# REFLECTIONS ON OIL, DUTCH DISEASE AND INVESTMENT DECISIONS

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University of California, Los Angeles
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Recap of Presentation at the University of Ghana, 18 June 2009

At the very outset, let me make it clear that I am in no sense an experienced Africa hand. I first set foot on this continent in a two-week mission to Malawi in 1985. This was followed by two visits of similar length to Egypt in 2002, and another to Madagascar in 2007. So I have to ask your forbearance as I speak in somewhat general terms, based mainly on my 50-odd-years of experience in developing countries in other parts of the world (mainly in Latin America but also in India, Indonesia, China, the Philippines and a few other places), and partly also on the insights that experience has helped to develop, helping me to interpret the bits and pieces of evidence that have come to my attention as I prepared for this talk and then gave it as this 2-week visit was drawing to a close.

In selecting the title for this talk, I was partly motivated by a sort of apprehension that I sensed among development economists, concerning what might happen when Ghana's oil finally began to flow to the world's markets. The apprehension concerned the phenomenon of "Dutch Disease", sometimes also called the "resource curse" or "the curse of oil". Lying behind this apprehension was a sense that once Ghana's oil came on line, there would be a big upward leap in the country's foreign currency receipts, which in turn would very likely result in a major appreciation of the cedi (a sharp reduction in the cedi price of the dollar), in real terms.

"Dutch Disease" has been a subject of interest for more than 30 years. I have never been happy with that term, or with the notion of a resource "curse", because its connotation of

something unqualifiedly bad is itself mistaken. An important new source of foreign exchange should be applauded, not lamented by a country. Indeed, if the disease or curse is nothing more than a disease or curse, an easy answer would be to leave the oil or copper or diamond deposits untapped, and just let the economy go on as before. But this is not the case. The discovery of an important new source of foreign exchange is a good thing for a country, with benefits that at least potentially are far greater than its costs. Even the appreciation of the real exchange rate, which is what gave "Dutch Disease" its name, turns out to be a net benefit in any country whose imports exceed its other (in this case non-oil) exports. A fall of, say, 20% in the cedi price of the dollar (again in real terms) would benefit the final consumers and other users of imports to the tune of 20% of what they spend on imports, while it would hurt the producers of other (non-oil) exports, also by 20% of what they earn. It takes only very simple math to reach the conclusion that the country is a net gainer, so long as its total imports exceed its other (non-oil) exports. (Non-oil applies in the case where oil is the new source of foreign exchange receipts; non-copper would apply if the new source were copper, non-diamonds would apply if the new source were diamonds, etc.)

So we start by recognizing that oil, copper, and diamond discoveries are indeed, at least potentially, net benefits for the country concerned, <u>even when</u> the discoveries are allowed to have their full effect in causing the country's real exchange rate to appreciate. But that does not mean that the country could not do even better by seeking another outcome. In what follows I will recount a few cases of countries trying to deal with this sort of situation. But before I start with the stories, let me emphasize that when things turn out badly for a country, it is not the oil, or copper or diamonds that is to blame. Rather, it is the weakness of character of the country's policymakers that turns out to be the biggest source of trouble.

**Some Oil-Boom Experiences**

I was lucky, in a sense, to have first-hand experiences with oil booms in Venezuela (1974-75), Mexico (1979-80) and Indonesia, and thus can share with you some of the insights these experiences produced. First came Venezuela, where I was asked to join with a group of Venezuelan economists to try to determine the best way for the country to use the foreign exchange proceeds of the 1974 oil-price boom. The group in question was the country's so-called Investment Fund (Fondo de Inversion), whose responsibilities included advising on the use of such funds. We were in principle prepared for meetings spanning up to a week, but in the end we finished in a few hours on a single afternoon. The reason was our discovery that a total consensus existed among the dozen or so people in the group. Our joint message was that the Venezuelan government should in the first instance invest its petrodollar proceeds in the capital markets of the world. In so doing it should seek a respectable real rate of return, perhaps comparable to what major universities like Harvard and Stanford are able to earn on their endowments. Then it should gradually repatriate those funds, if, as, and when it finds investment projects at home which have likely real rates of return (for the economy as a whole) that exceed what can be expected from the country's international investment portfolio.

This was very sound, prudent advice. It recognized that the oil in the ground was a capital asset, and that it was perfectly sensible to consider its proceeds as capital rather than income. And secondly, counting those proceeds as capital, it was fully appropriate to use them prudently to generate, over time, a flow of benefits to the Venezuelan people.

I'll jump now to my Mexican experience of 1979. Once again there was a major rise in the world-market price of oil. Since Mexico's sole producer of oil was Pemex, a government corporation, it was natural for the question to arise of how best to use the proceeds of the boom.

So a meeting was called, this time in the Presidency of Mexico, to seek an answer, and once again I was lucky enough to be invited to the meeting. Perhaps not surprisingly, it was an almost exact replay of the Venezuelan meeting five years earlier. The first step was to invest the proceeds abroad, seeking a prudent but good real rate of return. The second step would repatriate the money gradually, but only to the extent that sound investments were found within Mexico, generating a real (cost-benefit) rate of return higher than what could be expected from the country's foreign portfolio.

But now came a difference from the Venezuelan case. The Mexico group went on to advise that "above all, we must avoid the type of mistakes that Venezuela made in 1974-75!" What was this mistake? It was spending all those petrodollars as fast as they came in. What had happened in the Venezuelan case was that the government could not resist the temptation to use whatever funds became available, to advance its own political purposes. Little was invested productively, and once the oil-price boom was over, Venezuela had little to show from the exercise.

In order not to repeat the Venezuelan experience, the group in the Presidency of Mexico strongly advised that the President himself make a nationally televised speech in which he would explain the wisdom of our recommended policy. This he actually did, and for a while it seemed as if the policy might really be carried out.

What we did not recognize was the enormous political strength of the governors of the separate states into which Mexico is divided, a strength that was perhaps made even more demanding as a consequence of the provision that governors were limited to just one term of office. As a consequence, it was quite natural for the governors to want to use the petrodollar proceeds sooner rather than later.

Mexico's State governors had always looked around for sources of funds. New national programs to help finance their projects, grants from the national treasury, loans from the development banks or the Central Bank -- all these were standard sources to be tapped. But before the oil-price boom, the national authorities could truthfully say, most of the time, that they just didn't have the money to finance every governor's list of favorite projects. But in the presence of the oil-price boom, this response was no longer credible. Now the national authorities would have to say, "yes, we have money parked overseas, but we are not ready to tap into that fund, in order to finance your projects." That response seemed to work for a time, and a number of governors went away disappointed. But before long a couple of very powerful governors got their way, and received financing for their pet projects. Almost in a wink of an eye, the rest of the governors were back in line, asking for their cut.

The horrible denouement of this political ballet was not that all the proceeds of the petrodollar boom were spent -- no, it was far worse than that. Before it was over something like 3 or 4 times the petrodollar proceeds were spent, the excess being financed by the central government's borrowing abroad, against future oil revenues.

Mexico's 1979 surrender to political pressures involved more than just spending far too much money. It also entailed spending this money very unwisely. The great bulk of the petrodollar outlays from that experience went to build civic centers, stadiums, plazas, etc. -- items which had little or no yield even in pesos, let alone in the hard currency that was needed to service the massive increase in the country's foreign indebtedness that financed most of its spending spree of that period. Little wonder, then, that Mexico ended up defaulting on its foreign debt in the wake of the 1982-83 debt crisis.

Indonesia is an especially interesting case of petrodollar management, because it spans both bad and good responses. In the 1974-75 oil-price boom, Indonesia too went on a big spending spree, which included an ill-fated investment in a steel mill based on a new technology that never passed the economic test. But by 1979, the country had learned its lesson, and thanks to an economic team led by Ali Wardhana and Professor Widjojo and advised by a Harvard group captained by Professor Malcolm Gillis, Indonesia managed to resist the temptation to spend, and actually did put the great bulk of its petrodollar proceeds into foreign investments, as the Venezuelan and Mexican panels had originally advised.

But the model of self-restraint in the management of oil revenues is surely Norway, which really carried to its full extreme the principle that oil which started as "national capital in the ground" should still be national capital after it was extracted. In Norway's case, the principle is to invest the nation's petrodollar proceeds in international capital markets, but then not to contemplate repatriation of that capital, instead treating it as a permanent income-producing fund. Thus Norway's rule is to repatriate just the income from the Oil Fund. This effectively handles any problem linked to Dutch Disease, since the flow of foreign currency is very steady, particularly so since Norway does not repatriate each year's earnings, but smoothes out the flow by repatriating a moving average of several years' earnings of the Oil Fund.

Norway's policy wins hands down on the criterion of self-restraint, but it does not on strictly economic terms surpass the simple rule endorsed by the Venezuelan and Mexican panels, which advised repatriating petrodollar proceeds when, as, and if they promised to yield a larger return at home than abroad. I myself, however, would probably vote for the Norwegian approach, simply for the discipline that it imposes. Sort of like Ulysses having himself tied to the mast in order to be able to resist Circe's siren songs.

Alaska follows a scheme similar to Norway's, but with the special twist of actually distributing the State's petrodollar royalties to its citizens, also using a moving average scheme to smooth out year-to-year fluctuations. The special merit of this scheme is that it virtually guarantees compliance with the most basic of all cost-benefit tests -- that benefits should be greater than or equal to costs. Like the Norway scheme, it may miss some public investment opportunities with very high ratios of benefits to costs, but it absolutely guarantees that high-cost white-elephant investments (like those of Mexico in 1979-80), with costs far in excess of benefits, would be avoided. This is because we can take it for granted that families and individuals will get what to them is at least a dollar's worth of benefits, out of each dollar that they receive.

## It's Not Just Oil, Or National Resources

I hope it has already been made clear that Dutch Disease is not really a disease, but merely one negative consequence of a disturbance like an oil or copper price boom, that is in and of itself is, at least potentially, a net benefit for the country in question. Now I want to emphasize that the syndrome referred to as Dutch Disease can come from many different sources. It is not just oil, not just minerals, not just natural resources. The same consequences can flow from a big inflows of foreign exchange from any source -- a big increase in manufactured exports, for example, or in foreign aid, or in emigrant remittances, or in capital flows from abroad.

The defining characteristic is in the first instance a big increase in the supply of foreign exchange. The mantra is -- when dollars are abundant, they will tend to be cheap in real terms; when dollars are scarce they will tend to be expensive.

Here is a story from El Salvador, which illustrates the point. In the latter half of 1988, I organized a mission to El Salvador under the auspices of USAID. Its members were all first-rate economists, most of them having had wide experience in ministries, Central Banks, budget offices, etc., in their home countries. Our purpose was to survey the economic scene in El Salvador, and then, drawing on our own past experiences, make suggestions which would likely be useful to the new economic team that would take over after a Presidential election in early 1989. In visits spanning close to six months, we spoke to all the presidential candidates, to their economic advisors, and to the various interest groups (from agriculture, commerce, manufacturing, services, etc.) concerned with economic policy.

Most notable was our experience with the representatives of Salvadoran agriculture. The main export product of the country was coffee, and its coffee growers were up in arms about the exchange rate. In meeting after meeting with our group, they would rail against El Salvador's Central Bank. "How can these people be so uncomprehending, even so stupid," they would say, "Here we coffee people and other farmers are suffering all the time, fighting day-by-day simply to keep going. And there is the Central Bank standing idle month-after-month, in spite of its having the power to solve all our problems with the stroke of a pen! All our trouble comes from the exchange rate being fixed at 5 Colones per dollar. If that rate were 8 or 10 instead of 5, our businesses would be thriving. We simply cannot comprehend how the Central Bank can be so insensitive to this reality."

These complaints of the coffee farmers opened the door for us to try to educate our audiences to the economics of real exchange rates. It was true at that time, as the farmers alleged, that the dollar was cheap in real terms, a fact which made life difficult for coffee farmers and other producers of internationally traded goods. But the reason why the dollar was cheap

was not a simple caprice of the Central Bank. In fact, dollars were cheap (in real terms) because they were abundant. This abundance derived mainly from two sources -- foreign aid and emigrant remittances, each of these contributing an annual flow of dollars adding up to more than 5% of the country's GDP.

Our message was simple. If the dollar was to be made more expensive in real terms, something would have to be done to reduce its abundance, to make it scarcer. And so, only half in jest, we would tell the coffee growers that they shouldn't keep complaining about the Central Bank's failure to devalue the currency. Instead they should press their government to turn down next year's offers of foreign aid from the United States, the World Bank and others. And then they should write to their relatives in the U.S. to please stop sending dollars, and should plead with their friends and neighbors to do the same. Obviously, neither of these things had any likelihood of actually happening. Our real message was that the dollar was not cheap because of some arbitrary Central Bank decision, but rather because dollars were so abundant. Unless this abundance was somehow significantly reduced, the dollar was going to remain cheap in real terms.

Fortunately, we could refer our listeners to the not-too-distant history of El Salvador itself. In the early 1980s there had indeed been a major devaluation, from 2.5 to 5 Colones per dollar. Needless to say, this major jump in the price of the dollar gave a huge incentive to the expansion of the country's exports, and a similarly big incentive for Salvadorans to curtail their use of imports. As a result, the Central Bank ended up buying lots of dollars, as it was committed to do at the new fixed exchange rate of five Colones. This fueled an increase in the country's broad money supply, which then stimulated spending by the people, which in turn sparked a general rise in the prices of even those goods and services which were not directly

affected by the exchange rate move itself. This process is exactly what economic analysis tells us to expect when a fixed exchange rate is devalued in the absence of an important change in the underlying real circumstances of the economy. And it is essentially what happened in El Salvador. By a mere 18 months after the exchange rate had been doubled (from 2.5 to 5 Colones per dollar), the country's overall price level had also doubled, so that the real exchange rate was restored to its previous equilibrium level. This is what happens when a devaluation occurs without a major change in the underlying real equilibrium of the economy. Economists applaud a devaluation that helps an economy to move to a new equilibrium real exchange rate, reflecting changes that have in reality made the dollar scarcer than before. We do not see merit in a devaluation that serves no such equilibrating function.

## Dollar Abundance in Ghana

It does not take much exposure to the Ghanaian economy before one realizes that it is wrong to anticipate a huge surge in the aggregate flow of foreign currency into the country to happen as its oil reserves begin to be tapped over the next few years. Yes, there will be a big jump in petrodollars, but the total flow of dollars from other sources will have to suffer a drastic decline. It all has to do with the starting point. The year 2008 marked a peak in total foreign financing (equal to around a third of the country's GDP), and in the government's fiscal deficit (around 13% of GDP, counting grants from abroad). Without question, these levels are unsustainable; they simply must go down, and quite soon. The IMF, in April of this year, projected foreign financing to drop to 25% of GDP, and the government's fiscal deficit to be cut to 7-8% of GDP for 2009 and 2010. These cutbacks will be continuing beyond 2009-10, as Ghana's oil comes on line.

The relevant prospect is thus for oil revenues to enter the picture in place of the heavy borrowing that occurred in 2008, and that is likely to fall only modestly in 2009 (being replaced in part by special foreign aid funds linked to the world recession). When all is said and done, it is unlikely that Ghana's import capacity (financed by exports plus foreign grants plus capital flows plus remittances) will be significantly greater, as a fraction of GDP, in 2010 and 2011 than it was in 2008 or 2009. It might experience a relatively modest jump of, say, 2 or 3 percent of GDP, but not the kind of leap that would lead to a major real exchange rate appreciation.

Where does that leave us? My short answer is that if Dutch Disease is to be thought of as a problem for Ghana, it is already here, and has been here at least as of 2008, and probably starting earlier than that!!

The evidence favoring this interpretation is quite convincing. Though my stay in Ghana was too short and too busy to permit a scholarly assembly and analysis of all the relevant data, I had ample opportunity to see quite a number of symptoms that are characteristic of so-called Dutch Disease. Hotel rates, house prices, house and apartment rents, all appear to be close to U.S. levels in dollar terms. Restaurant meals are not far behind. Perhaps more important are the reports we received concerning the recent experience of Ghana's manufacturing sector. We were told that only a few firms remain out of Ghana's once-thriving textile industry. Nobody can point to a manufacturing sector yielding the kind of real rates of return that would be a magnet for new capital investment from both domestic and foreign sources.

Looked at from a different angle, a key feature of Dutch Disease is a boom in the nontradable sector of the economy. In the case of Ghana, construction has probably been the most dynamic part of the economy in recent years. Some of this has been public sector infrastructure investments using the proceeds of foreign borrowing by the government. Some

has been construction of family housing, using the proceeds of emigrant remittances, and, equivalently, investment by Ghanaian emigrants in houses for their own expected use as they later return to their native land. I was interested to learn from a number of different sources within Ghana, that there was a significant amount of housebuilding in Ghana by natives of Nigeria and other African countries. This was viewed as an important dividend of Ghana's notable recent record of political stability -- Ghana being regarded by residents of some other African countries as a "safe haven" to which they could repair in the event of trouble in their home countries, or even just as a comfortable place in which to retire. All this reflects the kind of increase in nontradables demand (and the associated bidding up of the prices of nontradables) that is a standard symptom of Dutch Disease.

Finally, there is the total flow of dollars into the country. A new inflow may have the effect of displacing some exports. It also may induce an increase in the country's foreign holdings (e.g., in an oil fund, or as international reserves, or simply by being held abroad for later use). But whatever is left after these offsets is reflected in the country's imports, which grew in Ghana from 62% of GDP in 2005 to 65% in 2006, 67% in 2007 and then leaped to 78% in 2008 (IMF, Regional Economic Outlook -- Sub-Saharan Africa, April, 2009, p. 81) A clear reflection of dollar abundance!!

## What To Do About Dutch Disease

If I am correct in diagnosing the actual situation of the Ghanaian economy as one in which the country already is indeed experiencing an episode of Dutch Disease, the question immediately arises of whether this experience should trigger some policy response, and if so, what sort of responses might be contemplated, and of these which ones might make sense?

At the outset let me repeat that in and of itself, an abundant flow of dollars (be it from exports, from capital movements, from foreign aid, from remittances, etc.) should in principle be a good thing for a country. And, indeed, it generally is. It is rare that an increment of dollar flows into a country will end up being initially spent exclusively on imports (or on tradable goods generally). Typically, it will be spent partly on tradables and partly on nontradables. It is this latter part, spent on nontradables, that acts as a stimulus to their demand. When the dollar inflow is in the form of capital or grants or remittances, the economic adjustment that is required in order to absorb these flows amounts to an unequivocal stimulus to the production of nontradables. This tends to pull resources away from the tradables sector, creating a gap that is mainly filled by an induced increase in imports. There is a famous trio of identities in national accounting which says:

The excess of a country's imports over its exports

(M-X)

must be exactly equal to

the excess of that country's demand for

tradables, over their supply

$\equiv (T^d - T^s)$,

which in turn must be exactly equal to that country's

total demand for currently produced goods and services

over its supply of same

$\equiv (y^d - y^s)$

This last expression says that any such situation of dollar inflows actually generates a case where the country's total demand for goods and services exceeds the total supply. When

that pressure hits the markets for nontradables, the demand for them goes up, and typically also their relative price (and a rise in the relative prices of nontradables means a fall in the relative price of tradables, i.e., Dutch Disease).

But does it make sense for a country to turn down foreign aid, or to ask its emigrants to stop sending money, or even to discourage capital inflows? My suggestion to the Salvadoran farmers was that this was a way to make the dollar scarcer and thus more valuable, but it was not something that I actually recommended their doing. The purpose of the suggestion was to make clear to the farmers that their intuitive solution of the Central Bank simply raising the nominal price of the dollar by 60 to 100 percent would not change the real situation (except during a short transition), while making the real changes that would in fact lead to a real devaluation of the Colon would be very costly, probably prohibitively costly, and was therefore not a reasonable option.

In the Ghanaian case, the least costly way to have influenced the real exchange rate in 2008 would probably have been not to borrow the extra U.S. $750 million that the government in fact borrowed in 2008, or maybe to have drastically reduced the size of that bond issue. But I'm told that part of the motive for that borrowing was connected with the 2008 presidential election, and that a goodly amount of the extra government spending that took place last year was aimed at helping the party then in power (recall that the 2008 fiscal deficit amounted to over 13% of GDP). But there is little ground to believe that if good advice on borrowing had been given, it would have been heeded, and very good ground to assume that such advice was indeed given, and that it was not heeded. New borrowing plus grants is projected by the IMF to fall from 18.1% of GDP in 2008 to 12.1% of GDP in 2009, some of that 2009 borrowing being motivated by a desire to cushion the impact of the world recession on the Ghanaian economy. So for the

present year it would in all likelihood not be prudent to push for a still sharper cutback in this item.

I now return to my basic theme. Ghana very likely has been experiencing Dutch Disease for several years. But this has by and large reflected good things that were happening to the economy -- capital inflows, foreign aid, emigrant remittances, high gold and cocoa prices. The economy has grown nicely, largely as a consequence of these expanded flows. There has been very good growth in construction, good growth in services, but relative stagnation if not decline in manufacturing. As we look to the future it is pretty clear that the country's heavy borrowing will continue to decline, and possibly its inflows from grants as well. But oil will pretty soon be coming on line, so the phenomenon of dollar abundance will very likely continue to prevail.

This does not seem (to me at least) to be too bad a fate for the Ghanaian economy. People constantly talk in such circumstances about diversifying exports and about building a new manufacturing base. These are not necessarily bad ideas but they can easily turn out to be bad. The absolutely key element for producing a good result is to recognize that the dollar will in all likelihood continue to be abundant and continue to be cheap in real terms. This means that any new activities that are to be developed within the tradable sector should be able to successfully compete in world markets, even with cheap dollars. Finding such activities is a real challenge, to which we will turn in the next section.

## Seeking New Activities of Comparative Advantage

The best broad piece of advice that one can give on this subject is that the government should try to create a framework in which market prices come as close as possible to reflecting the true economic costs, of final products, of intermediate inputs, and of factors of production. Using such instruments as taxes and subsidies to reflect true positive and negative externalities

falls fully within this schema, but care has to be taken to have a sound basis for such interventions. It is relatively easy to justify subsidies to education, sanitation, medical care for the poor, etc. Likewise it is easy to justify taxes that help deter traffic congestion and air and water pollution. But it is very hard to find genuine externalities connected with the production of any manufactured product. Likewise, in electricity, the received (and I believe correct) wisdom on the subject is that the best policy is to make sure that new capacity is available to meet the growing energy demands of a growing economy, at prices which reflect the true economic cost of that energy.

The bottom line is that a good framework in which prices reflect true costs is the starting point. This should be supplemented by efforts to curtail corruption, to make the judicial system more modern and efficient, to make it easy for new firms to start up and then freely and fairly compete with existing enterprises in any and every legal line of activity. Within such a framework, there is little sense in policymakers trying to "pick the winners". Those who are able to fight their way to gain a place in the market will be those who have found and proved the comparative advantage of their activities.

I think that the above advice surely covers the full range of manufacturing, retail, and regular service activities. But a special word is in order on the manufacturing side. Here we are witnessing a vast shift of production from the old industrial centers of the world to the new ones. This is particularly true for low-end manufacturing (textiles, shoes, simple electric appliances, furniture, etc.) China, India, Indonesia and the other Asian Tigers have amply demonstrated that they have a substantial comparative advantage in these areas.

China and Indonesia are especially attractive to manufacturing firms because, in addition to low labor costs and business-friendly government policies, they have the attraction of a huge

internal market with vast numbers of consumers and rapidly growing incomes. The question to ask, if one thinks of trying to promote foreign investment in any given low-end manufacturing activity, is for what reason would Ghana be viewed as a preferable location vis-a-vis, say, China, for establishing a new firm in that industry? I am sure that there are in fact industries in many developing countries for which the answer is yes. But among these we have to distinguish between the cases where this answer stems from a genuine advantage on the one hand and those where it is motivated by special subsidies and other artificial stimuli. In principle, the right test for whether a particular case falls in one category or the other is a standard cost-benefit test, to see whether the activity carries a net benefit for the country as a whole, vis-a-vis alternative uses of the same national resources. A sound policy framework should itself do most of the work, in the sense that the activities that turn out to be viable under such a framework will be those whose benefits will very likely exceed their costs.

## Agricultural Research and Extension

Special considerations come into play with respect to agriculture. In the first place, we have the issue of the size of the productive unit. Any given crop is likely to be raised by hundreds, or more likely thousands of different farmers in a country like Ghana. No one of them has a scale of operations large enough to justify serious scientific research activities at the level of the individual farm. Yet such activities can bring substantial net benefits to the country when they are carried out at the national level. This has been a traditional role for public-sector agricultural research stations, with their results being transmitted to individual farmers via a network of agricultural extension activities.

The special situation of agriculture stems from the importance of soil and climate in determining the economic viability of different varieties of seed, different rotations among crops,

and different treatments (planting times, watering, amounts and kinds of fertilizer and pesticides, uses of farm machinery) applied to a given crop. Machines to make shoes are typically invented in one or another advanced country, but once they are on the market, they are available for use all over the world. This is not generally true for the results of agricultural research and experiments. I often point out, in this context, that the great hybrid corn revolution that swept the United States in the 1930s and 1940s turned out to require hundreds of different hybrid varieties. Often, a hybrid that produced ample profits in one county would be a failure in its neighboring counties. Thus, even when Ghanaian farmers can truly profit from the results of agricultural research in the rest of the world, these results typically need to be further refined and adapted to Ghana's soil and weather before the stage of profitability is reached.

So there is an important role for public sector action with respect to agricultural research, and, of course, for the extension activities to make the results of that research available to farmers. It is important to realize, however, that in these as well as most other activities, the results turn on how well the job is done. An important issue here is the capacity of the teams that design and undertake agricultural research. Ideally, the leaders of these activities should have extensive training plus practical experience in major world agricultural research centers. And almost automatically this raises questions concerning the salaries and working conditions that are needed to attract such people. Experts from the advanced countries are likely to be far too expensive. Hence the need to ensure a steady flow of Ghanaians studying and gaining experience in the various world centers. These will be less costly (than foreigners) to attract and retain, but it is still likely that it will require serious effort to do so. One really wants to have, in the research leadership, people whose abilities and experience are strong enough to give them genuine opportunities in the worldwide market for scientific talent.

**Diversification Within Primary Exports?**

The preceding two sections lead quite naturally into the question of whether future products that prove to be of comparative advantage to Ghana might not themselves tend to be concentrated in the primary products sector. Manufacturing is composed very largely of footloose industries. It is very hard to imagine that a particular place would be especially good for making textile products, but quite bad for making shoes or kitchen blenders. But it is very easy to imagine that a country could be a natural place for the cultivation of bananas, mangoes and dates but not for apples and pears. This simple comparison suggests that whereas it makes little sense to try to pick winners in advance within manufacturing, it may be quite reasonable to seek out possible new primary products that have a good chance of being in a country's comparative advantage.

Chile provides a very interesting example of this point. Before Chile's takeoff as Latin America's growth champion of the past quarter century or so, it was known for its wines but had no exports of table grapes; no kiwis were produced on its soil; and no salmon were cultivated in its southern fjords. Yet today, taking advantage of the reversal of seasons between the northern and southern hemisphere, Chilean grapes can be found piled high in the fruit sections of just about every U.S. supermarket during the first half or so of every calendar year. Also, Chile's kiwi production has grown to the point where its exports rival those of New Zealand in supplying markets in North America and Europe. Finally, Chile's originally nonexistent salmon industry has grown to the point where it rivals Norway and Scotland (also blessed with many fjords) in the race to be the top salmon-exporting country.

These achievements and many more were helped to be set in motion by public-sector sponsored research and investigation. The end result has been a greatly expanded list of

important Chilean exports, with the characteristics, however, that the great bulk of them come from the primary sector. This is what one would expect once one recognizes that Chile has little hope of challenging China, India and Indonesia in low-end manufacturing, but can confidently claim a place in supplying the world market with maritime, agricultural and mineral products. On this basis Chile has shown Latin America's highest growth rate of real GDP over the past four decades, and has found remunerative employment, at real wages that have more than tripled, for a labor force that has itself close to doubled over that period.

I am not here trying to predict the nature of Ghana's future list of comparative advantage products. But I do see two quite distinct roles for public policy in influencing that list. The first, relevant for all activities, is to create a healthy framework of general economic policy which provides fertile soil for new and old activities alike, in all economic sectors. The second is a battery of research and extension activities, designed to carry out functions that are beyond the capacities of individual farmers. One agricultural product in Ghana that seems to be revealing significant comparative advantage status is oranges. The reports we received tell of increasing investments in orange orchards, with highly remunerative returns. This is the kind of result that one seeks, in the entire effort of agricultural research and extension.

## On Oil, Once Again

This paper has argued that the onset of production from Ghana's oil reserves is not likely to itself cause a major appreciation of the Cedi, even if the government's share of the oil proceeds were to be fully repatriated. However, we have argued that the revenues generated by oil should be thought of not as income but as national capital. The challenge is to use that capital wisely.

The examples of Venezuela and Mexico highlight the temptations that are almost inherent when a big new revenue source suddenly opens up for a government. It takes courage and discipline to resist these temptations. One way of helping in this direction is that followed by Norway -- of simply treating all public revenues coming from oil exports as being strictly capital -- to be invested abroad and only abroad. Why only abroad? So as to take away the temptations and pressures linked to dozens of competing domestic uses, many of them being promoted by powerful political forces. In this variant, only the income from the Oil Fund comes to Norway each year. This is a much smaller and steadier flow than that stemming from the original exports of oil, and is more easily managed. The Alaska scheme of an annual oil dividend directly to the people is another route that might be taken.

The most sensible alternative to the Norway or Alaska solution is the one suggested by our Venezuelan and Mexican panels -- that of investing the oil proceeds abroad at a good rate of return, and then repatriating them gradually, over time, but only to finance projects whose expected real rates of return (to the economy as a whole) are clearly higher than the rate expected to be earned by the Fund. On this alternative it becomes critical to have a sound, professionally-based judgment as to the real rates of return that are to be expected from different possible domestic uses of the repatriated funds. A direct implication is that this provides an added argument for the establishment of a national system of investment appraisal, and of the training and support programs needed to ensure the quality of its work.

## A National System of Investment Appraisal

It is hard to think of the last alternative being implemented at all successfully if each potential project to be financed with repatriated funds were subjected to an ad hoc evaluation of its expected real rate of return, probably conducted or at least sponsored by that project's own

interested parties. No, in order for the idea to work at all well, the prospective returns of different possible objects of repatriation should be evaluated on the basis of a common set of sound professional criteria, the evaluation being conducted by an entity that does not have a direct interest or stake in the project.

All this can quite easily and rationally be accomplished via a national system of investment appraisal. Such an entity, like the auditors of an accounting process or the U.S.'s General Accountability Office, would be separate and independent of the projects themselves. But it would not be sensible to establish such an office just for the use of repatriated oil proceeds. Its natural scope is the evaluation of public sector investments, regardless of how they are funded.

To me, the careful evaluation of public expenditures is the great public finance challenge of the 21st century. The nations of the world have made amazing progress in the last 30-40 years in improving the tax side of the public finance ledger. Tariffs in developing countries have been greatly reduced and made more nearly uniform. Top income tax rates, which ranged over 90% in the early 1950s and up to 70% in the early 1970s have been brought down significantly. The value added tax, probably the least distortive of economic decisions, among all the major taxes, has spurted to become the largest single source of worldwide tax revenue. These great achievements were made possible by small groups of technically-trained people operating in the ministries and agencies of country governments, in international organizations such as the IMF and the World Bank, and in bilateral aid agencies, including USAID). It didn't take armies of people to achieve what look like miracles in the tax policy field. A few platoons of well-placed experts seem to have been enough.

But the field of investment appraisal (also known as project evaluation or cost-benefit analysis) is different. It is not that some broad categories of projects are all good, while other

broad categories are all bad. The facts are that some road projects have very high expected returns and are of urgent priority, while other road projects have no promise of even producing benefits equal to their initial investment costs-- their expected real rate of return is negative. It is just the same with electricity projects, port projects, irrigation projects, etc., etc.

So one needs battalions of trained people to do the job of investment appraisal, whereas it took only platoons to work wonders in the area of tax reform. The horrible truth is that it can be a big mistake to start a program of investment appraisal if one does not have the right people, and enough people.

The best advice is to start from the bottom with serious and continuing training programs. Then one should build evaluation cadres at a pace which incorporates more and more people, as they come out of the training programs. Highway projects are a good place to start, because the cost-benefit methodology is well-developed and quite straightforward. Moreover, experiences of widespread traffic congestion suggest that many viable highway improvement projects are out there, just waiting to be done. From the highway project area one could proceed to general public works, and then on to an even broader classification of projects.

We had serious discussions with Ghanaian authorities and economic advisers, of the need to proceed along these lines. They were very receptive to these ideas, but rightly concerned with the problems of starting and maintaining such an operation. There was special sensitivity concerning how to deal with the strictly political aspects of investment appraisal. How do you say no to a project that has powerful political support? To this concern most cost-benefit experts recognize that science does not trump politics most of the time. But it helps to be able to establish that project A (which has strong political support behind it) has a negative present value, in strictly economic terms, of, say, $100 million, while project B (which the political

forces may like only a little less) has a negative present value of just $10 million. And maybe the experts can point to project C, also an alternative to A, but with an economic present value of plus $20 million. With this information, the authorities might often be persuaded to accept B, or even better, C, in preference to their uninformed choice, which would be A.

This is not the place to give a full development of the arguments in favor of a formal system of cost-benefit analysis. Let me just say that it is a big plus for a government to have knowledgeable people in this field sprinkled up and down, throughout the ministries, agencies, provinces, municipalities, and legislative bodies that deal with decisions on public expenditures. Some bad ideas can be aborted very early, and others can be modified so as to eliminate their worst features (from an economic cost-benefit point of view).

Before closing this section let me add that perhaps the worst strategy is to establish a big agency with wide scope over investment decisions -- before an adequate cadre of trained people can be assembled. This can create a vested bureaucratic interest with the wrong leaders and the wrong troops, which will only make it more difficult to insert the right trained people, when they finally come along.

Instead of starting with a vast program, but without the right people, the goal should be to establish one or more serious training programs within Ghana, capable of producing a steady flow of well-trained people;. A one-year master's level course is what is called for. But before establishing that one needs the key people to staff the run it. Here one should probably rely on people trained in the best world centers and perhaps with experience in entities like the World Bank and the regional development banks. That is a first step that should be of the highest priority.