts in demand (rather than in supply, as is typically the case for agricultural products), when output is depressed, so are prices. Similarly, when output is up, so are prices. This means that profits, and the taxes governments collect on profits, are particularly volatile.

Market instability makes it difficult for developing countries to count on revenues from the mineral sector, and hampers the effective planning needed for economic development. It also means that government revenues and foreign exchange earnings are curtailed exactly when an expansionary monetary policy is needed to help the domestic economy weather a recession in a vital economic sector.

3.3. *The Dutch disease*

A mineral boom, such as the expansion of the natural gas sector of the Dutch economy during the 1960s in response to the discovery of the Groningen fields, requires adjustments within the economy. Typically, domestic wage rates rise as the booming mineral sector is forced to offer workers higher salaries to attract the labour it needs. In addition, rising mineral exports cause the domestic currency to appreciate. Both of these developments harm those domestic industries, such as agriculture and manufacturing, that have to compete in home or foreign markets with overseas competitors. This impedes economic diversification and increases dependence on the volatile mineral markets. Protectionist responses may move the country towards autarky, while taxing away mineral rents to such an extent that there

⁸ There are two other conditions that contribute to the short-run fluctuations in mineral commodity prices. First, the elasticity or responsiveness of demand to changes in price is small in the short run. Second, the elasticity of supply to change in price is also small in the short run once output approaches existing capacity. This means that both the short-run supply and demand curves are quite steep, so a shift in either curve will cause the market clearing price to change greatly. As noted in the text, the shift occurs in the demand curve as a result of fluctuations in the business cycle.

is inadequate investment in the sector. Moreover, according to the alternative view, after the mineral boom is over, the country's traditional sources of exports will be devastated and beyond resuscitation, or there will be significant adjustment costs in moving back to agriculture and manufacturing.

3.4. *Nature of mining*

The alternative view also points to several characteristics of mining itself. First, local communities tend to bear most of the environmental and other social costs associated with mining, while the benefits flow largely to the central government and elsewhere. In addition, it is argued, mining is often an enclave activity. Needed supplies are imported, and little value added is carried out domestically, as ores and concentrates are exported for processing abroad. On top of this, mining requires few workers, and many of those it does employ (particularly the more skilled workers) come from abroad. As a result, the host country gets little from mining besides the monetary benefits flowing from corporate taxation and royalties.

3.5. *Use of rents*

The mining rents captured by the State end up in government coffers, which according to the alternative view often cater to the ruling elite. For this and other reasons, mining accentuates the income disparity found between urban and rural areas. In addition, the poor are largely excluded from any benefits.

Political control of the rents, moreover, makes it worthwhile for individuals and organizations to devote considerable effort and resources to appropriating a larger share of the rents. Such rent-seeking activities are unproductive; they are devoted to increasing the share of the existing economic pie that a particular group enjoys, rather than to increasing the size of the pie itself.

Even worse, the presence of mining rents may lead to a decline in institutional quality (Ross, 2001b; Sala-i-Martin and Subramanian, 2003) and in some instances to civil insurrection and war (Collier and Hoeffler, 1998; Gylfason, 2001; Sachs and Warner, 1997a). Even when the rents are not squandered, but used by the government to promote economic development, the results are often disappointing due to incompetence and poor planning.

For one or more of the above reasons, many who subscribe to the alternative view of mining believe that the negative association between mining and economic development does in fact reflect a causal relationship.

4. **Current status of the debate**

The conventional and alternative views of mining, despite their differences, actually agree on a number of important issues. In particular, there is widespread consensus that:

1. Mineral deposits that can be extracted profitably are (natural) capital assets. If they are converted into human or physical capital, they can promote economic growth; and if they are consumed, they can lower current levels of poverty. In either case, they can enhance economic development. In short, mineral resources provide developing countries with opportunities that they would not otherwise enjoy.
2. Some countries have taken advantage of these opportunities, and used their mineral wealth to promote economic development. Historically, Britain, the United States, and Germany are often cited as successful examples. In more recent times, it is generally agreed that mineral resources have promoted economic development in Australia, Botswana, Canada, Chile, Malaysia, Peru, the Netherlands, and Norway.⁹ Botswana, it is interesting to note, is the only country ever to graduate from the United Nations' grouping of 'least developed countries' (UNCTAD, 2002:128), though unfortunately the devastating impact of the AIDS epidemic has significantly reduced life expectancy in Botswana over the past decade with adverse effects on the country's development.
3. Similarly, it is widely recognized that in other countries mining has impeded long-term economic development through many of the avenues described earlier. For example, UNCTAD (2002) unequivocally asserts that mineral production is responsible for the large and rising levels of poverty in the Central African Republic, the Democratic Republic of Congo (formerly Zaire), Guinea, Liberia, Niger, and Sierra Leone.

The debate, oddly enough, is not currently focused over these issues, but on whether mining has promoted or impeded economic growth and development in most developing countries, and whether such impacts are likely to persist in most developing countries as they increasingly exploit their large mineral endowments (see Table 1). Ross (2001a) and a few other recent studies suggest that this issue is now settled. Mining, they contend, on balance hinders economic development and aggravates poverty in the developing world, and any past successes are unlikely to be repeated.¹⁰ Yet other scholars (Acemoglu *et al.*, 2001a; Davis, 1995; de Ferranti *et al.*, 2002; Lederman and Maloney, 2002; and Sala-i-Martin, 1996, 1997) either find that on average mining has had no reliable impact on development or that its impacts have been positive. Here the consensus found on other issues does not exist.

Debate also continues over the validity and the importance of the possible causal routes by which mining may impede economic development. So it is useful to examine these arguments once again.

⁹ See, for example, Wright and Czelusta (2004).

¹⁰ For example, Power (2002) questions the relevance of the US, Canadian, and Australian experience in the 1900s for currently developing countries.

4.1. Declining terms of trade

Numerous studies have both attacked and defended the thesis that the prices of primary products have fallen over time relative to the prices of manufacturing products.¹¹ The mere fact that studies continue to appear on this topic indicates that the issue is far from settled.

One troubling problem arises because many manufactured products improve in quality over time. For some products — computers being a particularly good example — the improvements are spectacular. So even assuming the trend in the ratio of prices for primary to manufactured products is indeed downward, this may simply reflect improvements in the quality of the manufactured goods. Removing this bias, however, is extremely difficult, particularly over many decades (Svedberg and Tilton, 2003).

Perhaps of greater importance, even if the alternative view is correct and the true terms of trade are declining, is that the relevance of this decline for developing countries is not clear (Tilton, 2005). We know, for example, that the real price of copper has declined over the past three decades, which presumably has diminished the terms of trade of Chile, the world's largest copper producer. We also know that this decline has come about largely because the costs of producing copper around the world have fallen as a result of new technology and other developments (Tilton, 2002a). The wealth or economic rent created by Chile's mining industry depends not only on the price the country receives for its copper but also on the costs of production. If the country's costs have fallen faster than the copper price — which seems quite likely given the many world class copper mines starting operations in that country over the past 15 years — the benefits flowing to the country from mining may actually be rising despite the downward trend in the price of copper.^{12,13} Not surprisingly, the recent empirical evidence shows no link between terms of trade and the economic growth of mineral economies (Sachs and Warner, 1995a).

4.2. Volatile markets

There is little dispute over the fact that mineral commodity markets are volatile, particularly over the business cycle, for the reasons laid out earlier, and that countries whose economies and exports are dominated by a single mineral commodity are likely to face considerable swings in government

¹¹ See Sapsford (1990) for a survey of this literature. More recent contributions include Powell (1991), Ardeni and Wright (1992), Bleaney and Greenaway (1993), Bloch and Sapsford (2000), and de Ferranti *et al.* (2002).

¹² As a result of the opening of new mines and the introduction of new technology at existing mines, labour productivity in the Chilean copper industry more than doubled during the 1990s (Garcia *et al.*, 2001).

¹³ Economists have long known that the ratio of export to import prices, or what is called the net barter terms of trade, does not necessarily reflect trends in a country's gains from trade. To deal with this issue, they have developed other concepts of terms of trade. See Meier (1968: Ch. 3).

revenues and export earnings. Yet advocates of the conventional view of mining tend to discount this concern.

Some argue that volatility is actually not all that bad for economic development. While it does make planning more difficult, and may reduce the efficiency of both public and private investment, downturns in the commodity cycle often force needed changes that would not occur under less stressful conditions. Government spending programmes, for example, often take on lives of their own and continue long past the time when they would best be put to rest. When government revenues and export earnings are down, it is clear to all that the budget has to be cut, providing the government with the needed political cover to terminate programmes that are no longer useful.

Similarly, market slumps provide mining companies with strong incentives to improve their productivity and reduce their costs. Between 1980 and 1986, for example, with copper prices in the doldrums, the US copper industry doubled its labour productivity, and managed to survive despite media predictions of its imminent demise (Tilton and Landsberg, 1999). Improvements introduced during such crises, such as new work rule agreements with organized labour, would be more difficult if not impossible under more normal conditions.

Moreover, even assuming that fluctuations in government revenues and export earnings are a deterrent to economic development, governments can mitigate these fluctuations. In particular, when mineral markets are booming, they can put some of their commodity revenues into a stabilization fund. Then, when the markets are depressed, they can withdraw the accumulated revenues to support government programmes that otherwise they would be forced to curtail. Indeed, Alaska, Canada, Chile, Ghana, Norway, Papua New Guinea, Venezuela, and other countries have created such funds.

It is true that the results of these stabilization funds have been mixed, and the experience of some countries has been disappointing. Some conclude that this shows stabilization funds cannot work, but others point to their more positive performance in other countries, and argue that better governance and stronger institutional arrangements can and should correct the problems. Perhaps it is due to this mixed success that Sachs and Warner (1995a, 1999a) find no correlation between mineral price volatility and the slower growth of mining economies.

4.3. *The Dutch disease*

The structural adjustments that occur within a country during a mineral boom, such as in the Netherlands in the 1960s, are by themselves not a problem. In fact, the term, the Dutch disease, is really a misnomer: it is not a disease, nor is it particularly Dutch. Many other countries have gone through similar experiences. Indeed, the Dutch disease actually allows a country to benefit from its new found mineral wealth by encouraging resources to flow from other

sectors of the economy to the booming sector. It basically reflects the mechanisms by which this occurs, an appreciating domestic currency and rising wage rates.

For the Dutch disease to be a true disease, in the sense that it hurts economic development, additional assumptions are necessary. One approach that achieves this end is to assume that the resource boom will eventually peter out and when this happens the country will find it difficult or impossible to shift resources back to its traditional export industries, presumably in agriculture or manufacturing. Since there have been few countries that have recently made this transition, it is perhaps too soon to tell whether this hypothesis has any merit. However, there is little evidence to suggest that resources would not flow out of the resource sector and into other sectors once the boom ends. Davis (1995) identifies Tunisia as the only economy that has drastically decreased its oil and mineral intensiveness since 1970, and it seems to be doing fine, with a Human Development Index that has increased remarkably since 1975 (UNDP, 2004).

Another approach is to assume that learning occurs in the production of manufactured goods, but not in the production of mineral commodities. Learning causes production costs to fall as the cumulative output of a firm or country increases, and is reflected in increasing productivity. Countries that take advantage of a resource boom crowd out manufacturing and lose this benefit. If in addition one assumes that the profits or rents countries could earn in the future as a result of this learning by doing exceed the profits or rents from mining, then it can be demonstrated that moving resources out of manufacturing and into mining is a mistake.¹⁴

Of course, the assumption that no learning takes place in mining can be challenged. Mining is, after all, a form of manufacturing that takes rocks and other resources and transforms them through a highly mechanized means into metals and other useful products. The theoretical models of this Dutch disease effect have minerals flowing out of the ground without employing labour or capital (Sachs and Warner, 1995a, 1999), which truly eliminates extraction as a manufacturing activity and by definition rules out learning from production. Contrary to these models, the discovery, extraction, and processing of mineral commodities entails sophisticated technologies, which have advanced rapidly in recent years. As a result, learning may occur in mining at a pace equal to or above that found in many manufacturing industries.

So the debate regarding the Dutch disease is not over the macroeconomic structural adjustments that a resource boom precipitates. These by themselves are benign, even beneficial. Rather, it focuses on the plausibility of the additional

¹⁴ This argument also assumes that the governments of other countries, which presumably are equally aware of the potential benefits from learning by doing, do not encourage, through public policies and subsidies, sufficient over-investment in the manufacturing sector to offset the potential external benefits arising from learning by doing.

assumptions required for the structural adjustments to affect current economic development adversely. To date, researchers have been unable to verify empirically whether these assumptions are reasonable.¹⁵ And, even if the assumptions do hold, the optimal policy response may be subsidization of the shrinking sectors, rather than a curtailment of mining (van Wijnbergen, 1984). This policy response has been naturally forthcoming in most mineral economies, to such an extent that many studies fail to find significant Dutch disease effects in natural resource abundant economies.

4.4. Nature of mining

Few would dispute that most of the environmental and other social costs of mining are inflicted on the local community, while most of the rents realized by the country flow elsewhere.¹⁶ This has led to growing demands that a sufficient portion of the benefits from mining should flow to local communities to ensure that they are adequately compensated for the costs of mining that they incur. If this is not possible, or if it is not done, then for many the basic principles of equity suggest that mining should not proceed.

On this point, local communities have increasingly demonstrated an ability to stop mine development and even to shut down existing operations when they believe the costs to them exceed the benefits. As a result, many mining companies are no longer prepared to proceed with new projects without the support of the local community.

Once the full costs are covered, however, there is less agreement on how the rents from mining should be allocated. These rents are in part created by exploration and by research and development, and the mining companies themselves often feel entitled to them. However, they are also a gift of nature reflecting geological processes that occurred hundreds of millions of years ago. To whom does this portion of the rents rightfully belong? To the local community, or the country as a whole? To the poor and disadvantaged? To the original landowners and indigenous peoples? To the current generation, future generations, or both? Reasonable people can disagree on the answer to this question.

The argument that mining is typically an enclave industry with the host country realizing few benefits aside from its share of the rents, though not new, is also far from settled. Many studies of mining regions show that wages and other domestic expenditures do have a significant multiplier effect on the local economy (Ahammad and Clements, 1999; Aroca, 2001; Clements and Johnson, 2000; Clements and Greig, 1994; and Stilwell *et al.*, 2000). Others document that mining in many cases does in fact promote

important downstream and upstream linkages (de Ferranti *et al.*, 2002). However, for various reasons, these studies concentrate primarily on the developed countries and the more advanced developing countries. More evidence from the poorest developing countries, where mining is most likely to follow the enclave pattern, would be useful.

A more direct challenge to the enclave argument, suggested by some, is that it is irrelevant. So what if the benefits to a country are mostly in the form of money from taxes? Such returns are as good as gold; they can support education, public health, infrastructure developments, and other investments that stimulate development. Indeed, host government efforts to replace expatriate employees with nationals, to promote downstream processing, and to require mining firms to acquire supplies from domestic firms can be counterproductive if these efforts raise the costs of mining and so reduce the monetary rents flowing to the host country. In such situations, the government is in effect subsidizing these linkage activities simply because they are associated with the mining industry. While a desire to create domestic employment may be commendable, there are far more labour-intensive industries than mining or mineral processing. Moreover, economic development requires the creation of wealth. Subsidizing industries that would otherwise lose money destroys wealth.

More developing countries, it is true, would probably enjoy a comparative advantage in downstream processing if the developed countries did not impose a structure of tariffs and other barriers to mineral trade that discriminates against the more processed mineral commodities. So changes in the trade policies of the importing countries could help mineral-producing developing countries (and consumers in the importing countries as well). But this does not change the fact that, as long as the current structure is in place, subsidizing unprofitable industries reduces the wealth of the developing country. This is true even when the industries receiving subsidies would not need them in the absence of discriminatory trade policies.

4.5. Use of rents

The use of rents, it is widely recognized, is critical in determining whether or not mining promotes economic development. When they are squandered by corruption, war, and other rent-seeking activities, mining is likely to be a negative rather than positive force for development. The same is true when the rents are wastefully consumed — on luxury automobiles from abroad, for example — rather than invested in alternative forms of capital.

The conventional view of mining contends that good governance can thwart the economic incentives that give rise to rent-seeking behaviour, and ensure that mining rents are re-invested in human capital and other assets that promote economic development. As always, good governance requires adequate incentives, either by extensive property rights and a domestic political structure that constrains

¹⁵ Sachs and Warner (2001:835) note: “It seems fair to say that some variant of these crowding-out stories are the most likely explanations for the curse of natural resources, although further refinement is necessary”.

¹⁶ However, other benefits of mining, such as local development programmes and the opportunity to acquire technical skills, may be more focused on the local community and region than the rents (see McMahon and Remy, 2001).

inappropriate public sector behaviour, or by international pressures linked to loan programmes. For example, there is a move to make corporate royalty payments transparent, so governments that do not use these rents wisely may receive less aid and development assistance. Other proposed initiatives include allocating less of the rents to government and more to citizens (Sala-i-Martin and Subramanian, 2003) or to mining companies to invest in community services.¹⁷

The alternative view of mining counters, not so much by claiming that mining rents cannot foster economic development, but by arguing that in practice this rarely happens. Botswana's success is heralded as atypical (Acemoglu *et al.*, 2001b; Samatar, 1999). In addition and perhaps even more troubling, the alternative view points to evidence suggesting that large mining rents may themselves undermine good governance by breeding corruption and a decline of institutional quality. The debate therefore centres, as we have mentioned, not on the type of governance needed, but on whether most mineral-dependent developing countries can achieve the desired governance.

5. Findings and policy implications

In the 1950s, Charles Kindleberger, a well-known professor of economics at the Massachusetts Institute of Technology, wrote while working on the first edition of his textbook, *Economic Development*: “Anyone who claims to understand economic development *in toto*, or to have found the key to the secret of growth, is almost certainly wrong” (Kindleberger, 1958). The 4th and final edition of Kindleberger's book, published in 1983, contains a modified and even stronger warning: “Anyone who claims to understand economic development completely, or to have found ‘the’ key to ‘the’ secret of economic growth, is likely to be a fool or a charlatan or both” (Herrick and Kindleberger, 1983:xvi).

Clearly the lack of progress is not for want of effort. Economic development is a main area of economic research. Nobel Prize winners and others have dedicated their lives to unraveling the development mystery. Rather, it is because of the extreme complexity of the problem. Each nation brings its own nuances to the issue, and all nations interact regionally and globally in creating the observed economic outcomes. Since a comprehensive model of development would have to consider thousands of variables, it is perhaps not surprising that models focusing on only one or two variables are disappointing.

Within this conundrum lies the narrow set of questions explored here: Can mining promote the development of developing countries possessing mineral wealth? And does it do so in practice? For some time, most experts thought

the answer to both questions was yes. The past two decades, however, have seen a growing number of studies challenging the conventional view of mining, precipitating a lively debate in the process.

In reviewing the literature, we have focused on the differences between the conventional and alternative views of mining, but have also stressed the fact that significant areas of consensus do exist. No one to our knowledge contends that mineral wealth in the ground is not an asset. Like other assets or other forms of capital, it provides a country with potential opportunities. In addition, no one to our knowledge believes that mining has never actually contributed to economic development, just as no one goes to the opposite extreme and argues that mining has always promoted economic development.¹⁸

Rather, the debate centres on whether mining usually promotes or retards economic development, the reasons why in some cases mining is a positive force and in others a negative force for development, and finally the implications for public policy.

In exploring the policy implications, raising the right questions matters. Some studies have addressed the question: Should governments and international organizations encourage or discourage mining in developing countries? Subscribing to the alternative view of mining, they contend that developing countries would be better off if their mineral wealth were left in the ground.

To question this conclusion on the grounds that the debate over the alternative view of mining is far from settled, while valid, misses the critical point that this is simply a response to the wrong question. Asking whether mining should or should not be encouraged implicitly presumes that the correct policy choice is the same under all conditions and for all developing countries. Yet, as we have seen, there is a widespread consensus that mining can promote economic development, and has actually done so in some countries. Even in countries where mining on balance does not promote growth, selected projects may. If we want to help developing countries and reduce poverty, to discourage mining where it promotes these goals is clearly counterproductive. It impedes poor countries from mobilizing their mineral wealth — a capital asset that for some accounts for a significant portion of their total wealth — in their struggle to develop and to shed poverty.¹⁹

¹⁸ In the words of *Striking a Better Balance* (Salim, 2003, Vol. 1:2), “The historical record of extractive industries in contributing to economic growth has been mixed. . . . While some resource-rich countries have outstanding records of growth and poverty alleviation, others have shown little economic growth or have even experienced negative growth”.

¹⁹ Another aspect of the mineral sector that argues against assuming that one policy is appropriate for all situations is its tremendous diversity. The production of metals, industrial minerals, construction materials, and energy are quite different. Similarly, among the metals the mining of gold, copper, cobalt, iron ore, and bauxite vary greatly. Most of the literature on the resource curse, including this study, tends to ignore the great differences found between the various industries within the mineral sector and even within the same industry from one producing site to another.

¹⁷ According to Wallace (1999), community expenditures by the mining companies and suppliers at Minera Yanachocha in Peru are an example of what can be done at a local level.

More appropriate and useful questions for policy are: How can public policy maximize the net benefits a country receives from its mining sector? How can policy ensure that these benefits are effectively used for economic development and the reduction of poverty? How should policy and international development institutions respond when the good governance and other conditions necessary to ensure that mining will on balance promote development are not in place? These, of course, are much harder questions to answer, in part because there is no single answer that fits all countries and all situations. In addition, there is, as we have seen, still much we have to learn about why mining promotes development in some situations and impedes it in others.

These questions, however, do recognize that mineral wealth provides some developing countries with opportunities they would not otherwise have, and that mining can be a positive force for development. They also recognize that good policy can foster the conditions needed to ensure that mining is on balance a positive force for development, and that mineral resource exploitation continues to expand through advances in geological knowledge and local extractive technologies. The third question even suggests that mining policy can help promote more broadly those conditions, such as good governance, that enable economic development.

So in the end, the appropriate policy question is not should we promote mining in the developing world, but rather where should we encourage it and how can we ensure that it contributes as much as possible to economic development.

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