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## SPECIAL POLICY BRIEF 17

### The Wealth Curse from Natural Resources

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#### **INTRODUCTION**

Natural resources, which include such marketable ones as minerals, metals and fertile land, are not equally distributed upon the Earth. Some countries have an abundant supply, while others have hardly any. The countries that are more wealthy in their endowment of these resources would seem more likely to be among the rich and prosperous countries of the world. However, this economic intuition is not always borne out. Instead, the list of resource-rich countries contains many that are poor and undeveloped while the list of resource-poor countries contains those with high-incomes and living standards. This had lead to the term “natural resource curse” to describe the failure of many resource rich countries to develop and growth into wealthier developed economies.

The natural resource curse is an economic issue that is both a challenge to economic intuition and yet familiar in another way. Consider the old insult “poor little rich kid” or the old warning “be careful what you wish for.” There are also literary metaphors of cursed treasures and the tragic tales of lottery winners. This suggests that our folklore includes the awareness that riches may lead to problems that would not otherwise be confronted.

This might just be the essential idea behind the economic development problem labeled the “natural resource curse.” Resource wealth is both a blessing of greater potential, but also a potential cause of ruin.

This chapter explores the reasons behind this economic development issue and some of the possible policy remedies (rites, rituals and spells are outside the scope of this work) for avoiding economic damnation.

## **DOES THE CURSE EXIST?**

The incidence of the natural resource curse can be observed from comparing resource rich countries such as Venezuela and Zaire to resource poor nations such as Japan. Some countries end up doing very little with a lot while others do a great deal with a little.

A more systematic study of the correlation between resource abundance and the creation of economic wealth was conducted by Sachs and Warner (1995, 2001). The study compared countries over 1970 to 1989 based on their growth rates and their exports of natural resources as a share of national production (measured by GDP). The results show that the lower the share of exports of natural resources the faster the rate of growth over this period. Assuming that low shares of resource exports measured the natural resource abundance of the country, the study showed that resource poor countries such as Korea, Botswana, Indonesia and Mauritius grew rapidly while resource rich countries such as Zambia, United Arab Emirates and Guyana suffered negative real per capita growth.

Another broad empirical study was conducted by Higgins and Williamson (1999) in which they found that natural resource abundance was associated with higher income inequality.

While this pattern of resources and economic performance can be straightforward to identify, the same cannot be said about the economic debate over why this occurs, whether it is incidental and how might be solved.

## **WHAT MIGHT CAUSE THE CURSE?**

There are several competing hypotheses that attempt to identify and explain the cause for the natural resource curse. Most of these arguments conform to the following line of reasoning. The curse occurs when a country's abundance in natural resources causes a distortion in their economy which results in resources being used less efficiently than they otherwise would be. The consequence of this distortion is to lower actual or potential growth prospects by hampering the growth of the manufacturing sector (and especially the export of manufactured goods). This distortion can appear as various things such as corruption, complacency, over borrowing or high wages, and hence there is a variety of explanations for the cause of the curse.

The first to be developed, starting over 20 years ago, is known as the Dutch Disease. It was named after the economic troubles experienced by the Netherlands after the discovery of oil reserves lead to an oil boom but also a decline in manufacturing and overall economic growth. The reasoning is that the rapid increase in oil exports leads to

a surplus in international trade (alternatively a current account surplus) which in turn leads an increase in the value of the Dutch guilder in foreign exchange markets. The higher value of the guilder made exports from the Netherlands less competitive and thereby depressed the growth rate.

These is another, although similar, version of the Dutch Disease explanation. In this case the oil boom drives up wages throughout the economy. This raises the costs of producing tradable manufactured goods as well as non-tradable goods and services. As a result, exports are less competitive and local non-tradable goods are more expensive. Yet another possible reason for the cause of the Dutch Disease is that the manufacturing sector is characterized by increasing returns to scale technology while that for the oil sector is not. Thus the substitution of labor and other resources into the oil sector reduced overall long-term productivity and growth potential by starving the manufacturing sector of inputs.

## **MORE DISTORTIONS**

There are also several behavioral problems that have been linked to the effect of abundant resource wealth. These behavioral problems, such as corruption, sloth, fiscal profligacy and the lack of entrepreneurial spirit, are viewed to be exacerbated if not caused all together by the presence of resource wealth.

This type of reasoning follows in the tradition identified with Aristotle, Politics, Book VII, Chapter 7, where Aristotle focused on natural climatic conditions rather than minerals, metals and soil fertility per se.

*Those who live in a cold climate and in Europe are full of spirit, but wanting in intelligence and skill; and therefore they retain comparative freedom, but have no political organization, and are incapable of ruling over others. Whereas the natives of Asia are intelligent and inventive, but they are wanting in spirit, and therefore they are always in a state of subjection and slavery. But the Hellenic race, which is situated between them, is likewise intermediate in character, being high-spirited and also intelligent. Hence it continues free, and is the best-governed of any nation, and, if it could be formed into one state, would be able to rule the world.*

Later, Rousseau pushed this reasoning further in the Social Contract, Book III, Chapter 8 by connecting natural resources, social behavior and the type of government that is consistent with it.

*We find then, in every climate, natural causes according to which the form of government which it requires can be assigned, and we can even say what sort of inhabitants it should have.... Lands where the surplus of product over labour is only middling are suitable for free peoples; those in which the soil is abundant and fertile and gives a great product for a little labor call for monarchical government, in order that the surplus of superfluities among the subjects may be consumed by the luxury of the prince: for it is better for this excess to be absorbed by the government than dissipated among the individuals.*

These competing arguments for why natural resources wealth leads to economic distortions and in turn slower growth can be briefly stated as follows.

- The presence of immense wealth leads not to the development of entrepreneurial skills and inclinations amongst the population but rather the pursuit of easier money from less productive if not unproductive rent-seeking activities that seek to appropriate instead of producing value.
- The resource wealth causes a wealth effect whereby people think it is advantageous to spend more and save less. This can reduce overall resources available for investment into developing a diversified economy including that for manufactured exports.
- The government too can be overcome by imprudence from the wealth effect. The resulting fiscal imprudence leads to deficit spending – while not unique to resource rich countries, it exacerbates the problem. Further adding to the problems is that higher perceived wealth increases the willingness of foreign investors to extend credit to the country.
- A related problem is that the government's tax revenues from the production and export of the resource allow it to fail to develop a proper tax base that can efficiently extend beyond the natural resource sector.

In addition to these behavioral explanations for the cause of the resource curse, there is an additional economic argument concerning the

The prices of primary commodities, such as minerals, metals and agricultural products, are notoriously volatile. As a result, the more a country's income depends upon the production and export of one or a few natural resource based commodities, the greater will be the volatility of its income. A high degree of fluctuation in the real income of a country is a significant deterrent to economic development and growth. The uncertainty of future returns on capital investments acts to diminish investment. Plus, the standard of living is reduced by the fact that the costliness of an economic downturn is greater than the benefit of an economic boom. Together these set back growth prospects. Moreover, if the national government's revenue or overall budget is closely linked to the price of resource related exports, then the budget will expand and contract with export revenues so that it acts pro-cyclically to fuel booms and exaggerate downturns.

## **CRITICISM OF THE THEORY OF NATURAL RESOURCE CURSE**

Any argument that challenges economic intuition is likely to have its critics. One particularly thoughtful criticism comes from Wright and Czelusta (2004). They explain how natural resource wealth is a blessing and that any perceived problems have arisen from the failure of governments and countries to properly develop the industries needed to make them wealth producing vehicles to drive the economy towards more robust development and growth.

They differ in large part because they are more optimistic about the prospects for developing countries to successfully pursue more appropriate policies (see below) that designed to turn the resources into an industry

They sight the example of the United States that was successful at both mineral production and manufacturing. The success came because the US developed its mineral capability through investment in “exploration, transportation, geographical knowledge and the technologies of extraction, refining, and utilization” (Wright and Czelusta 2004).

They draw another example from the comparison between the US and Chile in the production of copper. Chile, whose endowment of copper deposits greatly exceeds that of the US, produced more copper than the US until the 1880s. Yet between 1900 and 1914 output in the US was ten times higher than that in Chile. The authors attribute this to massive US investment in production technologies, transportation and the formation of “giant integrated business enterprises” (2004, p. 12).

While the criticism does successfully identify some of the short-comings in some of the principle studies, it does not refute the case that bad policies and unproductive economic behavior have been identified in countries with relatively large amounts of natural wealth.

## **POLICY REMEDIES**

Developing leading and lagging links to domestic production so that more value is added in the developing country. Policy directed so that more value is added to natural resource in production and export. Whereas the price of primary products may suffer from volatility and secular declines relative to manufactured goods and services, that of intermediate and finished goods – those with more value added – will face more favorable elastic supply and demand conditions.

Examples of this are Australia’s successful attempt to develop their own engineering schools so that those higher paid jobs would produce more value for the local economy. Similarly, becoming more vertically integrated adds more value. Brazil developed the capacity to sell frozen orange juice contrite and not just the perishable fruit. Earlier, the U.S. did not just export timber but ships and furniture.

Developing countries today could apply similar policies. Moving beyond resource extract to more value added in processing as well as marketing and distribution. Also, developing the local industry in exploration and mining means earning more than royalties on drilling and mining from foreign corporations.

## **RISK MANAGEMENT**

In his novel “East of Eden”, John Steinbeck described the variability of the natural resource wealth generated by farming. He described how the rain would come in cycles in which several wet years would be followed by several dry years. During the wet

years the land was rich and fertile, and in turn the people grew rich and prosperous. During the dry years the land was bare and desolate, and in turn the people became poor and often moved away. He concluded, “And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way.”

But it does not have to be that way. Appropriately designed and implemented public policies can stabilize the income from resource wealth so as to avoid Dutch Disease type problems and promote prosperous as opposed to unproductive behavior.

### **Stabilizing the effects of the wealth**

Some of the ways in which natural resource wealth becomes a problem is through its impact on individual and government consumption spending behavior and its macroeconomic impact on exchange rates and international trade competitiveness.

One way to prevent or substantially diminish the effects of a sudden increase in wealth is by establishing financial institutions, something akin to trust fund, that will prudently manage the wealth and its disposition over time. Two examples of such social trust funds are known as Stabilization Funds and Savings Funds. In both of these cases the purpose is to mitigate any harmful impact of natural wealth, and especially new found wealth, on fiscal policy and international competitiveness.

- **Stabilization Fund**

The basic economic lesson for Stabilization Funds is as old and familiar as the Bible. The story of Joseph can be read in the Torah, the Christian Old Testament and the Koran where Yusef is given his own sura. The scripture described how Joseph advised the leaders of Egypt to conserve output during period of bumper harvests – called the “fat” years – and then to dispense the inventory during future “lean” years. This inventory management stabilized Egypt’s income over time and contributed to its peace and prosperity.

Stabilization Funds are designed to accumulate funds when resource prices exceeds a target level and dispenses funds when the price falls below the target level. In doing so it takes income away from current spending when the price level generates windfall gains, and it makes income available again when times are depressed by low resource prices.

In order to be effective, Stabilization Funds require two types of budgetary protections. The first, which is important during boom periods, prevents surpluses in the Stabilization Fund from being used as collateral to increase borrowing and thereby increase overall spending. The result would be that government spending was not dampened during a boom period and that instead the interest cost of on the foreign debt would put a burden on future income when commodity prices might not be so high. The second, which is important when prices are depressed, protects the fiduciary integrity of the fund so that it is not raided for short-term reasons. The Stabilization

Fund is designed to pump money into the government budget when commodity prices fall below their target levels, but sometimes there is great pressure for additional resources. In order to protect that fund for future stabilization purposes, it needs to be managed by leadership that is professional, protected from immediate political pressures and ultimately representative of the people served by the fund. One manner of doing this it to have a commission or board appointed by the legislative body to terms of intermediate length that expire at staggered years in the future.

An successful example is that of Chile's Copper Fund. Established in 1985, its funds are held in an account at the Central Bank and its management comes from an independent board (which includes members from the state owned copper corporation CODELCO). It has been credited with helping the Chilean government avoid fiscal deficits up until 1999. A poor example is that of the Macroeconomic Stabilization Investment Fund (FIEM) of Venezuela where the lack of strict budget rules has allowed the government to borrow against accumulated assets in order to increase spending as well as to delay scheduled payments into the fund. The result is that the FIEM has only \$700 million in reserve<sup>1</sup> (even though oil prices have been very high), and that its effectiveness has been diminished.

A successful Stabilization Fund will stabilize government budgets, and protect against the effects known as the Dutch Disease by preventing the appreciation of the currency. This is accomplished by investing the funds assets in foreign currency denominated securities. Most of all, the fund will serve as a signal that the resource wealth can be constructively channeled into a stabilizing force in the economy.

There is, however, a key limit to this policy strategy. It is premised on the assumption that the "fat" years will come first. Unless the fund can borrow against future income, then it cannot begin to exercise a stabilizing influence on government budgets until resource prices have first exceeded the target level, and therefore the fund has the additional political burden of having to first act as a drag on the economy before it can act as a stimulus.

- Savings Fund

Savings Funds are designed act as a rainy day fund or to help transfer wealth to future generations. This is especially desirable for non-renewable natural resources that might otherwise be exhausted by current generations. A Savings Fund is designed to accumulate assets during times when the resource price exceeded the target level, and hence provide some dampening or stabilizing function, but the assets would then form a trust and the income on the trust could be paid out over time. One example of such a Savings Fund is the Alaska Permanent Fund; it was created in 1977 and by the end of 2003 it had accumulated over \$28 billion in assets.<sup>2</sup>

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<sup>1</sup> ) Venezuelan Ministry of Finance, April 2004.

<sup>2</sup> ) Alaska Permanent Fund Corporation, financial statements for December 2003.

## Commodity Bonds

Aside from the wealth effects from natural resource riches, there are the shock effects from changes in the prices of those resources. Long-term plans made on the assumption that resource prices would remain high will likely be disrupted by actual future price movements. Governments, businesses and individuals that operate by spending out of current income will find that their spending, investing and living standards fluctuate greatly as the result of changes in resource prices.

One method to reduce exposure this volatility is to transfer the price risk to others through the use of commodity-indexed bonds or commodity-linked bonds.

- Commodity-indexed bonds.

These bonds are structured so that their coupon and/or principal payments are determined by the price of some underlying commodity. In some versions, the price linkage is structured like a forward derivatives so that payments will be higher or lower depending on the commodity price. For example, the payment is equal to the commodity price times a specified amount of the reference commodity; in the case of crude oil, the principal might be one million barrels of West Texas Intermediate crude oil times the market price at maturity – thus it would amount to a \$25 million bond at \$25 a barrel, or a \$40 million bond if prices were \$40 a barrel at maturity.

Another structure for commodity-indexed bonds would link the coupon and/or principal payments to the price of the underlying commodity through an options-like structure. In this case, the payments would be some cash amount or the amount of the underlying reference commodity times its market price.

Commodity bonds structured in this option-like arrangement are sometimes known as commodity linked-bonds, and they are of two basic types. Bonds with a “long” call give the bond owner the right to the higher of a certain cash payment or a payment determined by the price of the commodity. In this instance the bond investor would share in the upside gain from higher resource prices. Bonds with a “short” put option provision give the issuer the right to pay the lower of the certain cash payments or one determined by the commodity price. This type of commodity linked-bond shifts the downside risk of resource prices to the foreign bond investor.

While these commodity bonds help the developing county to transfer some of its exposure to commodity price risk, and do so over the intermediate to long-term maturity of the bond, it can be expensive. Complexity is expensive, and options premiums are expensive, and so borrowers should to pay much higher yields on bonds that must be sold to the subset of foreign investors that are also willing to buy commodity price risk.



## Government policy to hedge budget

The price fluctuations on natural resources can also act as a curse on government budgets. If government budgets are not protected from these price fluctuation, then the price changes are likely to be transmitted throughout the economy through fiscal policy.

The following table provides examples of 10 countries whose government revenues (far right column) is highly correlated with changes in the price of the country's major export commodity. An additional example is Mexico where oil accounts for 10% of its exports but 40% of government revenues.<sup>3</sup> An extreme example is the case Russia: when oil prices are high they run budget surpluses and when oil prices fall, as they did in 1998, the government defaults on its foreign debt and causes a financial crisis that reaches around the world.

**Correlations with Major Export Commodity Price**

Country	Commodity	GDP	Exports	Revenue
<b>Burundi</b>	Coffee	-0.55	0.44	1.00
<b>Colombia</b>	Oil	0.05	0.30	0.62
<b>Ethiopia</b>	Coffee	0.44	0.33	0.36
<b>Ghana</b>	Cocoa	0.75	0.22	0.72
<b>Kazakhstan</b>	Oil	0.65	0.90	0.44
<b>Nicaragua</b>	Coffee	0.48	0.40	0.48
<b>Nigeria</b>	Oil	0.30	0.66	0.11
<b>Uganda</b>	Coffee	0.65	0.52	0.64
<b>Uruguay</b>	Beef	0.20	0.00	0.45
<b>Venezuela</b>	Oil	0.01	0.71	0.50

-- GDP and Revenue in real 1995 local currency values  
-- Exports in nominal U.S. dollar values  
-- International Financial Statistics

Instead of taking the risky approach of doing nothing to protect against this price exposure, governments can and should manage their risk exposure. Stabilization Funds and commodity bonds are two risk management strategies. Yet another, which is more direct and potentially less expensive, is to use derivatives to hedge the price exposure.

There are a variety of derivative instruments available on either exchanges (mostly futures and options) and in the over-the-counter (OTC) market.<sup>4</sup> While the exchange traded contracts are mostly short-term, they can be effectively rolled-over in order to provide an effective hedge over a long period of time. This approach has its skeptics who are worried about the risks associated with the roll-over process. While roll-over risks are real, they are small and manageable in comparison to the risk of not hedging. Moreover, many multinational oil corporations, global agricultural corporations and other businesses regularly use this technique as an inexpensive and effective hedge against price risk.

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<sup>3</sup> ) Larson, et al. 1998.

<sup>4</sup> ) See Dodd (2002, 2004) for primers describing the various instruments and the markets in which they trade.

An important variation on this approach comes from the Australian government's practice hedging its exposure to its domestic agricultural programs; as recently as the late 1990s it was the largest participant in the wheat futures market on the Chicago Board of Trade.

Hedging works by selling forward, i.e. taking a short position in, a major export commodity. The hedge will generate gains when prices fall (loses when prices rise) and thereby reduce the variability of budget revenues due to price volatility. This will help prevent pro-cyclical fiscal budgets and allow the government to serve a more counter-cyclical role in stabilizing economic performance and promoting sustained growth.

The advantages of this approach are that it is inexpensive, it is a reversible policy and it does not depend on the "fat" years coming first. It allows the government to borrow through conventional debt instruments instead of paying a premium to tap into smaller pools of investors willing to invest in commodity bonds. Unlike Stabilization Funds it neither tempts corrupt officials nor acts as a target for those seeking easy funding for new or expanded programs. The disadvantage is that it gives up some of the gains of price increase.

## **Governance reform**

Corruption can be a major factor in the problems identified as the result of a natural resource curse. One way to reduce the incidence of both gross fiscal mismanagement and corruption (meaning the outright embezzlement of funds and the misdirection of funds for political purposes) is to require a high degree of transparency in government budgets and budgeting processes and to distribute budget authority across the executive and legislative branches of government.

- "Publish what you pay"

One of the most frequently cited causes of the natural resource curse are corruption of government officials and the tendency toward profligacy of national budgets. In order to put pressure on governments to make their budgets and budgeting processes more transparent, the Open Society Institute has embarked on an advocacy campaign to get corporations to report on their costs for royalties, rights and all other payments to development country governments for the extraction of oil, other minerals as well as metals. This "publish what you pay" campaign is designed to both make corporate reports more transparent – thus possibly exposing bribes – and make developing country budgets more transparent by showing their revenue from foreign investors.

The best analysis and account of this policy recommendation is found in Palley (2003). He points out that the "publish what you pay" rule would provide a "double-entry check on government revenues, since companies' reported payments should match governments reported natural resource revenues."

## CONCLUSION

While it is perplexing to think that wealth can become a curse, it is vexing to see so little done about it. All of the above policy remedies are both feasible and affordable, and none of them would pose a major policy challenge. They would each benefit from further research and investigative reporting in order to discover more of the advantages and flaws as well as what could be learned from earlier experiments. The biggest political challenge is the widespread lack of understanding of the costs of doing nothing, and the lack of knowledge amongst policy makers about the merits of appropriate policy remedies.

## SOURCES

- Hausmann, Ricardo and Roberto Rigobon. 2002. "An Alternative Interpretation of the 'Resource Curse': Theory and Policy Implications." *National Bureau of Economic Research*, Working Paper 9424.
- Higgins, Mathew and Jeffery Williamson. 1999. "Explaining Inequality the World Round: Cohort Size, Kuznet and Openness." *National Bureau of Economic Research*, Working Paper 7224.
- Palley, Tom. 2003. "Lifting the Natural Resource Curse." *Foreign Service Journal*, Volume 80, No. 12 (December), pp. 54-61.
- Palley, Tom. 2004. "Oil and the Case of Iraq." *Challenge*, (May/Jun), Vol. 47, Iss. 3; p. 94-112.
- Wright, Gavin and Jesse Czelusta. 2004. "The Myth of the Resource Curse." *Challenge*, Volume 47, No. 2 (Mar-April).
- Sachs, Jeffrey D. and Andrew M. Warner. 2001. "The Curse of Natural Resources." *European Economic Review*, 45: 827-38.
- Sachs, Jeffrey D. and Andrew M. Warner. 1995. "Natural Resource Abundance and Economic Growth." *National Bureau of Economic Research*, Working Paper 5398.