The Growth and Natural Resource Endowment Paradox: Empirics, Causes & the Case of Kazakhstan

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Introduction: The Counterintuition

> *He who knows what sweets and virtues are in the ground, the waters, the plants, the heavens, and how to come at these enchantments, is the rich and royal man. Only as far as the masters of the world have called in nature to their aid, can they reach the height of magnificence.*
>
> -Ralph Waldo Emerson, "Nature"

It is a casual, if excusable assumption that mighty economic giants such as United States achieved the magnificence told in Emerson's epigraph above in large part because they were abundantly endowed with natural resources. Since things of value can be traded for other things of value, and this permits the vestiture of capital according to its most lucrative prospects, natural resource wealth ought to be what Jeffrey Sachs and Andrew Warner call a virtual *sine qua non* of national wealth in the abstract.[1] What better evidence is required for the validity of this perception than the European race to colonize? Motivated by the impulse to grab natural resources such as precious metals, European powers sought what they could not find in such profusion upon their own territory.[2]

How odd, then, that since the close of World War II, natural resource "wealth" appears a curse rather than a blessing. The list of development success stories in the second half of this century reads, with few exceptions, like the pauper rolls where physical wealth is concerned: Japan, Singapore, Israel, Taiwan, South Korea, and Hong Kong. Similarly, nations like Nigeria, Mexico, Argentina, Iran, Libya, India, Costa Rica, Haiti, Armenia, Burma, Azerbaijan, Georgia, and Jamaica provide abject examples of the converse, where the exploitation of natural resource endowments appears to have propelled nations into various states of poverty, instability and chaos (economic and otherwise). Miguel Urrutia of the United Nations University wrote in 1987:

> It is now obvious to many economists that since World War II the developing countries that have achieved the highest economic growth rates are those that are apparently not richly endowed with natural resources. (…) On the other hand, paradoxically, resource-rich countries as diverse as Ghana and Argentina achieved very low growth rates, and a country like Mexico had a much worse economic performance after it became a major oil producer.[3]

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The proposition that nations may suffer, rather than prosper, through the exploitation of their material wealth has developed over the past several decades from a notion held by an inquisitive few, to a suspicion of many, to an observation of most. [4] In 1995, the hypothesis crystallized in econometric form under the pens of Jeffrey Sachs and Andrew Warner at the Harvard Institute for International Development, such that the affliction of natural resource wealth now has currency as a truism, and a range of fiscal and macroeconomic policy prescriptions almost reflexively appertain.

This study will approach the old question with three purposes. First, it will briefly discuss the empirical validity of the conclusion that natural resource wealth works in counterpoise with economic development, ultimately taking the hypothesis as proved *arguendo*. The second, more ambitious goal is the collection of a comprehensive set of potential explanations for the observed veracity of the natural resource hypothesis. The many putative causes of the phenomenon range from conventional wisdom (such as corruption, rent-seeking, and "The Dutch Disease") to *cuasi belli* among development scholars (such as terms-of-trade effects, volatility, neglect or atrophy of linkages in other sectors, and environmental degradation). The final section will apply the recent lessons of the natural resource-economic growth dilemma to the development problem of Kazakhstan. This section will consist of two parts, one descriptive and one analytic. The latter section will extrapolate from the Sachs and Warner regression parameters to offer an econometrically derived "prediction" of its growth trajectory over the next few decades in light of its projected reliance upon natural resource exports.

This paper will *not* explicitly tackle the *problématique* of divining the natural resource-economic growth hypothesis's counterfactual. A quest for conditions which existed in the prior era but not in the current era might bear engaging analytic fruit, but would require an analysis of the development conditions which *did* prevail prior to World War II—a project beyond the scope of this paper.

Assessing the Hypothesis: The Natural Resource Trap

"Before the 1950s," Gillis et al. write, "it was conventional wisdom that the road to development could be traversed most rapidly by following comparative advantage, exporting foods and raw materials, raising per capita income, and permitting structural changes to take place as a consequence."[5] Prior to the Sachs and Warner study, the proposition in development economics literature that natural resource exploitation could retard, rather than promote growth among developing nations crystallized at an uncharacteristically slow rate for such an important topic in a much-scrutinized field. Rather, throughout the 1960s, 1970s, and the first part of the 1980s, a minor collection of literature on the subject began to build, mainly upon the recognition that nations which

earned their bread on primary exports were not, in fact, becoming rich as those in the now-industrialized "North" once had. Lesser-developed nations that traded their primary commodities for manufactured products suffered a variety of macroeconomic instabilities, ranging from volatile terms of trade and real exchange rates, to current account imbalances, to shortages of foreign exchange, to a stagnant real wage, to extreme debt burdens and fiscal crises. While theorists offered a litany of plausible causes for this problem, none had "confirmed the adverse effects of resource abundance on growth on the basis of a worldwide, comparative study of growth."[6]

In the face of a dearth of empirical work on the subject, Sachs and Warner hypothesized that if nations which began with a rich array of natural resources did indeed suffer some sort of "penalty" in economic growth, we would observe a statistically significant negative relationship between a measure of resource exploitation and growth, controlling for other variables. In their regression, resource endowments were initially captured statistically as the share of primary product exports in gross domestic product ("GDP") in 1971, called "SXP". They measured growth as the change in GDP over a twenty-year period.[7]

In effect, Sachs and Warner tested the significance of this new variable, SXP, when controlling for traditionally related variables such as initial income, an index of openness to trade, an index of bureaucratic efficiency, and a dummy regional variable to control for the independent effects of regional factors.[8] The team confirmed the hypothesis at more than ninety-nine percent statistical significance, even controlling for other seemingly important variables.

The quality of the Sachs and Warner model is difficult to dispute with significance at such high confidence intervals. Nonetheless, one must not confuse the model's statistical significance with the quality of the regression as proof of the initially-proposed hypothesis. Sachs and Warner demonstrated only a robust negative correlation between the share of export earnings in GDP and per-capita GDP growth between 1970 and 1989. They did not show that natural resource endowments, *ab initio* and *per se*, handicap a nation in its effort to develop.

There are two reasons, in fact, to think this hypothesis might diverge meaningfully from the hypothesis tested econometrically. First, the Sachs and Warner result was predicated upon a link between *exports* of natural resource raw materials and per-capita growth. Crucially, certain explanations for the natural resource-economic growth paradox (such as the lack of industrial diversification) would rely on effects that would not be measured by export shares. Second, the SXP index is based on a single year's export share of GDP. Given that any particular year may deviate significantly from the long-term mean or trend line, Sachs and Warner's inverse relationship could be shown merely to be the byproduct of the errors (relative to normal exporting trends) embedded within the chosen original

year's sample.[9] Despite such doubts, this paper shall simply consider the hypothesis proved, then explore its potential causes and implications.

Explanations for the Natural Resource Trap

For a counterintuitive theory, there is a curious profusion of plausible explanations for the natural resource "trap." Roughly grouped, the rationales fall into five categories: socio-political, political-economic, macroeconomic, microeconomic, and trade-related. Curiously, most explanations involve second and third-order consequences of otherwise normatively unproblematic results or activities.

Declining Terms of Trade and the Prebisch Hypothesis

One of the earliest explanations for the apparent dilemma that developing nations have faced since World War II has roots going back to the late 1950s. It derives from the recognition that developing nations which relied on exports of primary products were not getting rich despite the value of the goods they exported to the developed world. Some initially attributed the problem to the unscrupulousness of the capital class, which paid low wages and gathered extravagant rents for investors. Often enough, the primary export industries that constituted such a large share of these nations' exports were, in effect, "enclaves" which provided few benefits to the labor force at large.[10]

In 1950, development economists Raul Prebisch and Hans Singer, earning their place among dismal scientists, ushered in an era of "export pessimism" through their empirical analysis of the resource-growth paradox.[11] Prebisch and Singer demonstrated in 1950 that developing countries that exported primary products and imported manufactured products from industrialized nations would always suffer uncongenial terms of trade.[12] Taking a ratio of the trade-weighted price of exports to the price of imports—or the "net barter terms of trade"—the economists found that such trade patterns would always be stacked against primary product exporters. An extrapolation of the Prebisch hypothesis justified the protectionist trade and investment policy of "import substitution." Only by substituting foreign manufactured goods with domestic, the principle went, could countries surmount the net barter terms of trade problem. Countries subsidized domestic manufacturing with the hope of ultimately creating comparative advantage.

The underlying hypothesis that primary product exporters suffered perpetually declining terms of trade has been forcefully challenged. An early study integrated oil-exporting nations into the mix to demonstrate that the primary product exporters actually enjoyed positive, accelerating terms of trade relative to manufactures exporters. From the developing nations' perspective, between 1960 and 1990, (excluding petroleum producers) it can be agreed that the net barter terms of trade have been in gradual decline.[13] The better target of research, some maintain, are the income terms of trade,

adjusted for the purchasing power of export earnings. Excluding oil exporters, the income terms of trade increased by six percent per year on average from 1954 to 1991, a fact that discredits the role of chronic terms-of-trade imbalances of natural resource-rich nations.[14]

Refutations of the Prebisch Hypothesis have been many and varied, but the steady eroding trend of commodity prices—admittedly a crude metric—is indisputable. The real value of a basket of such goods is indexed today at an astonishing twenty percent of their 1845 value. Despite its high volatility, the declining trend-line is unmistakable.[15]

Volatility and the Dependence upon Commodity Exports

Prebisch and Singer's terms of trade analysis led to speculation that volatility itself was a more consequential factor in retarding economic development. Put tersely, "The LDCs [lesser developed countries] whose exports consist mainly of primary commodities inevitably face greater instability in export earnings than do DCs [developed countries]."[16] The first United Nations Secretary General Dag Hammarskjöld encapsulated the view of the day: "[w]ild fluctuations in the prices of primary products, the main foreign exchange earners, paralyze the efforts of underdeveloped countries for long-term development."[17]

The fundamental economic narrative of price volatility's negative effect on development has both micro- and macroeconomic components. The prices of commodities—especially minerals and agricultural goods—fluctuate much more frequently and with greater amplitude than the prices of most manufactured products. Indeed, commodities are exchanged in almost perfect markets where suppliers are defined as price-takers. "The variability of prices, it is argued, leads to fluctuations in export revenues which make it difficult for countries specializing in primary commodities exports to plan their economies."[18] Developing nations that export primary commodities presumably deal in a product with very price-inelastic demand and cannot afford the luxury of fiscal support to spread their risk across other sectors and regions. They are besotted by current account crises, capacity shortages, gluts in unpredictable alternation, and income unpredictability. Inflation and real exchange rates are linked to all of these factors, such that macroeconomic instability is an unpleasant fact for small exporting countries.[19]

Despite the intuition, the empirical research on export earnings instability is decidedly inconclusive concerning the long-term costs of these very real fluctuations. In a notable work in 1966, Alasdair MacBean canvassed the literature on export instability. He discovered, first, that the phenomenon had been passed around and accepted uncritically among development economists as fact, primarily, it seemed, because the *a priori* case for the economic effect of the problem was so persuasive. MacBean set out merely to chronicle the extent of the problem and instead brought into question its very existence through his own empirical research. He found that the relationship between commodity concentration (i.e., the degree of dependence upon a smaller subset of commodities) and

export earnings stability held only for a ninety percent confidence interval, and thus he concluded that there might be only "some slight tendency for specialization in primary products to enhance risks of export instability."[20]

Several theorists have since taken up the question of export instability, but it seems clear that the empirical result depends primarily upon the period one chooses to analyze. Some studies from the mid-1970s, for example, found that this volatility exerted deleterious effects upon those nations that relied upon primary product exports for a large share of their income.[21] In refutation, one might posit that fluctuations, if foreseeable, encourage saving behavior in reaction to booms thereby providing a stock of investment-ready capital in volatile economies. Christiàn Moran's empirical work over a long period (1954-1975) concluded that such fluctuations are costly in the short, but not long term. This implies, contrary to most expectations, that most commodities do not exhibit price-inelastic demand characteristics significant enough to reduce net incomes—or at least that time heals the wounds inflicted by this elasticity problem.

What is to be made, then, of the literature on export instability? "It would be fair to say that the number of cross-country studies which show the absence of any positive relationship between export instability and commodity concentration is far greater than the number which show the presence of such a relationship…[But] those resource-rich LDCs with a large share of export sector that is dominated by a few primary commodities have a high level of export instability."[22] In other words, the conclusion that such fluctuations impose economic burdens—direct and structural—is automatic for a small nation in which export earnings make up a large portion of GDP.

Linkages and Diversification

Emerging from the literature on export instability are the observations that concentrated primary commodity exporters, as a class, lack the ability to hedge risks by diversification into other products. In effect, in goods markets just as in asset markets having one's eggs in many baskets isolates and minimizes the risks associated with acute shocks to a given industry or activity. A highly-diversified economy, on the contrary, will shift more fluidly much of the suddenly-unproductive resources from that industry to another profitable undertaking, minimizing risks and cutting potential losses.[23]

The development implications of the diversification rule, however, are more subtle than they may at first appear. The imperative to diversify seems obvious, but the diversification cannot be forced as a matter of policy against the conditions that determine comparative advantage. Investment in diverse industries for diversification's sake in the abstract is folly, for if these industries are intrinsically uneconomic, their creation as a matter of policy is rather like erecting the economic equivalent of a Potemkin village; no one, least of all the market, is fooled, and these inefficient businesses fail.

On the other hand, there is a theoretical "head start" enjoyed by nations with an abundance of a valuable natural resource towards the development of a comparative advantage in the *processing* of that primary product. Transaction costs (e.g. transportation costs) may be minimal—within the nation that extracts the resource itself—relative to foreign export costs. Countries rich in lumber from their forests, for instance, may also quickly develop a comparative advantage in processing those logs into boards, or even further upstream, into furniture, shingles, and siding for export. Those states that can capitalize upon this proximity to the resource's extraction often achieve a measure of diversification which may be even more sustainable than the predicate industry. The nation may develop economies in the capacity to process the same resource from foreign suppliers. Furthermore, each primary commodity industry is likely to require the provision of a panoply of specialized goods and services. Many of these needs—on-site services in particular—come from sectors which are "non-tradable," and those sectors, in turn, require provisioning and create jobs. This iterative commercial diversification process is known as a "linkage effect," first articulated by Albert O. Hirschman in 1958. [24]

Hirschman called the development of a supply industry from a demand for factor inputs to feed the incipient industry (such as the provision of tools to extract minerals) a "backward linkage" (from the perspective of the minerals industry). As Peruvian fishmeal production developed, for example, such accompanying supply industries (now world leaders) as boat building soon grew up alongside, employing more nationals and diversifying the economy.[25] Other, more indirect linkages may develop. As more workers earn a wage, their additional consumption creates "consumption linkages" as other industries grow to meet their expanding demand. Financial institutions may develop to provide credit to the primary industry, creating a credit infrastructure and greasing the wheels for other entrepreneurial projects.

Although rather accurately descriptive of the history of development in the nineteenth and first half of the twentieth centuries, Hirschman's linkage development tale has a diminished predictive value within the modern context. "Backward, forward and consumption linkages often fail to work."[26] Instead, development economists sometimes conceive of the linkage effect as a potential *impediment* to development in a resource-rich country through the channel of "Dutch Disease".

The Dutch Disease

Of all the theory-making pertaining to the apparent natural resources-economic development paradox, the literature on Dutch Disease is the most extensive, elaborate, and perhaps the most logical and convincing. Dutch Disease, to oversimplify, results when the above "linkages" scenario folds in upon itself and sends a resource-rich country into a spiral of macroeconomic imbalance. It derives its name from the experience of the Dutch,

who perplexingly failed to benefit from the tremendous wealth of natural gas they discovered in the 1960s. The Dutch economy instead ailed from stagflation and sluggish exports throughout the 1970s.

Although the basic dynamic of Dutch Disease has been understood since the work of John Cairnes in his studies of Australian gold discoveries in the 1850s, development economists began systematically to account for the Dutch Disease effect in the early 1980s. [27] The literature came into its own by mid-decade, offering a generalized explanation and integrating a host of other potential causes (such as foreign aid, asset-price or real-estate booms, etc.).

Dutch Disease begins when a new source of great wealth is discovered (usually, but not limited to natural resources), and its exploitation brings in large profits and foreign currency. These large profits appreciate the domestic currency relative to those of trading partners'. High profits encourage entry into the industry, drawing resources into the "boom" sector for the sake of export, and they are drawn away from the "lag" sectors—both the "non-tradable" and other export sectors. The earnings from the export of the boom product expand national income as a whole (including the government sector), increasing demand generally but unevenly. As the "lag" non-tradable industries hemorrhage resources, the domestic economy suffers a double-dose of inflationary pressure: new wealth (bringing increased demand) and deteriorating supply of non-tradable goods both bid up the prices of domestic goods sharply. The accelerating prices appreciate the real exchange rate further, eating away at non-boom sector exporters' profits. Exporters outside of the boom sector begin to transfer their capacity to the boom sector, exacerbating the problem. The government usually collects large revenue from the boom sector, which it commonly spends on domestically produced products, causing further inflation and embedding a dependence on expected future revenue streams.

When Dutch Disease has run its course, usually after the ephemeral boom has gone bust, the economy falls into stagflation with a current account imbalance and an over-valued real exchange rate. It may also have a hollowed-out non-boom industrial sector, shortages of non-tradable goods, and extensive fiscal deficits from over-ambitious government projects that lie uncompleted for lack of funds.

Examples of nations which have been ravaged demonstrably to a greater or lesser extent by Dutch Disease are Mexico (oil), Brazil (rubber) and Paraguay (hydro-electric energy), to name a few.[28] Nigeria, for example, one of Africa's most richly-endowed nations, remains one of the poorest countries in the world, its countryside littered with abandoned factories. Alan Gelb, after looking at several oil-exporting nations in 1988, observed that "[v]olatility plus poor [export value] prediction translates, on average, into a poorer use of

resources during the cycle, which may more than offset the increment to resources from the windfall."[29]

Several other economies "suffered" the discovery of oil or other mineral wealth on their territory, and went on to become stable, wealthy, moderately diversified nations. Indeed, Graham A. Davis disputes the applicability of Alan Gelb's results to mineral exporters, claiming that the long-term earnings of oil-rich nations have been extremely positive on the whole.[30] The example of Indonesia upon its discovery of oil demonstrates indubitably that the Dutch Disease is curable by preemptive inoculation in the form of careful fiscal policy and exchange rate management. As the classic scenario unfolded, Indonesia consistently devalued its currency (thereby dismantling the real exchange rate channel) and amassed government revenues in offshore accounts, prudently eschewing domestic spending and investment during the period of booming oil exports.

It is no great leap to ascertain the potential role of the Dutch Disease in explaining the natural resources-economic development paradox. Still, a consensus has emerged that the effects of Dutch Disease are preventable, so that if Dutch Disease had indeed been a major source of resource-rich countries' development woes, it need not be in the future.

Rent Seeking and Corruption

That corruption and overt rent-seeking behavior sap the normal flow of growth in a developing nation with a significant resource base seems quite intuitive. Yet, some theorists have proposed that bribing behavior can serve a benefit by robbing excessive regulation and bureaucracy of its bite, and they cite the success of several very corrupt economies as evidence.[31] This point of view has been severely discredited. A rich literature has developed in a very short time, led by economists Paolo Mauro at the International Monetary Fund ("IMF") and Shang-Jin Wei at Harvard, who demonstrate that corruption can act as an oppressive tax: "An increase in the corruption level from that of Singapore to that of Mexico is equivalent to raising the tax rate by over 20 percentage points."[32] Recent research at the World Bank found that, no matter the type of corruption, a country's "rate of investment would be significantly higher were there less corruption."[33] Put simply, "while costs may vary and systemic corruption may coexist with strong economic performance, experience suggests that corruption is bad for development."[34]

An emerging set of theories (with specific reference to the African case) goes much further in predicting the effect of natural resource wealth on corruption in a developing nation. In a recent paper, Paul Collier and Anke Hoefller of the World Bank and Oxford, respectively, observed that, "many rebellions also appear to be linked to the capture of resources: diamonds in Angola and Sierra Leone, drugs in Columbia, and timber in

Cambodia."[35] The Collier and Hoeffler model illustrates the most extreme of ways in which the possession of natural resources carries costs.

On the other end of the spectrum is an impediment to natural resource led growth known as the "obsolescing bargain."[36] While not exclusively a form of corruption, the model recognizes that negotiating power shifts drastically over the life of long-term infrastructure investment projects in LDCs when foreign investors contract with sovereigns. With enormous sunk costs and no control over the political landscape, foreign investors have exceptional leverage on the terms of risk allocation in the initial negotiation of contracts and almost none when the project is completed and the key is turned. The great temptation for the government to "defect" from the contract—whether by legitimate means or not—both erodes the value of current projects and raises the cost of credit (perhaps prohibitively) for future ones.[37]

The corruption quagmire receives detailed attention in formal economic studies because of its presumed effect, but solutions to the corruption problem—that is, attacking its causes—are, by necessity, mainly legal or political. As a practical matter, the paralysis resulting from natural-resource-based corruption in developing nations has been the target in recent years of aggressive problem solving, policy implementation, and legal reform efforts among the multilateral lending institutions, individual nations and the development agencies of the OECD countries. [38] Still, the DC's primary attempts to temper corruption in the developing world have come in the form of efforts to establish "rule of law" enclaves in those developing or transitioning nations which otherwise lack the legal certainty of a developed regulatory program.[39]

Regulatory and Policy Infrastructure

Development economists from the developed world who preach minimal government intervention in all aspects of LDCs' economies from the outset parade their myopia by glossing over one of the starkest lessons of their own nations' economic histories—that laws and institutions must underpin liberalized transactions.[40] This problem seems exceptionally potent in economies in transition, and/or where high-rent natural resources are at stake. An admittedly idiosyncratic list of essential institutions or regulatory programs would include, *inter alia*: 1) establishing police power over criminal acts (particularly helpful in attacking corruption) and legislative and independent judicial power to define those criminal acts; 2) enforcing contracts to allow for expectations to settle meaningfully and obligations to be regulated fairly; 3) defining and enforcing property rights; 4) breaking up monopolies, collusion and other unfair and anti-competitive practices; 5) establishing bankruptcy/credit and transaction-securing law to encourage lending and economic risk-taking and the development of a financial infrastructure; 6) creating welfare-minding and business-cycle smoothing monetary and fiscal policy institutions; 7) codifying and enforcing full disclosure régimes in large markets with wide

asymmetries of information such as capital markets; and 8) serving as the provider of some humane social safety net and funding for public goods.

Since efficient economic allocation generally depends upon the soundness of most of these legal institutions, the fact that economists have been first at the door to reform resource-rich nations in transition has put the cart before the horse, sometimes with fantastically negative consequences.[41] Because institutions take time, public confidence, and political will to erect, they may imprudently be delayed, especially in newly liberalized or in wealth-discovering nations, promoting Dutch Disease, inviting corruption, or, perhaps most importantly, denying residents at large the surplus of the marketplace they would otherwise garner in countless immeasurable, incremental ways under the protection of economic rights.

In his last book, influential economist Mancur Olson forcefully emphasized the contribution to development of a clear assignation of rights over property and the enforcement of contracts. The former commits the owner to stewardship and creates incentives to support otherwise under-produced public goods, and the former and the latter together commit economic actors to more surplus-rich "repeat play" strategies, squeezing out net-negative dominant strategies like the vaunted prisoners' dilemma.[42] "To realize all the gains from trade, then, there has to be a legal system and political order that enforces contracts, protects property rights, carries out mortgage agreements, provides for limited liability corporations, and facilitates a lasting and widely used capital market . . ."[43]

In the realm of market regulation, studies have confirmed that "a primary factor accounting for whether the impact [of foreign direct investment (FDI)] is strongly positive or negative [to the *people* in the destination country as a whole] is the extent of competition in the markets in which the FDI is embedded."[44] This concern is not churlish; to the contrary, traditional theory holds that FDI is usually most forthcoming to those developing nations where high barriers to entry and concentration—often created by government fiat—prevail. The implication is that, if welfare is the true concern, a competition regulatory policy is cardinal.

The institutional development problem, in other words, has no independent cost; rather, it is the catalyst for other types of high-priced development failures. Many of the dangers of the unregulated economy, such as monopolization, failed property allocation, and lack of enforcement of contracts are likely to be peculiarly acute within the economy that is dependent upon natural resource production. Legal institutions must precede free transactions, since they both establish the context for marketplace transactions and they serve as the recourse when such transactions need to be enforced.

Environmental Degradation

Few resources can be harnessed or extracted without some immediate environmental harm. Mining causes erosion, run-off, health and safety hazards and destroys the landscape. Oil extraction is messy business. Logging causes runoff problems, landslides and air pollution, as well as endangering wildlife habitats and watersheds. Agriculture, if intensive, can have runoff problems and lead to desertification, salinization and inefficient water use. Even hydroelectric power has serious environmental consequences because of the damage it inflicts upon riparian ecosystems. There is a legitimate claim that this degradation alone can explain why natural resource-rich countries fail to develop.

Consider, for example, the large investor who buys the rights to exploit a forest's resources within a developing nation. Suppose that she would earn a return from the harvesting the forest's natural annual growth of nine percent. *Ceteris paribus,* if this return looked attractive relative to the rate of return offered on a bond of, say, six percent, the investor would choose to harvest the forest sustainably, culling its surplus and stewarding it as a source of cash flow well into the future, not to mention preserving a variety of unpriced environmental use and non-use values in this forest.

Of course, should the forest's replenishment rate compare unfavorably with the real interest rate, allocative efficiency is served if the forest's owner were to clear-cut and invest her savings. If the capital is repatriated into domestic bonds by the forest's owner, the developing nation has been divested of a critical component of natural capital which could have yielded surplus for its peoples for generations to come. In effect, rather than gaining in the long-run for its extensive natural resource endowment (effectively a form of capital),[45] the nation yields only modest, short-run gains when the property or property right is initially purchased and in short- term linkages when the resource is extracted:

> [M]any [developing nations] depend heavily on receipts on sales from [primary] commodities to the advanced industrial economies. Exhaustion of indigenous supplies, especially fuel supplies, could have disastrous impacts on developing economies dependent on such revenues. As well, depletion for the sake of monetary gain now might have significant future deleterious effects for a country as it reaches the stage of industrial development when its internal demand for fuel and minerals has grown to higher levels than at present. Finally reaching the stage when it has the technological capability and capital resources to reap the higher value-added benefits from domestic processing and manufacturing of raw materials, a developing country may find that domestic supplies have already dwindled.[46]

Traditionally, international economists presume that differences in the value of assets in two countries (i.e., differentials in real interest rates) are explained by the differences in the ratio of the exchange rates on those currencies. It can be safely assumed, however, that the risk premium is quite high on investments in many developing nations, so that a foreign investor in a natural resources extraction project will require a higher return altogether for

her investment if it is in a risky developing country.[47] If, for example, there is a risk of property expropriation, the threshold effective real interest rate climbs; in the new calculus, the investor is much more likely to clear-cut the forest and repatriate the profits.

The environmental degradation associated with natural resource exploitation exerts its destructive economic effect in one of the several general problems with natural resource-led development (such as corruption, lack of diversification, or even Dutch Disease) already cataloged. Another matter entirely is the recognition that, as a development metric, growth measured as GDP both undervalues essential expansions in welfare and overvalues those economic activities that rely heavily on natural capital. The former observation would not explain the paradox as empirically measured since these regression results only examine (though obviously simplistically) changes in GDP itself. The latter, if meaningful as an explanation, might cut the other way for nations with great natural resource endowments, since the exploitation of natural resource assets would show up in national accounts only once exploited (although, they should be counted as natural capital before their exploitation). With this varied set of possible explanations for the natural resources-development paradox, the case of an economy in transition with large natural resource endowments should prove didactic.

The Case of Kazakhstan

> The republics of Central Asia emerged from the Soviet Union with a combination of assets and handicaps. Their geographic isolation has complicated establishment of commercial relationships, and even name recognition in the West. (…) Serious deterioration of the Soviet-era education systems in all five countries threatens to diminish the capabilities of the next generation to contribute to the national economies at a time when those economies may be ready to flourish. At the same time, ample natural resources hold out the prospect that at least the republics most blessed in this way—Kazakhstan, Turkmenistan, and Uzbekistan—may ultimately enrich their economies and hence the standard of living of their people.[48]

As this citation suggests, the transitional economies' development problem is virtually historically unique, as they have inherited a great deal of capital—cultural, physical and human—from their days as oblasts in the Soviet Empire. Yet, they are still fundamentally "developing" economies. Planning for the use of their received capital—along with policy and political questions such as the institution of programs to protect human rights, democratic and civil freedoms, and the creation of an economic and financial infrastructure—is the path to prosperity in these nations which are, most decidedly and completely, "in transition".

However, natural capital is this study's exclusive concern. Kazakhstan boasts vast natural resource wealth, with mineral deposits (gold, natural gas, oil, coal and other minerals) topping the list, but it also produces cotton, cereals, and a variety of other foodstuffs. Arguably, the most important challenge that this economy faces in the coming century is

devising a policy for the proper management of these tremendous endowments of natural resources and primary products. Given the perplexities of natural resource development strategizing as described in this essay, this final portion of the paper will explore the challenges which the republic now faces as it works to parlay its broad natural resource wealth into economic well-being and higher per-capita standards of living for its 17.5 million inhabitants.

The analysis below will present the characteristics of Kazakhstan's natural resource base, then tackle the nation's specific natural resource *problématique* in qualitative, then quantitative terms. The former analyzes the pitfalls and opportunities associated with the nation's natural resource profile given the ostensible causes of the natural resource-development paradox. The latter will apply the Sachs and Warner regression slope parameters predictively, rather than retrospectively, to provide an assessment of Kazakhstan's prospects for development upon the back of its natural resource base.

Background

The largest Central Asian republic, Kazakhstan, has enjoyed independence from the Soviet Union since December 16, 1991, and has been ruled by Nursultan Nazarbayev since early 1995. Its population is predominantly Kazakh (forty-six percent), but it is home to a substantial Russian minority (about thirty-five percent). In the mid 1990s, Kazakhstan half-heartedly privatized many formerly-state-owned industries, notably selling some oil and mineral extraction facilities (arguably its economically healthiest holdovers from Soviet days) to Western companies.[49] Privatization continues apace, and the government hoped to raise another $550 million last year from state assets.[50] In early 1999, Kazakhstan removed the exchange rate peg on the tenge, its currency, which was pegged previously at ninety to the dollar. Upon float, it steadied at about 115 tenge to the dollar.[51] At a $2500 GDP per capita (measured by purchasing power parity, or "PPP") and with foreign direct investment ("FDI") in the range of $1 billion annually, Kazakhstan is the most economically dynamic of the Central Asian republics.[52] In the last quarter of 1998, Kazakhstan's growth faltered, and the *Economist Intelligence Unit* estimates that the nation's GDP will have shrunk by two-and-a-half percent in the final analysis, mainly caused by Russia's financial collapse and chronically low oil prices.[53]

Industrially, Kazakhstan retains (albeit rusting) capacity, producing manufactured products such as tires, paper, cement, fertilizer, chemicals, and yarn. It is still heavily dependent upon exports of primary products. The lion's share of its output consists of coal, natural gas, gold, cotton, iron ore, electricity, meat, milk, timber, sugar, and, of course, crude petroleum.[54] In the petroleum industry, Kazakhstan has actively and successfully courted western companies to invest in oil extraction in the Tenghiz oil field, north of the Caspian Sea.[55] The transportation infrastructure in Kazakhstan, however, remains rather primitive; the nation's true capacity to export its extracted mineral wealth

will be observed when new pipelines to ports on the Black and Mediterranean Seas are completed. With this natural resource profile, how will Kazakhstan fare in the face of the natural resource export-development paradox?

Qualitative Analysis

The declining terms of trade problem is a legitimate threat to Kazakhstan' natural resource exports because the country depends heavily upon oil exports which, until recently, have suffered spiraling price declines. If OPEC's recent agreements to limit supply can hold, however, oil earnings may take Kazakhstan down the road of the Arab exporters, enjoying successful one-product-led development. Otherwise, the terms-of-trade issue will not trump other concerns in Kazakhstan, which produces several manufactured products in addition to its array of primary products for export. Thus, if the terms of trade continue to decline as they have against primary commodities generally, a set of industries, though small and inefficient, can begin to pick up the slack. Additionally, its proximity and historical link with the Russian markets will serve it well as both an outlet for Kazakh exports when Russia recovers and, in the meantime, as a source of cheap imports of some basic manufactured products and spare parts. Still, the recent upswing in the price of oil serves as a forceful reminder that Kazakhstan stands as a potential exception to the rule of falling commodity prices.

On the other hand, the very reason for recent sanguine estimates of earnings from oil exports demonstrates the dangers of price volatility. Troublingly, there is also some evidence that price volatility may affect the agricultural sector adversely. Cereals trump cotton as the primary crop in Kazakhstan, and in 1992, a bumper crop of wheat might well have depressed regional prices were it not for the ironic fact that farmers were so undercapitalized that one-third of the grain could not get to market.[56] With increasing investment in distribution infrastructure, Kazakh growers, with their Soviet-era farm equipment, soon will be exposed to the productivity disciplines and cost strictures of prevailing world prices. Kazakh cereal growers generally have produced in such variable volume from year to year that output more than doubled in 1992 from 1991 levels, indicating that agricultural export earnings will continue to be an extremely volatile source of income.[57] And yet, in the first half of the decade, more than a third of all Kazakhs earned a living in the agricultural sector, showing its importance in the economy overall. While resources and capital in the mineral extraction industries may sometimes be liquidated and moved to more productive uses in the face of a sustained shock, such sectoral restructuring is much more difficult when the victim industry is agriculture, since its primary asset, land, is non-liquid.

In terms of diversification, precisely because it used to supply raw *and* intermediate products to other regions of the Soviet Union, linkages have developed around

Kazakhstan's specific set of natural resources, such that its economy is somewhat diversified in the face of possible primary product shocks. Its timber industry, for example, has paper processing facilities; it has steel plants to process its own metal ores, as well as some capacity to process foodstuffs. Perhaps as importantly, Kazakhstan's array of primary products for export is itself diverse, though by value, the nation's earnings are precariously concentrated in one or two major exports. Further linkages—particularly for oil, coal and gas refining and processing—must be forthcoming to maintain diversification. Such an industrial restructuring will be driven by the signaling effect brought on by free trade; "[t]he lowering of barriers to market-based trade is expected to realign the Kazakhstan economy towards primary production, like [sic] Chile in the late 1970s."[58] In particular, Kazakhstan should exploit an emerging comparative advantage in the industrial processing of indigenously available minerals.

Poised to become a major fossil fuel exporter, however, Kazakhstan faces a strange anecdotal history with respect to the Dutch Disease problem. Of course, it could take the competing examples of Nigeria and Indonesia as a lesson that it must craft a policy expressly acknowledging and reacting to the enigmas of the Dutch Disease. If it does follow this path, the National Bank of Kazakhstan (the central bank, or "NBK") must be prepared to devalue the tenge in response to pressures caused by the concentration of exports in one sector and by the sectoral restructuring at home. It must also commit to various forms of fiscal discipline, as explained above, in particular given the recent volatility of oil prices.

Alternatively, Kazakhstan may look at the experience of other oil exporters—OPEC nations in particular—and come to the conclusion that the Dutch Disease, for mineral exporters, is a taste which may be acquired. There has already been ample speculation, in fact, that Kazakhstan will be the next Kuwait, thriving upon the accumulated wealth of its single primary commodity.[59] Given the aggressiveness with which Kazakhstan has initiated the process of oil drilling and extraction in the past half decade, however, and its relatively small economic size, the nation's susceptibility to the affliction ought to be presumed.

Richard Auty's general assessment in a 1997 paper begins with the recognition that Kazakhstan's government may already have convinced itself that it will look more like Kuwait than Nigeria. His concern, in short, is that it ought to look more like Indonesia or Botswana—wary of Dutch Disease and, accordingly, careful with its policies. "[A] clear strategy for the deployment of oil sector revenues is required, reinforced by appropriate institutional mechanisms."[60] He calls for the use of a sort of precautionary principle, noting that the damage from not preparing for a case of Dutch Disease which strikes is much greater than the lost benefits associated with an ultimately unnecessary policy of circumspection and prevention. He concludes that oil rents should be accumulated in an

offshore capital fund until their size and potential uses can be better gauged. In the meantime, Kazakhstan should focus on balancing public finances without oil rents, improving its domestic capital markets, and promoting the agricultural sector. In the final analysis, there is, as of yet, little indication what policies Kazakhstan will pursue in the face of the prospect of Dutch Disease.

With abundant natural resources, the corruption trap could easily ensnare Kazakhstan. With a government (chief executive included) similar in composition to Soviet days and a law enforcement system also a holdover, the possibility of system-wide kleptocracy is quite real. Kazakhstan's 1994 privatization program seemed legitimate only relative to its neighbors' (Russia in particular), and Nazarbayev's *dirigisme* has lithely transgressed usually sacrosanct political lines. [61] In late 1995, he staged a referendum requesting the extension of his presidential term to December 2000, winning by a stunning, if not outright fraudulent ninety-five percent majority.[62] Nazarbayev won the last election by wide margins, and has thus established himself as "effectively… president for life."[63]

What is clear about the prospects for the development of corruption is that, as oil goes, so will go the nation. The country continues to debate whether and how to privatize its largest company, Kazakhoil, waffling because the company alone recently generated thirty-seven percent of government revenues. The current plan is to maintain Kazakhoil as a quasi-state monopoly with a mandatory twenty-five percent equity stake in any new oil projects in the country—a plan which appears totally out of date given the negotiating strength of the world's newly-merged oil conglomerates. The plan, along with state control of oil transport through Kaztransoil, is an open invitation for rent-seekers. The Chevron and ExxonMobil investment and the recently begun construction of the Caspian Pipeline Consortium's ("CPC") private oil export pipeline holds promise that the government's chokehold on oil will be relaxed.[64]

Government-led corruption, if not always malignant, accompanied the initial inflows of investment to fund oil extraction projects: "[l]arge oil and mineral contracts that require official approval and participation have surely contributed to the rampant corruption, but people in authority tend to use their position to let things happen (and then take a cut) rather than to obstruct and delay."[65] The issues in the Kazakh corruption question boil down to these three: 1) is Kazakh corruption "good" corruption (i.e., regulation-eliding); 2) would even this "good" corruption have significant adverse effects; and 3) will small-scale "facilitation" corruption soon and easily devolve into large-scale, obstructionist corruption? Answers to these questions are not yet apparent.

If the realms of property rights allocation, macroeconomic policy, and economic regulatory policy provide any indication, there is reason for optimism. Kazakhstan made strides early. By March 1, 1995, property rights were fully codified (including more

abstract forms of property such as that for securities and obligations) and banking law soon followed.[66] To the extent that such law is both enforceable and enforced, Kazakhstan's rules can be said to be quite near some parity with basic modern Western standards, though its bankruptcy laws are weak and its government is still (understandably given its history and the state of transition) touchy about seeing inefficient firms close their doors.[67]

The nation passed an important stage in 1995 with the establishment of viable monetary and fiscal policies, initiated originally with the help and at the behest of the IMF in 1992. In 1993, Kazakhstan broke with the "ruble zone," and monetized its way out of its share of Soviet-era debt. The result was a hyperinflation in the realm of 1,200 percent annually in 1994. By 1996, seigniorage and inflation were under control as a result of IMF directives; inflation steadied at an annual rate of twenty-six percent. Similarly, Kazakhstan reduced its budget deficit from seven to four percent of GDP during the same period.[68] Kazakhstan introduced (and successfully collected) a value-added tax ("VAT") of twelve percent in 1995, again out-performing its Russian counterparts in transition.[69] These orthodox stabilization policies elicited rosy predictions in 1996, but the Russian economic collapse and the continued negative trajectory of oil prices put the Kazakh economy on the skids by the end of last year. While inflation was low because of the flood of cheaper Russian manufactured products and falling commodity prices (primarily oil), the current account deficit grew to nine percent of GDP, renewing calls for trade restrictions and significantly worsening Kazakhstan's reserves position. It was this pressure that forced the NBK to begin a slow depreciation of its exchange rate (now floating), to raise interest rates, and to draw down part of its IMF stand-by loans to back its currency.[70] These signs are not positive, but not disastrous, as the two shocks which Kazakhstan endured simultaneously (the Russian collapse and chronically low oil prices) were extraordinary, severe, and have also largely passed.

Resource extraction usually comes at a considerable environmental cost, and Kazakhstan is coming into its own as a nation with an albatross-like environmental handicap. Soviet resource exploitation policies left Kazakhstan in environmental disarray. "Most of the water in Kazakhstan is polluted by industrial effluents, pesticide and fertilizer residue, and, in some places, radioactivity."[71] Though less affected economically than Uzbekistan by the shocking desiccation of the Aral Sea, Kazakhstan suffered severe, irreversible degradation of its cotton production capacity because of the imprudent irrigation projects and profligate water use that were encouraged in Soviet times in order to increase cotton yields at all costs. The fishing industry, well capitalized to harvest the bounty of the Aral Sea, is literally useless, as there is very little of the Aral Sea left today. What does remain of the Sea is unproductive because concentrations of salt and mercury are so poisonous to life that no fish have survived. The dust bowls left behind spew salt and poison in the air, making the land wholly barren. Because Kazakhstan served as the Soviet testing ground

for nuclear warheads, radiation accumulated over some 500 to 600 tests causes severe damage to human health.[72] The environmental problems are grave, and because they will be expensive to remedy, they cannot always be a priority in such a poor, economically unstable country.

More elaborate arguments about the economic effect of environmental harm and pollution aside, Kazakhstan's brand of environmental damage will weigh upon its capacity to develop, and its history suggests that there are long-term consequences to unsustainable development. These are valuable lessons for the nascent natural resource extraction industries which one hopes will not be lost.

Quantitative Predictions

The value of Kazakhstan's exports in 1997, freight on board, totaled $6.366 billion. While it is difficult to disaggregate the primary product exports from the secondary, a decent estimate of the total export earnings from primary products is about $4.561 billion.[73] To arrive at a variable comparable to Sachs and Warner's 1971 ratio of export earnings on primary products to total GDP (SXP), this inquiry will divide $4.561 billion by the 1997 figure for GDP at the average exchange rate (since this determines the values used in trade, rather than PPP), totaling $22.5 billion. The resulting index figure is about .203 (or 20.3 percent of GDP earned by exports of primary products). At the rate of growth as defined in the Sachs and Warner regression parameters, Kazakhstan stands to lose 2.73% ($600 million) of GDP per annum because of its concentration of primary product exports.

Below is a matrix giving the annualized losses, *ceterus paribus,* to the Kazakh GDP as estimated by the Sachs and Warner primary export concentration parameter.

T=	1	5	10	20	30	60
Year	1997	2002	2007	2017	2027	2057
Y_T ($bil.)	$20.42	$18.29	$15.93	$12.08	$9.166	$4.001
%?Y	-2.73	-12.9	-24.1	-42.5	-56.3	-80.9

The Kazakh economy, according to the Sachs and Warner parameter, would shrink by about eighty percent in sixty years!

It is important to emphasize, first, that this chart shows the predicted effect of Kazakhstan's reliance upon export of primary products in its GDP isolated from the effect of all other consequential variables. In reality, the effect on change in GDP is the sum of this and many other factors, such as openness to trade, absence or presence of corruption, labor force issues, etc., which all contribute to Kazakhstan's GDP from year to year. The figures merely illustrate the downward *pressure* of the natural resource paradox, isolated econometrically.

Finally, the Sachs and Warner regression data are, by definition, highly aggregated and therefore cannot account for specific characteristics (i.e., idiosyncratic errors) of any given country's primary product export profile. There is reason to believe in fact that a nation like Kazakhstan would be an outlier in any regression like Sachs and Warner's, for the cohort of former Soviet regions-*cum*-states, as economies in transition, have development profiles so different from the traditional. Because country-specific characteristics alone might effect development much more profoundly than any such generalized trend, a theorist ought to be circumspect when applying a generalized formula such as the Sachs and Warner regression to the profile of an individual nation.[74] Though the factor has been considered in the parameter, the separable dilemma of an oil exporting nation merits the search for and use of a distinct parameter applicable only to oil exporters.

The result of this inquiry is striking. If we take the Sachs and Warner parameter at face value, countries which have Kazakhstan's export profile—that is, they earn more than the mean twelve or so percent of their GDP from export—are poised to suffer this tendency to retrogression, rather than enjoy the spoils of growth as they exploit their natural resource endowments.

Conclusion: Leadership and the Mineral Exporter

Mineral Exporter Exceptionalism?

There are various reasons to suspect that the Sachs and Warner regression parameters are biased or not applicable, and that the result is ironic for a reason—it may be simply wrong. Nonetheless, this conclusion provides an occasion, looking back, to discuss analytically the finer points of the natural resource paradox as applied to the mineral-based economies specifically. If the natural resource paradox is a rule, could mineral economies (or perhaps economies endowed with high-rent natural resources) prove to be the exception? Alan Gelb explicates the subtleties of this issue well:

> [M]ineral production has some peculiar features: it is large-scale, enclave, and capital-intensive, usually with close links to multinational firms, often with high wages compared with the rest of the economy and with a high degree of uncertainty (…) .
>
> The available evidence concerning the impact on development of rent in general, and of mineral rent in particular, can only be described as mixed. On the one hand… [rent] has indeed played a leading role in the growth of such industrial economies as the United States, Canada and Australia (…).
>
> On the other hand, a positive causal link between high-rent activities and development is certainly not inevitable. A lengthy literature raises the possibility that the high-rent sector may inhibit the accumulation and upgrading of reproducible factors of production, and that in the long run this diversion of resources and attention can stultify growth.[75]

In short, there is no consensus on the development trajectory of mineral exporting economies, and anecdotal evidence is dichotomous.

With the significant levels of FDI inflow associated with oil exploitation, Kazakhstan may be able to count on the stability that a thriving oil business brings to the rest of the economy for a long time. [76] Supposing that stability (which was notably lacking until very recently), these figures bode well for Kazakhstan's macroeconomic health. "Increased oil wealth," agrees Richard Auty, "could help the Kazakh transition because the mineral rents allow a higher rate of investment while the extra export revenue eases the foreign exchange constraint on development."[77]

Leadership

What is clear, nonetheless, is that *lack of clarity* implies strongly the value of the precautionary principle and hence effective leadership; nations in transition such as Kazakhstan, which face a poorly understood development problem as a whole, confront additional complications in policy-making since their natural-resource-based growth strategies are also generally poorly understood. It would be tempting to perceive the development process—especially in the "post-Prebisch" era—as dependent only upon comparative advantage and guided only by the invisible hand. Yet this paper's analysis ought to lead the reader to the conclusion that, while *dirigisme* in its crudest, caricatured form is not in order, the form of governmental activism which has permitted the OECD countries after World War II to smooth their business cycles, plan and stabilize their growth and react to those aspects of their economies which create instability, must sit on top of the agenda for natural resource rich nations.

The questions, answers, and examples—qualitative and quantitative—of the natural resource paradox lead to the assessment that leadership will be the ultimate arbiter of the fate of nations like Kazakhstan that face a policy imperative. Leaders must ensure that oil revenue predictions are taken at their most conservative, as Auty prescribes. They must temper the impulse to reward friends and family with lucrative, questionable natural resource extraction contracts. Leaders must choose to sequester boom-sector revenues foreign savings rather than investing heavily in self-aggrandizing projects as monuments to vanity. They must see to it that mundane laws and the rule of law more generally precede the glamorous exchange in more abstract forms of property such as securities and obligations. They must call in experts in the face of complex economic conditions, and decide just the right amount of discretion these experts will be accorded. Leaders must resist the temptation to load insupportable costs on future deals by backpedaling on its commitments, rendering its project bargains "obsolete." Finally, they must stay the course in the face of pain when economy-wide restructuring is required.

In short, leadership promotes stewardship. It prevents the temptations of the short term—arguably the root cause of all the above-posited channels of the natural resource paradox—from derailing the economy along its path to long term, sustained growth. Indeed, there are many parallels here with the broader environmental dilemma of "sustainable development," which charges leaders with the awesome responsibility of preserving intergenerational equity; as a principle, it forbids those living today from arrogating power and resources from those not yet born, those who have no voice beyond their abstract mathematical existence integrated within the value of a discount rate. It takes, in other words, discipline to adopt a long-term focus.

At the risk of wrapping the analysis in the straight-jacket of Protestant work ethic mythologies, this paper proposes that it is leadership alone which will need to drive a decision-maker in a well-endowed LDC to withstand the easy-won gains of the short term at the expense of the hard-won gains of the long, transforming natural resource endowments from a curse to a blessing.

> *Is it not better that a man should accept the first pains and mortifications. . . which nature is not slack in sending him, as hints that he must expect no other good than the just fruit of his own labor and self-denial?...Let him esteem nature a perpetual counselor, and her perfections the exact measure of our deviations. Let him make the night the night and the day the day. Let him control the habit of expense. Let him see that as much wisdom may be expended on a private economy as on an empire, and as much wisdom may be drawn from it.*
>
> -Ralph Waldo Emerson, "Prudence"

Notes

[1] See Jeffrey D. Sachs and Andrew M. Warner, "Natural Resource Abundance and Economic Growth," Harvard Institute for International Development, Development Discussion Paper No. 517a (October, 1995). For an interesting, brief explanation of the role of natural resources in the various stages of development, see John H. Adler, "Changes in the Role of Resources at Different Stages of Economic Development," Joseph J. Spengler, *Natural Resources and Economic Growth* (Washington, D.C.: Resources for the Future, 1961), 48-70 Also Richard Auty, "Does Kazakhstan Oil Wealth Help or Hinder the Transition?," Harvard Institute for International Development, Development Discussion Paper No. 615 (December, 1997). For the general principle, that natural resources were a prerequisite for growth, see Henry Bienen and H. Jeffrey Leonard, "Environment, Economic Growth, and Distribution in the Third World", H. Jeffrey Leonard, *Divesting Nature's Capital: The Political Economy of Environmental Abuse in the Third World* (New York: Holmes & Meier, 1985), 52-53.

[2] An exchange between Candide and Cacambo in Eldorado appropriately parodies European colonists' expectations that they may get something for nothing in the New World: "[Candide] *voulut savoir comment on priait Dieu dans l'Eldorado*. « *Nous ne le prions point, dit le bon et respectable sage; nous n'avons rien à lui demander, il nous a donné tout ce qu'il nous faut* »" Voltaire, *Candide ou L'Optimisme*, (Paris, Bordas, 1984), 110.

[3] Miguel Urrutia, *Preface*, Miguel Urrutia & Setsuko Yukawa, *Economic Development Policies in Resource-Rich Countries* (Tokyo: The United Nations University, 1988), ix.

[4] Works running the gamut of these perspectives are the following:"Primary Exports" (Chapter 17), Malcolm Gillis, Dwight H. Perkins, Michael Roemer and Donald R. Snodgrass, *Economics of Development*, 4 ed. (New York: W.W. Norton, 1996), Joseph L. Fisher, *Foreward*, Joseph Grunwald and Philip Musgrove, *Natural Resources in Latin American Development* (Baltimore, MD: Johns Hopkins Press, 1970), Sachs and Warner (1995) and "A Raw Deal for Commodities," *The Economist*, 17 April 1999; .

[5] Gillis, 462.

[6] Sachs and Warner, 3.

[7] *Ibid*, 8.

[8] These indexes are, of course, subjectively determined and no doubt controversial. The data and the methods used to develop these indices are available on the Harvard Institute for International Development website http://www.hiid.harvard.edu.

[9] The larger problem with the hypothesized relationship is the possibility that the dependent and independent variables are mutually dependent upon initial GDP.

[10] See Ann Seidman, *Natural Resources and National Wealth: The Copper Case* (New York: Praeger Publishers, 1975), 3-11.

[11] Gillis, 107.

[12] United Nations, *The Economic Development of Latin America and its Principal Problems* (Lake Success, New York: United Nations, 1950). Hans Singer, "The Distribution of Trade between Investing and Borrowing Countries," *American Economic Review*, 40 (May 1950), 473-485.

[13] Gillis, 470. Also, David W. Pearce and Jeremy J. Warford, *World Without End: Economics, Environment and Sustainable Development* (Oxford: Oxford University Press, 1993), 284-285.

[14] See Gillis, 471. Note also that others have found the income terms of trade constant over the same period. See*, e.g.*, Pearce and Warford, 284-285. Collier and Gunning, for example, point to terms-of-trade deterioration as an important factor in the poor African economic performance. "Explaining African Economic Performance," *Journal of Economic Literature*, 37**,** (March 1999), 72-73.

[15] "A Raw Deal for Commodities." Moreover, the 1997 World Bank Report, commented that "[c]ommodity prices may have taken another step down in the long history of declining prices relative to those of manufactured goods."

[16] "A Raw Deal for Commodities".
[17] Brian Urquhart, *Hammarskjold* (London: W. W. Norton, 1972), 374.
[18] Deepak Lal, *The Poverty of "Development Economics"* (Cambridge, MA: Harvard University Press, 1985), 49.
[19] Further, on the microeconomic level, consumption theory posits that consumers could derive a great deal of utility from the capacity to smooth their consumption across time, independent of fluctuations in their income. Volatile prices prevent consumers from spreading their risk predictably, since they, as producers, have difficulty estimating their lifetime incomes.
[20] Alasdair MacBean, *Export Instability and Economic Development* (Cambridge, MA: Harvard University Press, 1966).
[21] Christián Moran, "Export Fluctuations and Economic Growth: An Empirical Analysis," *Journal of Development Economics*, 12 (February/April 1983), 195; 216.
[22] David Lim, "Export Instability and Economic Growth", in Urrutia, 69-70.
[23] For an explanation of this evolutionary process of "creative destruction" or adaptive efficiency, see Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper Torchbooks, 1942), 81-86.
[24] Albert Hirschman, *The Strategy of Economic Development* (New Haven, CT: Yale University Press, 1958), 98.
[25] Gillis, 464.
[26] *Ibid.*, 475
[27] Alan Gelb, *Oil Windfalls: Blessing or Curse?* (Oxford: Oxford University Press, 1988), 21; W. Max Corden and S. Peter Neary, "Booming Sector Deindustrialization in a Small Open Economy", *Economic Journal*, 92 (December 1982).
[28] Bradford L. Barham & Oliver T. Coomes, "Reinterpreting the Amazon Rubber Boom: Investment, the State and Dutch Disease," *Latin American Research Review*, 29, (1994); Donald G. Richards, "Booming-Sector Economic Activity in Paraguay 1973-86: A Case of Dutch Disease?," *The Journal of Development Studies*, 31 (December, 1994).
[29] *Ibid.*, 141.
[30] Graham A. Davis, "Learning to Love the Dutch Disease: Evidence from the Mineral Economies," *World Development*, 23, 10 (October 1999), 1765.
[31] "A Global War Against Bribery", *The Economist*, January 16, 1999. See also Fritz F. Heimann, "Should Foreign Bribery Be A Crime?", *Transparency International* 2 (1994).
[32] "A Global War on Poverty."
[33] For an extensive bibliography on the economic literature on corruption, see the World Bank's web page on the subject: http://www.worldbank.org/publicsector/anticorrupt.
[34] The World Bank, "Corruption and Economic Development," and The World Bank Poverty Reduction and Economic Management Group, "Helping Countries Combat Corruption: The Role of the World Bank" (September 1997), 8.
[35] Paul Collier and Anke Hoeffler, "Justice-Seeking and Loot-Seeking in Civil War," The World Bank (February 17, 1999), 1.
[36] Edith T. Penrose, "Profit Sharing between Producing Countries and Oil Companies in the Middle East", *Economic Journal*, 69 (June 1959): 238-54 and Edith T. Penrose, *The Large International Firm in Developing Countries: The International Petroleum Industry* (London: Allen and Unwin, 1968); see also Charles P. Kindleburger, *Economic Development* (New York: McGraw-Hill, 1965).
[37] Theodore H. Moran, *Foreign Direct Investment and Development* (Washington: Institute for International Economics, 1998), 142-145
[38] Stuart H. Deming, "International Legal Developments in Review: 1998", *International Lawyer* (Summer 1999), 507.

[39] For an effective critique of the rule of law movement, see Thomas Carothers, "The Rule of Law Revival", *Foreign Affairs* (March/Arpil 1998), 95.
[40] For an excellent, accessible review of the most reasonable justifications for some such government interventions, see Robert Kuttner, *Everything for Sale* (New York: Knopf, 1998), 225-280.
[41] Carla Anne Robbins and Steve Liesman, "Aborted Mission: How an Aid program Vital to New Economy of Russia Collapsed", *Wall Street Journal*, August 13, 1997.
[42] Olson divides the world's market transactions into the "self-enforcing" and the "socially contrived", the former being "irrepressible" and thus less dependent upon rights assignation, and the latter being much more dependent upon the creation and effective enforcement of an economic rights régime. "Socially contrived" markets, of course, predominate in rich, industrialized countries. Mancur Olson, *Power and Prosperity: Outgrowing Capitalist and Communist Dictatorships* (New York: Basic Books, 2000) 173-195.
[43] *Ibid*. 185.
[44] *FDI and Development*, 24-25, citing studies by the United Nations Conference on Trade and showing that one-third of all FDI projects "would actually reduce the country's national income, even though they were profitable to the foreign investors who undertook them." (citing Sanjaya Lall and Paul Streeten, *Foreign Investment Transnationals and Developing Countries* (Boulder, CO: Westview Press, 1977)); United Nations Conference on Trade and Development (UNCTAD), *Incentives and Foreign Direct Investment*, Geneva, UNCTAD, 1996).
[45] Robert Costanza, Ralph D. Arge, et al., "The Value of the World's Ecosystem Services and Natural Capital," *Nature* (May 15, 1997).
[46] Henry Bienen and H. Jeffrey Leonard, "Environment, Economic Growth, and Distribution in the Third World", in Leonard, 54.
[47] Paul R. Krugman and Maurice Obstfeld, *International Economics: Theory and Policy* (New York: Harper Collins,, 1994), 352-353.
[48] United States Library of Congress, *Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan: Country Studies* (Washington, DC: Federal Research Division of the Library of Congress, 1997), lxi.
[49] *Country studies*, xlii-xliv.
[50] *Economist Intelligence Unit*, *Kazakhstan* (1st Quarter 1999), 14.
[51] "Tetchy Tenge", *The Economist*, April 17, 1999.
[52] The Central Intelligence Agency, *The World Factbook* (Washington, DC, 1998), 249.
[53] *Economist Intelligence Unit*, 14.
[54] Richard Pomfret, *The Economies of Central Asia* (Princeton: Princeton University Press, 1995), 84.
[55] In the middle of the decade, Chevron signed a $1.5 billion oil deal for extraction in the Tenghiz and Mobil soon followed. *Country studies*, xliv.
[56] Pomfret, 80-84.
[57] *Ibid*.
[58] *Ibid.*, 12, citing Amin Guiterrez [sic] de Pineres and Ferrantino 1997.
[59] Auty, 3.
[60] Ibid., 14.
[61] Kazakhstan instituted a voucher privatization program which, it is said, reached at least ninety-five percent of the population. Those vouchers ended up highly concentrated in the hands of a few; twenty companies collected sixty percent of the vouchers. It was rumored that Nazarbayev's nephew controlled the privatization program and gave away many not-so-credible deals to cronies. *Country Studies*, 59-60.
[62] *Ibid.*, 77.
[63] *Economist Intelligence Unit*, 6.
[64] *Ibid.*, 28-29.
[65] Pomfret, 95.

[66] Michael Kaser, *The Economies of Kazakhstan and Uzbekistan* (London: The Royal Institute of World Affairs, 1997), 39.
[67] *Economist Intelligence Unit*, 22.
[68] Kaser, 27-29.
[69] *Ibid*, 30-31.
[70] *Economist Intelligence Unit*, 34-35.
[71] *Country studies*, 22.
[72] *Ibid*, 23.
[73] *Economist Intelligence Unit*, 37-38. The year 1997 is the chosen as the benchmark year to avoid the use of estimates for 1998. Export totals are taken directly from the table on page 38. Primary product exports are taken from page 37, and include cereals, non-metallic minerals, metal ores and scrap, mineral fuels, precious metals, ferrous metals, and (arbitrarily chosen) one-half of the values for "copper and manufactures" and "zinc and manufactures". Excluded are inorganic chemicals, one-half of the values for "copper and manufactures" and "zinc and manufactures", and machinery excluding electricity.
[74] That said, it should be noted that Sachs and Warner do examine the oil exporting economies in their paper as a separate class and find a similar trend even over the period of OPEC market hegemony. They also control for regional effects.
[75] Gelb, 32-33.
[76] Kaser, 30.
[77] Auty, 2.

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